

Transforming Economics 144 away from traditional teaching towards student centred learning

Faculty of Economic and Management Sciences | Department of Economics

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Learning activity:
Flipped classroom

Learning technology:
Clickers, vodcasts

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Background overview

As the largest faculty (in terms of number of undergraduate students) at the University of Stellenbosch (US), Economic and Management Sciences are faced with unique challenges. These challenges are related to the lecturer-student ratio, the pressure on staff time, keeping the success rate, enhancing the quality of graduates and improving both the student and lecturer's overall teaching and learning experience. Technological development and associated advances in knowledge regarding the use of technology in teaching and learning provide multiple opportunities to address these challenges. For this reason, enhancing the use of learning technologies is prioritised within the faculty.

Intended learning outcomes

Upon completion of the module students should have a thorough knowledge of the basic macroeconomic concepts and should be able to analyse the macroeconomic issues from the perspective of different schools of thought in economics. Students should also be able to apply their knowledge in understanding South African macroeconomic issues, such as economic growth and development, inflation, unemployment and balance of payments stability.

Established practice and subject area

Economics 144 (Macroeconomics) is a second semester module that follows on Economics 114 (Microeconomics). The module has six lecturers and therefore six groups of students that attend either Afrikaans or English lectures. Economics 144 is an introductory macroeconomics module that focuses on several areas, including the theory of income and production determination, the foreign sector and monetary economics. The theory is illustrated using South African data and examples throughout the module, to give it a South African perspective.

Lectures focus on a framework for the particular topic as well as the context within which it should be studied. Students are expected to prepare for each lecture by reading the relevant sections in the textbook. During the lectures the material is placed in context and the more difficult parts of the work is emphasised.

The challenge

In spite of the lecturers' best efforts to incorporate discussions and excellent presentations in lectures, running a comprehensive, efficient tutorial programme as well as having a summer school in place they were still frustrated with the lack of student engagement and success over the past couple of years. Although the summer school has led to an average improvement of about five percent in the pass rate over the past five years, the pass rate is still on average only about 75%. The quality of these passes is also not what they would like it to be – on average only 8,8% of students achieved distinctions over the past five years. This motivated the lecturers to rethink the mode of delivery of the Economics 144 module.

Possible advantages associated with the integration of technology

The body of higher educational literature clearly shows that active, student-centred learning methods outperform traditional models in terms of effectiveness, also in teaching economics. Inspired by a colleague's positive outcomes in chemistry using a collaborative, problem based model, the lecturers successfully replaced the lecture approach with this student-centred approach during the winter school for Economics 114 in July 2011 and July 2012. These successes gave them confidence that a student-centred, collaborative learning approach is possible for large class groups.

Student overview

There were 1 863 first year students registered for Economics 144 in 2014. These students are divided into six groups. Towards the end of Economics 114 (first semester module) students were given the option to enrol for the project in the second semester. Two groups (one Afrikaans group and one English group) were taught under the project. A total of 427 students enrolled for the project.

Learning and assessment activities

Educational approach and learning activities

The aim of this project was to pilot a reshape of the Economics 144 module to become truly student centred and aligned with the graduate attributes of the university. The lecturers aimed to show that cooperative problem-based learning is possible (and in fact more successful than the traditional approach) for large class groups in economics by flipping the classroom



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(of two of the six lecture groups) in 2014 – incorporating high and low technology in a blended learning approach to facilitate and enhance engagement and monitoring attendance, participation and progress of the students.

The lecturers assessed, reviewed and improved the content material, questions to be used for problem based sessions, equipment and logistics before the commencement of lectures in July 2014.

Students attended lecture sessions in six groups of which two (one English and one Afrikaans group) piloted the new approach. Each of these two groups was divided into small groups of three – but later in the term the groups ranged in size from groups of two to five, due to some students not attending classes. Students remained in these groups for all contact sessions as far as possible. Full class attendance was required (and explicitly mentioned in contracts with these students). During the term, however, when students wrote tests (for other subjects) many students missed classes – for example during a week when three tests were scheduled, there were only 80 (out of 250 students) students present in class. Although students had agreed to attend all classes (and signed a contract stating this much), the lecturers could not enforce class attendance.

In order to monitor class attendance a combination of methods were used: registering with smart phones on SUNLearn with student numbers and submitting answers to objective questions; handing in of homework; writing a spot test; submitting of group assignments; signing of a register but then validated by a head count and more.

To facilitate the problem based peer instruction approach in class, both low tech and high tech equipment were used. Students used their cell phones as clickers and were then able to individually indicate his/her answer(s) to the problem(s) stated. Groups got the opportunity to discuss the question and indicate their answer to the lecturer using the low tech clickers (LTC) (flash cards) and if necessary using the low tech tablets (LTT).

After discussion students got the opportunity to then again use the “clickers” to indicate their final answer. The high tech equipment (cell phones as clickers used with software on Android Tablet) allowed data to be captured

on each question posed and the learning that then takes place can be measured. It also generates immediate feedback for students that enhance learning. The low tech equipment enabled the lecturer feedback on who the students with problems are and leads to some (healthy) competition in the classroom.



Assessment activities

Students were still only assessed on the three semester tests and examination as in the previous teaching model. As part of their preparation activities they did answer a short quiz but these were not assessed. In class they took part in group work and answered questions using clickers and mini-whiteboards. These in-class activities were also not assessed.

Feedback practice

Students received immediate feedback on their in-class activities from other students and the lecturer. Students wrote the same semester tests as those not in the project group, and received feedback two weeks after the tests.

Learning Environment

Learning setting

Learning took place in traditional lecture halls. The layout of the lecture halls did not prove conducive for flipped classrooms. Furthermore, the Wi-Fi rarely worked in some of these buildings. This proved a great challenge for the lecturer since their approach relied heavily on technology for the



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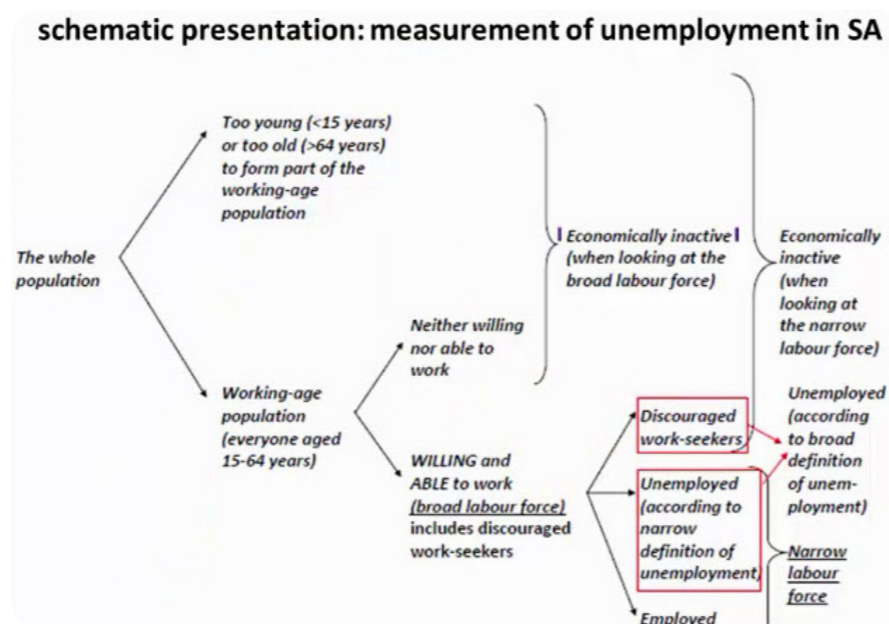
clicker activities. Students had to use their own data or write their answers on paper.

Collaborative settings

Students worked collaboratively in groups in lectures. These groups had two to five members. To create the groups at the start of the module proved to be a big administrative task. Students also did not always attend classes which proved more difficult for group work.

Content resources

Students still had access to the traditional module content on SUNLearn. The text book was also recommended to the project group. On SUNLearn, lecturers posted their own vodcasts or links to Khan Academy videos for students to watch as a preparation activity.



In the feedback students stated that they preferred watching the lecturer's vodcasts instead of other videos.

Student experience

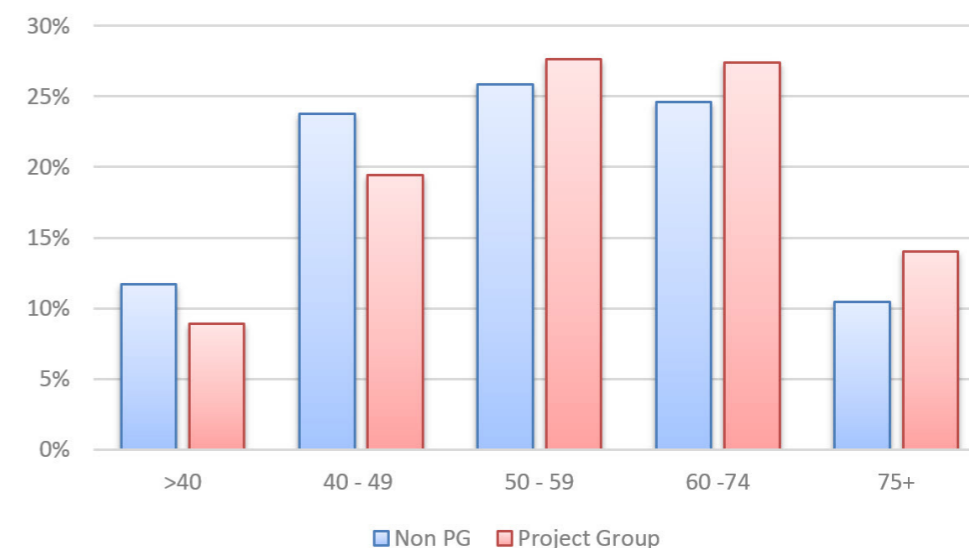
Student feedback on learning experience

Students completed questionnaires at the end of the module. Almost all (94%) of students stated that the videos helped them understand

economic concepts better. A large part of the class (77%) found clickers useful. Less students, but still a significant amount (66%), found the low tech clicker (colour flash cards) effective. Students (82%) that working in groups helped them learned better and 86% felt that they are more prepared for the examination.

Assessment impact

From the predicate marks it emerges that overall the Project Group students have a higher predicate. Therefore, the use of flipped classroom had a positive impact on the students' assessment.



General

Opportunities

Once the project is securely in place, it will be easily duplicated in future years. The initial inputs and expenses will therefore benefit students (as well as lecturers) for this module in future years. As designers of the project, the lecturers are keen to find a workable model that they will definitely also apply to other courses and will continue to measure and report the outcomes. Through sharing the results and model, lecturers hope to help in revolutionising the mode of instruction for large class groups worldwide.

Challenges

The lack of Wi-Fi were challenging in most lecture halls. Since lecturers



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were dependent on the use of online clickers at the beginning, the method of teaching had to be adapted.

There are tests banks available in English, which made setting up questions easy for the English lecturer, but the Afrikaans lecturer had to translate many multiple choice questions into Afrikaans, which was very time-consuming. The large class size (specifically in the English group) made it difficult for the lecturer to answer each group's questions during class. Next year there will be two teaching assistants (Master's students) present during every class.

Advice

The lecturers have the following advice for colleagues that wish to engage in a flipped classroom:

- Make ALL the vodcasts (videos) available BEFORE the start of classes. During the semester unforeseen circumstances arose, and there were some weeks that the lecturers could not record and produce the vodcasts.
- Plan each week's activities, and give a week by week plan to students so they know what to expect in terms of videos to watch, question sets etc.
- There may be trade-offs in terms of content covered during class. This content needs to be in vodcasts for students to watch, or students will have to read more. The objective, however, is to do more problem sets/

question sets during class, so that students truly learn by doing.

- Provide as much feedback to students as possible – they learn by doing, seeing (understanding) what they do wrong and then being able to correct it. Keep the students engaged!

Other concluding thoughts

This project was funded by the RDF (Finlo and Teaching Development Grant).

