

Implementation of Teaching Learning Activities during single lectures on a multiple teachers' course

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Introduction

The multidisciplinary approach to teaching in universities involves teachers or scientists from different scientific disciplines. These multiple teacher courses can result in individual teachers only having the opportunity to teach once, or perhaps twice, during a semester. During a multidisciplinary course the students will, most likely, meet as many different forms of teaching as there are teachers. So, what can a teacher do to be sure that the students achieve the learning outcomes intended? Having to give only one or perhaps two lectures, one approach could be to write out the intended learning outcomes (ILOs), for instance, on the blackboard, then the students know what they should be able to do after completion of the lectures.

In general, lectures are very effective for presenting information to the students, but not so effective for student learning. Using Teaching and Learning Activities (TLAs) that address the intended learning outcomes, outstanding and inspiring teaching is possible. Maintaining the students' attention can be hard, especially if there are no breaks or change in activity during a lecture. Instead of sitting passively listening to a lecture for 30 to 60 minutes, incorporation of student activities or short rests will improve the students' learning outcomes, as illustrated in figure 6.1.

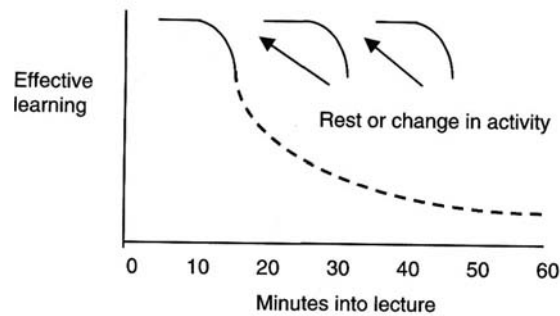


Fig. 6.1. The figure illustrates the effect of rest or change in activity on learning (Biggs & Collis; 1982).

Teaching and learning activities

The course *Mikrobielle Interaktioner* was split up in three subjects: *Interaktioner i forhold til det ydre miljø*, *Interaktion mellem mikroorganismer* and *Interaktion med højere organismer*. I was responsible for half a day of teaching in the last theme and taught innate immunity in plants. I designed two ILO statements for the 35-minute lecture I gave using verbs from the SOLO (Structure of the Observed Learning Outcome) taxonomy (Biggs & Collis; 1982). There are several levels of understanding and the SOLO taxonomy, which is a hierarchy of verbs, can be used to classify the learning outcomes in relation to their complexity. The two ILOs for my lecture were: After this lecture: 1) you will be able to *explain* the term MAMPs and *estimate* its importance in plant innate immunity. 2) You will be able to *analyze* peptidoglycan and muropeptides as MAMPs in plants. Here I used the verbs “explain”, “estimate” and “analyze” mainly from the relational level in the qualitative phase. I found the relational level to be suitable for this second-year course.

Instead of lecturing, I decided to engage the students by introducing TLAs, which I felt was received very well by the students, even though it was something quite new for them to try. I used TLAs that included activation of the students. I do not think that the use of TLAs when lecturing is a common way of teaching at LIFE yet, but the students were motivated and participated actively in the activities/discussions. I found the introduction of the TLAs made time fly not only for me as a teacher but also for the students. I incorporated two TLAs, one every 15 minutes. After a short introduction to the theory, the students had their first assignment, a student-to-student talk where they had two minutes to explain in their own words

what I had just gone through and come with examples of it. This form of TLA requires that the students participate actively in the lecture, but the idea is also to give the students the opportunity to talk to a fellow student and if there is something they do not understand they can then approach the class saying, "We do not understand...".

After another 15 minutes the level was raised and the students, in small groups, were given four minutes to discuss and reflect on two scientific figures. The points raised during the two TLAs were listed on the blackboard and feedback was given to the students. The incorporation of the TLAs, here in the form of assignments, resulted in a very interactive lecture.

Student evaluations

After my day of teaching, I asked the students for evaluation of my teaching. I made an evaluation sheet with the following three questions:

- Blev læringsmålene opfyldt? (Were the learning objectives met?)
- Hvad var det bedste ved undervisningen? (What was the best thing about the teaching?)
- Hvad kunne gøres bedre? (What could be done better?)

All the students answered the three questions in the evaluation sheet. From this type of evaluation sheet, one can expect as many different answers as there are students. The evaluation sheet covers the whole day, not only the lecture but also the following colloquium. Findings from the evaluation revealed that 100% of the students felt that the ILOs were achieved, that is, they answered "yes" to question one. In addition to this, a majority of the students, 54%, rated the incorporation of the TLAs as the best thing about my teaching. Another 31% of the students rated that handing out a copy of my PowerPoint slides when the lecture started was the best part of my teaching, 15% of these 31% meant that the incorporation of TLAs *and* handing out a copy of my PowerPoint slides as the best part of my teaching (see the illustration in Figure 6.2 for the students' answers to question 2).

There is always room for improvement, and as my last question I asked the students "Are there somethings I should have done differently?". In their feedback, 46% of the students answered that the breaks/preparation time of the following colloquium had been too long, while others (15%) said that it was good to have time for preparation. Overall this is a task that is easy to improve/change in the future, but it also depends on the

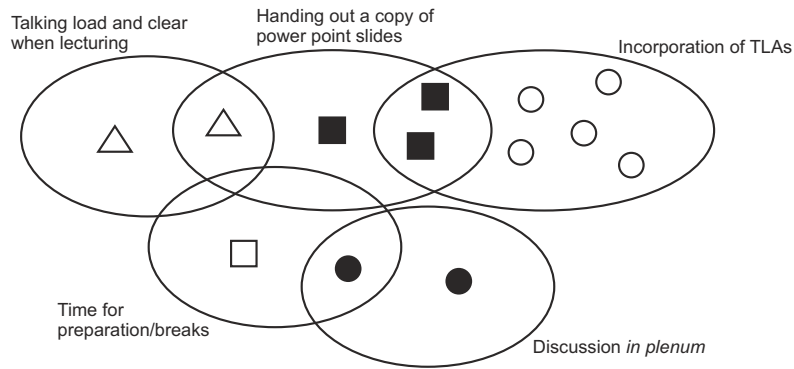


Fig. 6.2. The figure illustrates the distribution of the students' answers to question 2 "What was the best part of my teaching?". The different subsets represent their answers. White circles: incorporation of TLAs. Black squares: handing out a copy of PowerPoint slides. Triangles: speaking loud and clear when lecturing. White squares: time for preparation/breaks. Black circles: discussion in plenum.

participating students; what level are they at in addition to the difficulty of the material being taught. In general, the answers to question 3 were mainly about the following colloquium not the lecture.

Conclusion

In general, the feedback from the students has been very positive, and I find consistency between the students' and my perception of the teaching. From the discussion we had in plenum during the colloquium, I could tell that the students had achieved what I had intended they should learn. They were aware of the definitions we had gone through in the lecture, and they could use them in context as well as being able to go beyond what we had discussed during the more formal part of the teaching.

I do not know how the other teachers on this course teach, or how well their teaching is aligned with what is intended for the students to learn, but this assignment has convinced me that it is possible to make students learn even though you only have a few lectures in a course. It is not a matter of being responsible for a course during a whole semester or only being responsible for a few lectures; it is the way you teach that matters, or I should say, how you make the students learn.

Even though I only had one day of teaching in this course, I tried to align my teaching with what I wanted the students to learn and the final assessment. The student evaluations tell me that it has been possible for me to align my part of the teaching on this multiple teacher course with the ILOs. The final assessment is constructed in a way that will tell us how well the students have achieved the intended learning outcomes. The form of the final assessment is a 24-hour written exam, where the students are given an assignment as well as a paper and have 24 hours to show that they have achieved the learning outcomes for the course/subject. Three different assignments were made, corresponding to the three subjects within the course and the assignments were randomly divided between the students. This means that a third of the students received an exam assignment in the subject *Interaktioner med højere organismer*, this group of students performed very well. The assignment was exactly on the subject plant innate immunity, the subject I, to a large extent, taught. This summative assessment told me that the students had learned what I laid out in my ILOs.

All contributions to this volume can be found at:

http://www.ind.ku.dk/publikationer/up_projekter/2010-3-1/

The bibliography can be found at:

http://www.ind.ku.dk/publikationer/up_projekter/kapitler/2010_vol3_bibliography.pdf/