Active Learning to Unlock Higher Order Learning Skills in Public Health Students

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Abstract

Despite extensive research showing that students learn more and achieve higher order learning outcomes when they are actively engaged, large class lectures with a single instructor teaching, which encourages more passive forms of learning, are still a widely used format at universities. In this paper, I present insights from an experiment where I changed a classic lecture into more student-centered learning to promote higher order learning at the course Organizational Analysis and Philosophy of Science taught at the third semester of the bachelor programme of Public Health. I did so by replacing the lecture with two exercises activating the students: one where I asked the students to stand up, move around and discuss with each other and one where students were asked to generate questions. Drawing on my own experience and interviews with two student representatives from the course I conclude that the intervention successfully activated higher order thinking among students. At the same time, the intervention highlighted how much extra energy and situational awareness is required for active learning, not only from students but also from the teacher. While substituting traditional lectures with student activating exercises might increase higher order thinking it also places greater demands on the teacher's experience and ability to manage the learning process.

Introduction

The aim of university education is to enable students “to independently identify, formulate, and solve complex problems” (Uddannelses- og Forskningsministeriet, 2013, §2). University education should accordingly move beyond memorization of facts to foster higher order learning and thinking (Young, 1997). Extensive research show that students learn more and achieve higher order learning when they are

actively engaged in the teaching (Deslauriers et al., 2019; Entwistle, 2009; Ulriksen, 2014). Nevertheless, large class lectures with one instructor teaching up to hundreds of students, which invites to more passive forms of learning, are still a widely used format at universities. This is not at least a because of the "Massification of in higher education" where universities are expected to enroll more students without a corresponding rise in funding (Hornsby and Osman, 2014, 712). In educational literature, large class lectures are criticized for their monologic style, the passive role it assigns to students due to limited possibilities for teacher-student interaction, and the difficulty teachers face in relating to diverse student prerequisites and backgrounds (Hornsby and Osman, 2014; Maringe and Sing, 2014).

In this paper, I present learnings from an experiment where I changed a classic lecture into more student-centered learning (Russell et al., 2016) to enable higher order learning. I did this by substituting the lecture with two exercises activating the students: one where I asked the students to stand up, move around and discuss with each other and one where students were asked to generate questions. In the following, I first introduce the course in which I did the intervention, then the two exercises which form the intervention and followed by the signs of learning I look for. I then turn my own experiences of the intervention as well as how two students experienced it. I conclude with some reflections about future interventions.

Setting: Organizational Analysis and Philosophy of Science for Public Health students

The intervention took place at the mandatory course Organizational Analysis and Philosophy of Science at the third semester of the bachelor education of Public Health. A total of 50 students were signed up for the course. The course has 15 modules, and each module consists of a 45 minute lecture with all students present and 2X45 minutes class room sessions, where the group is split up into two smaller groups consisting of 25 students. The group of students are relatively homogenous: mostly young Danish speaking woman in their early twenties. I was the course

leader and in addition to being responsible for 12 out 15 lectures I was also class teacher for one of the two groups.

The course aims to develop students' analytical skills by enabling them to identify implicit and explicit normative, ontological, and epistemological assumptions in both academic and non-academic texts concerning various healthcare relevant questions (https://kurser.ku.dk/course/SFOB20010U/2024-2025). This should allow the students to reflect on how these assumptions shape the types of knowledge and claims a text produces. To meet the learning outcomes, students therefore need to apply higher-order thinking skills (Young, 1997).

Structurally, the lectures take place in auditoriums with rows of chairs and tables bolted to the floor facing a podium where the lecturer talk, inviting the communication to flow from the lecturer to the students rather than inviting a dialectic conversation. In the lectures I, or a guest lecturer, would normally do a lecture using power point with shorter student activations throughout the lecture. The classroom teaching is situated in smaller classrooms with movable chairs and tables and are centered around student engagement activities.

Intervention

I experimented with making the lecture more student-centered by keeping the students active throughout the lecture and giving them substantial responsibility for the class content. The intervention consists of two open-ended exercises with the aim of creating a learning environment which stimulate higher order learning skills. It took place in module 14 out 15 in the course in a 45-minute lecture. I chose this timing for the intervention for two reasons. Firstly, the students had already established norms for active participation throughout the course (Tanner, 2013) especially during the class room teaching where the students have practiced discussing and formulating thoughts about texts on their own through various forms of think-pair-share assignments, through students presentation and through peer-feedback (Tanner, 2013). Secondly, I chose the end of the course to do the experiment because the content of the module touched upon topics which we had discussed previously in the course. The theme of the day was "Economy, management, and

incentives". As preparation, the students had read three texts all related to the topic of the day.

Research shows that students respond more positively to being activated during lectures if they are presented with the evidence that it increases their learning prior to the activation (Deslauriers et al., 2019). Therefore, I started the lecture by telling the students that they would play a more active part in today's lecture compared with a normal lecture and that the reason for this was research shows that being active during lectures increases higher order learning skills. After that I introduced the first exercise.

Exercise 1

As the students entered the class I wrote on two whiteboards in each side of the class the words: **Motivation** and **Incentive.** After I had introduced the theme of the day and the rationale for the intervention, I asked them to stand up and stand next to one of the two words (**Motivation** and **Incentive**) without further explanation. The purpose of the exercise was to articulate how that discourse and the naming of a phenomena matter for how it is perceived for the people involved. To foster higher order thinking skills I wanted to facilitate a dialectic conversation allowing the students themselves to formulate these points, rather than telling them in a lecture, but I did not tell that to the students. To those who asked based on what they should choose, I told them to pick the one that intuitively appealed most to them. Then I asked them to pair and share with the people standing next to them the reason for choosing that word, and what they saw as the differences between the two words. I chose the pair and share approach to enable all students to verbalize their thoughts (Tanner, 2013). Afterwards I asked them to share their discussions in plenum.

Exercise 2

For the second exercise, I asked every student to formulate one question to one of the readings of the day. Making students formulate questions is a way for the students to develop and practice critical thinking, because in-depth questions require a thorough understanding of the matter being

questioned and to "link new ideas to existing knowledge" (Aflalo, 2021, 63).

I asked the students to each write down one question about one of today's readings. I told them that the questions should be something their peers can learn from, and/or, reflect something that puzzled them, and/or highlight something they found important from the text. The structure for the exercise I had planned was the following: first students will discuss their questions in small groups with the people sitting next to them. After the discussion, each student will write down one question. Once everyone had written a question, I would re-organize students into new groups of four. In these new groups, the students shared their questions and selected the one they found most suitable for discussion. Finally, I would ask the students to write selected questions on the whiteboard. My intention was that the rest of the session would be spent discussing these self-selected questions in groups of four and in the end in plenum. The intention of moving the students around in class and asking them to choose between the questions was to expose them to each other's questions, and thereby each other's thoughts about the texts.

Signs of learning

To explore whether the students were activated and reached higher order learning I looked for several signs. First, I looked for how active students were during the exercises. Second, I had formulated some thoughts about what I wanted the students to get out of the lecture, and some things that I would myself have highlighted. My intention was to facilitate a Socratic-conversation to enable the students to formulate these points themselves. If they managed to formulate themselves what I would have highlighted in a lecture I will take this as a sign of higher order learning. Third, I conducted interviews with two students about how they experienced the lectures and asked them what they took from the lecture. I recruited the students by contacting the student representatives who are responsible for facilitating the evaluation of the course. One of the student representatives was not present during the lecture. The other student representative agreed to participate and also found another student who agreed to participate in an interview. I interviewed the two students

separately. The interviews took place at an office at the university around two months after the lecture after the students had finished the exam for the course. The interviews lasted 22 and 23 minutes respectively and were transcribed with a license agreement through the tool GoodTape. The students have been anonymized in the assignment.

Outcome: My own experience and student reactions

Exercise 1

In my experience students were successfully engaged in first exercises. For the first exercise I was tugged in between the rows of chairs and tables while the students were standing by the whiteboard. This structural change gave an interesting dynamic where students where physically placed higher than me. In the time when the students were paired and shared there was active buzzing and from what I could see most students were active.

The first response I got when I asked the students to share their thoughts in plenum was from a student who said she chose the word incentive, because she was not motivated. This incited a lot of laughs and might be an indication that some students, despite me prompting them about how active participation increase learning, still feel resistance to active participation in lectures, as has been described by Deslauriers and colleagues (2019). However, the comment also gave me the opportunity to ask the student in more detail how she understood incentive to be different than motivation. While her intention might have been to tell me she disliked the exercise she was actually doing exactly what intended: reflecting on the power of wording. Suddenly, this non-motivated student was reflecting in front of the whole class on the difference between the two words. This stimulated a longer discussion about how the student understands the word differently; for instance someone found incentive to be extrinsic and something which included some sort of power and hidden cohesion. It showed that people associate the two words with very different things and one student also explicitly said that it would be very important to her what an employer called what they did to encourage a specific form of acting. During this discussion the students in different ways ended up formulating what I wanted them to learn from the session;

namely that there is a power in naming things and that it matters to people which words we use.

When asked about her experiences with the first exercises where students were asked to get up and choose between two similar words Vera, a student I interviewed, said:

> " [when] you are asked to reflect on how and why you choose one option over another, and how you think they differ (…) you also become aware of how you actually understand the concepts yourself. It's a way of making your own conceptual understandings visible."

Based on Veras words, the exercise seemed to have successfully activated her higher order thinking in a way which also leaves her with the impression of having learned something.

Exercise 2

For the second exercise, as suggested by Aflalo (2018), formulating their own question did indeed foster higher order thinking, both in my experience and according to the students I interviewed.

During the exercise the other class teacher and I circled around and made ourselves available for students both to discuss and ask questions. When doing this, I realized something that I had not anticipated: instead of quickly picking one question and writing on the whiteboard, as I had imagined they would do, the students started discussing each of the questions in detail. The students wanted to choose the best questions and to do so, they also needed to discuss what their peers would learn from each question. This provided lively discussions and I let the discussion run for longer than I had originally intended. I take this as another sign of learning showing the students engaged critically with each others questions, not just their own.

With about 15 minutes left I asked the students to write a question on the whiteboard. Together with the other class teacher, we quickly gathered the questions into groups with similar questions and asked the students what they had talked about for each themes of questions. This again provided a lively discussion and when time was out more students

still had their hands raised and I heard that the students continued to talk during the break. This suggests that giving the responsible to the students might motivate them in other ways.

During the interview about her experiences the student Cecile expressed:

> "there's also the thing about formulating a question. That can also be quite difficult, but I also feel that it's a really good way to become aware of what exactly you've been questioning in a particular text. So even though it requires a bit more brain capacity and mental effort than just sitting and receiving information, in the sense that you actually have to back yourself up with something."

Similarly, Vera said:

> "I also think that when you're forced to take a stance and ask some questions about the texts, you end up thinking about them in a different way. So I also feel that I got something out of having to sit down and formulate questions. You have to think very critically as well, and you maybe also practice asking more discussion-oriented or critical questions."

What the students express is that it requires critical thinking and a greater understanding of the text to ask questions.

A final thing I take as a sign of learning, which I had not anticipated, was shown in the final exam. One of the texts we discussed during the day of the intervention, which I know from previous years of teaching that students struggle with understanding, was used in surprisingly many of the final exams. I take this as a sign that the students got a deeper understanding of the texts when they where asked to formulate their own questions compared to when I formulate questions and ask them to answer them.

Conclusion and thoughts for future interventions

In this assignment, I have reported and reflected on an intervention designed to increase active student learning to unpack higher order thinking skills. Unlike what Deslauriers and colleagues (2019) have

found when asking students to be active during the lectures, the students I interviewed did not express that they liked this less than more traditional lecturing, though some students expressed hesitation during the lecture. Vera said:

> "I'm also very aware that I feel I learn more when you're forced to think and not just understand. I think many of the more traditional lectures are very much like: something is said, and then you have to write it down and understand it and remember it, but not actively."

This suggests that students might not be as reluctant to participate in alternative teaching as teachers expect.

In my own perspective, I experienced that this teaching form where the content was very open required a lot of energy and overview from my side. It is difficult to prepare for and to ensure that the students cover what is intended. During the lecture I constantly had to be aware of how the different comments could be tied together which requires more energy and overview than a normal lecture, where I know what I will cover. Accordingly, this form of lecturing required a deeper understanding of the topic, confidence from the teacher and also experience in teaching. I also have a concern, that this type of engagement will leave some more insecure or shy students behind.

Overall, I consider the intervention a success and I will continue to incorporate more active engagement into classic lectures.

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