RESEARCH

Student and Faculty Perceptions of Lecture Recording in a Doctor of Pharmacy Curriculum

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Submitted February 25, 2013; accepted May 1, 2013; published October 14, 2013.

Objective. To describe students' and faculty members' perceptions of the impact of lecture recording in a doctor of pharmacy (PharmD) curriculum.

Methods. Second- and third-year pharmacy students and faculty members completed an anonymous survey instrument regarding their perceptions of lecture recording with 2 classroom lecture capture software programs, Camtasia Studio and Wimba Classroom.

Results. Most students (82%) responded that Camtasia was very helpful and almost half (49%) responded that Wimba Classroom was helpful ($p < 0.001$). Forty-six percent of the students reported being more likely to miss a class that was recorded; however, few students (10%) reported using recordings as a substitute for attending class. The most common concern of faculty members was decreased student attendance (27%).

Conclusion. Pharmacy students consider lecture recordings beneficial, and they use the recordings primarily to review the lecture. While faculty members reported concerns with decreased attendance, few students reported using recordings as an alternative to class attendance.

Keywords: lecture capture, recording, attendance, technology

INTRODUCTION

Classroom lecture capture technology has made recording in-class lectures simple and readily available to faculty members. Lecture capture involves recording an instructor's presentation and making it available to students via Web-based technology.¹ Two commonly used classroom lecture capture software programs are Camtasia Studio (TechSmith, Okemos, MI) and Wimba Classroom (Wimba, Inc, New York, NY). Camtasia Studio is video-based screen capturing software that records audio lectures and synchronizes them with onscreen display. This offers flexibility for both the educator and student. It also provides students with the opportunity to re-listen to all or portions of a lecture.²

The West Virginia University School of Pharmacy uses Camtasia Studio in our PharmD curriculum to record class sessions held by on-campus faculty members with on-campus students. Wimba Classroom is virtual classroom software that allows instructors and students to

simultaneously log in to an online classroom environment. Students can see the instructor via Web cam and questions can be asked and answered either verbally or by text messaging. Wimba Classroom can also be used to create a recorded archive of each lecture that can be viewed much like an archive produced using Camtasia Studio.³ Wimba Classroom is used for courses delivered when students and instructors are dispersed as everyone joins the virtual classroom using an Internet browser. Some faculty members do not use Wimba Classroom when the instructors and learners are in the same room.

The impact of lecture capture on student performance has not been fully described in the literature and most available data come from medical education programs.⁴⁻⁸ Undergraduate and medical schools have measured varying outcomes.^{1,4-9} Most studies suggest that students place a high value on recorded lectures and perceive them to be beneficial. A few studies of the impact on student performance have yielded variable results. Most studies report no difference in course grades with the implementation of classroom lecture capture.⁴⁻⁶

Approximately 70% of US colleges and schools of pharmacy reported routinely using classroom lecture capture software for curriculum delivery.¹⁰ Faculty concerns

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related to classroom lecture capture include decreasing class attendance, less participation in on-campus professional student organizations, and lost opportunity for students to practice face-to-face interpersonal social skills.^{11,12} A study of pharmacy student attendance found course content availability from another source to be a reason for nonattendance; however, the study did not address classroom lecture capture technology.¹³ Some data exist regarding lecture recording in medical school curriculums with students reporting mostly favorable experiences.^{8,12,14} One study reviewing both student and faculty perceptions noted that faculty members were less positive about classroom lecture capture.¹²

Given the widespread use of lecture recording technology in colleges and schools of pharmacy, additional data are needed regarding the perceptions and use habits of classroom lecture capture by both students and faculty members. At West Virginia University School of Pharmacy, faculty members have been using classroom lecture capture technology for 3 years. This study describes the perceptions of the school's students and faculty members regarding the impact of classroom lecture capture technology in a lecture-based PharmD curriculum. Secondary objectives were to assess the impact of recorded lecture material on student attendance, the frequency with which faculty members use classroom lecture capture technology, and the reasons why faculty members choose to use or avoid classroom lecture capture technology.

METHODS

This study was approved by the Institutional Review Board at West Virginia University. Second-year (P2) and third-year (P3) pharmacy students at West Virginia University were asked to complete a survey instrument with questions about their perception regarding the impact of classroom lecture capture technology on their performance, the ways in which recorded lecture materials were used, and their patterns of absenteeism for classes that were recorded and those that were not. Students were provided information about the research project at the time of survey completion. They were informed that participation was voluntary and anonymous, and that their grade would be unaffected by either participation or refusal to participate. Survey instruments were distributed in the spring 2012 semester during a required course.

All full-time faculty members teaching PharmD courses were asked to complete a separate electronic survey instrument. The participants were asked questions about their perception of classroom lecture capture technology's impact on students' performance, frequency

with which classroom lecture capture technology was used in lecture-based courses in conventional lecture halls, ways in which they used the recordings for their individual classes, and their reasons for using or not using the technology. Each eligible participant received an e-mail message from the primary investigator with a link to the survey instrument. The message informed faculty members about the research project and stated that participation was voluntary and anonymous.

The completed survey instruments were collected from students at the end of the class session. The faculty survey remained open for 2 weeks with 1 followup message sent to nonresponders before the survey was closed. The results of both surveys were analyzed using GraphPad InStat, version 3.10 for Windows (GraphPad Software, San Diego, CA) and Microsoft Excel. The Fisher exact test was used to analyze differences between P2 and P3 student groups on individual survey items.

RESULTS

Student Survey

Seventy survey instruments were distributed to the P2 class and 72 survey instruments were distributed to the P3 class. Seventy completed survey instruments were returned from each class for response rates of 100% and 97%, respectively.

Of the 140 students who responded, 115 (82%) indicated that Camtasia was very helpful compared to 69 students (49%) who responded that Wimba Classroom was very helpful ($p < 0.001$) (Table 1). Forty-two (30%) students responded that Wimba Classroom was somewhat helpful compared to 21 (15%) students who responded that Camtasia Studio was somewhat helpful ($p = 0.004$). There was no significant difference between the P2 and P3 classes regarding their perceptions of the usefulness of Camtasia Studio and Wimba Classroom.

Students in both classes reported using both software programs to review portions of lectures or entire lectures rather than as an alternative to attending live sessions (Table 2). However, 54 students (46%) reported being more likely to miss a class that was recorded. The P2 students reported using Camtasia Studio as an alternative to attending class more often than P3 students using Camtasia Studio or P2 students using Wimba Classroom ($p < 0.05$).

Students were asked to list their most important reason for attending live sessions when recordings were available (Table 3), with pop quizzes or other graded in-class assignments being the most cited reason regardless of which software program was used to record (45.9%). When comparing Wimba Classroom with Camtasia Studio, more students reported pop quizzes or other graded

Table 1. Doctor of Pharmacy Students' Perception of Usefulness of Classroom Lecture Capture Technology as a Learning Tool (N=70)

Group	Very Helpful, No. (%)	Somewhat Helpful, No. (%)	Neutral, No. (%)	Not At All Helpful, No. (%)
Camtasia software				
P2 students	63 (90)	6 (8.5)	1 (1.5)	0
P3 students	52 (74.3)	15 (21.4)	3 (4.3)	0
Wimba software				
P2 students	38 (54.3)	12 (17.1)	12 (17.1)	8 (11.5)
P3 students	31 (44.3)	30 (42.8)	7 (10)	2 (2.9)

Abbreviations: P2=second-year; P3=third-year.

in-class assignments as the most important reason for attending live class sessions when lectures were recorded with Wimba Classroom (57.3% vs 32.7%, $p=0.002$).

Faculty Member Survey

Completed survey instruments were submitted electronically by 26 (55%) of 47 faculty members invited to participate. Demographic information of faculty respondents is summarized in Table 4. Nineteen of the 26 respondents reported that they were responsible for coordinating a course in the PharmD curriculum. When asked how often lectures were recorded, 2 faculty members responded always (11%), 9 responded sometimes (47%), and 8 responded never (42%). Table 5 summarizes the reasons why course coordinators and other faculty members recorded lectures.

All faculty members were asked about their concerns regarding recorded lectures. Twenty-four faculty members responded, with multiple responses allowed (62 total responses). Concerns of faculty members included decreased attendance (27%), decreased professional socialization (23%), decreased understanding of material (18%), decreased performance for individual students already struggling academically (14%), decreased overall

course performance (10%), and other reasons (5%). Two faculty members (3%) indicated no concerns with lecture recording.

Faculty members were also asked why they chose not to record lectures either all or part of the time. Twenty-one faculty members responded with multiple responses allowed for a total of 38 responses (Table 6). When asked if all lectures in the PharmD curriculum should be recorded, 9% responded yes, 69% responded no, and 22% responded that only large lecture class sessions should be recorded.

DISCUSSION

Classroom lecture capture technology offers potential benefits to students and faculty members, including the ability to review content prior to examinations, learning support for students who are unable to attend live lectures, and increased class time that may be devoted to application of content, such as case-based discussions and simulation activities.^{15,16} Most students perceived these technologies to be beneficial, which is consistent with previous studies.^{8,12,14,17} This provides insight into how pharmacy students may choose to use this technology and why students may choose to attend

Table 2. Pharmacy Students' Reported Use of Classroom Lecture Capture Technology

Student Responses	Camtasia Software Used		Wimba Software Used	
	P2 (n=94), No. (%)	P3 (n=79), No. (%)	P2 (n=80), No. (%)	P3 (n=84), No. (%)
As an alternative to going to class	12 (12.8) ^{a,b}	2 (2.5) ^a	1 (1.2) ^b	2 (2.4)
To review specific parts of lectures that were missed or were not clear during class	39 (41.5)	42 (53.2)	39 (48.8)	58 (69)
To relisten to entire lectures	43 (45.7)	42 (53.2)	33 (41.2)	20 (23.8)
I do not use recordings	0	3 (3.8)	7 (8.8)	4 (4.8)

Abbreviations: P2=second-year, P3=third-year.

Multiple responses allowed.

^a $p<0.05$ for P2 responses compared to P3 responses for Camtasia Studio.

^b $p<0.05$ for P2 responses for Camtasia Studio compared to Wimba Classroom.

Table 3. Pharmacy Students' Most Important Reason for Attending a Live Lecture When Classroom Lecture Capture Technology is Used

	Student Responses When Camtasia Software Was Used		Student Responses When Wimba Software Was Used	
	P2 (n=48), No. (%)	P3 (n=60), No. (%)	P2 (n=57), No. (%)	P3 (n=65), No. (%)
Not motivated to watch recorded lectures on my own	1 (2)	5 (8.3)	0	3 (4.6)
To show professionalism and respect for the instructor	9 (18.8)	13 (21.7)	2 (3.5)	5 (7.7)
To feel I am getting more from my tuition	2 (4.2)	3 (5)	2 (3.5)	1 (1.5)
I learn better live	3 (6.3)	7 (11.6)	1 (1.8)	7 (10.8)
To ask questions and hear other questions from classmates	5 (10.4)	4 (6.7)	6 (10.4)	9 (13.8)
More fun way to learn	0	1 (1.7)	2 (3.5)	1 (1.5)
Good lecturer	3 (6.3)	3 (5)	1 (1.8)	0
To actively participate or feel involved	3 (6.3)	3 (5)	3 (5.3)	4 (6.2)
Pop quizzes or other in-class assignments	16 (33.3) ^a	19 (31.6)	39 (68.4) ^a	31 (47.7)
Not applicable; I rarely attend live lecture	5 (10.4)	1 (1.7)	1 (1.8)	0
Other	1 (2)	1 (1.7)	0	4 (6.2)

Abbreviations: P2=second-year, P3=third-year.

^a $p < 0.05$ for P2 responses for Camtasia Studio compared to Wimba Classroom.

live class sessions when recordings are available. The faculty member survey results provide information regarding their perceptions about lecture recording.

Students use recorded lectures for multiple purposes, including preparing for examinations, listening to segments of a class lecture again, improving understanding of course material, and supplementing notes taken during class.^{14,17} Most of the students in our survey used recorded lectures to review specific parts of lectures or entire lectures. Only a small percentage of students reported using the recorded lectures as an alternative to going to class, or not using the recordings at all. There were some differences found in the number of students in the P2 class who reported using Camtasia Studio recordings as a substitute for attending lecture vs those who reported using Wimba Classroom (Table 2). The importance of this finding is difficult to determine. In our PharmD curriculum, Wimba Classroom is used primarily for pharmacotherapeutics lectures taught by regional faculty members, and these classes have pop quizzes or in-class activities that may influence students' decisions about attending class. Camtasia Studio is used by our instructors as a means of archiving audio and presentation content when they are in the same room as students. The differences in student responses probably reflected differences in the instructional methods used in specific courses and individual class sessions rather than differences between the 2 products.

Concern about reduced class attendance was a major reason given by faculty members at our school

who chose not to record lectures, which is consistent with feedback from previous studies.^{7,14} Absenteeism is especially concerning in health professions programs because it is associated with poorer academic performance, may decrease morale of educators and students who attend class, and may necessitate repetition of information for those who missed previous lectures.¹³

Table 4. Demographic Information of Pharmacy Faculty Members Responding to a Survey on Use and Perceptions of Lecture Recording Technology

Characteristic	No. (%)
Gender (n=26)	
Male	14 (54)
Female	12 (46)
Tenure status ^a	
Tenure track or tenured	11 (44)
Nontenure track	14 (56)
Campus location	
Main (Morgantown)	19 (73)
Regional (Charleston or Martinsburg)	7 (27)
Academic rank ^a	
Assistant professor ^b	13 (52)
Associate professor ^b	4 (16)
Professor	8 (32)

^a Twenty-five respondents answered this question.

^b Includes nontenure track clinical assistant or clinical associate professors.

Table 5. Reasons Given by Faculty Members for Recording Lectures Using Classroom Lecture Capture Technology, No. (%)

	Course Coordinators, 34 Responses	Guest Lecturers, 49 Responses
Course coordinator request	—	11 (22.4)
Improves learning	4 (11.8)	5 (10.2)
Improves course grades	0	1 (2)
Student demand	6 (17.6)	9 (18.4)
As a supplemental learning tool	6 (17.6)	7 (14.3)
So students can use either live or recorded	0	0
For students who must occasionally miss class	6 (17.6)	8 (16.4)
Other	4 (11.8)	1 (2)
Not applicable, I never record	8 (23.6)	7 (14.3)

Although 27% of faculty members in this study expressed concern about decreased attendance with recorded lectures, only a small percentage of students indicated that they used lecture recordings as an alternative to attending lectures. The literature shows mixed results about the effect of lecture recordings on live lecture attendance. Some data show that lecture recordings have a minimal impact on pharmacy student attendance,¹⁸ while other data demonstrate a moderate correlation between skipping class and viewing recorded lectures.¹

Additional factors may influence students' decisions about class attendance, including student motivation to satisfy professional goals, previous experiences with lecturers, and predictability of class sessions.^{7,8} Students in introductory courses may be more likely to miss live class sessions in favor of watching recordings than students in advanced courses.¹⁹ Class attendance also declines as the academic semester and year progresses.²⁰

The main reason students attended live lectures when recordings were available was the possibility of pop quizzes or in-class assignments. Reasons for pharmacy student absenteeism are complex and include interest in course content, provision of additional information beyond PowerPoint slides and readings, a high level of course difficulty, feeling an obligation to attend, in-class

activities, and pop quizzes. The reasons that pharmacy students report missing live class sessions include illness, tiredness, work related to other courses, not learning during class, attendance not impacting course grade, course content being available from another source, and a low level of course difficulty.¹³ Educators concerned with course attendance may choose to incorporate motivating factors for live class attendance, such as pop quizzes and interactive class sessions. Additionally, some argue the decision to record lectures should not be based on the effect on class attendance but on whether it facilitates student learning.¹¹

Analyzing a student's ability to learn from recorded lectures is challenging because of multiple variables influencing the learning process.¹⁷ Faculty members reported student performance as a concern with recording lectures. One study analyzing student performance in a pharmacy therapeutics course taught to both distance and main campus students in which distance students were given access to recorded lectures from previous years found no clear student preference for content delivery method.²¹ A second study found that the availability of pharmacy therapeutics lecture recordings for 3 days after the live session improved final examination scores compared to an historical control (grades from the same students

Table 6. Reasons Given by Faculty Members for Not Recording Lectures Using Classroom Lecture Capture Technology, No. (%)

Reason	All Faculty (38 Responses)	Course Coordinators (32 Responses)	Guest Lecturers (6 Responses)
Attendance concerns	7 (18.4)	6 (18.7)	1 (16.7)
Performance concerns	7 (18.4)	6 (18.7)	1 (16.7)
Don't want to learn technology	1 (2.6)	1 (3.1)	0
Difficulty with technology in the past	2 (5.3)	2 (6.3)	0
Not appropriate for course material	4 (10.5)	3 (9.4)	1 (16.7)
Not appropriate based on mode of delivery	8 (21.1)	7 (21.9)	1 (16.7)
No reason, I just have not	2 (5.3)	2 (6.3)	0
Other	4 (10.5)	4 (12.5)	0
Not applicable, I always record	3 (7.9)	1 (3.1)	2 (33.2)

in the previous 2 semesters of therapeutics) but did not have an impact on final course grades.¹⁸

Results from studies in non-healthcare-related disciplines provide conflicting results. Some data suggest that recorded lectures can be used in place of live lectures with no impact on performance⁵ whereas other data indicate that lecture recording may be beneficial for lower-achieving students.¹ One study showed a negative correlation between course grades and frequently accessing lecture recordings.⁶ Students who use recordings as study aids may have improved course performance, but students who use recordings as an alternative to class may have a decreased course performance.^{6,22}

Most faculty respondents did not believe all lectures in the PharmD program should be recorded. Responses to other survey questions suggested the reasons for this are multifactorial, including attendance, performance, and concerns with the appropriateness of recording for specific content or mode of delivery. Many pharmacy schools rely on the “unofficial” curriculum to enhance students’ development of professionalism and leadership qualities. One possible consequence of recorded lectures is that absenteeism may decrease student participation in professional organizations.¹¹ This was the second most commonly expressed concern by our faculty members. Professional socialization of students is especially important in health professions because this process imparts professional attitudes and values. In a PharmD curriculum where students could obtain recordings of the entire lecture-based curriculum, participation in professional organizations could suffer. We did not address this issue and there are no other published data demonstrating that this occurs.

The study was conducted at a single institution. The survey was administered at a single point in time and participants had no option to provide free-text comments. The study was also based on self-reports by students and faculty members with the assumption that participants had an accurate recollection of their past activities.

CONCLUSIONS

Pharmacy students consider lecture recordings to be beneficial and use the recordings primarily for lecture review. Most students did not use lecture recordings as a substitute for attending most or all class sessions. The presence of pop quizzes and other graded in-class activities was a major determinant in students’ decision-making about class attendance, while other studies have suggested that course content may be the primary factor in deciding whether to attend class. Faculty members’ reasons for recording lectures included course coordinator requests, student demand, and a learning tool for

students who must occasionally miss class, and improved student learning. Their concerns about classroom lecture capture technology included potential detrimental effects on course performance, class attendance, and professional socialization.

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