



FLIPPED CLASSROOM TEACHING IN STATISTICS

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Classical lectures are rather inefficient for the members of the Z-generation. They do not feel any motivation in it and it is usually not helpful in the learning procedure. They need much more chance to interact in the classroom and this interaction must be forced. We also need to make them realize that during their university studies basically they will not be taught but they have to learn on their own to reach deep, advanced level knowledge and skills by the end. The balance of the responsibility of their studies must be pushed toward them, so they will be able to handle their future life responsibilities as well. If the students are motivated to study before the “lectures”, there is a chance in the classroom for a real discussion of the topics. The aim of this presentation is to introduce some techniques, methods that can be used in a “flipped classroom”, together with the experiences of the previous semester in a 2+2 type statistics course.

INTRODUCTION

Classical lectures in the universities are rather inefficient for the members of the Z-generation. It can be seen in every field of higher education that students do not feel any motivation in it and this attitude is usually not helpful in the learning procedure. These young adults need much more chance to interact in the classroom and this interaction must be forced. We also need to make them realize that during their university studies basically they will not be taught but they have to learn on their own to reach deep, advanced level knowledge and skills by the end. The balance of the responsibility of their studies must be pushed toward them, so they will be able to handle their future life responsibilities as well. If the students are motivated to study before the “lectures”, there is a chance in the classroom for a real discussion of the topics.

This paper presents a “good practice” from University of Pécs, Faculty of Business and Economics. First the idea of the flipped classroom teaching methodology is introduced. In the second part the reader can find a detailed description of the flipped classroom tools that are applied in a course called Business Statistics (within our English programme). The results and feedbacks of the students and the feeling and experience of the teacher are discussed in the third section. Finally some conclusions are formulated together with advises for those who would like to have flipped classroom.

ABOUT THE IDEA OF FLIPPED CLASSROOM

The idea of the flipped class started with lecture being done at home with the help of video and/or audio files, and what was once considered homework is done in class. So, the order of the lecture and homework components of the class are flipped. In other words, learning is done at home and deeper understanding, practicing is done at school, with the help or guidance of the teacher. So the main aim is to provide more time in the classroom for real learning and understanding.

This method is transferring the responsibility of learning from the teacher to the students. If the student has the freedom to decide about the timing and way of learning, it will more belong to him/her. The role of the teacher will be to guide the understanding, and students become active learners rather than just sitting in a classroom without doing anything. (Alvarez, 2011)

I had the feeling for a few semesters now, that lectures make less and less sense. The students hear the terminology, the idea and methodology of certain statistical problems for the first time during the lecture. Even if they pay attention, only a few of them would catch the main ideas. We all know, that simply asking them to read the book before the lecture is not working. I have read about the flipped classroom methodology, but I had to see it in practice to really understand it. I had a chance to visit Capilano University in Vancouver, Canada to see more types of courses applying this technique in a certain way. This real life experience made me start to think of “my own” flipped classroom.

The basic tools for a flipped classroom, as I see:



- very well defined learning material (book, book chapters, articles, etc.), which is available for students before the beginning of the course;
- pre-prepared, short videos about the most important topics or about the steps of exercise solving (also available for students before the beginning of the course);
- assessment of preparation even before class
- interactive atmosphere supported by
- group work (random group members is the best),
- name tags to be able to call anybody,
- little tasks to involve more and more students;
- group exercises which aim deeper understanding of the problems and solutions or higher order of critical thinking;
- diverse assessment scheme;
- trust in the method and trust in yourself.

As it can be seen the basic idea has several tools and solutions. Obviously a teacher in a certain course might not use all of the tools, but only those that fit in the topic, nature, type of the course, and most importantly to the personality of the teacher. Based on my own experience, I have to say that this latter point is indeed very important. Any type of teaching methodology will only work if the teacher believes in it, and feels comfortable in the classroom. So everybody should find a personalized tool set for his/her temper.

FLIPPED CLASSROOM IN THE COURSE CALLED BUSINESS STATISTICS

I have introduced this method in a course called Business Statistics at University of Pécs, Faculty of Business and Economics, which is for second year BA students in our English programme. We have 2+2 class format (2×45 minutes of lectures and 2×45 minutes of seminars each week, for 13 weeks). The group size was about 50.

The idea of preparation from the students' side before they actually come to the class was the basic of the main concept from my point of view. In the course outline they received a detailed schedule about what and when they should read. As a motivation, they had to fill in a quiz of the given topic before the lecture (it was closed 1 hour before the lecture). Beside the motivating function I also had the chance to check their answers and see, which parts were clear, or which parts were unclear to most of the students. It helped me to focus on the unclear parts during the lecture period. They had another quiz from the same topic after we have discussed and practiced the given material together, so we could see, how they developed. (Altogether they had 20 quizzes during the semester, each worth 0.5 points.) I did not prepare short videos, however I clearly declared the book chapters/pages that need to be read before the class. It was never longer than 25 pages (with pictures, exercises, etc.).

At the beginning of the first class everybody created his/her own nametag. One side it contained the first/nickname of the student, with huge letters, and on the other side the full name. The name tags were taken from a box at the beginning of the class, it was hanging in the students' neck during the class, and it was replaced to the box at the end. The nametags have several useful roles:

- the creation was fun with colorful papers;
- the teacher and the classmates can call everybody by name;
- those nametags, that remain in the box indicates the missing students, so no additional check of presence is necessary.

In the lecture period all the students were together. Before each class a random group schedule was introduced, so from week to week different four students had to work together. Randomness makes it a bit more complicated for the students to sit down in the given structure, however, it has many advantages:

- they have to get to know each other;
- Hungarian speaking and non-Hungarian speaking students were mixed up, so they were forced to discuss everything in English;
- they experienced how to work in a group, they had the pressure on them to prepare for the classes, otherwise they could not participate in the work, which might have been a an inconvenient situation that they want to avoid later;

- the distribution of “good” and “not so good” students were random, so they had the chance to learn from each other, or to realize that the material can be understood.

During the lectures there were no lectures. A question or small subtopic was introduced, then the groups had to discuss it in 5-8 minutes. After it their conclusions were discussed together. The teacher cleared up or summarized the information. There were mainly 3-4 sets of these rounds. There was an additional exercise for the groups in the last 10-15 minutes, which they had to submit in paper before they have left. The solutions were always discussed at the beginning of next week’s class. The group works were evaluated each week, and every member received the same amount of points. Altogether the group exercises worth 10% in the overall grade.

The tutorials or seminars were held in a computer lab in two groups. They were more like regular seminars: solving exercises with the help of Microsoft Excel using different datasets.

The assessment scheme is as follows:

- 10% quiz results;
- 10% group exercises;
- 15-15% midterm tests;
- 50% final exam (additional condition: 50+% has to be gained in the final exam in itself).

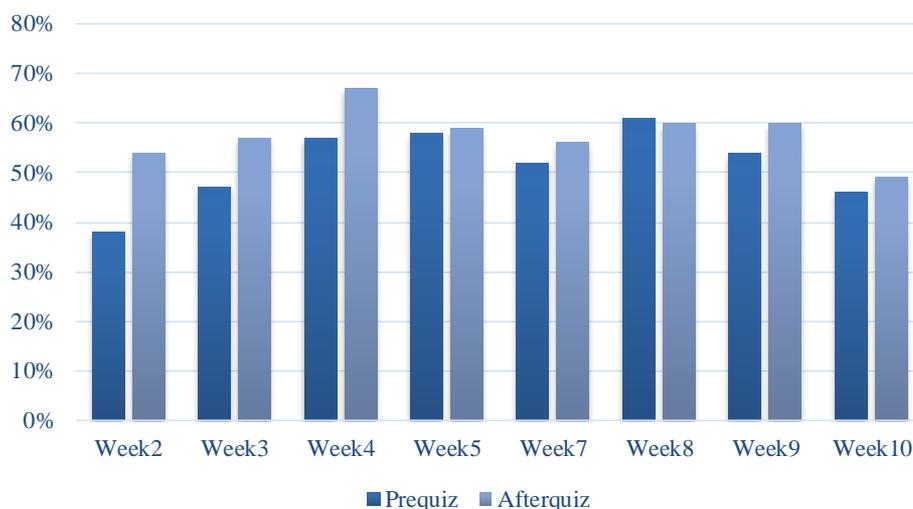
RESULTS AND FEEDBACKS

The final results of the course were better in average as in the previous years, and there were much less grade 2 (pass) and much more grade 5 (excellent).

The participation in the classes is not really a good indicator, as in our English programme students must attend at least 75 percent of the classes to have permission to participate in the final examination. So teaching methodology basically makes no difference, because they are forced to be there anyway.

The participation rate of the quizzes was between 70 and 85 percent. This means that students felt the responsibility of fulfilling the requirements. The detailed results of the “prequiz” and “afterquiz” can be seen in figure 1. The average of the “prequiz” results is 52 percent, which means for me that students really took some effort in the preparation for the classes. In each week the “afterquiz” results were higher compared to the “prequiz”, so students could learn more during the courses. And it is also clear, that there were some remaining tasks in studying as the mean of the “afterquiz” results is not more than 60 percent.

Figure 1: Results of the quizzes by weeks



Source: Own edition from Neptun results

Altogether the performance of the students was better compared to the pervious experiences (I teach the course now for 9 years). As the structure, the material, the exercises and the examination



is generally the same, we can conclude that flipped classroom techniques inspired the students for more learning and understanding.

There is an official evaluation form that students have to fill in for every course they have at the end of each semester. According to the overall average results I gained my personal best. The students have the chance to give comments in two questions. For the question “What was the worst aspect of the module?” nobody had put anything. For the question “What was the best aspect of the module?” I received the following comments (all comments are quoted word by word, and only those are mentioned, that are in connection with the teaching methodology):

- “Because we have quizzes, so we can review knowledge well.”
- “We have the group work, we can share our idea with each other.”
- “Regular quizzes, two midterms. It required continuous work (to do well).”
- “That we had quizzes and got group works every lecture to achieve points.”
- “The number of midterm and quizzes helped to describe materials.”
- “We have the group work, we can share our idea with each other.”

It might sound strange, but I think that students do not really pay attention to the weight of certain evaluation elements, but the nature of the exercise, experience is what matters. They really enjoyed the group works and worked hard to have them solved in the last ten minutes of the classes. Most of them filled in the quizzes week by week, even if they were not so successful. Most of them studied hard for the midterm tests. It seems they did not have the thought that they should consider the final as “most important” just because it is 50 percent of the points. It means that is worth to give them “little” challenges, because they will work on them, and – perhaps sometimes unaware of the fact that they are learning – they gain the knowledge in the meanwhile.

CONCLUSION

My own, and it seems that also most of my students’ experience is very positive of the elements of the flipped classroom teaching methodology. It gently forces them to catch up with the speed of the learning from week to week. The classes are more personal and interactive, so the topics get closer to them. Each student had a chance to talk aloud at least once during the semester. I, as a teacher, also enjoyed the classes because we had much more chance to discuss things, and many good questions came up, which was unimaginable in the way of “regular” lectures.

I continued to use this model in this semester as well, and I try to apply some of the elements in other courses as well. The success seems to be similar, which verifies my own feelings. (*We have a so called “Board of Studies” meeting in the middle of each semester in the English programme, where the student representatives have the chance to present mainly their problems of the different modules. This autumn the second year students – to whom I teach Business Statistics now – highlighted that they are really like the way of teaching, and enjoy the classes. This was a real honour.*)

I can only recommend this methodology to every teacher within a certain group size. It can be a good starting point, to visit some classes where you can see the techniques in practice. You can simply personalize the tools by selecting those that you like, or those that you can manage. And from semester to semester you have the chance to expand or modify the tools to fit the students’ and your needs in the best way.

REFERENCES

Alvarez, B. (2011). Flipping the Classroom: Homework in Class, Lessons at Home. *Education Digest: Essential Readings Condensed For Quick Review*, 77, 18-21.

