

Face-to-Face, or Online, That Is the Question

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ABSTRACT

¹ In this lightning-talk paper, we aim to invoke discussion on face-to-face (F2F) instruction versus online delivery of IT courses. As a case study, we experimented teaching a foundational course of information assurance in two consecutive years. We surveyed students and compared the effectiveness of teaching two sections of F2F and online teaching, side-by-side. Based on students' feedback, we argue that while online teaching can be as effective, F2F teaching should not be completely replaced.

KEYWORDS

Online teaching; virtual labs; virtual classroom; IT education

1 INTRODUCTION

In our university, the cyber security and IT program has experienced a rapid expansion and enrollment is quickly becoming capacity restricted. Online teaching has potential to be a solution for this issue. Many of our students are urban commute students and some of them work part-time throughout the school year. Therefore, there are potential demands from students for flexible online learning. As a case study, we conducted experiments investigating the feasibility of online teaching over 2 school years to teach a core IT course – the Foundations of Information Assurance (FIA).

2 THE EMPIRICAL STUDY

The course of FIA has lab components and covers a broad range of topics in cyber security and information assurance. According to [1], it is regarded as challenging for delivery in a short quarter. We designed the course delivery into small components to engage students' active learning.

In year 1, we experimented teaching one section of face-to-face (F2F) with efforts to examine the feasibility of completing some core components online. At the end of the course, we conducted a class survey and found that 48% of the students (n=23) would have liked to take the course online while others

preferred to take F2F. All the students agreed that the course was designed well for online offering.

In year 2, we offered one online section along with two traditional F2F sections. Out of 102 participating students, 33% enrolled in the online section. One of the authors taught one online section and one F2F section. Both types of offerings were structured with the same course components. We used a virtual lab environment which is accessed online. A few other core components were presented using a learning management system. We experimented with creating virtual classroom platforms requiring student discussions for both sections. To evaluate the performance of online teaching, we compared the final exam scores using *t*-test analysis. Students from both sections took the final exam in an on-campus classroom setting. It shows that the null hypothesis of "true difference in means of class average is equal to 0" cannot be rejected with *p*-value greater than 0.05. Therefore, the performance in the two sections shows no significant difference, which agrees with the study in [2].

3 SURVEYS AND DISCUSSION

We have surveyed students for their feelings of each individual component's helpfulness to learning. We used Likert Scale method to collect the data. Independent group *t*-test was done for each correspondent component (textbook, active reading quiz, instruction, lab, lab quiz, online discussion, final practice) in the two sections. Except for the textbook, which showed that students from the online section felt the textbook more helpful (*p*-value < 0.05), there is no significant difference in feelings for any other course component (*p*-value > 0.05).

With the effectiveness and feasibility justified, the question becomes: Is there any concern to completely replace F2F classes with online teaching? We surveyed one F2F section of 39 students for the reasons why they chose F2F. They each showed strong feelings about their choices. Because 67% of the students chose F2F with valid reasonings, we argue that when we consider online teaching, F2F teaching should not be completely replaced.

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