Outcome and Satisfaction Analysis for Online Exams in an E-learning Class

Neftali Watkinson and Lubomir Bic
Department of Computer Science, University of California, Irvine
Irvine, California
watkinso@uci.edu, lbic@uci.edu

Abstract—In recent years universities have been leveraging the use of E-learning to enrich their offerings. One of the main concerns when deciding for this route is to understand if the students will respond positively and if the instructor is experienced with this type of setting. The University of California, Irvine has a dual offering for ICS 6B - Boolean Logic and Discrete Structures, one traditional and one in a virtual classroom. In this work we analyze student outcome and satisfaction with the online experience and preference towards online or traditional exams. We discover that there is a very small correlation between grades and preference but we also found that most of the students who changed their opinion about online exams did it towards a positive one.

Keywords: E-learning, Boolean Algebra, Classroom, Canvas

1. Introduction

The University of California, Irvine (UCI), is under a transition towards hybrid (online and traditional) classes. Some of the low level courses have very large enrollment numbers, and in order to supply to the demand, students are given the option of taking some classes on a completely E-learning platform.

ICS 6B: Boolean Logic and Discrete Structures [2] is an introduction to Discrete mathematics and is a required course for all Computer Science and Computer Engineering majors at UCI. It is also taken as an elective course by many other majors to satisfy math requirements. A similar course is offered at most other universities worldwide. The course covers fundamental topics of discrete mathematics, including logic, sets, functions, relations, proofs, Boolean logic, and models of computation, such as finite state machines and Turing machines. In some quarters, there could be as much as 500 students applying for it. The course is generally taken during the first or second year in the program when most students had no or very little exposure to online instruction delivery. Due to the large enrollment numbers the results of the comparison study are expected to be statistically significant as well as give us a good perspective on how students interact with online platforms.

2. Methodology

We opted for a completely online offering. UCI gives the instructor the option of having traditional exams, however, we opted for virtual proctoring. The students need to log into their account at a given time and they will be proctored using their web cameras and other tools that ensure they are not getting information from other sources.

Students interact with the professor online. There is a timed midterm and a final. The classroom is setup using a exclusive version of Canvas [1] (an online learning platform) and every assignment is graded on the same platform. On week 1, we asked the students about their opinion and previous experience with online learning. On week 10 we ask them opinion questions to see if their opinion changed.

We had an enrollment of 215 students, the final grade’s average was 83.7 (out of 100) with a standard deviation of 13.8. The midterm had an average score of 82 and a standard deviation of 20. The final had an average of 78 with a standard deviation of 30.

3. Results

We will discuss the statistics per survey and then do a cross analysis between them and include student performance.

3.1 Entry survey

Our entry survey had 5 questions with multiple choices:
- Have you ever taken an online class before?: 53% answered YES
- Are you taking this online version because the traditional setting was not available?: 50% answered YES
- Rate the following advantages of online class (percentage represents number of students who rated it as a major advantage):
  - Decreased commute: 39%
  - Able to listen to lectures at any time: 81%
  - Able to listen at any place: 67%
  - Able to repeat difficult segments: 74%
- Rate the following disadvantages of online class (percentage represents number of students who rated it as a major disadvantage):
  - Unable to ask live questions: 14%
Office hours are not in person: 19%
Need more self-discipline: 32%
• Do you prefer online exams or exams in the traditional setting?: 20% answered that they prefer online and 26% said they didn’t have a preference.

There is a slight bias towards traditional settings. 35 students (17%) that answered that they had previous experience with online classes answered they preferred traditional in-class exams. This might mean that there is a negative experience with online testing.

3.2 Exit survey

The exit survey contained the same opinion questions as the first one. We saw no statistical difference in the answers about the major advantages and disadvantages of online learning, however, in the last question about exam preference, 32% of the students answered they preferred the online setting with 21% saying they have no preference. 3 students (1.5%) changed their opinion from preferring online to prefer traditional, two of them had a final grade of B+, borderline A- and the other had an A-. 13 (6.5%) students changed their opinion from traditional to online, the average score being 88 with grades ranging from C- to A+

From all the answers, 22 students (11% overall) that said they had taken an online class before, changed their opinion from preferring traditional settings or having no preference to having a preference towards online exams. This implies that their experience with this class was more positive than we previous online classes.

The average score for students that had a favorable opinion towards online exams in the exit survey was 86.43, while the average score with an unfavorable opinion was 82.25.

There seems to be a slight correlation between academic performance and preference for online exams.

4. Analysis

While our surveys where directed towards general perception about online environments, it turned out that the topic of online versus traditional exams yielded the most interesting results. Before the experience, we theorized that students who generally did well in the exams would have a preference towards them. While those who had a positive view by the end of the class had a slightly higher grade average, the difference is not as high as we though it would be. We believe there are several reasons why a student might prefer one or the other, and these will have to be explored in the future, but the fact that a considerable group of students who had previous experience with online platforms positively changed their opinions, speaks well about this class. The main takeaways of this experience are:

• Online exams are challenging when following strict timing and proctoring policies. The average grade for both the midterm and the final shows that students didn’t have an easy experience
• Making online exams challenging grades has little to no effect in students’ opinion about them. We see a weak correlation between lower grades and negative opinions.
• Students should be exposed to online classes. Half of our students had previous experience with online settings.

4.1 Future work

In future experiences, we plan to review students’ academic history, as well as compare with the traditional class. We plan to look into specific topics that students in general have difficulties with and how they differ between online and traditional learning.

References