Lecture Capture Pilot Project Results
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Background
Lecture capture is a set of technologies that record what takes place in the classroom so that students can review what was covered during class. Many lecture capture systems exist, at widely varying costs in terms of usability, infrastructure, and support. The capabilities of these systems range from do-it-yourself audio capture to fully automated capture of video and audio.

Over the past several years Academic Computing has initiated several efforts around recording lectures. They have: inquired into and responded to faculty and institutional interest in recording lectures; learned about initiatives at other institutions, including Stanford and Duke; explored technologies for capturing lectures, including classroom technologies and personal devices such as iPods; And they have tested and developed applications for publishing lectures, including iTunes and Blackboard. The background research collected by Academic Computing is very useful but in order to move forward with lecture capture, different possibilities need to be tested in Dartmouth classrooms.

A Lecture Capture Working Group (LCap) was formed in June of 2007 with representatives from Academic Computing, DCAL, the faculty, and the students to devise strategies for moving forward with lecture capture here at Dartmouth. The group, of which I am a member, has met regularly in an effort to investigate, test, and recommend lecture capture options for faculty. The LCap group does not believe there is a one-size fits all solution to lecture recording at Dartmouth; rather, they seek to better understand which technologies to recommend for different types of courses and teaching styles.

Based on initial investigations into possible technologies for lecture capture, the LCap group decided that the best approach was to start by testing a relatively low-tech solution – audio-recording only using iPods – in a range of Dartmouth classrooms. While capturing lectures with an iPod may not be adequate for all faculty members and classrooms, we believe it is a good starting point and might prove to be all that is necessary in some cases. Most of the content in a typical lecture or discussion-based course may be easily captured by an iPod. Audio-only recordings, however, in courses that make extensive use of small-groups or physical demonstrations may not be adequate.

The LCap group ran a Lecture Capture Pilot Program during the 2007-2008 academic year to determine the strengths and weaknesses of lecture capture using iPods in different classroom situations. With funding from the Computing Technology Venture Fund the group purchased 20 iPods that they distributed to faculty across campus to capture their lectures. Faculty, in turn, agreed to survey their students about the availability of the lecture recordings. Through the pilot program and survey we seek to answer several questions: Does access to recorded lectures...
improve learning? Does access to recorded lectures affect attendance? And, on a practical level, how do different recording methods measure up (e.g., audio only, audio and slides, synchronized audio and slides)?

Potential benefits of podcasting as reported by Duke University include (CIT, 2005):
- Convenience for both faculty and students of portable digital course content, and reduced dependence on physical materials;
- Flexible location-independent access to digital course materials, including reduced dependence on lab or library locations and hours;
- Effective and easy-to-use tool for digital recording of interviews, field notes, small group discussions, and self-recording of oral assignments;
- Greater student engagement and interest in class discussions, labs, field research, and independent projects;
- Enhanced support for individual learning preferences and needs.

Dartmouth Student Feedback

A survey, which was adapted from one developed at the University of Washington (Lane, 2006), was administered in 11 different courses. As shown in Table 1, the 11 courses included courses across different disciplines ranging in class size from 14 to 169. A total of 451 students completed the survey with an average response rate of 70%. Students were surveyed at the end of the term using either an online survey through Blackboard or SurveyMonkey.com or a paper survey distributed in class (I let the faculty members choose how they wished to survey their students).

<table>
<thead>
<tr>
<th>Course – Term</th>
<th>Survey Responses</th>
<th>Total Enrollment</th>
<th>Response Rate</th>
<th>Survey Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology 11 – Fall</td>
<td>120</td>
<td>169</td>
<td>71%</td>
<td>Paper</td>
</tr>
<tr>
<td>Biology 34 – Fall</td>
<td>18</td>
<td>22</td>
<td>82%</td>
<td>Paper</td>
</tr>
<tr>
<td>Chemistry 5 – Winter</td>
<td>60</td>
<td>105</td>
<td>57%</td>
<td>Paper</td>
</tr>
<tr>
<td>English 5 – Winter</td>
<td>13</td>
<td>14</td>
<td>93%</td>
<td>Paper</td>
</tr>
<tr>
<td>Psychology 26 – Winter</td>
<td>67</td>
<td>77</td>
<td>87%</td>
<td>Online</td>
</tr>
<tr>
<td>Biology 29 – Winter</td>
<td>23</td>
<td>26</td>
<td>89%</td>
<td>Paper</td>
</tr>
<tr>
<td>Biology 11 – Spring</td>
<td>53</td>
<td>73</td>
<td>73%</td>
<td>Paper</td>
</tr>
<tr>
<td>English 17 – Spring</td>
<td>11</td>
<td>23</td>
<td>48%</td>
<td>Online</td>
</tr>
<tr>
<td>Chemistry 51 – Spring</td>
<td>17</td>
<td>52</td>
<td>33%</td>
<td>Online</td>
</tr>
<tr>
<td>Government 4 – Spring</td>
<td>42</td>
<td>50</td>
<td>84%</td>
<td>Paper</td>
</tr>
<tr>
<td>German12 – Spring</td>
<td>27</td>
<td>38</td>
<td>71%</td>
<td>Paper</td>
</tr>
</tbody>
</table>

Overall: 451 649 70%

The purpose of the survey was to determine if and how students used the recorded lectures and whether they felt the recordings affected their learning. The survey started by asking the students: “What percentage of the recorded lectures did you listen to during the quarter?” If students didn’t listen to any of the recordings they were directed to skip to question 5. Those students who listened to at least one of the recorded lectures were asked the questions listed in Table 2. Questions 2 and 3 were included to understand students’ listening habits. The series of
Likert-scale questions included (#4) were meant to get student opinions on a variety of aspects of the lecture recordings. Two final questions asked students if the availability of lecture recordings affected their attendance (#5) and for general comments about lecture recording.

Table 2. Survey Questions 2-5 for Students Who Listened to Some Recordings

<table>
<thead>
<tr>
<th>2. Of the following, which best describes your typical listening habits? (check one)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- I listened to the entire recording once.</td>
</tr>
<tr>
<td>- I listened to the entire recording multiple times.</td>
</tr>
<tr>
<td>- I listened to the entire recording once and certain parts of the recording multiple times.</td>
</tr>
<tr>
<td>- I fast-forwarded to certain parts of the recording and listened to them once.</td>
</tr>
<tr>
<td>- I fast-forwarded to certain parts of the recording and listened to them multiple times.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Of the following, which best describes your activities while listening to the recordings (check all that apply):</th>
</tr>
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<tbody>
<tr>
<td>- I listened to the recordings while doing something else (e.g., running, riding the bus).</td>
</tr>
<tr>
<td>- I annotated my existing course notes.</td>
</tr>
<tr>
<td>- I took further notes.</td>
</tr>
<tr>
<td>- I followed along with notes from lecture or PowerPoint slides.</td>
</tr>
<tr>
<td>- Other (please list): _________________________________________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. The items listed below relate to your use of the lecture recordings. For each item indicate whether you <strong>Strongly Disagree</strong> (1), <strong>Disagree</strong> (2), are <strong>Neutral</strong> (3), <strong>Agree</strong> (4), or <strong>Strongly Agree</strong> (5) by circling the appropriate number.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture recordings were a convenient way to access course materials.</td>
</tr>
<tr>
<td>Lecture recordings helped me catch up when I missed class.</td>
</tr>
<tr>
<td>Lecture recordings helped me prepare for homework and exams.</td>
</tr>
<tr>
<td>Lecture recordings clarified concepts discussed in class.</td>
</tr>
<tr>
<td>I learned more in this class by using the lecture recordings than I would have if they had not been available.</td>
</tr>
<tr>
<td>I could easily access and download the lecture recordings.</td>
</tr>
<tr>
<td>I could follow all parts of the classroom discussion on the lecture recordings, including student questions.</td>
</tr>
<tr>
<td>The sound quality of the lecture recordings was good.</td>
</tr>
<tr>
<td>The lecture recordings made sense alone, without visual aids.</td>
</tr>
<tr>
<td>I knew which visual aids (e.g., slides or notes) the instructor was talking about during the recordings.</td>
</tr>
</tbody>
</table>

Results from the survey are presented in Figures 1-13. Some of the results are reported by course. In order to keep the results anonymous, the courses are referred to in the Figures and discussion by a random CourseID. CourseIDs, along with a characterization of the course, are listed in Table 3. As noted at the bottom of Table 3, classes with more than 50 students are considered “large,” while those with less than 25 students are considered “small.”
Table 3. Course Characterization

<table>
<thead>
<tr>
<th>Course ID</th>
<th>Characterization of Course</th>
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<tbody>
<tr>
<td>C1</td>
<td>Lecture-based course.</td>
</tr>
<tr>
<td>C2</td>
<td>Large, lecture-based course.</td>
</tr>
<tr>
<td>C3</td>
<td>Large, lecture-based course.</td>
</tr>
<tr>
<td></td>
<td>*Both audio and video were recorded.</td>
</tr>
<tr>
<td>C4</td>
<td>Large, lecture-based course. Heavy chalkboard use by the professor.</td>
</tr>
<tr>
<td>C5</td>
<td>Lecture-based course.</td>
</tr>
<tr>
<td>C6</td>
<td>Small, discussion-based course.</td>
</tr>
<tr>
<td>C7</td>
<td>Large, lecture-based course.</td>
</tr>
<tr>
<td>C8</td>
<td>Discussion-based course.</td>
</tr>
<tr>
<td>C9</td>
<td>Discussion-based course.</td>
</tr>
<tr>
<td>C10</td>
<td>Large, lecture-based course.</td>
</tr>
<tr>
<td>C11</td>
<td>Large, lecture-based course.</td>
</tr>
</tbody>
</table>

Large = >50; Small = <25

The first question on the survey asked the students: “What percentage of the recorded lectures did you listen to during the quarter?” Student responses for all of the classes surveyed – 451 students responded – are shown in Figure 1. The majority of the students listened to at least one recording; 23% of the students reported listening to “none” of the recordings. In addition to the overall results for Question 1, Figures 2 and 3 show the responses by course since usage seemed to vary by course; note that the column in Figures 2 and 3 represents the average for all of the courses. Based on Figure 2, which shows the percentage of students who reported listening to none of the recordings, students in C4, C6, and C8 were least likely to use the recordings. C6 and C8 were discussion-based courses, whereas C4 was a large, lecture-based course (a course for which I would have predicted high usage of the recordings). The professor of C4, however, used the chalkboard heavily and students did not seem to find the audio recordings (without the notes on the board) as useful. Figure 3 shows the percentage of students in each course that reported listening to more than 75% of the lecture recordings. C1, C2, C3, and C11, all of which were lecture-based courses and three of which were large classes, were above the average for percentage of students listening to more than 75% of the recordings. Also note that both audio and video were recorded and available to the students in course C3.

Figure 1. Overall Results for Question 1
To better understand how students used the recordings and what they did while listening, we asked them to describe their listening habits and activities. Based on Figure 4, the majority (68%) of the students reported listening to the entire recording once, with 29% of the students reporting listening to the entire recording once and certain portions multiple times. As far as what the students reported doing while listening to the lectures, 34% responded that they followed along with notes from lecture and 34% reported taking further notes. Only 7% reported doing something else (e.g., running, commuting, etc.). While we didn't ask the students how they were listening to the lectures (e.g., on an iPod versus a computer), based on their responses to questions 2 and 3 my guess is that most students used a computer to listen to the recordings.
Likert-scale responses for questions 4a-4j are presented in Figures 6-13, with Figures 6-9 showing overall results and Figures 10-13 giving the results by course. Student responses to these questions were overwhelming positive. With the exception of questions 4g and 4i, the number of students “disagreeing” or “strongly disagreeing” with the statements was negligible (disagreeing was negative for this survey).

The slightly negative responses to questions 4g and 4i were not unexpected. Question 4g stated “I could follow all parts of the classroom discussion on the lecture recordings, including students’ questions”; 27% of the students “disagreed” or “strongly disagreed” with this statement (see Figure 8). One trade-off with using the relatively easy and inexpensive iPods to record lectures is that they don’t pick up student questions and discussion very well. One way to get around this is for the professor to repeat the question. For discussion-based courses it may be possible for the professor to move around the room but the iPod might not be the best choice for these types of courses.

Students also disagreed or strongly disagreed more often (29% of the students) with the statement (4i) “The lecture recordings made sense alone without visual aids” (see Figure 9).
Interestingly students mainly agreed or strongly agreed with statement 4j that asked if they knew which visual aids the instructor was talking about during the recordings (see Figure 9). Thus, it seems to be that students’ main complaint was that there were no visual aids (i.e., either PowerPoint slides were not made available to the students or notes put on the chalkboard were not recorded).

**Figure 6. Likert-scale results for Questions 4a, 4b, and 4c – Classes Combined**

![Figure 6](image)

**Figure 7. Likert-scale results for Questions 4d, 4e, and 4f – Classes Combined**

![Figure 7](image)
Figure 8. Likert-scale results for Questions 4g and 4h – Classes Combined

![Likert-scale results for Questions 4g and 4h](chart.png)

Figure 9. Likert-scale results for Questions 4i and 4j – Classes Combined

![Likert-scale results for Questions 4i and 4j](chart.png)

Figure 10 through 13 present the Likert-scale responses for questions 4a-4j by course. As shown the results were positive across the classes with little variation (most of the responses are clustered closely around the overall average) and most are very positive (typically over 4 on a scale of 1 to 5 with 5 being most positive). As seen in Figures 10-13, students in classes C4 and C6 tended to give lower ratings (tending more toward disagree/negative); though overall the ratings were still quite high. As shown in Table 3, course C4 is a large, lecture-based course (but with heavy chalkboard use) whereas course C6 is a small, discussion-based course. Based on these results, audio-only recordings might be less useful (though only slightly so) for both of these course formats – chalkboard-based delivery and discussion-based delivery. Note that I use a Tablet PC to record “chalkboard” notes that I then distribute to the students through Blackboard; like the audio-recordings, student feedback for this approach has been very positive. The Tablet PC might be a good alternative for professors who rely on notes on the chalkboard.
Figure 10. Likert-scale results for Questions 4a, 4b, and 4c – Compare Classes

Figure 11. Likert-scale results for Questions 4d, 4e, and 4f – Compare Classes

Figure 12. Likert-scale results for Questions 4g and 4h – Compare Classes
One of the main concerns that I’ve heard from faculty is that if they record their lectures students will not attend class so I included Question 5 that stated “The availability of lecture recordings…” –had no effect on my attendance; –increased my attendance; or –reduced my attendance. 88% of the students who responded to the survey (432 students answered this question) said that the lecture recordings had no effect on their attendance. 11% said the availability of lecture recordings reduced their attendance and only 1% said the availability increased their attendance. Note, however, that at least for courses that used paper surveys, students who regularly did not attend class (due to the availability of recordings or other reasons) possibly did not respond to the survey. As shown in Table 3, response rates on the paper surveys were fairly low, particularly in the larger, lecture courses. The response rates reported in Table 3 are based on total enrollment numbers at the end of the term (after any drops might have occurred).

**Written Comments**

Many of the 451 students who responded to the survey included written comments. I asked for comments specifically related to attendance as well as general comments; many students included both attendance and general comments. Note that all of the written comments are included in the Appendix of this report.

Most of the comments related to attendance were positive – the students who responded seemed to recognize that going to class is generally better but they appreciated having the recordings available for when they had to miss class. Here is one of my favorite comments related to attendance: “In the beginning I got cocky and didn’t come to class, relying completely on recordings. I learned that they [recordings] are not enough.”

A few students did acknowledge that they used the recordings rather than attend class: “I still learned what happened in class just got more sleep.” While this comment may be perceived as negative, this student states that s/he “…still learned what happened in class” so the comment
could be seen as positive; students have been skipping class and reading the textbook instead for years.

The vast majority of the comments were positive. There were only a few comments that I would classify as negative and these related primarily to the sound quality of the discussions and students’ questions and linking audio with lecture slides.

Based on the general comments, many students used the recordings to study for quizzes, review confusing material, and pay closer attention in class (all wonderful benefits). The following comment sums up some of the positive aspects of lecture recordings: “I am able to go over lectures more than once and go over finer points I missed in class, take better notes in relation to PowerPoint and hear my peers’ questions more than once. I am able to sit in class and not worry about taking crazy notes and instead focus more on discussion.”

Faculty Feedback

While several faculty members did report that they perceived a drop in attendance (these drops were especially apparent in larger and morning classes), two faculty members said they perceived no drops in attendance (these professors administered pop quizzes). Note that overall 88% of the students responding to the survey stated that the recordings had no effect on their attendance. While lecture recordings may have contributed to lower attendance rates in some courses it is difficult to say for sure based on this survey. And does it really matter? – if students are learning the material (possibly on their own through lecture recordings or a textbook) at least they are learning the material. Students have different learning styles and for many the lecture-mode is not a great way for them to learn. Lecture recording may provide an opportunity for faculty to focus less on covering content in class and more on student-student and faculty-student interactions.

Many of the faculty members reported that making and posting the recordings was somewhat time-consuming. Most faculty members said that once they got used to it, using the iPod was fairly easy (though they still occasionally forgot to turn it on or accidentally stopped it during the lecture). Using (and transporting) the microphone attachment drew several complaints – one faculty wrote: “It [the iPod] is bulky with the mic attachment and does not fit into any holder I have been able to find, so I put it into a clip upside down.”

Faculty also said that being able to edit the recordings was important (to remove private conversations after class when forgetting to turn off the iPod or deleting segments when running demonstrations or group activities). Several faculty members also expressed the need for additional technical support for lecture recording – and reported having difficult getting responses and technical help from academic computing personnel.

Despite these issues, the majority of the faculty members in this pilot project said that they planned to continue recording their lectures since the benefits outweighed the problems.
Conclusions

Based on the feedback from this pilot project, students and faculty were overwhelming in favor of the lecture recordings. Students found the recordings useful across a range of disciplines, class sizes, and teaching styles. While they seemed particularly useful in large, lecture-based courses, students in smaller, discussion-based courses were very positive about their availability as well. The benefits for students included being able to review material that was confusing, study for quizzes and exams, and pay closer attention in class rather than frantically scribbling notes. The availability of recordings also enabled students to review material when they needed to miss class without bothering the professor. The recordings provide a valuable additional course resource.

While a couple of students commented that they would have liked video recordings as well, for most courses I think audio-only is sufficient. One class (C3) in this pilot project recorded both audio and video and there was very little difference in the usage and support for this approach over audio-only. Video recordings might make the most sense for chalkboard or demonstration-heavy courses (though a Tablet PC might be a less expensive alternative for chalkboard-heavy courses).

Overall, I would recommend that faculty across the disciplines record their lectures. It provides another resource for students to learn the material.

References


Appendix – Written Comments

Comments related to attendance:
• I attended all but one class and would have done so either way. I take notes from the board.
• Coming to class did little to help my understanding of the material because the class is graded only on the ability to perform xxx calculations.
• Didn’t affect attendance because I didn’t use recorded lectures.
• You don't have a chance to ask questions or see what is written on the board.
• I learned best from the book/problem sets.
• I went to all the classes.
• I went to class.
• I usually attended class so didn't need to listen to recordings.
• I felt that going to class was more beneficial because I am a visual learner - so the podcast would have been helpful but not as much as actually being at the lecture.
• It's really hard to use the recorded lectures to learn more about the material. This class is more about solving problems.
• I felt that I would have to still take notes and observe demos.
• I attended class all the time. I did not like to rely on the lecture.
• I came to every class.
• I went to every class and the one I couldn't go to I got someone else's notes.
• It is basically useless to listen to the lecture if you can't see the equations xxx is writing on the board. I didn't use the podcasts as I attended all the lectures.
• Useful tool for help without walking to office hours.
• I have not missed any class and did not feel compelled to listen.
• I only listened the one time I HAD to miss class.
• I did not listen to recordings because lectures were mostly problem solving on the board - listening would not have helped.
• I went to all the classes and therefore had no need to listen to the lectures.
• I went to basically all the lectures, and I would not have skipped lectures because podcasts were available.
• This term due to other unavoidable circumstance (illness and death in family) I had to miss a few classes and having the lecture recordings helped for the classes I missed.
• The availability of podcasts solely reduced my anxiety about missing class but did not push me in the direction to skip.
• I didn't use them at all.
• I attended all lectures regardless of the lecture recordings.
• I came to almost every class, except for those I was off-campus for.
• I prefer going to class.
• It made me feel more comfortable if I had to miss class for some reason.
• Recorded lectures don't make up for being in class.
• I do better when I SEE the lectures. However, if the teacher used powerpoints too, I may have missed more.
• I had to miss class for something beyond my control; podcasts just helped me catch up.
• I wouldn't miss class just because I could listen to it later.
• I'm paying 500 bucks for a lecture. I might as well attend it.
• I used the lecture recordings to supplement class, not replace class.
• Probably didn't need to come everyday, but did anyway to hear the lecture. Probably helpful if you're not in class.
• I had trouble following the podcasts if I wasn't in class, so it didn't affect my attendance.
• I attended all the lectures I could, but would have listened to a podcast had I ever missed class.
• Even though I could have missed class and still learn about the same with the podcast, I decided to go to class to further my understanding. An extremely effective way of reinforcing course material. I think I would be having a much harder time succeeding in the class if it weren't for the podcasts.
• Class is difficult to wake up and attend. Great. Loved them!
• I knew my understanding of lecture material was greatly enhanced by class attendance. The only time I relied on a podcast was when I had the stomach flu.
• I never missed class.
• Though it had no effect on my personal attendance, the podcasts were good enough to substitute for regular attendance.
• I attended every class no matter what. Gives people an excuse to skip class. I am not in favor of recording lectures.
• Going to class is perhaps better sometimes.
• I used the recordings when I missed class because I was on ski trips not because I didn’t want to go to class.
• I didn’t miss a class.
• I continued to go to class, but it was nice to know that I would be okay if I missed a class or two over the course of the term.
• Still went to lecture and only used podcasts as review.
• I attended >90% despite podcast being available. The lecture recordings were a great resource, although I believe they did have negative effect on attendance.
• Only on days that I felt ill would I decide to skip class with the security that I could listen to the lecture I missed.
• If I felt sick I did not need to force myself to go to class.
• It was useful to have them, even though I didn’t use them, because I knew that if I was sick or confused about something in the lecture, I could go back and re-listen to that class. I think it’s a very good system.
• In spite of myself, I am able to not come to class, which was detrimental in the long run. Recording is a great idea, but only if students don't abuse the privilege.
• I went to class often, but several times I skipped and slept in because the lecture were available. I wouldn't have skipped class if the lectures weren't online.
• I understood the material better when I listened to the podcast than when I sat in class so it reduced my attendance.
• I still went to every class.
• I sometimes missed class because of relative inability to wake up early. I was comforted by the fact that there were podcasts that could aid me in catching up. Very helpful/useful. Should continue to be implemented.
• I came to class anyways, and just used the lecture recordings as a way to help study.
• I always came to class except when I had a doctor's appointment. The lectures online just helped me to further understand the material, to clarify any questions I might have had.
• I tried to go to class as much as possible. Keep it!
• I missed one lecture but not because I knew I could get the lecture afterwards. They were a godsend. I went to class and listened, but being able to go home and listen again at time and circumstances of my choosing was a great way to reinforce the material.
• At first I decided not to go to class because of them, then I realized I preferred going to class.
• I attended class when I could regardless of the podcast availability. Great tool.
• I came to every class.
• I tried to be present in every class-important to see what professor is referencing with visual aid.
• Missed class for different reasons but didn't purposefully skip class because of recording. Loved it.
• The podcast for me was to reinforce what was learned in lecture not replace it. It was nice having a recorded lecture to further understand something that wasn’t clear in class.
• Since it was my first class of the day, sometimes I don’t go. Love them!
• I went to all the classes so I’d be able to follow along with the podcasts. It was very interesting!! I also think I learned a lot. And the details clicked in the end!! :)
• A few times (3 to not very often) when I had a lot of work in other classes, it was convenient to be able to miss class and listen to the lectures later. It was also nice to be able to o back and clarify what the professor said in class.
• I missed one class I wouldn't have otherwise.
• I didn’t skip class just because I knew I could watch it online, I viewed the recordings as a study aid, not a class replacement. But they were sure nice when I did miss a class for other events.
• There was no incentive to go to class. I thought they were great.
• Only time I used lecture recording I was away at an athletic event. Very good way for students who missed class to not miss material.
• I only missed classes when I had a conflict.
• Amazing- but I think at the same time it encourages an increased frequency of skipping.
I had to miss a few classes because of athletic competitions, and found the podcasts a really easy way to catch up, finding that I learned better from the podcasts when I could control the speed than I did in class. Because of this, I felt more relaxed about missing classes occasionally to sleep in or study because I could catch up on missed class time later.

I often was not feeling well or slept in, so the podcasts made this less of a challenge. Keep this!

It was effective to get the basic idea in class and clarify by listening later.

I listened to lecture recordings both when I did and did not come to class.

I still attended class on a regular basis. It was extremely useful!

I came even though they were offered because it's better to get the info 1st hand and ask questions. Great idea and really helpful.

In the beginning I got cocky and didn’t come to class relying completely on recordings. I learned that they are not enough.

It didn't matter if there were podcasts or not. I still came to class, but podcasts were EXTREMELY USEFUL. I listened to them even when I attended class

Since I knew I could listen to the lecture later, incentive to attend class decreased. Definitely useful.

I didn't feel well a few days and chose not to attend because I knew I wouldn't fall behind -otherwise I still come

I used the recordings only if I accidentally slept through class. Wish I could know when to be looking at which ppt slide and could not hear student questions- repeat them maybe?

I think being present is still better, but recordings were nice when I had to miss. I like having it available.

It was helpful to go to class to see the ppt and be able to ask questions. So glad we had it. I wish all my classes used it. ESPECIALLY SCIENCES!

I still continue to go to class, however I felt more at ease that I could catch up easily with the podcast if I had to miss class

I came to lecture anyway and used recordings to reinforce what had been presented in lecture. WONDERFUL- Please keep it!!!

I never missed a class but I know many other did because of podcasts. There needs to be some way of rewarding attendance

Because I knew I could hear the lecture online, I was less strict with myself when it came to discipline in coming to class. When I was sick, I didn't come, whereas if there was no podcast, I would have come.

I attended every class- regardless of the availability of podcasts- that I was on campus.

Didn’t miss any classes. Didn't use them but it was good to know they were available.

They're there as help, not as replacement

I attend class everyday. They are extremely helpful and should be used in class much more frequently

I still learned what happened in class just got more sleep.

Let me get sleep one day when otherwise I would have died. Being in class still better also helped me since I switched in after 3 days!

I came to every class but knew I could go back to podcasts if needed. Great idea - good way to answer your own questions after lecture

I attended regardless of podcast availability

Recordings were a study tool not a substitute for class.

Some mornings it was nice to know that I could easily get caught up if making it out of bed wasn't an option.

I always noticed it was better to attend class abut in the cases I couldn't it helped

I came to class regardless of podcast availability

I still continued to attend class regularly and listened to the lecture recordings when I misunderstood a certain point. Lecture recordings are very helpful in providing further explanation

I still find it helpful to go to class in case I have questions and because I don’t think there's really a replacement for actually going to lecture.

I went to pretty much all the classes.

I feel that the 9L class is difficult for students to concentrate in and get to on time, so the recordings didn't reduce my attendance but reassured me I could learn more at a better time.

I still went to every class I could.

Alternate Formats:

• The Physics Department does it better. They do videos in Phys13-14.
• It would be easier to navigate the podcast if it was made available on iTunes. MIT does this with all their lectures and it's GREAT.
• It would be great to flag certain time points in the lecture by subject matter so they could be accessed more easily, as would more control over playback speed. Since 2k speed is still comprehensive. That way it could be easier and faster to access information.

Positive Comments:
• Perfect. Please keep for all classes since sometimes the speed of the lecture makes us miss some things.
• They made me less stressed in class if I missed a point b/c I knew I could go back and clarify what I had written in my notes.
• The online recordings were a good way to review though. I am so glad it was there.
• It was great to have it when I needed to re-listen to something for clarification.
• Especially in such a fast-paced course, the podcasts were vital to helping me catch things that I had missed. Even typing constantly, I wasn’t always able to catch what the professor had said, so I needed the podcasts to catch the whole lecture.
• Useful when I missed class, however not the most time-effective means of studying for me.
• It was a good source to have.
• Good tool. Really helpful if prof talks fast and you need to review or if you're sick and miss class.
• I really appreciate it.
• Lecture podcasts is a creative idea b/c I am also able to fill in holes I have while taking notes in class and it even helps me to prompt questions for office hours.
• I think it was really helpful to have the podcasts because I was able to go back and listen to it again and write my notes.
• Very useful!! Other classes should employ them.
• Great idea.
• It made it easier when I had to leave for an important reason. Great!
• I used the podcasts to review for tests and take notes on concepts that I missed in class. Great idea, really helpful.
• Great way to integrate technology into the course.
• I found that being able to pause, rewind, and take a break in the lecture recording was valuable.
• Good idea, very helpful to be able to listen to it a second time.
• I still went to class everyday, but listened to the recordings again to review for quizzes. They are VERY helpful!
• Always better in my perspective to go to class, everything is clearer but they were a good backup. Keep it and make it more widely available.
• I still went to class but I was less stressed when I did miss one (whether accidentally or for other reasons) because of the lecture availability. Very helpful!
• Perfect for athletes in season. Keep it up.
• Great idea for athletes who have to miss class.
• They were really a nice resource to use (esp since sometimes I was half-asleep in class!).
• Very helpful- rate at which class moves is greatly benefited by the availability of lecture readings. Good review for quizzes, reinforcement of material.
• It was hard for me to keep up with lecture but with podcast I could pause and repeat what had just been said. Great for studying-all classes should use podcasts.
• It made it easier to make up material for missed classes. GOOD IDEA!
• They really helped me a lot in reinforcing the information I learned in class.
• I wanted to hear the lecture more than once-it helps in understanding the material. Very helpful. I am able to go over lectures more than once and go over finer points I missed in class, take better notes in relation to powerpoint and hear my peers questions more than once. I am able to sit in class and not worry about taking crazy notes and instead focus more on discussion.
• As a traveling athlete it was a great tool to use when I had to miss class.
• Lectures were easy to follow and were useful to solidify concepts learned in lectures.
• The lecture notes were extremely helpful while taking notes because the video could be paused so you could write down what you needed to and then resumed without missing any information. It would take be about 2 hours to watch one lecture on video but I would have a thorough understanding upon completion.
• I love it! Because re-listening to class at my own pace was very, very helpful.
• This is good.
• Loved it, very convenient!
• Great idea, keep it going.
• It was an extremely useful technique to clarify concepts and take notes in a fast paced class and I think it should definitely be introduced to more classes so that students can access the material they need to
• It was very helpful. It made me focus during the lecture and not be too concerned about writing down what the professor is saying, this made me understand the material better.

Negative Comments:
• In certain classes it's very helpful, but in classes like this one it's really difficult to understand what the professor is referring to because he uses a lot of pronouns and there's no auditory cue that he's going to the next slide.
• In a very usual-heavy class (powerpoints, diagrams, blackboard) it's hard to get all of the info just from audio.
• Helps with missed classes but couldn't hear questions.
• The only problem was that we couldn't hear the questions students asked.
• The lectures were useful, though sound quality failed at times.
• Hard to hear student questions, sometimes I didn’t know which slide the prof was on.

Neutral Comments:
• I know that they were helpful for some students; I just have different study habits.
• I did not use any of the podcasts because: 1) I did not have enough time to view them as I was taking extra classes this term 2) I felt like the powerpoint presentations were clear enough that I could understand the material without reviewing the podcasts 3) When I was in class, Professor xxx did a wonderful job and I did not need to hear her more than once! :)}