

## **CHAPTER 8**

### **TO LECTURE OR NOT TO LECTURE?**

According to Bligh (2000), so ingrained is the lecture in higher education, that over 95 percent of science professors in the U.S. use it as their main teaching method, and this in spite of all the research showing that students do not learn well in lecture situations.



A study at the University of California at Berkeley (Angelo, 1991) has shown that college students only remember 20 percent of what they hear from a traditional lecture or demonstration several days after the class. Furthermore, this study also found that, in a room full of dozens of students, fewer than 15 percent are paying attention to what is being presented at any one time during the class, not counting the first eight minutes of a class when a much higher percentage of students are following the lecture.

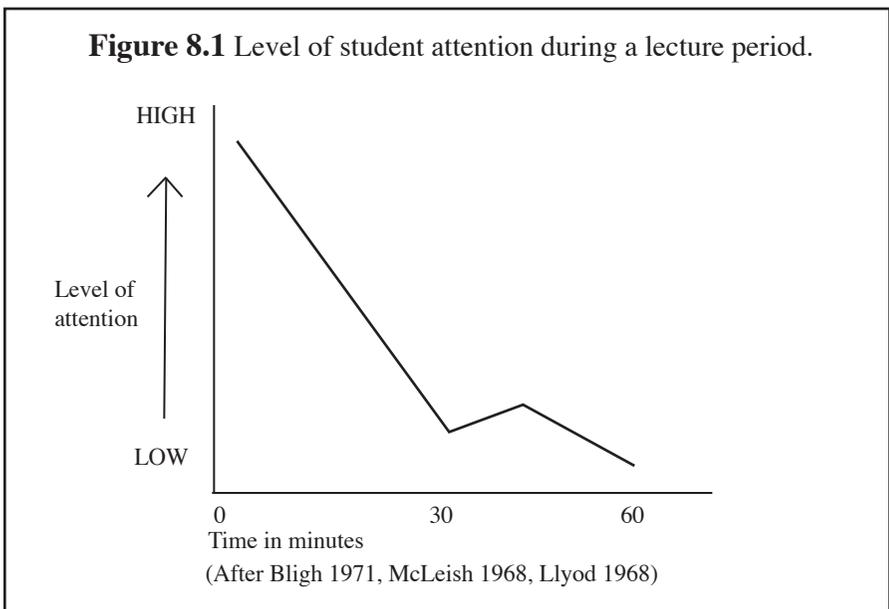
Thus, the major reason for this is that students do not expend much energy thinking about what is being discussed in a traditional-style presentation. Students may also be so busy writing notes that they don't have the time to think about what they are actually doing.

It reminds me of a cartoon I have, showing a student returning home from school and telling his father, "They don't give us time to learn anything; we have to listen to the teacher all day." How very true. This does not mean that we should suddenly abandon lectures to teach but make the best use of the time we have in a

## To Lecture Or Not To Lecture?

class to ensure students are actually learning. Otherwise, we might find that the following quote is all too true: “With the lecture, the information usually passes from the notes of the instructor to the notes of the students without passing through the minds of either!”

One thing that greatly influenced my own teaching when I became aware of it was the issue of student attention span in the *What's the Use of Lectures* book by Bligh (1971). One graph in his book shows the typical decrement curve for a person's attention to a single task over a period of time.

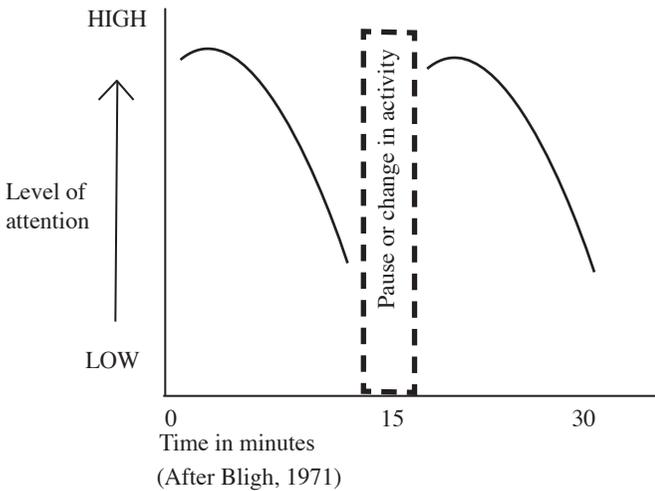


This pattern is usually displayed in the level of performance of students during a lecture. It has been suggested (McLeish 1968; Lloyd 1968) that student attention rises and falls in the last five minutes of a 55 minute lecture. Not surprisingly the student level of attention is highest at the start of a lecture but begins to decline thereafter, and around 10-20 minutes into the lecture the level of attention begins to decrease dramatically and continues to decline for the rest of the hour until the last five minutes. In

fact student attention has been shown to drop off after only 10 to 15 minutes (Hartley and Davies, 1978). This suggests that the attention span of an average student might only be around 10-15 minutes during which time the most learning takes place.

Bligh (1971) notes that several studies have found a marked improvement in attention after a short break. The second graph below shows the effect of a rest or change of activity on the level of attention after a break of a few minutes. If there is such a rest period for a few minutes, when the lecture resumes, the amount of effective learning is almost as high as it was at the start of the lecture. Again, the amount of effective learning will drop off during the next part of the lecture.

**Figure 8.2** Effect of a pause or change in activity on level of attention



A number of studies have examined the efficacy of pauses during a one-hour lecture period, and these all confirm that students are more attentive during the lecture period, and do better on subsequent tests.

Ruhl et al. (2007) point out that the pause may also benefit the lecturer since he/she may use the pauses to scan the lecture

## To Lecture Or Not To Lecture?

notes and, perhaps, improve the quality of his/her delivery after the pause.

Try it out for yourself! Inform your class that you will teach for 15 minutes and then take a two-minute break. During this break students should review their notes to see if there was anything they didn't understand, and discuss it with a neighbor to see if the neighbor could explain it to them. If not, the student can ask questions on the material after the break. The two-minute break allows students to socialize with, and get to know their neighbors, and will give you a few minutes to get organized for the next part of the lecture.

Several years ago, to try out the strategy I used the two-minute pause with a single class during an entire semester, and when the grades for all the sections were tallied at the end of term, that section performed significantly better than all the others. And why wouldn't they? I had taught in smaller chunks of time when student learning was most effective, and students could discuss problems with each other during the pauses.

Since that initial trial run, I've continued to use this technique when lecturing.



When talking to colleagues about my use of this technique, they often comment that I have *lost* four minutes of instructional time in a fifty-minute lecture! Of course, what is most important is not the *quantity* of teaching time, but the *quality* of the student learning.

It is important to point out that Bligh's graph points to a change of activity after approximately 12-14 minutes. It follows from what we discussed in previous chapters, that good science teachers employ more active techniques to allow students to become better involved in their own learning. Such activities might include solving problems you present to the class, small group discussions, demonstrations, and a variety of other techniques dealt with later in this book.

## ***Teaching in the Sciences: A Handbook***

It is perhaps also worth noting that Bligh (1971) reports that the rate of decrement (i.e., loss of attention) is steeper for more difficult subject matter and, therefore, the more difficult the lecture material the more frequent the pauses or variations in teaching should be. Bligh also points out that the same decrements in attention occur during the course of a day.



While some people reach their optimum level of performance during the morning, and others at midday, very few people are at their best in the afternoon. Thus, attention to lectures is more difficult in the afternoon and evening, lectures delivered at those times should be shorter, more varied, and more stimulating, should give way to small group teaching and other active methods of learning.

**To Lecture Or Not To Lecture?**

**Figure 8.3**

