

B Appendix: TLHE Project

Teaching Tools in Researched Based Courses: Experiences from Advanced International Trade

December 9, 2015

1 Introduction

I taught “*Advanced International Trade*” for the second time this semester, fall 2015. I am teaching the course with Rasmus Jørgensen. We have three hours of lectures per week, and Rasmus teaches the first half of the lectures. We have 35 signed up for the course and about 20 showing up for lectures.

Rasmus and I have updated the course to reflect the current research frontier in international economics. The course is an advanced, specialized course covering the most important contributions to the field using the original research articles.

We learned from last years exam that students struggle most with the technical content of the course. It could be either because they are technically not the strongest students and they forget what they learn in the mandatory BA courses, or because they do not understand that the technicalities are part of the learning objectives for the course.¹ We also learned that some of the papers on the reading list were not well suited for our exam type, three hours closed-book exam, and not essential to the intended learning outcomes (ILOs) either. We, therefore, reworked the curriculum once again and discussed teaching and learning activities (TLAs) that could enhance student learning and awareness of the skills/knowledge we expect students to acquire though the course. The initiatives should make teaching better aligned with the ILOs and the final exam and make the ILOs more transparent to the students (see Biggs and Tang, 2011, on constructive alignment).

First of all we introduced homework which is to be handed in via Absalon approximately every second week. These are not mandatory but a service to the students to help them comprehend the difficult material and take them through the algebra of the complex models that many students struggle with. Second, I made a couple of initiatives in my part of the

¹We write in the course description: “*The objective of this graduate-level course is to equip students with an in-depth understanding of the theory of international trade and enable them to read, understand and critically reflect on the most recent theoretical and empirical research in the field.*” In depth understanding should make students think we require more than basic intuition.

course, aimed at increased student learning and enhanced awareness of the ILOs. This paper evaluates the new TLAs.

The initiatives are:

1. **Socratic.** I prepared 1-2 Socratic quizzes for most of the lectures. I used Socratic a few times as a recap on last lecture but most often during lectures to see what the students understood. The quizzes were carried out as a collective formative assessment. I would always disable student names such that participation is anonymous and discuss the questions and suggested answers with them afterwards. Hence, the purpose is not to evaluate students individually; it is formative classroom assessment tool aimed at improving student learning through a better understanding of the students needs (see Angelo and Cross, 1993, for an overview and motivation for Classroom Assessment Techniques).
2. **Questions for preparation.** At the end of each lecture I presented a small assignment they should do before next time related to their required readings. I told the students that these questions are meant to increase their understanding of the required readings and guide them when reading difficult research articles. Hence, the aim of these small assignments is to improve students' pre-knowledge since this is known to be an important input to efficient student learning. The educational psychologist Aushubel (1968) highlights pre-knowledge as the single most important determinant for student learning. The assignments or pretasks are designed to help students recall prerequisites and to point them towards the insights they should obtain from the readings. The research articles on the reading list are written mainly with an audience of highly specialized researchers in mind and not for students who may not have the overview and be able to draw on the needed knowledge and skills to understand the paper. For this reason pretasks seem especially important. The questions should optimally create a common ground for learning in the next lecture and increase student engagement since students have had time to think at home before we discuss/address the questions in the lecture.
3. **Homework.** The assignments were often math-intensive and guided the students through central theories/models. I either covered the homework in following lecture, doing through all the calculations on the board, or gave brief written feedback directly to the students who have handed in. Homework assignments were not anonymous which allowed the individual feedback. Feedback was, however, never summative but pointed out good and weak points and guided students towards the correct solution. The homework addresses directly technical material which we learned from last years exam that students generally found hard.
4. **Questions in plenum.** This is an old classic. My experience from the first time I taught the course was, however, that I rarely paused and asked questions. Partly because I forgot and felt more comfortable talking non-stop, partly because I had not thought through what good questions could be. There is a lot of evidence that student

cannot concentrate for longer time spans; especially not in a classic lecture situation (see e.g. Mills, 1967). Hence, it is important to pause and try to activate students and for that purpose questions in plenum are a quick and easy tool. Few students may want to / be able to respond but at least it should wake up the rest of the audience and make them aware of important points. The innovation I had this year was to put short questions directly on the slides. These were questions that points the students to important insights and having them on the slides was a way to remind myself to stop and ask / discuss with the students.

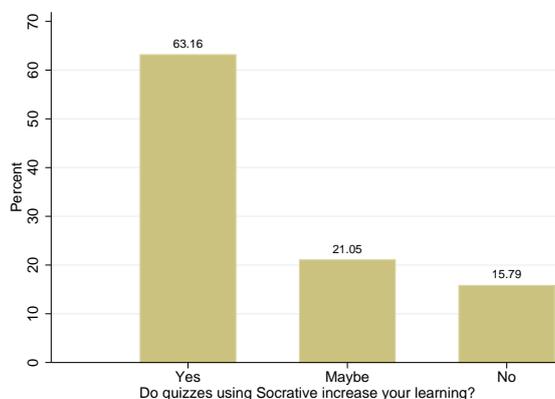
Another problem I often encountered in my lectures, especially last year, was strategic students asking specific questions about what we expect them to know for the exam. The ILOs should be understood from the course description, and I do not want to say whether say part A but not part B of a text or some technical derivations are relevant for the exam. The initiatives should contribute to students awareness and understanding of the ILOs - and of course help them achieve the learning goals - and so these types of strategic questions should be minimized through the teaching initiatives I made which is also what I experienced.

I handed out a questionnaire to all the students in the last lecture to find out what they thought about the different teaching tools I had introduced. Section 2 evaluates each of the four tools based on student responses to the questionnaire. Section 3 discusses whether each tool seemed to improve student learning and increase awareness of the course objectives. The final section concludes focussing on what can be done going forward.

2 Evaluation of new teaching and learning tools

2.1 Socrative

Figure 1: Socrative and self-accessed student learning



84 percent of the course participants would either like more Socrative quizzes or think the current frequency is fine. The remaining 16 percent (3 students) think Socrative “*is annoying interruptions of the lecture*”. Those who like the online quizzes generally believe it increases their learning (Figure 1, 63 percent “*yes*” and 21 percent “*Maybe*”).

Table 1 shows that most of the students in favor of Socrative like the learning tool because: “*It makes me reflect on the material*” and/or “*I become more aware of expected learning goals, it gives me an indication of what I have to work with*”. Almost half of the pro-Socrative students also agree to statements that indicate less direct learning from the quizzes. Namely, that the learning tool simply keeps students awake and it is a way for the teacher to get immediate feedback on student learning. I realized the importance of the latter argument in my teaching. I was often surprised seeing low scores on questions I thought should be easy for instance because I just covered the material. In that way, Socrative became a way for me to see if I should go over something once more.²

²Few students had comments to Socrative beyond what the questions covered. Two reminded me to hide student progress until everyone has finished, and two asked me to make the questions and correct answers available in Absalon such that they can look at them again when studying for the exam. Another pair of comments were simply very positive expressions about Socrative, and one said we should have a quizz for every model/theory we cover.

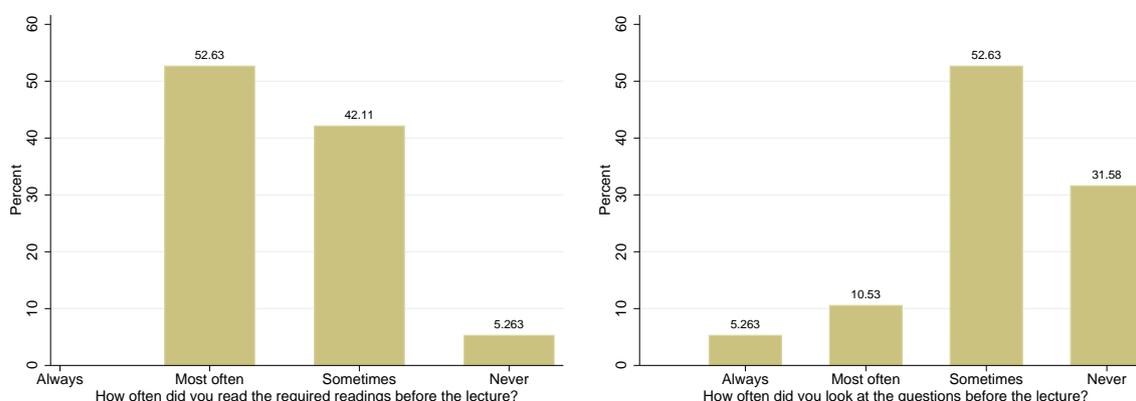
Table 1: Why do / why don't quizzes using Socratic increase your learning?

Statement	More	Fine	Fewer	Total
It keeps me awake	16	21	0	37
It makes me reflect on the material	53	16	0	68
It gives the teacher immediate feedback on student learning	16	21	0	37
It is annoying interruptions of the lecture	5	5	16	26
I like to learn how I perform relative to other course participants	0	5	0	5
I become more aware of expected learning goals, it gives me an indication of what I have to work with	26	21	0	47
Observations	10	6	3	19

Notes: Table entries are percent of total (19). Course participants were asked to mark all the statements they agree to so column percentages sum to more than 100. More, fine and fewer refer to whether students would like more Socratic quizzes, think the current frequency is fine or prefer fewer Socratic quizzes.

2.2 Questions for preparation

Figure 2: Preparation for lectures



The last slide each lecture listed the required readings for next time and a few questions or small assignments intended to guide and improve their preparation. No one read all the required readings everytime and only one always looked at the questions for preparation. However, the majority read the material and looked at the questions most often or sometimes, as shown in Figure 2. One student explained why he/she did not prepare for the lecture but instead prefer to study the material afterwards: “*it is an advantage to know the context from the lecture and focus on details while reading*”.

Table 2: How did you use the questions?

Statement	Total
I wrote down answers	16
I took notes related to / guided by the questions	21
I discussed them with fellow students	11
I reflected upon them but I did not discuss them or write anything down	42
I have not used the questions	16
I intend to look at them when studying for the exam	58
Observations	19

Notes: Table entries are in percent. Course participants were asked to mark all the statements they agree to so percentages sum to more than 100.

Table 2 shows that a few students “*wrote down answers*” and/or “*took notes*” using the questions (32 percent did some written preparation using the questions). 53 percent of the students either discussed the questions with class mates or reflected upon them, and 58 percent intend to use the questions when studying for the exam.

2.3 Homework

Two students did not hand in any of the problem sets and two students handed in five or all six homework; the rest (76 percent of students) handed in some of the homework (Figure 3, Panel A). 94 percent of the students believe - to a smaller or larger extent - that the homework helped them “*understand complex material*” and become “*more aware of the learning goals for the course*” (Figure 3, Panel B and D). Similarly, it is their impression that the homework helped them “*achieve the learning goals for the course*” (Figure 3, Panel C).

Figure 3: Homework

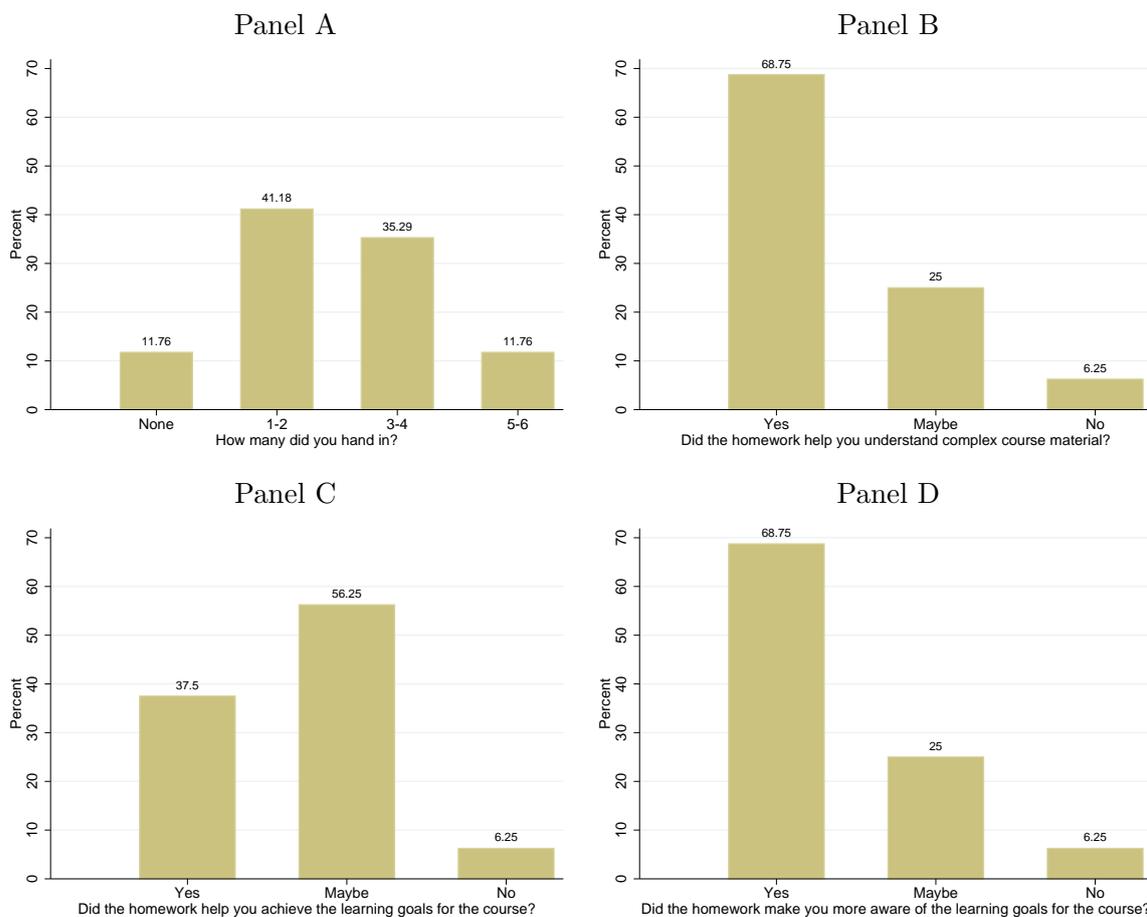


Table 3 shows that 65 percent of students suggest that we make it mandatory if we would like to increase submission rates for homework. One student elaborates more on this and suggests us to make around 80 percent mandatory. One out of four explain in the detailed comments that they simply do not have the time during the semester or they try but do not have enough time to finish and upload. 29 percent recommend that we make it more clear how relevant they are for the exam. One student suggests that we simply prioritize differently. Instead of three hours of lectures, he/she recommend that we have two hours of lecture and one exercise class every week and fewer topics/models focussing on a deeper understanding of the theories we cover (and do less empirics).

Table 3: What could make you hand in more of the homework? / How do you think we could improve the submission rate for homework?

Statement	Total
Make it mandatory	65
Never provide solutions/suggested answers, only individual feedback	6
Disable student names in Absalon / make submission anonymous	6
Make it more clear how relevant they are for the exam	29
Other, please write	29
Observations	17

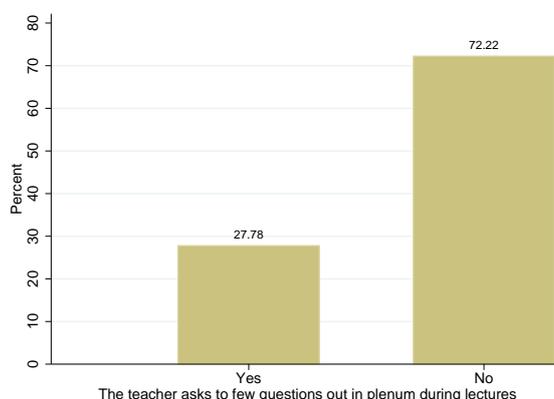
Notes: Table entries are in percent. Course participants were asked to mark all the statements they agree to so percentages sum to more than 100.

Two students complain about the use of old exams among the homework, explaining it weakens incentives to hand in, and they use the old exams when studying for the exam so homework should give additional opportunities for learning above what is already available and should not be something where they can find solutions beforehand.

Some students also explain that they feel homework is disconnected from the lectures and more difficult than the lectures seem. One student says “*it has nothing to do with your classes but it takes a lot of time*”, another write suggest that we “*talk about them in class and give solution guide*”, and finally a third student writes “*the homework most often was more difficult than what was covered in class*”.

2.4 Questions in plenum

Figure 4: Questions in plenum



Only 28 percent would like more questions in plenum. The reasons vary. 22 percent think questions in plenum are useless. Some say “*the majority do not learn from it*”. Most students

believe it questions asked by the teacher in plenum “*are primarily a way to interrupt monotone speech and/or they “prefer the anonymity via Socrative but oral questions have merit because they are faster.* A few students write comments. These comments largely confirm what is covered by the statements in Table 4, e.g. “*no one answers anyway*”/“*just one guy is answering*” or “*I prefer Socrative*”.

Table 4: Explain your opinion on questions in plenum

Statement	Total
They are useless	22
I prefer the anonymity via Socrative but oral questions have merit because they are faster	39
The majority do not learn	22
They are primarily a way to interrupt monotone speech, they wake me up	39
Other, please write	28
Observations	18

Notes: Table entries are in percent. Course participants were asked to mark all the statements they agree to so percentages sum to more than 100.

3 discussion

Socrative is an effective way to monitor learning and improve learning in the classroom (Learner-Centered Classroom Assessment, Angelo and Cross, 1993). The immediate and systematic feedback on student learning provided by the results of the Socrative quizzes make clear which important points need further elaboration. Without Socrative I knew I might be going too fast over some material but it can be difficult to guess what exactly students do not follow, and I would feel stupid repeating myself without the full classroom assessment provided through Socrative. It is also a very popular teaching tool among students. Everyone participates as opposed to when questions are posed in plenum, and the summary statistics from the quizzes provide more representative feedback on how the class performs compared to when one individual is able to answer a question in plenum. Students pause and reflect on the material which should in itself increase learning (68 percent state it makes them reflect on the material). Moreover, I can address directly the points that were not understood and improve my explanations (as noted by 37 percent of the student), and students (47 percent) also realize that this exercise increases awareness of learning goals and makes them see where they need to improve. Understanding ILOs and seeing whether you meet them probably also make students more susceptible when some points are being repeated after a quiz and quizzes did often times stimulate more student activity in terms of questions.

More students used the **questions for preparation** compared to what I expected, and the

majority plan to use them when studying for the exam. I did not have the latter use in mind when preparing the questions and most often I would build on the questions in the following lecture, meaning that I may expect even deeper insights for the exam than what I expect them to do in a pretask. So this is something I need to think about and maybe state more clearly the purpose of the preparatory questions.

It was an indirect aim that the pretasks should improve student engagement in class since they have a chance to think about answers at home. Indeed I struggled less getting students to answer if I asked questions in plenum related to what they had reflected upon at home. It also facilitated that more introvert students would sometimes answer, and I experienced that more students would give my “silent” feedback that they were following when I covered insights they had been asked to reflect upon (e.g. they are nodding and look attentive).

The introduction of **homework** successfully made students more aware of the ILOs and they also believed that doing the homework improved their understanding of complex material. Still relatively few handed in during the semester but probably plan to use them when studying for the exam. That was not the idea. Many old exams and suggested answers are available online, and our plan was not just to add to this pool of problem sets. Instead it should be a service that make students study the difficult parts during the semester. This is the main reason that I refused to give them suggested solutions; there needs to be an incentive to hand in and receive feedback during the semester, and homework is scheduled to test their understanding and help them as the topic is covered and issues could still be taken up for further discussion.

65 percent of students suggest that we simply make the homework mandatory to improve submission rates. We have seen from other elective courses in Economics that fewer sign up if mandatory assignments or mid-term are introduced. It should not be necessary in an advanced course and we also want to allow flexibility since many students have students job and intentionally plan their semester so they can put in all the effort in the exam period (typically taken those week off from work).

Some students have said that they would like to have answers to homework uploaded at Absalon. I am not a big fan of this for two reasons: 1) as I already said it reduces the incentive to do the homework, get feedback and come to lecture instead of just reading the solution guide when preparing for the exam. Problem sets with solution guides makes the service very similar to the freely available old exams with solutions. The only difference being that homework are given in the relevant context, as we teach the material. 2) Not being able to find the answer probably means they could not understand the text they read in the first place so more text possibly with references to the curriculum does not seem the way to go.

A few students also complained about our use of problems from last year’s exam in the

homework. Maybe we can gradually phase out the two problem sets building on last year's exam when we have created more material for the course. This simply has not been possible because just updating the curriculum and redesigning the course that had been taught by different external people over the year has been a lot of work.

Econ students are generally not happy about discussions and **questions in plenum**. Teaching students that are close to graduating does not make it easier, since they are used to years of lecturing and taking notes. Teaching activities that encourage engagement and spur questions like Socratic quizzes were 50 percent "fail" and pretask that made people reflect on the material before the lecture stimulated the overall student activity and helped create an environment where more students would also dare responding to questions posed in plenum without the aid of other teaching and learning tools. For me as teacher, questions were useful to have on the slides to remind me to pause and elaborate, which supposedly increase student learning even if it is hard to start a dialog about the question.

4 Conclusion

Students like Socratic and it is also my impression that it improved my teaching and their learning. I therefore plan to continue using Socratic going forward. Maybe have a few more quizzes (half of the students would like more), and maybe substitute some of the quizzes with improved ones next year. Many students dislike questions in plenum but I believe a few well thought through questions have some merit, at least to make me pause. In most of the situations Socratic is a good replacement for questions in plenum and often times superior since it engages all students and give the teacher representative feedback. On the other hand, it is more time-consuming.

The types of questions I make in Socratic are very similar to the small/quick questions we have at the end of the written exam. I will have this in mind then revising the questions for next year's quizzes and probably tell the students upfront that similar short questions appear in exams, though for Socratic student motivation does not seem any challenge.

The questions for preparation were modestly successful. Many used them and almost 60 percent want to use them when studying for the exam so I have to go through them again next year and probably be more careful that they are aligned with ILOs or explaining to the students if they are preparatory assignments that may not appear in similar level or content in exams - instead they are a prerequisite for the in-depth understanding we are demanding.

We will also continue giving the students homework and not make it mandatory in the coming year. We are simply afraid less students will sign up for our course if we toughen the rules. We will try to increase submission rates by being more clear about the relevance for exams and not giving them feedback unless they hand in and never go through entire problems

sets - maybe ask groups of students to take turns in providing solutions that we could check.³

Overall, the initiatives improved my information on student learning and allowed me to adjust my teaching accordingly and they contributed to a better learning environment. Some of the teaching tools have general relevance for teachers, e.g. Socratic that can be customized to the specific course and situation. Other initiatives were specifically designed to address challenges related to teaching a course based on frontier research articles that can be pretty tough for normal Master students to comprehend. The pretasks is an initiative that is especially relevant for advanced courses with no textbook and maybe also quite diversified students in terms of background knowledge.⁴

³This year they were given solution guides for some of the first homework.

⁴We have international students that enters our Master program with very different Economics Bachelor degrees and spread in terms of what students remember from mandatory courses is large.

Literature

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