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Flipped Classroom – How I Ended Up in Front of an Empty Room

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Abstract

A traditional course setup consists of a number of lectures, a number of assignments for students, and a final written exam at the course's end. The lectures' purpose is to present the theoretical foundations, which then get applied in the assignments. This model is criticized as it spends valuable in-person time to teach lower order skills (Bloom et al. (1956)'s taxonomy), but higher order skills get only applied in assignments where interactive support from teachers may not be available.

A possible solution comes from the concept of blended learning (Garrison & Vaughan, 2008), where in-person teaching is combined with online resources. One implementation of blended learning is flipped classroom teaching, which describes a pedagogical concept where students prepare before a lecture the (theoretical) concepts and then convene in the classroom to apply the learned theory. Direct student-teacher interaction allows a teacher to identify problems both of individual students and the whole class and then counteract them appropriately.

Inspired by success stories of flipped classroom applications (Mason et al., 2013) and accelerated by the Corona pandemic, a course in the network and system administration program was migrated from being a traditional course to a flipped classroom course. The course consists of a series of lectures that get examined by a final written exam and two practical assignments which were not changed as part of the migration and will not be further discussed. The process of this migration is presented here.

The course's lectures are strictly based on one course book. The course is hold annually in the lecture period of October to January and is given in English, which neither is the teacher's nor the students' native language. Up to Autumn 2019, the lectures were held in a traditional format with seven classroom lectures at the course's beginning to avoid overlap with the practical assignments. Based on the course feedback, students appreciated the slides' quality and the entertaining parts of the lectures. Other comments remarked that lectures contained much information, which, according to one student, made students fell asleep.

Due to the Corona pandemic, the course was held via Zoom in 2020, but no lecture was recorded. Students had cameras switched off and interaction happened primarily by students asking questions via text chat which the teacher answered via voice to the whole class. Due to the unfamiliar format and occasional technical issues, pressure to 'get through' the material in time was higher than normal. Whereas most students had no issues with online lectures, this pressure was mentioned in several comments in the course evaluation.

As it was unclear how future health restrictions would affect teaching, the decision was made to record lectures before Autumn 2021. The videos were based on updated slides with some entertaining material removed to keep the videos shorter and to avoid copyright issues. Audio recording and subtitles were both based on a shared manuscript. For each chapter from the course book one video was produced and all ähms and goofs were removed.

Student feedback on the recorded lectures was very positive. One student compared the teacher s voice with Bob Ross! The recorded lectures were complemented by four classroom meetings. At the course start, students were informed that they could ask questions on the lectures' topics. The result was disappointing: very few questions were raised by students and even after discussing previous year's exams only a fraction of the allocated time was used. Accordingly, attendance dropped and generally negative feedback was given in the course evaluation. One student remarked that the lectures material is not suitable for flipped classroom teaching as it is mostly about learning facts. Several students requested the return to classical lectures.

For 2022, in order to improve classroom meetings, a generic assignment was devised that would be used in each lecture, but applied to different chapters each time. Students were asked to assemble in groups and for a chosen chapter prepare a short summary and discuss one selected keyword in detail. After 20 minutes, one member of each group would present the group's results to the audience. Several problems became apparent: first, many students had not prepared the selected chapters, i.e. neither watched the videos nor read the course book. Second, as being scheduled as a lecture, students were disappointed

that they had to work while the teacher was doing nothing. Finally, many students had stage fright and did not want to talk in front of the class. This led to a drastic drop of attendance so that only a fraction of all students attended the last lecture.

Scientific literature on flipped classroom has probably a strong survivor bias documenting successful implementations in specific, suitable setups (Lundin et al., 2018). The body of literature thus may trick a teacher into believing that flipped classroom is some sort of pedagogical silver bullet.

Courses that are about learning facts are less suitable for flipped classroom: there are no obvious higher order assignments and without own experience, students cannot comment on the presented facts.

There are groups of students that prefer in-person lectures and there are students that prefer recorded lectures. Providing only one type of lectures will leave one group dissatisfied.

Based on our experience, we are considering the following changes for the next course iteration (Autumn 2023): Recorded lectures will be still provided to students as the material exists and is still relevant.

The four classroom lectures will be again used for real lectures, probably some kind of best of slide selection or bonus material. Students will still have the opportunity to ask for clarification of any relevant material.

The chapter summary assignment will be refactored into a series of off-line assignments and each submission will contribute a few points to the final exam.

References:

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