

Active Learning in a Large Classroom

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Summary

Introducing active learning techniques in large classrooms is associated with several challenges, such as time constraints associated with covering the material. In this project I implement a range of different instructional strategies in two large classroom lectures and evaluate them based on supervisor and student feedback. The three main take-aways are: 1) it is possible to include a range of activities and still be able to cover the material, 2) it is important to link individual exercises to some form of evaluation or assessment, and 3) tasks involving higher-level learning outcomes are more challenging to implement.

The Problem

Active learning is superior to passive learning in terms of student engagement and performance. However, implementing these techniques in large classroom lectures is challenging (Newland and Black 2020). For instance, a large class means fewer opportunities for the instructor to interact with learners and to guide them through exercises. Another challenge – especially in political science – is the extent and complexity of the material that needs to be covered (Damron and Mott 2005).

Active Learning

There are three main reasons for using active learning techniques in lectures:

1. students are diverse with respect to learning styles, so using a larger number of teaching styles makes it possible to reach a larger number of students (Damron and Mott 2005).
2. activating students increases engagement and participation, which improves the retention of the material (Newland and Black 2005).
3. active learning has a positive impact on performance (McNeal et al 2020).

Mixing different teaching styles – including lecturing – promotes deeper learning by exposing students to information, giving them the opportunity to apply the information, and to reflect on this experience (Fink 2003 in Damron and Mott 2005).

Previous research has found that active learning techniques also work in large classrooms. For instance, McNeal et al 2020 found that active classroom techniques were associated with higher student engagement as measured by student biosensor data.

Instructional strategies

Schneider and Preckel 2017 emphasize the importance of stimulating questions and discussion. This is particularly challenging in large classrooms (Damron and Mott 2005). Thus, many of the instructional strategies I used aim at increasing engagement and participation.

One of the most common techniques in large classrooms is the use of so-called "clickers" which allow students to participate in quizzes, polls, and multiple-choice exercises. Clickers increase student enjoyment, engagement, and performance. This type of participation has also been found to stimulate interaction between students and teachers, as well as encouraging traditional participation, such as speaking up in class (Newland and Black 2020). I used this technique mainly to elicit participation but also to gauge the level of student preparation and degree of comprehension. Figure 1 includes an example of how this was implemented.

Combining teacher-student interaction with student-student interaction improves performance (Schneider and Preckel 2017). Social interaction improves learning since it requires students to formulate their own knowledge and compare it with others' arguments (Chi 2009). In order to facilitate student-student interaction I included exercises in which participants first reflect individually on a question and write down their answer before discussing their answers with a partner. In the second lecture, this type of exercise was followed up by a discussion in plenum.

Another factor improving performance is conceptually oriented tasks (Schneider and Preckel 2017). An activity which combined concept orientation and social interaction was that after lecturing on a concept, I gave the students the task of teaching it to each other (peer instruction).

In another exercise I gave the students two minutes to individually write down key aspects of a concept that had been brought up in the previous class, and then formulate at least one remaining question (recap exercise)

Finally, a particular challenge in large classroom lectures is to encourage higher-level learning (Damron and Mott 2005). In my second class I implemented a longer group exercise in order to allow students to practice more analytical skills.

Empirical Strategy

- Two lectures in comparative politics (bachelors' level).
- 270 students enrolled in the course.
- Topics: 1) emergence of parliaments and extension of suffrage, 2) coups.

In order to maximize the number of exercises to evaluate, I included different activities in the first and second lecture. I adjusted the activities and how they were implemented in the second lecture based on the feedback from the first lecture

Data

- Feedback from two senior supervisors.
- Two student surveys (89 and 38 respondents respectively).
- Survey questions about general comprehension, the number of exercises, the exercises themselves, the pace of the lecture.

Limitations

- Since formal assessment was not part of my teaching – and since the active learning techniques were not implemented in an experimental setting – it was not possible to evaluate any effects on learning.
- A limitation with using student surveys is that the *feeling of learning* is not the same as *actual learning*. In fact, the cognitive strain associated with engaging in higher-level exercises might reduce student satisfaction while increasing learning (Deslauriers et al 2019). Thus, a problem with my survey is that although students may indicate that they disliked certain exercises, they might still be useful in improving their learning. **One way I tried to address this was to use supervisor feedback.** The two supervisors were embedded in class and could gather information on how students engaged with the exercises.

Results

I covered two main topics in each class. In the first class 29 and 22 percent of students indicated that they were still a bit confused (about each topic respectively). In lecture two, this shrunk to 5 and 16 percent.

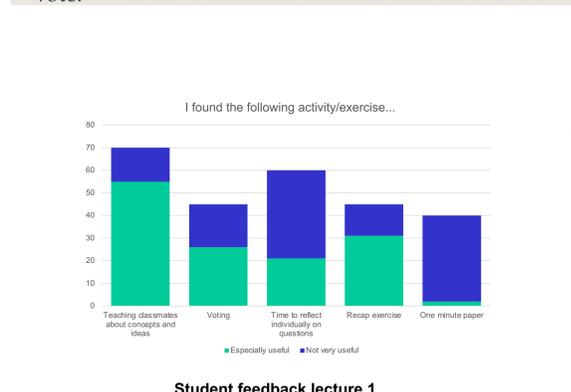
As for the number of activities in the first lecture, 54 percent of students thought there were too many, and 44 percent responded that the number was "about right". 43 percent agreed or strongly agreed that the exercises/activities were helpful for understanding the material, while 17 percent disagreed or strongly disagreed. **The students particularly enjoyed the recap exercise and activities involving them teaching each other about concepts and ideas. However, they did not find the one-minute paper to be very useful.**

The success of the recap exercise and voting were corroborated by the observations made by the supervisors. They also pointed out that reflection tasks – such as the one-minute paper – would work better if followed up by an in plenum discussion. **This observation led to adjustments in how I implemented activities in lecture 2, potentially explaining the higher share of students finding this type of exercise useful in the second lecture.**

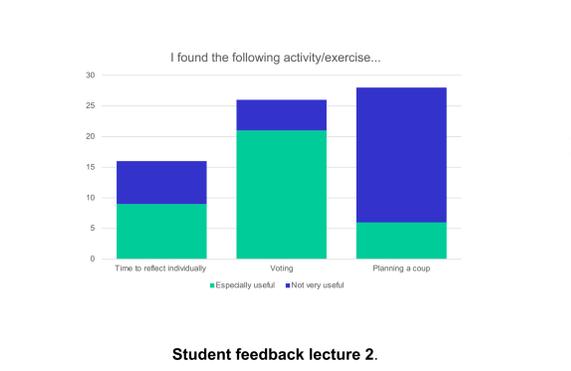
Since my goal was to evaluate as many techniques as possible, I did not try to reduce the time spent on activities and exercises. Rather, I tried to change the nature of them. For instance, in the second lecture I removed the one-minute paper and included in plenum discussions after individual/pair work.

After the second lecture, 71 percent indicated there were too many exercises and activities, while 29 percent thought it was about the right amount. 32 percent agreed or strongly agreed that the exercises/activities were helpful to understand the material, while 50 percent disagreed or strongly disagreed.

As for the exercises, **the students found voting particularly useful while they did not find the longer group exercise (planning a coup) to be helpful.**



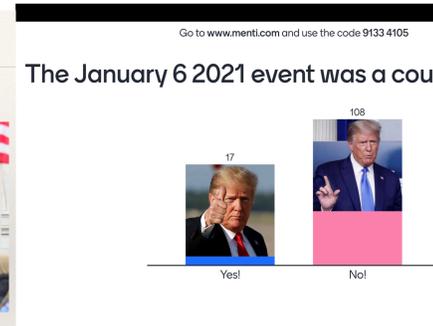
I also cared about how the students experienced the pace of the lecture. There is no use in introducing activities if it means rushing through the same material as in a normal lecture during the time that is left. After the first lecture, 33 percent indicated that the pace was too fast (60 percent thought it was "about right"). In the second lecture, only 24 percent of students responded that the pace was too fast, while 76 percent thought it was "about right".



In the second lecture I gave the students a more extensive group task. Because this was a longer exercise, I was able to walk around and interact with the students, which helped me get an idea of how they worked with the exercise and the challenges they met. My impression – as well as that of the supervisors – was that the exercise worked well and that the students had understood the task. **An additional advantage was that I could use the information received from interacting with the students in order to elicit participation later, when we discussed the task in plenum.** This was an advantage that could have been used even more extensively according to the feedback from the supervisors.

However, the students were less satisfied with this exercise. This may partly have to do with the additional cognitive strain associated with a more complex task. **But based on the qualitative responses from the survey I also believe the exercise could have been improved.** For instance, the students indicated that they had trouble with time management. Simplifying the exercise by choosing a case for them – instead of letting them choose themselves – could have helped here.

Figure 1: Example of voting
This question and vote was followed by an in plenum discussion and then by a definition of a coup.



Some students also indicated that the time allotted to the task was too short. Leaving decisions (e.g., choosing a case) up to students has advantages, but it also takes away time spent on the main task. **Reducing the number of choices students needed to make might have been justified in this case.**

Conclusions

My results are encouraging for instructors in political science who might be hesitant to include active elements in a lecture out of fear of not being able to cover the material.

Four lessons learned:

1. It is possible to introduce active learning elements without sacrificing coverage of the material.
2. Lower-level exercises such as voting is a simple way to increase engagement and participation.
3. Introducing activities aimed at higher-level learning outcomes are challenging.
4. Adapt the lecture to allow flexibility. Sometimes additional explanations are needed for an exercise to work, other times you may want to spend more time on discussion.

An interesting finding was that **students experience time to reflect on questions individually to be more rewarding if this is followed up by a discussion (either in pairs and/or in plenum).** This was evident from the surveys, where students indicated that time to reflect individually was more valuable in the second lecture where I followed up this exercise with a group discussion. By following individual reflection or pair discussions with an in plenum discussion, student-student interaction is combined with teacher-student interaction. My impression is that the quality of the former is improved if there is an anticipation that the latter will follow. This suggests that individual or pair exercises become more meaningful if students are given the opportunity to communicate their findings or questions with the teacher and the rest of the class.

The link between teacher-student and student-student interaction could be a fruitful avenue for future research. Another natural topic for future studies is to link active learning techniques and student interaction to learning outcomes.

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