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Effect of Posting Lecture Slides Online on Attendance and Student Performance

If I post my PowerPoint or Keynote lecture slides online, will students stop coming to class? The answer seems to be "no." In fact, it may increase class participation because students don't have to devote so much cognitive capacity to frantic notetaking—your slides provide the main points, and they simply add their own notations.

Whether slides are available before or after the lecture makes a difference. Before is more helpful to students, with better attendance results, and after tends to reinforce student disengagement from class and decrease attendance.

This article focuses in detail on research conducted at University of Windsor, with 175 students in two courses, first year Research Methods (RM) and fourth year Cognitive Development (CD) (Babb and Ross, 2009). The findings are compared with other findings in the literature.

Salient Findings

Some of the study findings are presented below, along with related findings from the study's literature review, for comparison.

Attendance

	Babb and Ross Findings	Comparison to Literature
1.	77% attendance rate in RM (yr. 1) for slides available before class sections , 60% for slides available after	79% said they used online lecture notes as a replacement for class attendance at least once; 29% six or more times (Grabe, 2005)
2.	Students who downloaded slides before class more often were also more likely to attend	Only 15% said they were less likely to attend if slides were available (doesn't say before or after lecture) (Frey and Birnbaum, 2002)
3.	CD (yr. 4): no attendance difference between class types (keep in mind that although attendance was mandatory for both courses, only CD awarded points for attendance)	Frequency of slide availability had no significant attendance effect (doesn't say whether availability was before or after lecture) (Debevec et al. 2006)

Exam Performance

	Babb and Ross Findings	Comparison to Literature
1.	Timing of slide availability did not affect exam scores in either of these 2 types of courses ("no significant difference" but before-lecture slide availability classes had higher mean exam scores: M=69.49, SD=11.61 (before) vs. M=66.75, SD=11.35	Students perform better if they take notes during class AND use them to study for exams than if they use notes for only one of these purposes (Kiewra et al., 1989, 1991; Knight & McKelvie, 1986)

	Babb and Ross Findings	Comparison to Literature
	(after))	
2.	For both RM and CD courses, for students who accessed slides after class, the more they used them as a substitute for attending class, the lower their exam performance	

Class Participation

Students in the before-class availability CD course (yr. 4) had a greater average in-class participation rate per person than the after-class availability CD course students.

This rate was only statistically significant when students who did not participate were excluded. It seems that the availability of PowerPoint slides for notetaking was not sufficient to increase the likelihood that those who are reluctant to participate would do so due, for example, to the increased cognitive capacity available because the slides reduce the notetaking burden.

Use and Satisfaction

- Students in the before-class-availability section for both courses used the PPT slides primarily as a guide for note taking.

- Students in the after-class-availability section RM (yr 1) course used slides as main notes, adding little of their own notations. And they were more likely to use them as a substitute for attending class.

- Students in the after-class-availability-section CD (yr 4) course added much more of their own information to slides and used them as double-check of own independent notes.

- Students in the before-class-availability section CD were more likely to use slides to review notes after class, compared to after-class-availability-only section.

- 10% of students in the after-class-availability sections of both courses did not use slides at all, compared to 0% of before-class-access sections of those courses.

- Students in the before-class-availability sections of both courses were more satisfied with slide quality, access timing, and found the slides more helpful.

- Students in the before-class-availability sections of both courses perceived slides to be more thorough, even though slides were same in the available-before-class and available-after sections.
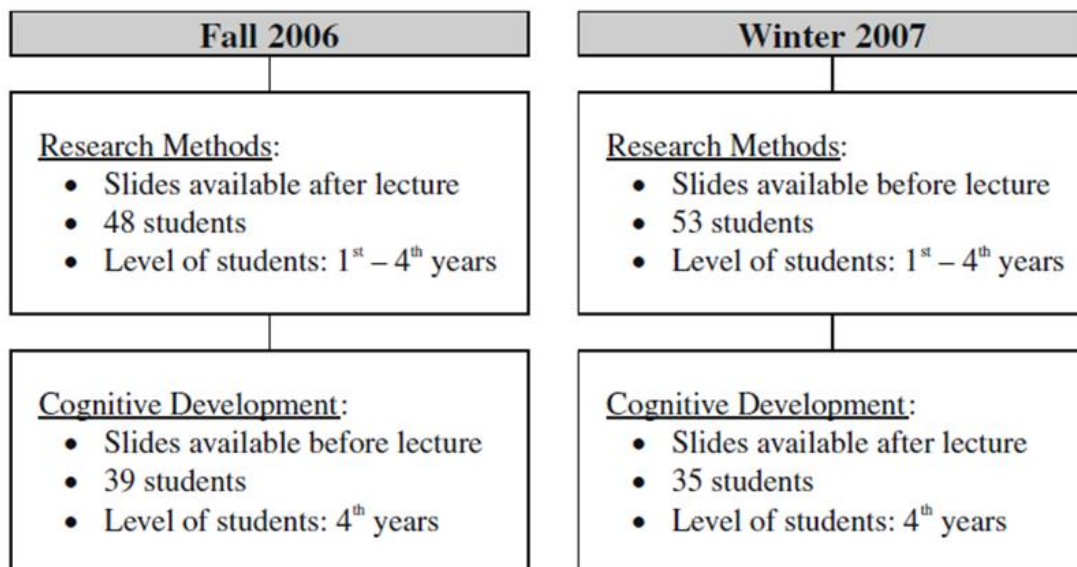
Research Details

The research hypotheses explored in the study were:

Students with PPT slides available online before class (rather than after) will:

- Have higher attendance rate (the study designers think students perceive having lecture slides before class as an advantage for their learning and exam performance). This turned out to be correct for the year 1 course—see attendance rates in table 1 row 1.

- Participate more in class (because fewer cognitive resources are devoted to notetaking). This turned out to be correct for only the fourth-year CD course, and may be accounted for by the mandatory attendance policy and participation expectations, for both of which students were awarded points. Perhaps general maturity is a factor as well. (In the first year RM course, attendance was mandatory but no points were awarded, and there was no participation policy.)

- Perform better on exams (because the slides and better notes help with encoding information in short-term memory for storage in and retrieval from long-term memory). Turns out there was no statistically significant difference, even though the "before class access" sections of both courses had higher mean scores on the final exam.

Experiment Setup:

The experiment was conducted in at the University of Windsor in two courses, a first year Research Methods course and a fourth year Cognitive Development course, each with 2 sections. Both courses were run for experimental purposes twice, once during the fall term and again during the following winter term. Each time, for each course, one section had access to PowerPoint slides before class and the other had access to the same slides after class. The sections were switched for each course between the fall and winter term serials of the course, for an unusual but effective "2 x 2" experiment design, as illustrated below.

Fall 2006	Winter 2007
Research Methods: • Slides available after lecture • 48 students • Level of students: 1st – 4th years	**Research Methods:** • Slides available before lecture • 53 students • Level of students: 1st – 4th years
Cognitive Development: • Slides available before lecture • 39 students • Level of students: 4th years	**Cognitive Development:** • Slides available after lecture • 35 students • Level of students: 4th years

PPT slides in PPT & PDF format, 15-20 slides each

First year Research Methods Course

There was a 50-minute course lecture, twice per week. Attendance was mandatory but no points were given for it. Class participation was not tracked, but questions were asked about it in the end-of-course survey. Assessment consisted of a 40-question multiple choice midterm, and an 80-question multiple choice final exam. The course also had labs and a lab exam, but attendance, participation and performance on these were not tracked for the purposes of this study.

Fourth Year Cognitive Development

There was an 80-minute "combination lecture-seminar," twice per week. Attendance was mandatory, for which points were given. Students are expected to participate a minimum of once per class, which is tracked and for which points are given. Assessment is comprised of a 40-question multiple choice/ short essay combination midterm and a 50-question multiple choice final exam. There is also a short thought paper, group presentation, and term paper.

Data Collected

Attendance, class participation and exam performance data were collected.

There was also an end-of-course, 50 question paper survey, which collected information on demographics, GPA, and attendance in other classes. Students' GPAs and typical attendance in other courses was used to control for pre-existing differences in attendance and exam performance.

Implications

Making lecture slides available online can actually increase student attendance and participation when slides are available to download or print before class, especially for first and second year courses. Having them available after class only seems to discourage attendance and encourage disengagement from class generally. Improved attendance, better participation because of the reduced notetaking effort, and slightly better exam performance are also likely if slides are provided before class.

Having slides available in PDF format as well as PPT or Keynote format is important because in order to view slides in their original format, students must own software for which they pay extra to have installed on their computers.

When posting slides, keep in mind that if students think slides are better notes than they would take themselves, then they may be lulled into a false sense of security and attend class less. So, too much detail per slide can be counterproductive. The point of having lecture slides available is to provide enough topic outline structure to reduce the frantic effort required to make notes from scratch. Whether they realize it or not, adding their own details is an important part of encoding the concepts in short-term ("working") memory so students can retrieve concepts later from long-term memory.

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