



## Can Tablet presented lectures promote engagement of first year bioscience students in lecture note-taking?

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Lectures are one of the major teaching methods at University, but many academics are disillusioned about the value of lectures because of poor attendance and ineffective note-taking by students. Tablet technology in lectures has the potential to promote student engagement and improve note-taking. In this study, a case control design was used to investigate the effect of Tablet lectures on note-taking and attitudes of first-year bioscience students. The results of the study could possibly add to our knowledge of the use of Tablet technology in lectures to large numbers of students.

**Keywords:** Tablet PC, engagement, lecture note-taking, bioscience, academic skills

### Purpose

The aim is to compare lecture note-taking skills and attitudes of bioscience students taught by lecturer-presented Tablet PowerPoint with students taught by lecturer-presented PowerPoint slides. It is possible that annotation of PowerPoint slides with digital ink allows the step-wise construction of conceptual knowledge and, as such will be more engaging and will promote more effective note-taking than the traditional PowerPoint lecture.

## Methods

Two lecture cohorts of first year bioscience students were set up by students self allocating. The test cohort of 280 students received Tablet PowerPoint lectures for a 3-week period, while the control cohort of 200 students had PowerPoint lectures without annotations and script writing. Pre- and post-testing involved marking notes of a 4-minute online lecture at [http://www.ted.com/talks/dean\\_ornish\\_says\\_your\\_genes\\_are\\_not\\_your\\_fate.html](http://www.ted.com/talks/dean_ornish_says_your_genes_are_not_your_fate.html). Two different scoring rubrics were used to mark lecture notes: rubric one marked points made in the lecture (0-50 scale); rubric two marked major concepts (0-10 scale). Student attitudes were evaluated by lecture attendance, by a likert-scale questionnaire validated by the University, and by written comments. Statistical analysis with Minitab v.13 was used for two sample t-Tests and Analysis of Variances.

## Results

The majority of students in both groups came from B. Nursing and B. Occupational Therapy courses but self-allocation to the lecture cohorts resulted in B. Emergency Health students being allocated to the test cohort and B. Midwifery students to the control cohort. Therefore the student composition of the cohorts was different and this was reflected in a significant difference in end-of-semester exam scores: test cohort mean 61.3% (sd 16.6); control cohort mean 56.7% (sd 15.8) ( $p=0.003$ ).

### Lecture attendance

Attendance at Tablet lectures remained steady over the 3-week period in contrast to a decline in attendance in the control lectures.

**Table 1: Student attendance (n, %) at lectures**

	<b>Week 1</b>	<b>Week 2</b>	<b>Week 3</b>
<b>Test cohort: Tablet PPT (280)</b>	212 (76%)	217 (78%)	232 (83%)
<b>Control cohort: PPT (200)</b>	162 (81%)	147 (73.5%)	125 (62.5%)

### Student attitudes

A 5-point likert questionnaire on lecturing was completed by 70% of students. The questionnaire items relevant to note-taking are shown in Table 2. Student responses to item 1 were significantly different.

Table 2: Mean scores (and standard deviations) of student responses

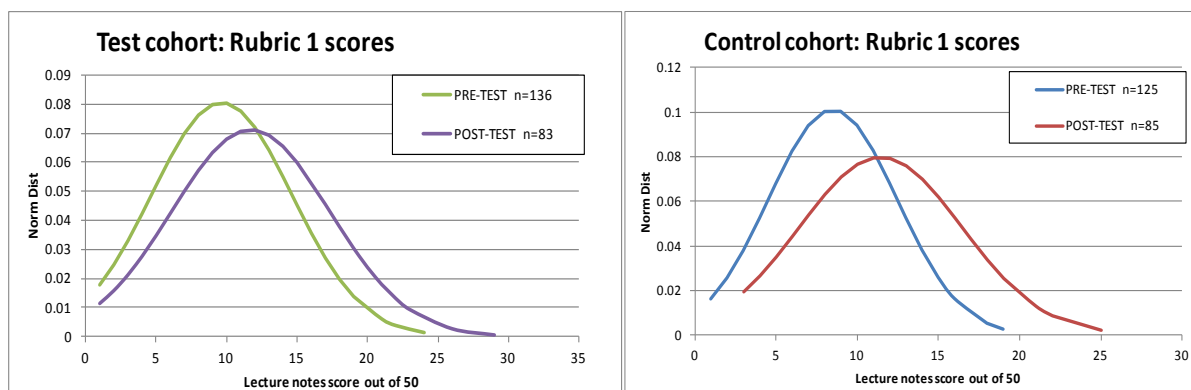
<b>Questionnaire item</b>	<b>Test cohort</b>	<b>Control cohort</b>	<b>p-value</b>
1. The lecturer's pace of presentation allowed me to take adequate notes	4.27 (0.89)	3.89 (1.07)	0.0006
2. I could comprehend the language and vocabulary used by the lecturer	4.41 (0.78)	4.24 (0.97)	0.087

**Written comments:** Some students found the pace of the Tablet lectures too slow while others found the pace helped in note-taking. For example:

The presentation method helped a lot. Often in lectures it is difficult to make notes because the lecturer goes too fast and by the time you are half way through a sentence they are explaining another point that you are trying to listen to, so you forget what you were writing down....labeling diagrams and writing down points helped to eliminate this and also helped with spelling, ensuring you heard correctly what was said.

## Lecture note-taking

A lower proportion of students in the test cohort chose to participate in the note-taking activity: pre-test 136/212 (64.2%), post-test 83/232 (35.8%) in the test cohort, compared to 125/162 (77.2%), post-test 85/125 (68%) in the control cohort. An Analysis of Variance for mean scores of lecture notes marked by rubric 1 is shown in Figure 1.



**Figure 1: Rubric 1 pre-test and post test scores of lecture notes**

There was a highly significant difference between the pre and post test mean scores ( $p < 0.001$ ) but no differences were found between the test and control cohorts ( $p = 0.37$ ).

Pre-test and post test scores marked by rubric 2 (not shown) produced similar results. Like rubric 1, there was a highly significant difference between the pre and post test scores ( $p < 0.001$ ) but no differences were found between the test and control cohorts ( $p = 0.35$ ).

## Conclusion

Better lecture attendance and generally more positive attitudes of bioscience students to note-taking in Tablet PowerPoint lectures were observed. However there was no evidence that lecture note-taking improved as measured in this study. It is possible that the lower participation rate of the test cohort in the note-taking activity may have skewed the results and also, the appropriateness of the measuring tool could be questioned. Measurement of lecture note-taking by marking samples of actual notes written in lectures may be more appropriate.

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