

# GOOD Flipped Classroom CASE



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Instructor  
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Department  
**Civil and Environmental Engineering (CEE)**

CSE1B01W

Transport and society  
(General University  
Requirement course)

Class size ~ 30

Students

Majority are Year 1 and 2  
students from various disciplines

## Details of Flipped Classroom IMPLEMENTATION

### Why did the instructor use the flipped classroom approach?

After conducting some research, Barbara was convinced by substantial empirical evidence that the flipped classroom approach significantly enhances both learning satisfaction and the overall learning experience. Consequently, she was eager to incorporate this approach into her daily teaching routine. She selected this particular subject for implementation because it falls under the General University Requirements (GUR) category. This category is not heavily discipline-oriented, making it relatively easy for general undergraduate students to comprehend. Barbara is confident that the flipped classroom approach is an appropriate strategy that can actively engage students in this subject, offering them a more interactive learning experience.

### How was the flipped teaching approach implemented?

#### Preparation of materials

→ The materials for each of the original 2-hour face-to-face lectures were segmented into short videos, each focusing on a single key message. The majority of these concise video segments incorporated interactive multiple-choice questions with automatic grading and feedback.

#### Pre-class activity

→ Students were required to watch the lecture videos and complete the interactive knowledge check questions before attending the class.

#### In-class activity

→ During the initial 30 minutes of the class, Barbara provided a comprehensive summary of the lecture content and addressed common questions or misconceptions stemming from the video lectures. The subsequent 60 minutes were devoted to group tasks (peer instruction) in the form of group discussions, mini research projects followed by group presentations, or case studies. In these tasks, students were required to apply the knowledge they had gained from the video lectures to analyse new situations, develop the ability to organise, evaluate, and integrate old and new information, and generate new insights. Worksheets were provided to guide students during these activities. Students were permitted to use AI tools, such as ChatGPT, to assist them in preparing their assignments. However, it was crucial to highlight the limitations of AI tools and encourage critical judgment when considering the information suggested by AI. All assignments were completed in class.

#### Post-class activity

→ To minimise the student's workload, no additional post-class activity was required.

### What was the impact on student learning?

Barbara evaluated the impact on student learning by comparing the performance of students in the same course using the traditional flipped approach from the previous two years to the performance after implementing the flipped teaching approach. The results, validated through statistical testing, indicated a positive impact on student learning, as evidenced by improved academic results and enhanced in-class discussion performance. Students demonstrated a more profound understanding of the subject matter, which translated into better performance on assessments. The interactive nature of the flipped approach also increased student engagement and participation during in-class discussions, enriched the learning experience, stimulated critical thinking, and fostered deep learning. This led to an increase in learning motivation and satisfaction.

### What are the good practices that can be learnt from this case?

#### Strategies to encourage student participation

- 10% of the course grade was allocated to multiple-choice questions in the lecture videos. This served as an incentive for students to complete the pre-class activities. During in-class activities, correct answers were intentionally withheld to allow students to learn from their mistakes and to foster active participation in the learning process.

#### Gradual implementation

- Barbara recommends a gradual implementation of the flipped classroom approach, starting with general and lower-level courses before extending it to more complex or technically challenging subjects. This phased approach allows instructors to gain experience, refine their methods, and customise the approach to suit the specific needs of different courses.

#### Preparing students for the new approach

- Early communication about the flipped teaching approach can ensure students' understanding and acceptance of the methodology. It's crucial to clearly articulate the rationale, benefits, and expectations of the approach, enabling students to make an informed decision about whether to continue with the course or consider withdrawing if they're uncomfortable with the format.

#### Creating effective videos for pre-class self-learning

- Engaging students in pre-class self-learning requires investing time in creating concise, informative videos that deliver key information. An effective video should be of appropriate length (around 5-6 minutes), and focused, i.e., each video covers only one key message.

To create effective teaching videos, Barbara suggests preparing and rehearsing full voice-over scripts prior to recording. Special efforts were made to ensure the sentences were brief and straightforward, and complex vocabulary was minimised to enhance self-learning effectiveness and cater to students' varying English proficiency levels. The presentation slides for the video were overhauled to reduce verbosity and enhance aesthetics, thereby boosting user engagement. Barbara also recommends voice-over style videos, as informal student surveys indicated a preference for this style over talking-head or side-by-side formats. This style maximises the content area on the device screen and minimises distractions from the teacher's expressions or body movements. It's also good practice to avoid time-sensitive data to enhance the videos' future reusability.

#### Revamping in-class activities

- Transitioning students from passive lecture attendance to active group participation can be challenging. Therefore, carefully designed and executed in-class activities are crucial for the success of the flipped classroom approach. The teacher needs to thoroughly understand their students and invest time and effort in transforming the class delivery into interactive activities. It's also recommended to include brief warm-up activities, such as summarizing the key points of the videos and engaging students in quick mini-research activities in class. This approach helps students ease into interactive discussions, fostering a more comfortable and engaging learning environment and preparing students for active participation.

### What were the challenges encountered during the implementation and what solutions were used?

#### Creating high-quality lecture videos

- The time-intensive nature of producing these videos posed a significant concern regarding workload. However, this issue was alleviated by reusing the videos for the same course in subsequent iterations. Barbara addressed the issue of video quality by setting up a dedicated video recording studio. Additionally, she employed an assistant to handle the logistics of video production, including script organisation, studio preparation, and post-production editing.

#### Evaluating the effectiveness of the approach

- Assessing the effectiveness of the new approach can be challenging, particularly for less experienced teaching staff. To tackle this, it's crucial to establish clear learning objectives and assess student performance through various means, such as class discussions, group activities, and examinations. Regular feedback from students can also offer insights into their understanding and engagement.