We Can't Get There in Time:
Assessing the Time between Classes and Classroom Disruptions

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Abstract

In response to student and faculty complaints about the amount of time available to travel between classes, an analysis of the time between classes problem was conducted at a large, public research university. Using facilities, course scheduling and student survey data, we discovered that many students had distances to travel between classes that would normally take longer than the allotted ten minutes. This forced them to leave class early, arrive to class late or skip class altogether and often left them with an inadequate amount of time to complete exams. These analyses supported a decision to implement a policy regarding student scheduling.

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The Challenge

The issues of time and distance between classes arose from student and faculty complaints at the University of Maryland, College Park, a large, public research university. Students had become increasingly vocal about the difficulties they experienced arriving to class on time when they had only ten minutes to walk across campus. Given that the campus is approximately two square miles and consists of more than 400 buildings, few faculty and administrators were skeptical of the problems students were encountering. In addition, faculty were complaining of disruptions in class due to students arriving late and leaving early, and some faculty claimed that students had approached them with concerns about arriving to class on time when they were faced with only ten minutes to make large treks across campus.

A recent article in the *Chronicle of Higher Education* (Schneider 1998) suggests that these problems are not isolated. Student incivilities are frequent and range from arriving late to classes to physical assaults on faculty. Research indicates that classroom incivilities, often in the form of disruptions, continue to have a tremendous impact on classroom learning (Boice 1996).

Students arriving late to class and leaving early are the most common forms of uncivil behavior (Boice 1996). Most would agree that these disruptions can be attributed to individual student motivation and disinterest (Wyatt 1992); however, on a large campus students may be arriving to class late and leaving early because of the distances they must travel to get from one class to another. Does the common ten-minute interval between classes give students enough time to get from one side of the campus to another?

While a great deal of attention has been paid to students' reasons for disrupting class, little research has been done to assess the impact of distance between classes and classroom disruptions.

If the allotted time between classes were not enough, many campuses would be faced with a difficult and perhaps costly policy decision. Colleges could simply choose to accept students' tardiness and change scheduling practices by increasing the amount of time between classes. To make such a significant change in scheduling would create logistical challenges and cost perhaps thousands of dollars to implement. Colleges could also take measures that would attempt to change student behavior. Either option is certain to be difficult and costly. Before making such a dramatic policy decision, colleges would be wise to assess the impact that distance between classes has on students.

The University of Maryland was faced with such a policy decision. With an undergraduate student body of about 25,000 students, the University is the flagship campus of the Maryland system. The average age of the undergraduates is approximately 21 years. Most of these students attend the university full-time, but many also commute from surrounding areas. Only about one-third of undergraduates actually reside on campus. In recent years the institution has become increasingly selective in its admissions, with average SAT scores rising quite dramatically.

A campus committee, chaired by the associate dean of a large college and made up of equal numbers of both administrators and faculty, was appointed by the Provost to address the issue of distance between classes. The committee was assigned the task of assessing whether the time between classes was a problem for students and how it impacted the campus. Understanding the extent of the problem was especially important

given the substantial costs of proposed changes to the class schedule. The campus had not performed any previous analyses on this topic, so the Office of Institutional Research set out to collect and analyze data that would inform and assist the committee in their decision-making.

Approach

In collecting reliable information for the task force, we combined "hard" data from the university course scheduling system with "soft" student survey data. To understand the extent of the problem we first estimated the time it takes to walk between classes using Fall 1999 facilities and course data. We then used the data to classify undergraduate students into three groups: students with no Monday-Wednesday-Friday (MWF) back-to-back classes, students with MWF back-to-back classes who could travel between the classrooms in ten minutes or less, and students with MWF back-to-back classes whose travel time between the classrooms was greater than ten minutes. (Tuesday-Thursday classes were not considered because of their longer fifteen minute break between classes.)

These three groups of students were surveyed via email and the Internet to determine their support for changing the course schedule as well as their actions in response to the time between classes problem, and why they chose a course schedule that made it difficult to travel between classrooms. The survey was conducted at the beginning of the Spring 2000 semester and comprised an initial email describing the location of the survey website, followed by three reminder emails to nonrespondents. The response rate was 40%.

We explored several reasons for nonresponse. While the institution assigns an email address to every student, many students use other email addresses and rarely check the one assigned by the institution. Because the institution only collects one email address, we cannot be certain whether students read our emails. To further investigate possible biases due to nonresponse, a follow-up telephone survey of student nonrespondents was conducted the week after the student survey ended. Most explained that they were either too busy to respond or that they had not received the email. Only slight differences existed between those that responded via email and those that did not.

Calculating times and distances between classes

To understand how long it takes to travel between classrooms across the campus, the Office of Records & Registration initially approached the problem by having students actually time how long it took to walk between pairs of buildings. The magnitude of this effort quickly became apparent and the project was abandoned. There are almost 4,500 unique building pairs for courses taught during the Fall 1999 semester, and having someone walk and time the distances between all the pairs was simply not practical. Indeed, this was the major stumbling block for the project, and we were forced to develop an alternative method to measure the times and distances between classrooms.

Our solution was simple. We combined the two-dozen building pairs that had been measured (before they abandoned the project) by Records & Registration with an estimated distance for each pair to run a bivariate regression model predicting travel time using estimated distance. We then applied the results to the estimated distances for all building pairs to derive an estimated travel time for each building pair. This approach

allowed us to calculate a reasonably accurate travel time that only required measuring travel times between a few building pairs. Given the time constraints faced by the committee, and the resources required to actually measure the travel time between each building pair, this seemed the best choice.

At our request, Facility Drawings generated a detailed map with a layout of 100 yards per grid square. Each grid line on the map was numbered starting with zero. The grid coordinates for each classroom building were then determined and used to calculate the Euclidean distance (i.e., distance "as the crow flies") in hundreds of yards between each possible classroom building pair using a statistical software program.

From their previous attempt, Records & Registration had already timed approximately two-1dozen trips between building pairs. Combining these times with their respective calculated distances in a simple bivariate regression provided an estimated walking time per hundred yards of distance. The bivariate regression equation fit the data well (R^2=.88), and according to the model results it takes on average a little over one minute to walk 100 yards across campus, a plausible result.

Using the estimated distances from the grid map calculations and the relationship between walking time and distance from the regression model allowed us to estimate a travel time for *all* instructional building pairs on campus. Two minutes were added to these times to account for miscellaneous activities such as bathroom breaks between classes and the time it takes to get from building entrances to classrooms.

Table 1 shows the distribution of walking times for undergraduate students with MWF back-to-back classes during the Fall 1999 semester. The first column gives the number and frequency of student/classes per week. For example, if a student has a class

on MWF that is followed by a class that meets only on Monday, she is counted once in this column. If she had a class on MWF followed by another MWF class, this student is counted three times. The second column gives the number and frequency of only students without taking into account the number of classes. Out of the 8,924 students with back-to-back classes, 2,570 (28.8%) have one or more back-to-back classes with walking times of 10 minutes or more. These students comprised 10.4% of all undergraduates registered during the Fall 1999 semester.

From the preceding analysis, we can see that the time between classes problem is substantial. During the Fall 1999 semester over 2,500 students registered for classes that were too far apart to travel between during the ten-minute break. While it is possible that these students were still able to travel between classes in the allotted time, such a large number of students indicate that class disruptions due to these schedules could be significant.

Survey data

Student responses to not having enough time to travel between classes are listed in Table 2. Students in the third group, those students registering for at least one pair of MWF back-to-back classes in classrooms greater than a ten-minute walk apart, were asked their actions in response to their back-to-back class schedule. Students were allowed to choose more than one action. Only 23% responded that they had enough time traveling between classes. The most common student response was leaving class early, with over half the group indicating that they chose this course of action. About 12% indicated they arrived for class late, and about 11% simply skipped class. Disturbingly,

almost 40% stated they had difficulty completing examinations because of their schedules.

The survey results indicate that over three-fourths of the students estimated by our algorithm to have problems traveling between classes did indeed have problems. Most of these students reacted by leaving class early, with smaller proportions arriving to class late or skipping class altogether.

In addition, we note that these disruptions are not randomly distributed amongst all class types. Because juniors and seniors will be taking a larger proportion of courses that satisfy their major, and because courses within a major tend to be taught within the same one or two buildings, freshmen should be more likely to have problematic class schedules. Using our estimated data from Table 1 and information about student class, of the students with back-to-back classes on MWF in Fall 1999, freshmen were less likely to have ten minute or less travel times than upperclassmen. Only 65% of freshmen with back-to-back classes had travel times of less than ten minutes, compared with 71% of sophomores, 76% of juniors and 76% of seniors.

Finally, we asked students why they constructed class schedules that made it difficult to travel between classrooms in the allotted ten minutes. Students were again allowed to choose more than one reason. The results are presented in Table 3. The two most common reasons were related to the courses themselves: either one of the courses was a required course or it was the only course offered at the time needed. Interestingly, the third most popular response was “wanted a compact course schedule.” Many students are registering for back-to-back courses not only out of necessity, but also out of convenience. From the focus group where we pilot tested the student survey, many

participants said that students schedule these back-to-back classes so that they won't have any “wasted” time by having a half-hour or hour between classes.

Conclusion

These data provided a great deal of insight into the problem of the time between classes and informed the task force committee about several aspects of the problem. First, the data indicate that the amount of time between classes is a significant problem at the University of Maryland, College Park. According to our analysis, a large proportion (over one fourth) of the students taking back-to-back classes on MWF do not have enough time between classes to arrive on time to their next class.

Second, the limited time students have to travel from one class to another is affecting the learning process. It causes students to leave class early, arrive to class late, and skip classes altogether, impacting both the individual student and the classroom as a whole. The time between classes also appears to limit the contact some students have with faculty. Most alarming is that a large proportion of students indicate they have encountered difficulties in finishing exams due to the time they have to travel between classes. Freshmen are also more likely to have back-to-back classes in rooms far apart. Given the research that indicates the importance that the first year of college has on the success of students, this is of particular concern.

Students indicated that they selected their back-to-back scheduling for many reasons, but most did so out of necessity. Students were forced to schedule classes due to limited offerings, major course requirements, and time conflicts. However, students’ reasons for scheduling back-to-back classes also indicate that they do so not only because

of the unavailability of courses but also out of convenience. Many students want compact schedules and appear to recognize the problems in scheduling back-to-back courses. Given that today's students often work to help pay for their education, it is not surprising they would want a compact schedule that allows them to pursue those efforts. As the traditional college education where students reside on campus and attend school full-time gives way to students living at home and working while attending college, administrators must increasingly take into account the external pressures faced by students when determining scheduling policies.

Currently classroom capacity is well over 90%. Given that the university was almost at capacity, it was not possible to simply add more courses to alleviate the problem. Instead, possible solutions focused on changing when and where current courses are taught. Armed with our data, the planning committee had several options.

The most obvious choice was simply to *change the current Monday-Wednesday-Friday schedule to increase the time between classes*. To implement such a change, the campus would have to choose between two dramatic adjustments to the current schedule: decrease the number of class periods on a given day or extend the schedule. Extending the time between classes would require a redistribution of classes. An analysis by Records and Registration demonstrated that with the current set of classrooms there would not be enough classroom space if the ten-minute break were increased by five minutes.

Under the second option, the schedule would have to be expanded so that the day begins earlier and ends later. However, survey data indicated that faculty and student support for expanding the length of the class day was very mixed. Not surprisingly, over

40% of students supported lengthening the class day only in the afternoon. A large proportion of faculty supported expanding the schedule, with 4% wanting only the day to begin earlier, 26% wanting only the day to end later, and 28% supporting both the day beginning earlier and the day ending later. Forty-two percent supported keeping the current schedule.

Given the diversity of opinion in the university community, the committee was reluctant to recommend a change in the class schedule. Another factor in their thinking was the potential cost of implementing such a change by reprogramming the university's course registration system. Although this cost was not actually estimated by Records and Registration, they indicated that this change would not be cheap.

Another possible option was to force a change in the distribution of classes, which tend to be clustered during the middle of the day, to a more uniform distribution of classes throughout the day. Informal feedback from faculty indicated that faculty were happy with the scheduling system. In addition, by spreading out classes, it would be more difficult for students to schedule a compact class schedule, which as indicated earlier was one of the prime reasons for their back-to-back classes in rooms far apart.

There were several other possibilities the committee did not consider. One was to reverse the solutions discussed above: rather than change the schedule and keep classes in their current location, for some institutions it might be possible to keep the schedule static but change the location of the classroom. This could be achieved in one of two ways. Classes could be moved to reduce the number of back-to-back classes in rooms far apart. This option was not considered at College Park because classes within a major tend to be grouped together in the same building. Also, there is no general pattern with general

education required classes at College Park, making it difficult to devise a plan to group these classes within specific buildings. Faculty would also be a potential obstacle to adopting this course of action. Faculty prefer to teach in their own buildings, not only for the sake of convenience but also because of ease of advising and working with students before and after classes.

The second way to change class locations is to go virtual, a process many institutions across the country are beginning to adopt. However, previous policy decisions by the university not to seriously pursue distance education due to the institutional mission prevented this alternative from being considered. For institutions with the infrastructure in place for distance education, this would be an effective way to handle the time between classes problem. Where feasible, courses that attracted large numbers of students with classes immediately following could also offer an online version for these students.

Armed with our analysis, the committee was faced with a difficult policy decision. They had two options: they could either accept student scheduling behavior and change the current scheduling system, or they could keep the current schedule and take measures that would attempt to change student behavior. With so many students experiencing problems, the committee knew that some action must be taken to help alleviate the problem.

Given the costs, logistical limitations, and the enormous task of changing scheduling practices by increasing the time between classes from ten to fifteen minutes, the committee recognized the impracticality of allowing more time between classes. They recognized that a problem did exist and began to search for other solutions. One

inexpensive solution was to use the results from our distance-time analysis to flag students at registration who may have problems. Currently, the University is working to implement a warning into the registration program that will notify students when they have scheduled back-to-back classes that are more than a ten-minute walk apart. So, as student register for classes by phone or the Internet, they will be warned when they are scheduling back-to-back classes that may be in buildings that are too far apart.

Given the lack of clear support and costs involved, the final solution was an incremental one. Records and Registration would institute the distance warning flag into the online course registration system. The distance analysis would then be replicated to see if the proportion of students registering for back-to-back classes in rooms far apart changed over time. If it does not, then the issue will be revisited and above options reconsidered.

References

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Table 1. Distribution of the Time Between MWF Back-to-Back Undergraduate Classes, Fall 1999

	Student/classes per week		Students	
Time between classes	Number	Percent	Number	Percent
Less than 10 minutes	13,251	69.9%	6,354	71.2%
10 - 10:59	1,555	8.2%	659	7.4%
11 - 11:59	1,168	6.2%	540	6.1%
12 - 12:59	623	3.3%	336	3.8%
13 - 13:59	862	4.5%	408	4.6%
14 - 14:59	819	4.3%	326	3.7%
15 - 15:59	408	2.2%	184	2.1%
16 minutes or more	264	1.4%	117	1.3%
TOTAL	18,950	100.0%	8,924	100.0%

Table 2. Student Reactions to the Time Between Classes Problem

I left class early.	56.6%
I arrived at class late.	12.1%
I skipped class because I was running late.	10.7%
I had difficulty completing in-class examinations.	39.0%
I was unable to speak with the instructor after class.	11.0%
I did not have any problems getting to class on time.	23.1%

Note: N=290. Question: "Which of the following did you tend to do because of this back-to-back class schedule? Please check all that apply."

Table 3. Reasons Why Students Schedule Back-to-Back Classes in Rooms Far Apart

Accommodate my work schedule.	25.2%
Accommodate family schedule.	3.1%
At least one is a required course.	49.7%
Only course offered at the time I needed.	43.1%
Only course available when I scheduled classes.	30.3%
Wanted a compact schedule.	37.6%
Limited course offerings.	24.1%
Had other scheduling conflicts.	35.2%
Transportation issues (bus, metro, car pool, rush hours, etc.).	6.2%
Other.	5.2%

Note: N=290. Question: "Why did you schedule these two courses back-to-back? Choose as many reasons as apply."