

Motivate student preparation with online tools and learning support

Kristian Agmund Haanes

Department of Biology
University of Copenhagen

Pre-face

It is a recurring issue in relation to teaching that students are not preparing for the classes, this has been particularly evident for me in the group teachings, where for example a scientific article has been given to the students in advance, so that it can be discussed during the course. Failure to prepare for these classes, leads in my opinion to a class discussion on a much lower level, as the teaching time will often be used to just read the article or a shallow discussion on understanding basics rather than context. It is also illustrated in previous research that students that read before classes were ready to participate extensively (Valde, 1997), and students who read before class better understand key concepts (Philips and Philips, 2007).

Previously, I have attempted to circumvent this issue by lowering my expectations on how much the students prepare, and actually giving a short introduction to the material that students were supposed to be prepared on, in the beginning of the classes. However, I don't find this to be an optimal solution, as one hands over own reflections to the student, rather than the students building their own. Therefore we started a pre-project where we wanted to know why students prepare (when they do), when are they preparing and for what type of teaching/problems/cases. The information from the pre-project is here used as inspiration for the main project, where some of the ideas will be implemented and experimented on using the knowledge obtained based on the interviews and reflections. The main outcome would be that the students feel motivated to prepare and do so.

I believe this will make the teaching more interesting for both the teacher and students.

For the pre-project we set out interviewing five BSc students, from different studies. Here there are two questions from which the inspiration for the current project and intervention study was selected: "When do you prepare?" and "What barriers do you experience when preparing?" It was evident from the first question, that students prepare or if the preparation needs to be accounted for and to live up to someone's expectations. This is exemplified with one citation "If you know you are checked on your preparation, you put a little bit more effort into the preparation". For the second question, the students particularly feel obstacles if there is too much reading and incomprehensible amount preparation material. A citation from one of the student illustrates this "If I have read 10 pages and I don't understand the main concepts, I will close the book or "I don't prepare if the amount of reading is too high, or when complexity is too high". Therefore if the "teacher selects material and shows what is more interesting I prepare more".

Conclusions from the pre-project

The conclusion on these questions were: I) prioritizing the material, so the students know what is important facilitates their preparation, so the material is not too incomprehensible, and they know they don't have to prepare for everything equally, II) responsibility for the group, teacher or the students profession motivates preparation, therefore the setting needs to facilitate such a relation, III) students need to know the expectations regarding preparation and need to stand accountable.

Background Literature

The main theoretical source of inspiration is a study from Hoeft (Hoeft, 2012), which touches upon the three areas of interest put forward here. A recurring suggestion among the students of why they do not read is: "Maybe a little less reading at the time", and "make it more clear what we are supposed to do". According to Hoeft (Hoeft, 2012), illustrating what the student were supposed to do, did not increase the preparation outcome,

however, giving the students quizzes had a huge positive impact. In addition, response in a form of written response after reading has been found to "encourage on-time reading of assignments, broader student participation, higher levels of discussion, and a more positive student experience" (Valde, 1997). Brost and Bradley (Brost & Bradley, 2006) further conclude that noncompliance, is not simply a student centred problem, and have to be addressed by faculty. They further illustrated that many of the students do not understand the pedagogical role of the assigned reading. Furthermore Kerr and Frese (Kerr & Frese, 2017) state that only 20-30 % students read the assigned reading material and that students need incentives like grades and quizzes to participate in the reading and suggest increased reading compliance if the teacher says he/she will check the reading and that student read more consistently when they understand the rationale for the reading. There are several studies illustrating the effect of quizzes. It is apparently very important that the students know that there will be a quiz if it will have motivational effect for the students (Cook & Babon, 2017) further illustrated by the work of Williams showing that random quizzes did not improve preparation (Williams, 1997). Most of the research approaches involving mandatory quizzes as a part of the final grade. However, I feel it's important that the intervention should not be about forced compliance; therefore the intervention is focus on guided compliance.

Aims

Based on the data from the pre-project and the literature the aim of the intervention study was therefore to investigate the influence of these factors on student preparation: I) Giving the student a "preparation info" to help the focus of the preparation; II) Giving the student a social commitment to prepare; III) Prepare a quiz performed in relation to preparation so the students are checked on it.

The intervention - Method

The course where the intervention took place was the *Cellular Integrative Physiology* which is a mandatory course in the specialization Cell Biology and Physiology of the MSc programme in Biology, and an elective course for the other specializations of the MSc programme in Biology and other

programmes at faculty of Science. The course is a 15 ECTS course, filling block 3 entirely and comprised of 32 students. I was giving 2 lectures of 2 hours and one interactive teaching of 2.5 hours. The main aim was to increase the preparation for the interactive teaching and use the lecture-time to increase the motivation for this preparation.

Firstly all material for the lectures (lecture slides) and interactive teaching (questions and 3 articles) was uploaded, together with a file named preparation info. Preparation info was the key element in motivating the preparation. It contained a description of what part of the material I wanted the students to look at before lecture 2, and importantly what to focus on in the 3 articles.

Intervention in lecture 1 - Friday: motivate the preparation info

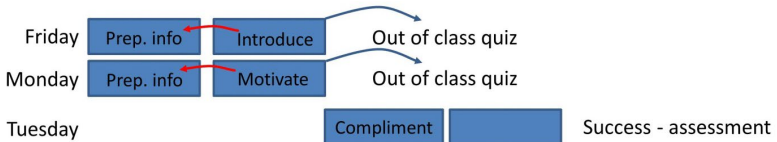
In the lecture, I told the students that I had uploaded a “preparation info” in Absalon, which would give them a focus on what to prepare for in relation to the next lecture and that there was an online quiz they could complete after reading the focus material. The motivation for the preparation was open and presented in a way that “if you want to have a look, and complete the quiz, please do”.

Intervention in lecture 2 – Monday: motivate the preparation info for the interactive teaching

Out of the total 32 students, 14 people entered the Absalon page over the weekend, and 3 people completed the quiz. During the lecture 5 people answered that they had prepared by reading the suggested material. Since few people had answered the quiz, I told the student to in groups have a look at the preparation info, open the quiz, think through the questions and discuss the answers before I started the lecture. Then I told them that for tomorrow interactive teaching it is very important to me that they read the preparation material and answer the quiz. The primary outcome of this was intended to be two sided: I) All students had a look at the preparation info, II) To create a social responsibility, that it was important to me that the students did this before the interactive teaching. Finally, at the end of the lectures I presented the 3 articles using the projector, and showed them which figures and tables were important, and therefore briefly introduced them to where they should focus.

Interactive teaching – Tuesday

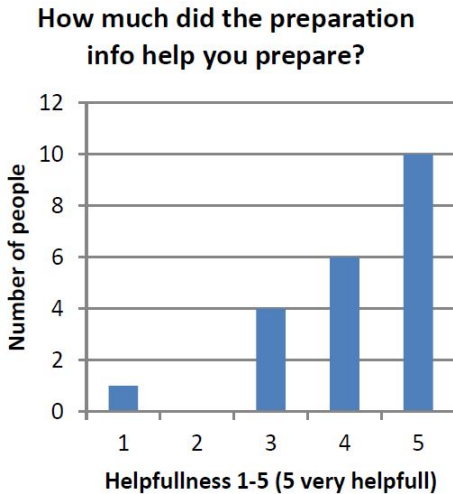
Before the interactive teaching 7(8 self-reported, one did not upload online) of the students had completed the quiz (with very good answers). There were 21 students that showed up for the interactive teaching. As the teaching commenced I asked how many had a look at the articles prior to the teaching (17 student were present at the start at 13.00, 4 students arrived later. Of the 17 students all of them had a look at the articles, and I complemented them for their preparation. Finally, I had prepared a small questioner related to the preparation to aid in concluding on the outcome and if the approach motivated them. I did not include in the form the social commitment, both rather the direct influence of the learning material “preparation info” and “quizzes”.



Outcome/results

The primary outcome was the preparation for the interactive teaching, with the goal that the students had an idea of the articles in advance of the teaching. The primary outcome was met with a surprising success. Out of 21 participating students, everyone had seen the “preparation info” and 91 % had prepared for the interactive teaching (19/21). When I asked about this in the same course in 2017, only 3 out of 16 students had a look at the articles before the teaching, and in 2016 none of them had read the articles. So it is clear that the students were well prepared and although a direct correlation to the previous years cannot be drawn, there appears to be a huge increase in the amount of student preparation. Below I will look deeper into the influence of the three approaches:

I) Preparation info



16 of 21 found the preparation info very helpful, and 20/21 told that the preparation info helped them prepare. I have selected a few citations from the comments on the preparation info:

”I think that you knew what was important made it way easier to handle the papers”.

”It gives me motivation to prepare. It also steers me in the right direction (understanding the text the right way). The info was a very good way to prepare yourself for teaching”.

“Limiting the amount we had to read in the articles was very motivating. Also this helped in order for us to understand what to focus on reading the articles. It was very useful”.

II) Social effect

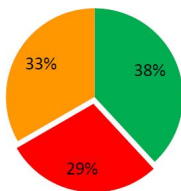
For the interactive teaching, we made a social contract, where the students were asked to prepare for me so that I could use the quizzes for my teaching and that it was important to me that they did what was written in the preparation info. For the interactive teaching, out of 21 participating students,

everyone had seen the “preparation info” and 91 % had prepared for the interactive teaching (19/21). This is in contrast to the lecture where only 8 of 21 prepared at all. One factor that limits the conclusion is the case that the lecture was on Monday whereas the interactive teaching was on a Tuesday, and some of this effect could be attributed to a “weekend” effect. Nevertheless, I believe both showing the students how to prepare and give them a sense of importance increased their preparation, although I did not quantify or ask the students. Finally, the learning support, and me showing the importance in the articles could also have had an effect to increase the feeling that preparation was important.

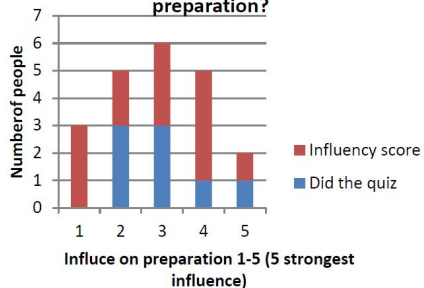
III) Online quizzes

Did the online quizzes/forms motivate your preparation?

■ Maybe ■ No ■ Yes

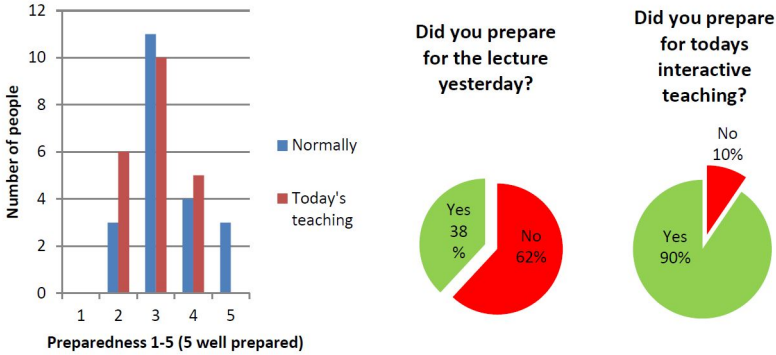


Overall how did you feel the preparation quizzes affect your preparation?



The most interesting finding was when you dive deeper into the numbers, of the 8 people who did the quiz, only 2 were extra motivated by them. In contrast, of the 7 people who were motivated by the quizzes, only 2 completed them. This is slightly surprising, and it might appear that the threshold for handing in the answers were too high. This could maybe be improved by changing the quiz to a multiply choice rather than short answer quiz as one of the students said: “Although the questions you prepared are better and you learn more from them (when being forced to write/formulate your own answers) multiple-choice questions might also be good? So it doesn’t seem like a too big a task, to find time to do both the reading and the

questions in the mind of the student” – said by **student who was motivated by the quiz, but did not complete it.**



For a limited number of students, the effect was as expected, illustrated with a quotation: “Very good. I feel a bigger pressure when there is a quiz” – said by **student who was motivated by and performed the quiz.** Although the quiz motivated the students to prepare for the teaching, there was no strong correlation between the students where they were motivated by the quiz and whether they performed the quiz. According to the questioner, the students did not prepare more for the interactive teaching compared to their self-reported level of normal preparation. This stands in strong contrast to the comparison to the previous years. Therefore it appears that the student might not have prepared more, but they time spent preparing was more beneficial for the teaching since it was more focused. In contrast to the above graph, only 8 students prepared for the lecture on Monday whereas 19 students prepared for the interactive teaching. Although some of this difference could be attributed to the difference in the two ways of teaching, there appeared to be a strong increase in preparing compared to the lecture. The preparation for the interactive teaching was much stronger, which I believe could be linked to the focus of the preparing info in lecture 2. Again the “weekend effect” might have had some influence.

Discussion

The primary outcome of the intervention was a success, and the student prepared for the teaching and they were also active during the interactive teaching. Overall the intervention model was therefore successful, however it might be difficult to pinpoint which of the three factors were the most important, but overall the main intervention that the students pointed to; was the preparation info. There were several positive comments, and this was also in line with what was expected after the pre-project interviews. Helping the students focus makes the preparation more attainable for all students, and increased the level of preparation. The implementation of quizzes have been used to motivate students in several previous studies. In contrast to the current study, most other studies have focused on mandatory and graded quizzes, many of them also with quizzes where students do not know the questions (which stimulates more in depth reading). In the study by Cook and Babon (Cook & Babon, 2017), where one of the student stated : “the quizzes were useful incentive to read the readings, and were helpful in acknowledge key themes/aspects from each reading.” This stands more in contrast to students suggesting they will prepare more if they hear “I will check your reading” (Kerr & Frese, 2017).

The most interesting finding is that the quiz motivated students to prepare, but the students it motivated the most did not perform the quiz. I believe that the quiz itself was not the motivation, but that there were some specific questions, that actually helped the students focus and know what to prepare. The threshold for answering the test might have been too high. Therefore it appears that the effect of the quiz was similar to the effect of the preparation info, not that they are being held accountable for their preparation disproving one of the hypotheses. Cook and Babon (Cook & Babon, 2017) found something similar, where in their study, only 7% commented on the quizzes in relation to assessment, and they conclude that the quizzes has many functions but assessment is probably one of the least important. In conclusion, the quizzes helped the student focus, which was the main motivating effect. Going in depth of publications which rates accountability as a major factor of the success of quizzes, you can still find student answers you can find similar ideas as what is presented here. For example, students in previous studies reported regarding the effect of the quizzes: “Sometimes I just look at the quiz, and then scan the book for the concepts that relate to the questions on the quiz” (Marks, 2002) or “I find that quizzes on webCT helped me a lot to pick out the key points in each

chapter” (Marcell, 2008). Hence here the student report the uses of quizzes as a preparation info, which gives focus, rather than a check on understanding the content. Still Marks (Marks, 2002) focuses in his conclusion that the quizzes are ”motivating student preparatory reading, the issue of accountability is particularly important.”

Interestingly, Marks (Marks, 2002), also showed that the web based quizzes typically motivates the people who do not read in the first place. One can guess that it is also similar here as the best student will easily complete the quiz, without being motivated by it, as they have intrinsic motivation. The weaker students were motivated, but did not complete it as they do not feel as academically strong. Since many of the students did not perform the quiz, one might question whether it would have been equally successful to online upload the questions, without having the possibility to hand in the answers. However, handing in the quizzes was an important aspect of the intervention, because I) I could check how many filled the quizzes and II) I since not so many had done the quizzes, I could use that as a starting point for discussing the interactive teaching preparation in the lecture. The latter was very important because this gave the possibility to make the social contract between me and the students for the interactive teaching.

There was not a strong difference between how much the student prepared for today’s interactive teaching and how much they usually prepare. However, there is a substantial difference between the two questions on how much you prepared for today’s teaching, and when you ask how much you normally prepare. Response to the latter, is more likely to be affected by a social desirability bias, the replies would be more linked to how you wished you prepared, in contrast to the question, how much you actually prepared, which is much more concrete. This has been shown in other studies (Sappington, Kinsey, & Munsayac, 2002) and also commented on by Hoeft (Hoeft, 2012), where students are likely to answer what the teacher wants to hear. This could also have implications for some of the other points in this intervention. Nevertheless, the interesting finding here is the correlation between actual preparation and their reported normal preparation (which is what the student probably has as a goal). This leads me to suggest that the students prepared for the interactive teaching according to their own expectations. Some of the students who usually prepare a lot, prepared less (time), because they know new what to prepare on (focus). Therefore the students prepared more “correctly” and their preparation was had more usefulness for the teaching and the student appeared more prepared.

In conclusion, the preparation info was very useful for the students, and strongly motivated preparation. The preparation quizzes also motivated the students, but not in the way it was hypothesized. The main motivation of the quizzes, the pure existence of questions, that further helped the student focus. Nevertheless, there are a limited number of students, that are motivated by the actual test, and that they can prove their knowledge. Therefore the intervention model, with preparation info, social contract and quizzes overall improved the student preparation, because they all contributed to giving a focus so that the material appeared comprehensible.

Perspective

The outcome of this project was greatly met, and students prepared for the teaching. The students found the preparation info and quizzes very helpful to focus their preparation. This had two outcomes, I) some students spent less time preparing since there was a focus and II) almost all student prepared according their normal (wished) preparation. For the future, perspective, it would be interesting to increase not only the amount of students who are prepared but the amount of students who are well prepared. This could be to focus the preparation with a preparation info, a questions for increased focus, and then having a quiz in the beginning of the lecture, where the students did not know the answers and hence had to prepare more broadly and more likely increase the number of students being well prepared, as there now would be a competition element. In addition, it is evident that not many students did the actual online quiz, and if the teacher would like to have more feedback on whether the students understood what they prepared on, a multiple choice quiz would probably increase the response rate.

References

- Brost, B., & Bradley, K. (2006). Student compliance with assigned reading: A case study. *Journal of the Scholarship of Teaching and Learning*, 101–111.
- Cook, B. R., & Babon, A. (2017). Active learning through online quizzes: Better learning and less (busy) work. *Journal of Geography in Higher Education*, 41(1), 24–38.

- Hoeft, M. E. (2012). Why university students don't read: What professors can do to increase compliance. *International Journal for the Scholarship of Teaching and Learning*, 6(2), 12.
- Kerr, M. M., & Frese, K. M. (2017). Reading to learn or learning to read? Engaging college students in course readings. *College Teaching*, 65(1), 28–31.
- Marcell, M. (2008). Effectiveness of regular online quizzing in increasing class participation and preparation. *International Journal for the Scholarship of Teaching and Learning*, 2(1), 7.
- Marks, B. P. (2002). Web-based readiness assessment quizzes. *Journal of Engineering Education*, 91(1), 97–102.
- Phillips, B. J., & Phillips, F. (2007). Sink or skim: Textbook reading behaviors of introductory accounting students. *Issues in Accounting Education*, 22(1), 21–44.
- Sappington, J., Kinsey, K., & Munsayac, K. (2002). Two studies of reading compliance among college students. *Teaching of Psychology*, 29(4), 272–274.
- Valde, G. A. (1997). Promoting student participation and learning through the use of weekly writing assignments. *Journal on Excellence in College Teaching*, 8(3), 67–76.
- Williams, A. M. (1997). Making the most of assigned readings: Some alternative strategies. *Journal of Geography in Higher Education*, 21(3), 363–371.