

MEASURING STUDENT PARTICIPATION AND EFFORT

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ABSTRACT

No matter how well designed a course is, students will not learn unless they put a reasonable amount of effort into the learning process. A problem for many students and educators is in determining exactly what a reasonable amount of effort is. Many studies have focused on the issue of attendance, documenting a clear link with success. However, in the age of e-learning new conceptions and measures of participation and effort are required. This paper will present data comparing measures of student effort with student success on an online course. The findings are discussed in relation to the possibilities for improving automated feedback mechanisms for students, instructors and advisors.

KEYWORDS

Effort, Participation, Attendance, Learning Management

1. INTRODUCTION

In studies of student participation and effort, most work has concentrated on the simple measure of attendance. Many studies have found that class attendance positively affects performance. This relationship has been found across a number of subject areas, such as: Economics (Romer, 1993; Durden and Ellis, 1995; Cohn and Johnson 2006), Psychology (Gunn, 1993; Launius 1997), Sociology (Day 1994), Business (Rodgers 2001; Rodgers, 2002), and Biology (Gatherer and Manning 1998). A minority of studies, such as Buckles and McMahon (1971) and Douglas and Sulock (1994), have found that class attendance is not a significant factor in performance.

On balance these studies provide evidence of the value of requiring attendance for students in conventional face-to-face courses. However, the question is not as clear for online and distance courses, where there is often no requirement to attend at a particular place or at a particular time. In fact, this is often seen as a specific benefit of the online mode of instruction.

There have been relatively few studies on the relationship between attendance and performance in distance learning classes. Cheung and Kan (2002) reported on students enrolled in a business course at the Open University of Hong Kong; they found a relationship between tutorial attendance and performance in a hybrid course. Riffell and Sibley (2005) evaluated the effectiveness of the online portion of a hybrid course in an introductory environmental biology course for non-science majors and found no relationship between lecture attendance and post-test scores. In a third study, Picciano (2002) studied a totally asynchronous online graduate education administration course, dividing the students into three groups by level of participation. He found no difference in exam performance, but the high participation group (measured by substantial discussion board posts) scored significantly better on the written assignments.

In online courses much or all of the interaction is asymmetric, and participation can be defined by activities such as logging in to symmetric class sessions, participation in discussion boards and forums, and reading class materials. Students who require substantial direction from the instructor may have problems with the asynchronous environment, which demands a certain level of self-discipline (Bullen 2007).

2. A STUDY OF PARTICIPATION

In order to investigate participation and its relationship to performance, data from an online course was analyzed to determine the effect of various measures. The course, part of an online Masters program in Library and Information Science, ran in the spring semester of 2007. Data was collected from 30 of the 32 students on the course. Two students were excluded: one ceased to participate half way through the course and did not respond to correspondence from the university, and the other was working with the instructor as a research assistant, which may have affected her participation rate compared with other students.

The students were given flexibility in terms of how they participated in the course. There was a choice among a predominantly asynchronous mode, attending synchronous class meetings, or a hybrid of both. The synchronous class meetings took place on 12 consecutive Monday evenings and lasted for two hours; if students chose not to attend, they were asked to participate in threaded discussion boards for the week they missed.

In each week of the class a number of research papers were covered. Students were encouraged to discuss issues arising from these readings in both the class and the discussion forums. The number of times someone spoke in class (asked a question or provided a comment), the number of emails to the instructor, and the number of posts on the weekly discussion boards were counted. Only voluntary posts in which students made an original point were counted. In addition, the total number of clicks for each individual on the course web site was calculated using the automated tracking feature of the course Learning Management System (LMS), Blackboard. Table 1 shows the overall data for the students who completed the course; there was a large spread between the lowest and highest participation rates.

Table 1. Measures of student participation

	Highest	Lowest	Average
Discussion posts	54	0	13.67
Class utterances	44	7	15.3
Email contacts	21	0	4.33
Combined score for the measures above	89	13	33.3
Course web site clicks	5017	1468	2871

Statistical analysis was carried out using two measures of participation: combined participation score (number of times a student voluntarily spoke in class + discussion posts + email contacts with the instructor) and the web click rate on the course web site. The combined measure was taken to be the most appropriate given that students were given flexibility in how they participated in the class. The performance measure was not the overall grade on the course, given that this was partially determined by participation. Rather it was based on the scores for the final exam, which consisted of three short essay questions. The average score for this exam was 16.85 (out of 20), the highest score being 20 and the lowest being 7.

Table 2. Statistical analysis of student participation

	Group 1	Group 2	T value
	Average Exam Score	Average Exam Score	
Composite	18.86	15.66	0.014
Course web site clicks	18.60	15.95	0.032

Two groups were compared in their exam performance. Those scoring above the mean for the participation measure were compared with those scoring below the mean. Roughly a third of the class scored above the mean in terms of course web clicks (Group 1, n=10) and the combined measure of class utterances (n=11). From table 2 it can be seen that those who scored above the mean for the combined measure of participation performed significantly better in the exam than those who scored below. It can also be seen that those who scored above the mean for the number of clicks they accumulated on the course web site performed significantly better. This would suggest that there is value in an instructor collecting and monitoring these measures to identify students whose effort levels may be below those that are required for course success.

The measures available are relatively crude, in that they are quantitative rather than qualitative. The number of discussion posts, web clicks, emails, and utterances are being recorded, rather than their specific helpfulness to the learning process. In addition, the click count can be distorted. For example, new users of an LMS will increment this count through mistakes while navigating through the site. It also could be easily manipulated by students who employ random clicking because they know the instructors are monitoring the

click rate. On the other hand, it is also reasonable to expect motivated students who put a lot of effort into reading threaded discussion posts, accessing all materials, and contributing many posts to accumulate a higher click count.

3. DISCUSSION

There is scope for those who develop LMS software to greatly improve the data collection and reporting features for online attendance and participation. Of the three measures used in this study only one (click count) was collected automatically. The attendance and discussion posts per person had to be counted manually. Those designing tools for educational use could greatly improve the participation reporting features available. The number and size of reports could be detailed in a way that showed students' relative contribution to the online discussion of course material. One possible measure of quality is the number of responses that occur in reaction to an initial post. High quality posts may engender more responses from others in the class.

It is possible to develop and evaluate more sophisticated text analysis tools that provide some analysis of the actual contributions submitted. Jeong (2006) reported on the development and use of such tools, with which he analyzed the language used in threaded discussions in an online class. Jeong's tools (<http://garnet.fsu.edu/~ajeong/ForumManager>) require the download of data from the Blackboard LMS to an Excel spreadsheet.

LMS systems could improve their web click reports by providing more specific information on what has been clicked on. It should be possible to separate out navigation clicks from clicks on content. In Blackboard it is possible to set up tracking of individual content items. However, this must be set up manually for each item and the instructor has to navigate to each tracked item and call up individual reports.

Given that there is some evidence to suggest that participation data is important, there are implications for class management and student advising. The role of academic advisor may be greatly enhanced by allowing the aggregation of participation data across all courses to be tracked for each student. This would allow quick identification of students whose participation falls well below the average and provide the ability for both advisors and instructors to be proactive in offering remedial assistance and advice. Students may need specific guidance in adjusting their effort when transitioning between different levels (high school to college) and modes (face-to-face to online) of learning.

In addition to providing better tracking and feedback to instructors and advisors, there is a case for reporting the tracking data directly to the students themselves. Students currently get feedback on their scores on assignments through an LMS. In addition to receiving their own score on an assignment, they can see how their score relates to the average score for the class. It would be interesting to investigate the effect of students being able to see their own participation measures on an online course and how these relate to the class averages. Meaningful information may prompt some self-reflection by students on their effort relevant to the class as a whole.

4. CONCLUSION

There is substantial evidence that class participation, no matter how crudely measured, is an important factor in academic success. In traditional forms of instruction, participation has primarily been measured by class attendance. There are relatively few studies considering an equivalent (or improved) measure in e-learning.

In this paper we have presented data suggesting that some participation data has predictive value for relative success of a student. The combined measure of participation (email, class utterances and discussion posts) and the course click count appear to be good predictors of exam performance in an e-learning course. There is scope for further research to examine the issue of participation in online courses and how its measurement may be better refined and automated.

The findings have implications for those who build learning management tools, suggesting the need to improve the tools' student tracking features. If student inputs (effort and participation) can be tracked in the same way as student outputs (assessment scores), instructors would have a powerful mechanism for the early identification of students who on a track to failure, allowing them to intervene earlier and with possibly better results.

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