Chapter 8.9
Improving the Tracking of Student Participation and Effort in Online Learning

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ABSTRACT

Much research into educational technology is focused on tools for supporting teaching and learning. In contrast to this work, relatively little research is conducted into technology that tracks student participation and effort. No matter how good the educational technology, learning is dependent on a sufficient input of effort from the student. Most Learning Management Systems have some tools for tracking students, but they are currently difficult to use and underused by instructors. This chapter examines the importance of tracking in student management, reviews attempts to improve the quality of tracking tools, and suggests paths for future research based on the deficiencies in current tools.

INTRODUCTION

The focus on educational technology has mostly been to create better tools for teaching and learning. The emphasis is on supporting the teacher's design and operation of a course while assuming the student comes to the course with the right set of attitudes and behaviors. There is another side to the formula leading to successful learning and that is the student participation and effort. No matter how well a course is designed, and no matter how good the content or technology, students will not succeed unless they put effort into their learning. For reasons out of the control of the instructor, a student may not be in the correct psychological frame of mind for learning. They may not be aware of the level of effort required, or may have too many other commitments and distractions to provide the right amount of effort.

Traditionally, one of the main tools for measuring participation and effort has been class attendance. Studies of class attendance show that it is strongly correlated with class performance. For

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example, Romer (1993) compared student performance and attendance in an intermediate undergraduate economics class and found a statistically significant relationship, with the performance of students who attended all lectures on average a full letter grade higher than that of students who attended a quarter of the lectures. Devadoss and Foltz (1996) reported a similar relationship in a study of 400 students from four universities over three semesters. Chen and Lin (2008), quantify the effect as corresponding to between a 9.4 and 18% improvement in exam performance for those who attend classes.

The findings related to attendance can lead to class attendance being required, or at least a requirement for monitoring attendance. At primary and secondary educational levels there may even be a policy of notifying parents when a student fails to attend a class. This only deals with the problem on a physical level, given that a student can physically attend but cognitively be absent from the proceedings in class. Although there is a long established literature on student motivation (Keller, 1983), and there are certain teaching techniques that can be employed to encourage cognitive participation and keep students' attention (e.g. breakout groups, random questioning), there are usually opportunities for students to tune out of what is going on in class. There is an element of self-discipline involved in learning and when this is lacking it needs to be identified and the student provided with appropriate feedback and counseling.

The potential for daydreaming in class has been supplemented by the potential distractions provided by technology in the classroom. Allowing laptops and mobile devices in class may have educational benefits, but it also allows attention to be divided between text messaging and Internet browsing during class time. There is a myth that the modern student has developed a greater ability to multitask; this has no basis in scientific research. Dividing attention generally impairs performance, as has been shown by the distracting effects of driving and talking on the phone.

Online classes present both a problem and an opportunity in relation to participation and effort. The problem is that attendance at synchronous events is often not required, and when it is, students cannot usually be seen. In a face-to-face class, a teacher can to some extent monitor the level of cognitive attendance by looking at the facial expressions and gazes of the students in class. In an online class this feedback is absent and although a student may appear to be present, they could be watching TV at the same time as undertaking a class. However, in online classes technology used presents new opportunities for automatically tracking students and reporting the data to both them and their instructors.

This chapter will review attempts to develop better technology for tracking students' participation and effort on courses. This chapter will begin by considering research into the usefulness of tracking data. In the following section we will describe the typical tracking tools found in current learning management systems. We will then review the research efforts that have been aimed at improving the quality of tracking tools, providing some examples of tools that demonstrate the variety of concerns related to tracking tools (e.g. improving data visualization). Finally we will consider what research is needed in future, not only to improve the tools, but also to better integrate them into course management practices.

STUDENT TRACKING RESEARCH

There have been a number of researchers who have looked into the factors that may cause some students to not fully participate in an online class. Mason (1994) classified online participants into three groups: active participants, lurkers who process activity but do not contribute and those who do not take part. Taylor (2002) came up with a similar classification of workers, lurkers and