

## **Does a simple exercise of student-generated take home message activate and thereby improve the attention level and learning outcome of the students during an academic lecture?**

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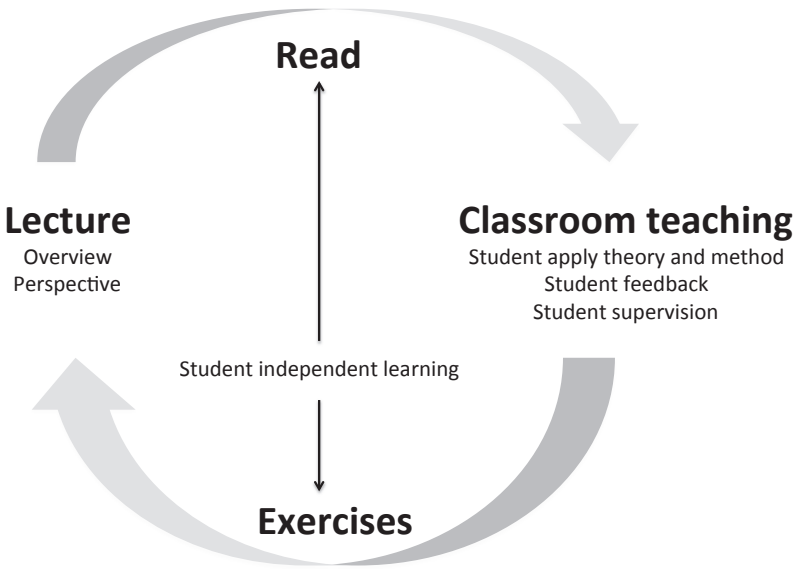
### **Introduction**

Compared to high school (*In Danish: Gymnasieskolen*) or other lower educational schools, the university is characterized by many hours of self-studying and few hours of teaching during which the students and the teachers are together. Even though most of the learning takes place outside the university, traditional lectures with the person lecturing doing most of talking from some kind of stage, are still a major part of the educational process at most universities.

Lectures are superb to give an overview of a dense curriculum and are among the most cost-efficient teaching methods, operating with a teacher-student ratio of up to 1:450. Lectures can be inspiring, motivating and promote high quality learning. Thus, students may look forward to some lectures, either because it's a great topic that they're very interested in, or because the person lecturing is really good and inspiring. Unfortunately, lectures can also be overwhelming (too much information and/or too fast communication) or boring. Traditional ways of lecturing are very difficult and challenged by the low level of student activation and feedback, two essential elements of learning. Long monolog talk without any contact or interactions with the students may easily result in a poor learning outcome due to a high degree of passivity among the students and a documented drop in concentration after 20 minutes (Dahl et al., 2015). If the lecturing

person is not engaged, well-prepared and/or not in tune with the students the students may feel happy to skip the lecture, their attention shift from the teacher to other activities such as online communication on Facebook or Snap chat, some students may even leave the lecture hall if they are bored and as a result the learning outcome can be rather limited.

At most universities, lectures are provided in combination with smaller-sized classroom teaching is used (figure 4.1) to ensure student activation and student-centered teaching in order to optimize learning and to stimulate deep learning approaches (Herrmann et al., 2014).



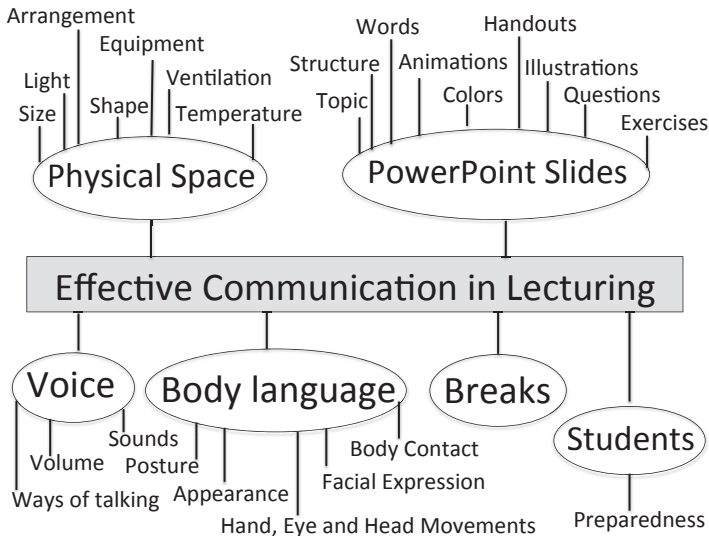
**Fig. 4.1.** Relationship between lectures, classroom teaching and student preparation (Herrmann et al., 2014).

Many other factors contribute to the learning outcome of the students of an academic lecture in addition to the relationship between lectures, classroom teaching and student preparation (Dahl et al., 2015). Some of these factors cannot be modified significantly during a single lecture by the lec-

turing person such as those related to the students, e.g. their motivation, time, capacity to understand the topic, etc.

The fact that lecturing in existing courses often is required by newly appointed scientific staff at the University can be a challenge because in such situations, the ‘guest’ lecturing person has no or very little influence on the structural factors related to the curriculum, the intended learning objectives of the course, the schedule, the alignment of the course, the alignment of the education and the alignment of the between teachers as well as time and place of the lecture.

Figure 4.2 summarizes some of the many modifiable factors that can influence on the learning outcome of the students during an academic lecture and that are feasible to modify by the lecturing person in a guest lecture settings.



**Fig. 4.2.** Simplified illustration of different factors that in addition to the spoken word and the context of the lecture may affect the effective communication in lecturing and that may be modified by a co-lecturer in an existing course.

The context as well as a well-structured and engaged presentation is important for the learning outcome. A way for the lecturer to keep the at-

tention of the students and hereby to improve their learning objectives is by changing lectures towards more student activating situations.

There are different ways of activating the students during lecturing such as:

- Introducing variation in the lecture
- Directly engage the students

PowerPoint slides are more and more commonly being used in lectures as they offer many great possibilities of quick presentation using beautiful and entertaining visual illustrations of complex matter. Sound and animations can be used too in order to increase variation in the lecture. Another strength of using PowerPoint slides instead of blackboards is that the person lecturing can face the students and have eye contact. Eye contact is very important for connecting with the students and adaptation of the teaching. PowerPoint can more easily be read as compared to my handwriting. Furthermore, PowerPoint slides allow the students to prepare in advance and it can save the teacher time as PowerPoint can be read easily so the teacher does not have to remember every detail and can re-use the slides. The main disadvantages relate to the high tempo and overload of information.

It is not straight forward to prepare a good PowerPoint slide presentation, too often the presentations are too dense and there is a risk of going too fast as compared with traditional black board teaching. In my point of view a good PowerPoint presentation is characterized by *less is more*, few words, use large sized text, and many visual stimulating illustrations. Less or no text forces the students to take the notes and they may learn more.

Most students require handouts of the presentations before class. It is good and bad. It may help the motivated student to study deeper, to prepare and take note, but there is a risk that the students pay less attention in class as they already feel they know the lecture and that they only pay attention to the written words not the spoken words.

Variation can also be introduced by the lecturing person though the voice, body language, by changing from a PowerPoint supported presentation to writing or drawing on the blackboard, playing animations or podcasts, showing overheads or simply by moving around in the room.

In a lecture setting students can also be activated by posing questions, through quizzes, games and other exercises such as being asked to present or do specific tasks.

## Objectives

The aim of the present report is to evaluate whether the use of a simple exercise of student-generated take home message as part of the traditional lecture to activate and hereby improve the attention level and learning outcome of an academic lecture. I am hypothesizing that it will help the students to pay attention and to recall the context of the lecture when they are actively reflecting about it at the very end of lecture.

## Methods

My project is based on an exercise that I used during three lectures I had at October the 10th, 11th and the 24th 2016 during which I was lecturing on the *Environment, Reproduction, Birth Outcomes and Children's health* as part of an existing, obligatory course for students at bachelor level in Public Health, which is provided in the 5th semester, called *Environmental Factors, Occupation and Health*.

### Learning by doing: Exercise for you:

- Write down 1-2 things that you learn during the lecture



**Fig. 4.3.** The exercise applied.

## Thanks for yesterday – you did a good job

### Summary of your replies:

- Infertility is common and affect 15-20% in Denmark
- Many risk factors, including non-environmental and cocktail effects
- Light and noise (i.e. non-chemical) exposures may also cause adverse reproductive effects
- Male fish develop eggs after exposure to estrogens in waste water due to p-pills
- Different critical windows of exposure
- Prenatal exposure can affect organogenesis and cause delayed reproductive effects
- Maternal exposure matters for daughter's reproductive health, not only the sons
- Reproduction in many generations may be affected by exposure to environmental factors
- Fathers-to-be should not smoke pot to minimize risk of reduced sperm quality
- Pregnancy is a dynamic stage of life, week 6 differ from week 30
- Maternal exposure to both air pollution and noise can increase the risk of preeclampsia
- Children of mothers with preeclampsia have higher risk of developing asthma



**Fig. 4.4.** Summary of the students' take-home messages.

When the students entered the room, I greeted them and handed them a note paper and a pen. After introducing myself and the topic of the lecture I presented the students for the exercise. I asked them to prepare their own take-home message (figure 4.3). I explained to them that it was important to be able to summarize briefly what you learn and that they would gain from doing so on their own in the future. After the lecture, I collected their notes and in the start of the following lecture I summarized the student's replies (figure 4.4) and we discussed if any issues were unclear.

## Results and Reflections

The exercise was successfully completed. As expected the exercise was easy to do. It required no preparation from me or the students. All the students wrote a line or two summarizing something they learned. There was some overlap in their replies, but much less than I had foreseen. It was fun

for me to read what was important and new information for the students. I did not systematic evaluate what the students thought about the exercise so I can't formally assess the student's perception of the exercise. I simply noted how many notes I got, if the replies made sense and from discussions with the students it is my impression that they liked the exercise. In my own point of view, it worked well to quickly summarizes the students' reply as a wrap-up the key-points of the earlier lecture in the start of the following lecture.

### **Perspective of the exercise**

My goal was simply to activate the students and make them reflect about what they learn being at the lecture. However, the if the goal had been to formally evaluate the learning outcome of students, one could had asked the students if they learn more doing the exercise or one could had given only a random half of the students the exercise and compared their performance in a multiple-choice quiz that I made for the final lecture with the performance of the non-exposed half. Finally, instead of using paper and pens, which I do not recommend as the students kept the pens, one could simply ask the students to e-mail their replies.

The exercise can be viewed as a simple way to active the students which make the students reflect and remember (low level of cognition) and also evaluate (higher level of cognition) the context of the lecture as illustrated by the Bloom's learning theory (figure 4.5).

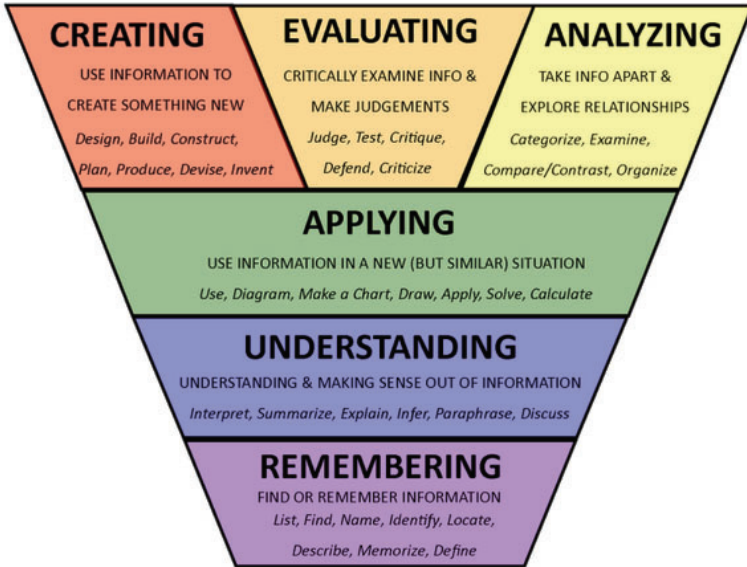


Fig. 4.5.

## References

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