

# Discussion Seminars

## – an Award-winning Pedagogical Method

Frida Heskebeck<sup>1</sup>, *Department of Automatic Control, LTH*

**Abstract**—There are many pedagogical methods to engage students in active learning. This paper presents Discussion Seminars, which is one such method that is much appreciated by students. This paper explains how to structure seminars and discusses their benefits and what requirements they put on the teacher. The paper aims to inspire other teachers to try something similar.

**Index Terms**—Active learning, Flipped Classroom, Discussion Seminar

### I. INTRODUCTION

WHEN discussing student learning, Bloom's taxonomy frequently occurs (see Figure 1) [1], [2]. In the lower levels of Bloom's taxonomy, the student is introduced to new content and information, and in the higher levels, the student works actively with the content. It is generally agreed upon that teaching methods designed to engage the students in tasks described by the higher levels of Bloom's taxonomy result in a deeper knowledge of the course content for the student [3]. It is also generally agreed upon that students engaging in active learning gain a deeper knowledge of the course content. Some methods for active learning are discussions and group problem-solving. In passive learning, on the other hand, the students are not as active, for example, when sitting at a lecture and only listening without actively processing the information [4], [5].

Many courses at LTH use the so-called traditional classroom methodology. In most courses, the students are introduced to new content during lectures, which generally engages the students in the lower levels of Bloom's taxonomy, and after the lectures, the students can attend exercises to ask questions about the course content. The students work actively with the course content during the exercises (or corresponding self-studies), and it is thus only after the lecture they start to gain a deeper knowledge of the content (see the left half of Figure 1). However, other pedagogical methodologies than the traditional classroom methodology exist, which are designed to aid the students in actively working with the content as described by the higher levels of Bloom's taxonomy. One such example is the flipped classroom methodology. In the flipped classroom methodology, the students are introduced to new course content at home, e.g., through video recordings, and work with the content in the classroom together with the teacher (see the right half of Figure 1) [6], [7].

This paper presents Discussion seminars, a method based on the flipped classroom methodology used in Automatic

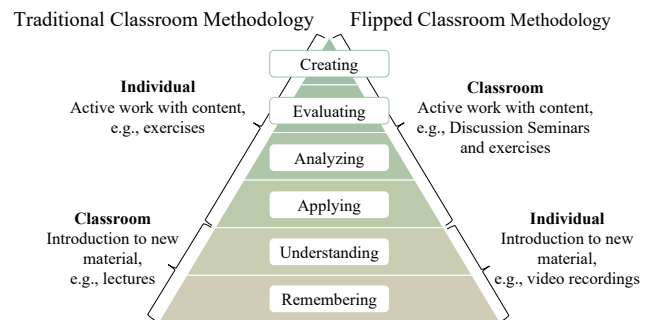


Figure 1. Bloom's taxonomy related to traditional and flipped classroom methodologies (inspired from [7]).

Control courses at LTH. Section II describes the structure of a Discussion Seminar, Section III presents the outcome of a Discussion seminar and student feedback, Section IV provides a discussion around Discussion seminars, and Section V concludes the paper.

### II. THE DISCUSSION SEMINAR METHOD

This section presents the suggested structure for a Discussion Seminar.

In each seminar, the content from one lecture is discussed, or the corresponding video material, book chapter, etc. The point is that the content to be discussed during the seminar is a delimited part of the course and beforehand known by the students. The students should have prepared for the seminar by looking at the content beforehand. During the seminar, a mind map is created of the topics that are discussed.

The seminar starts with the students, two and two, discussing for 5-10 min what they want to discuss during the seminar. Then, the whole group is gathered, and the students convey what they want to discuss during the seminar. These topics create the center of the mind map, and the teacher helps combine related topics into one point in the mind map. Once all students are satisfied with the seminar's agenda, i.e., they have no more topics to add to the mind map, the teacher decides in what order the topics are to be discussed. For the remaining time of the seminar, each topic is discussed by the students two and two for about 5 min, then the topic is discussed in whole-group, and the mind map is filled out. During the whole-group discussions of each topic, it is important to first let the students explain for themselves, then for the teacher to always summarize the discussion to allow the students to get more viewpoints on the same topic. The students are encouraged to find a new friend for every new topic to discuss. So, a topic on the mind map is first discussed

<sup>1</sup> Frida Heskebeck (e-mail [frida.heskebeck@control.lth.se](mailto:frida.heskebeck@control.lth.se)) is a Ph.D. student at the department of Automatic Control, LTH.

in small groups, then with the whole group, before the next topic is discussed.

### III. RESULTS

During the seminars, a mind map is created, which is preferably documented and made available for the students after the seminar, e.g., by taking a picture of it (see Figure 2).

Most LTH courses perform CEQ evaluations at the end of the course, where the students provide feedback [8], [9]. These evaluations show that the students appreciate the Discussion Seminar method. Below are some (translated) quotes from students' answers to the freeform question: "What were the best aspects of the course?"

The discussion seminars with Frida. They were a good incentive to keep the pace of the course and put words on what you understand and don't understand.

From the course Systems Engineering (translated),  
FRTF10, 2021

The webinars! They really gave understanding, I think all courses should have something similar.

From the course Systems Engineering (translated),  
FRTF10, 2021

... Frida's Discussion seminars helped a lot to understand what this course was about and gave a deeper understanding of the content, which was useful for the calculation exercises. A very good initiative of her to start with them.

From the course Automatic Control, basic course,  
(translated), FRTF05, 2021

... Webinars: Great! Perfect way of revising key concepts and to earn an understanding of how they are connected.

Making a mind map makes it easy to follow the session and to understand the whole picture. The discussions in smaller groups make everyone participate actively even though you do not want to speak up in front of the whole group, and since questions always came up the discussions in whole class were great. ....

From the course Systems Engineering, FRTF10, 2020

These quotes highlight that the students appreciate the method of discussion seminars but, more importantly, that the method, as intended, aids the student in gaining a deeper knowledge of the course content.

Another indicator of the students' appreciation for the Discussion Seminar method is that the author has been awarded "Teaching Assistant of the Year" twice.

### IV. DISCUSSION

As stated in the introduction, the Discussion Seminars are a concrete example of a method for the flipped classroom methodology. The method is first discussed from the students' point of view and then from the teacher's point of view.

#### A. Students' point of view

During a seminar, the students actively discuss the content of the course. The students practice identifying and formulating their knowledge gap and explaining the content to other students, which corresponds to activities in the higher

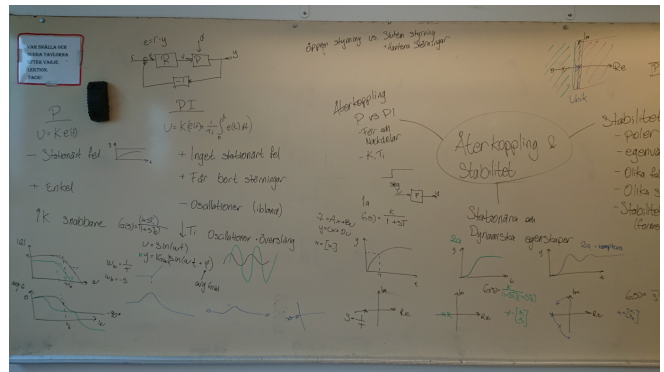


Figure 2: Mind map from a seminar in the course Automatic control, basic course.

levels of Bloom's taxonomy.

Since the students are required to look at the content for the seminar in advance, they must take more responsibility for their learning than in a course with traditional lectures, where they can show up without any preparations. However, the students at a university should be able to take that responsibility. Since the students must prepare for the seminar, the teacher must make the course content available beforehand. This is not necessarily a problem but requires planning from the teacher. Also, the students' preparations for the seminar should preferably not be a full recording of the corresponding traditional lecture because that would mean that the students spend twice as much time on the lectures compared to a traditional course design with only lectures, which we have understood from the students is not appreciated.

Apart from activating the students in the higher levels of Bloom's taxonomy, one of the main advantages of the seminars is that the students get feedback on their learning during the course, both from other students and the teacher. Another advantage is that the students get to know each other, which is always pleasant and, more importantly, good for learning.

Marketing the seminars and how they work is needed early in the course to successfully organize them. The students must know what they should prepare and what will happen during the seminars. A clear structure for the seminars is thus needed.

#### B. The teacher's point of view

Organizing a seminar can be challenging for the teacher since the teacher shouldn't have a detailed plan for the seminar – the whole point is that the students should decide what to discuss during the seminar. The teacher should plan the *structure* for the seminar but not the content of the seminar. However, the teacher can prepare by guessing what the students will bring up. It can be challenging for the teacher to go into a teaching situation without any definitive plan, and that requires practice.

The teacher must be extremely responsive to the students' needs, which also can be challenging since the teacher must come up with answers and explanations on the go. Falling into the "student ask, teacher explain" loop is easy. However, for a well-organized seminar, the students will first explain to each other, and then the teacher's role is to summarize, clarify, and provide another point of view on the topics rather than explaining basic concepts. However, if basic

explanations are needed, they should be given. Once again, the teacher must be extremely responsive to the students' needs.

In a course where seminars are used as a teaching method, it is also important that the examination reflects the effort the students have put into understanding the theory and concepts of the course. In other words, in a course with seminars, the exam should include some questions about the theory, not only questions where the students do calculations.

An additional benefit from the teacher's point of view is that it is fun to organize seminars and that the teacher often gets a closer relationship with the students than in a lecture setting. This generally makes it easier to provide feedback to the students.

A final note to the discussion is that the suggested Discussion Seminar method is only one example of a method from the flipped classroom methodology. There are many more similar, and totally different, methods to try. It is important that each teacher identifies what works best for them and uses that method in their teaching. We can always take inspiration from each other but must, in the end, create our own versions of the teaching.

## V. CONCLUSION

The Discussion Seminar method presented in this paper is one approach to the flipped classroom methodology, which encourages active learning for students and for them to engage in tasks reflected in the higher levels of Bloom's taxonomy. The method has good reviews from the CEQ evaluations and has proven to complement calculation-based exercises well. However, one teaching method does not work for everyone, but this paper can hopefully inspire you to try something similar.

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