

How Students Utilize Recorded Lectures for an In-Person Class

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Abstract

The COVID-19 pandemic caused university classes around the world to move from face-to-face classes to online instruction for the first time. Many instructors recorded their online lectures for asynchronous learning while others offered recordings of synchronous lectures. At North Carolina State University, the return to in-person classes meant more recording options for instructors. Recording capabilities were expanded to most classrooms on campus with instructors being able to opt-out of the recordings or limit student access to recordings.

The current study tracks student opinions and views of recorded lectures for a face-to-face undergraduate engineering course after the return of in-person lectures. Thermodynamics I is taught in the Mechanical and Aerospace Engineering department for sophomore MAE students and for students in other engineering disciplines. The course was taught in-person for the first time since the pandemic began in the fall of 2021. Student attendance was not required and all students were given access to the recorded lectures. After each exam, students were asked if they had watched the recorded lectures. Results show that a majority of students accessed the recordings and reported using the recordings to complement their in-class learning.

Keywords

Thermodynamics, lecture recordings, attendance

Introduction

During the spring 2020 semester, universities were forced to move classes online in an effort to limit the spread of Covid-19 among students, faculty, and staff. Online lectures were taught in a variety of ways with some posting recordings of the lectures. At North Carolina State University, undergraduate courses in the Mechanical and Aerospace Engineering (MAE) department were taught online through the summer of 2021. In August 2021, students returned to face-to-face instruction, and instructors had the option to record lectures and provide access to students.

A number of studies have looked at ways of using lecture recordings in teaching¹. Peart, et al.² and Gardner³ studied the effect of providing lectures recorded by Panopto and concluded that students found viewing the videos in addition to face-to-face instruction useful. Nadeem, et al.⁴ found that learning tasks done during an in-person class were more beneficial to students than if students completed the tasks asynchronously. Additionally, Bekkering, et al.⁵ found that attendance and attentiveness were good predictors of student performance along with Pilotti⁶ who concluded that attendance reflects a student's motivation.

The current study analyzes data from a section of Thermodynamics I during the fall of 2021 to determine how many students utilized the recordings and which recordings were most viewed. It

was unclear that semester if students would feel safe returning to the classroom or want to return given the mask mandate, so the study's author recorded each lecture and did not require attendance. The lectures were not live-streamed. This undergraduate course in the MAE department was taught face-to-face in a classroom and recordings were accessible to students through Panopto, the university's video management system.

Method and Analysis

The course was taught in the fall of 2021 similarly to how it was taught prior to the pandemic. Students were provided partial notes to follow during the lectures and given time to work on problems in class with their neighbors. Three tests and a final exam were administered along with weekly participation quizzes. For the first time in this face-to-face course, a classroom recording of each lecture was available to students on Panopto later the same day. These recordings were accessible for the rest of the semester. Panopto provides captions based on voice recognition, but these captions were not proofread before students could access nor was any editing done to the videos.

In the participation quiz given after each test, students were asked the following question: *Do you rewatch the lectures or part of the lectures? Please explain.* The enrollment in this section was sixty-seven students at the end of the semester. Fifty students completed all three quizzes and their answers are included in the self-reported data presented here.

After the first test, 70% of students self-reported that they had watched at least some of the recorded lectures. This number increased to 76% after each of the other two tests. Students provided various reasons for choosing to watch or not watch the recorded videos. The following responses are representative of what students self-reported:

Yes I do, it helps me understand concepts that I needed more time to think about in class when the notes are not enough.

I think that rewatching key parts of the lectures is helpful, but doing more practice problems is more important, so I try to spend more time doing that.

I would re-watch the solving part of the class problems

I do not rewatch the lectures. I usually feel like the notes provided answer all of my questions and that the homeworks give me good practice on the material covered.

The data for each student was compared to determine if their opinion changed through the semester. Twenty-nine students reported watching recordings for all three tests. Of the fifteen students that reported not rewatching the recordings for Test 1, four did watch for Tests 2 and 3 and seven students did not watch any for the semester. All of the students who watched some or part of the recordings for the first test then watched for either Test 2, Test 3, or both tests. Because it was not possible to administer a participation quiz after the final exam, the self-reported viewership for that period is not available.

Panopto provides instructors with information about who accessed each recording and how much of it was viewed. This data has been analyzed to determine how students utilize recorded lectures.

There were twenty-seven class meetings during the semester, including three test periods, so twenty-four lectures were recorded with Panopto. Figure 1 shows the number of unique viewers for each recorded lecture. Lectures 1-7 were given prior to Test 1 that was during the eighth class meeting, lectures 9-14 prior to Test 2 that was during the fifteenth meeting, and lectures 16-22 prior to Test 3 that was during the twenty-third meeting.

Because recordings were available to students for the rest of the semester, Figure 1 shows that students went back to watch many lectures after the test on that material had been taken. For Test 2, lectures 4-7 were accessed, and for Test 3 lectures 11-14 were accessed. To prepare for the final exam, every lecture recording was accessed by at least two students.

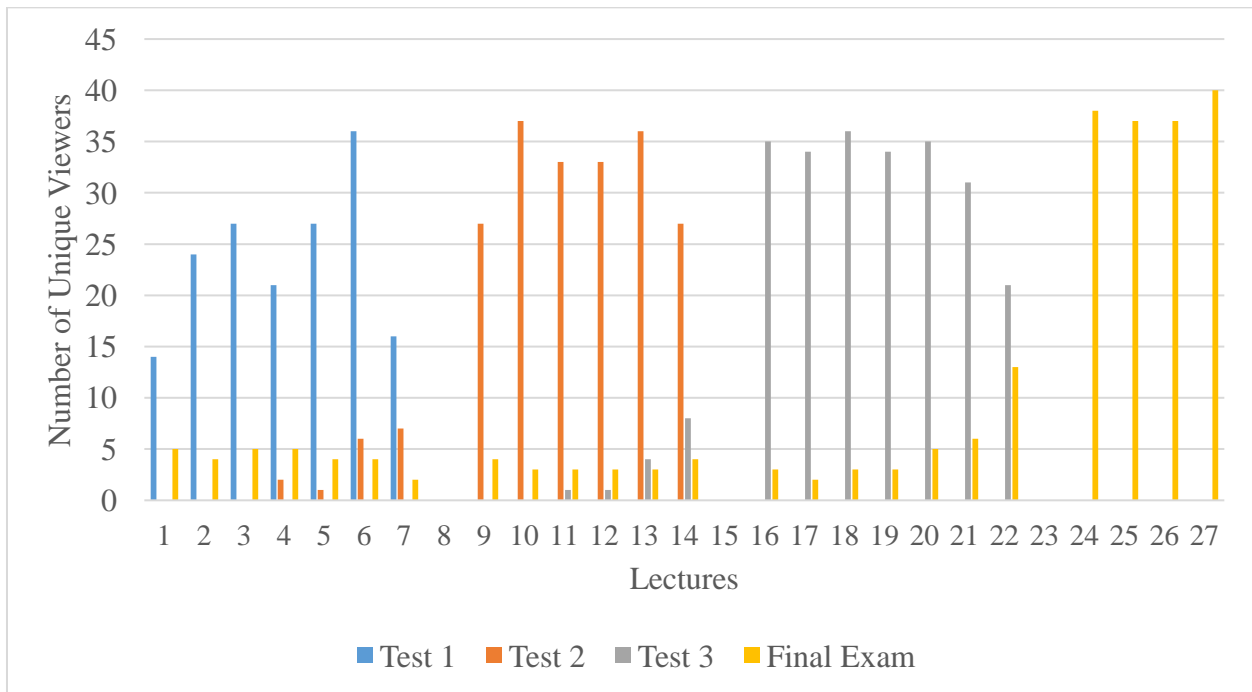


Figure 1. Unique Viewers for Each Lecture

Conclusions and Future Work

Students in an undergraduate Thermodynamics course were provided with access to recordings of face-to-face lectures. Over 70% of the students reported watching or rewatching some of the recordings and found them useful. Panopto statistics also verify that each recording was accessed prior to the final exam by at least two students.

Data from subsequent semesters will be included in future work to determine if the results are consistent. The statistics from Panopto will also be studied further to find trends in the parts of each lecture that are viewed most often prior to each test and the final exam. These results could provide the instructor with valuable information indicating the material that students find most confusing. Furthermore, student performance in the course will be compared to each student's use of the recorded lectures. The completed study should provide valuable information for the best use of recorded lectures in an in-person course.

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