

The Flipped Classroom Project: Testimonials from Educators Who Made It Work

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Abstract

The article is a study based on the e-classes project (2017-1-RO01-KA202-037344), which is funded by the European Commission (under the Erasmus+ programme) for the years 2017-2019; the project is being implemented within an international partnership including a wide range of educational institutions (teacher training centres, schools, non-governmental educational organisations and IT centres) from Bulgaria, Italy, Spain and Romania. The project's main objectives are centred on strengthening VET teachers' professional profile and on improving VET students' low achievement and stimulating their motivation to study science subjects. The article focuses on science teaching and learning and its challenges and suggests an innovative method, the flipped classroom. The paper highlights the project's most important outputs based on the flipped classroom method: the lessons and their short video lessons illustrating basic scientific concepts from science school subjects. It gives examples on how transversal topics such as career orientation, motivation, inclusion, absenteeism (dropout) and CLIL can be effectively used by teachers for the benefit of students to stimulate their motivation. The testimonials collected from teachers and students participating in the implementation give some insights into the teaching/ learning experience.

Keywords: *Vet teachers and students, science, transversal topics, flipped classroom method*

1. European context and the E-classes project

The unprecedented advance of technology has brought about innovative changes in the methodologies used by schools interested in updating their curriculum, engaging students in the learning process, motivating them to study and bringing education closer to the world of work. The European E-Classes project is an illustration of how schools integrate technology into classes to the benefits of their students. The European E-Classes project promotes the flipped classroom methodology and aims at:

- ✓ improving VET teachers' e-skills and collaborative learning skills;
- ✓ creating multimedia educational resources;
- ✓ stimulating VET students' motivation to study science subjects using ICT

1.1 The project's methodology: the flipped classroom

The flipped classroom method is rooted in a large body of literature on student-centred learning (constructivism and collaborative learning, problem-based and active learning, peer-assisted, experiential learning etc.). It supports the 21st century teaching and learning structures and practices, focusing on the individual student's needs, their responsibility for their own learning and differentiation of learning adapted to the strengths and weaknesses of all students [1].

Before introducing the method, teachers should explain to students how the method works, what its benefits and challenges are. Lessons based on the flipped classroom method consist of two stages: *outside activities* where short videos introducing the main concepts and provided with embedded tasks checking comprehension are viewed by students at home before the class and *in-class activities* where students are actively engaged in exercises, projects, or discussions. During in-class activities students are busy inquiring about the content, deepening and applying knowledge, doing research and interacting with one another while teachers function as guides, coaches or advisors, encouraging

students in individual inquiry and collaborative effort, monitoring them and providing help and feedback [2].

2. The flipped lessons

Five teachers and 96 students from several high schools in Iași, Romania, took part in the flipped lessons as part of the E-classes project. It is important to mention that, though the flipped methodology has been around for a while in the international practice, only 2 of the teachers involved, have previously done flipped lessons, but none with the students involved in this project. Equally, none of the students had prior exposure to this methodology.

What is unique about this project is that teachers had to create their own videos, which would become one of the intellectual outputs of the project. Thus, we focused on lessons of Science (Physics, Chemistry), language learning (English and French) and Counselling. The lessons aimed at introducing in students' learning transversal topics such as career orientation, motivation, inclusion, absenteeism prevention and CLIL (teaching/learning a non-language subject through the medium of a foreign language). Teachers and students were recruited according to their interest in the experiment, availability and access to the required IT tools. After being familiarised and trained with the method, teachers devised lesson plans and created videos introducing the main concepts of the lessons. Teachers also collaborated in the selection of the activities students were supposed to participate in during classes: research, PPT presentations, quizzes, Think/ Pair/ Share activities, brainstorming, discussions etc. They also set a sequence of stages to be covered in a flipped class, which students were informed about:

Pre-class activities: students watched videos and did embedded tasks outside the class;

In-class activities:

questions testing students' understanding of the content of the video (checking the embedded tasks)

exercises and critical thinking activities;

discussions and review of the lesson.

During some classes, students could use the internet, online dictionaries and other online resources. The main feature of all classes, however, was the collaborative aspect of learning whereby students consolidated their learning from the videos by being engaged in active learning activities designed not only to assess their understanding, but to apply the newly gained knowledge in new contexts to further their learning.

2.1 The questionnaires

Students' questionnaire (Table1) assessed their perception and feelings about the classes by asking them to grade using a scale 1 – 5 (5 - the highest), whereas teachers had five Yes/No questions (Table2).

Table 1: Students' questionnaire

1. The lesson was easy to understand.	1	2	3	4	5
2. I found the format of this class helpful to the way that I learn.	1	2	3	4	5
3. Watching the video before the lesson helped me learn better.	1	2	3	4	5
4. I felt that this class format engaged my interest.	1	2	3	4	5
5. I felt comfortable in this class.	1	2	3	4	5

Table 2: Teachers' questionnaire

1. Do you feel confident in using the flipped classes' methodology in your teaching activities?	YES/NO
2. Do you find the lessons to be appealing for your students?	YES/NO
3. Do you find the lessons to be useful for students?	YES/NO
4. Do you consider that is difficult to prepare your lessons using this method?	YES/NO
5. Would you recommend the flipped classroom method to your colleagues?	YES/NO

Participants were also asked to answer open ended questions about challenges and benefits of the method (teachers) or report on what they liked or disliked about the class (students).

2.2 Questionnaire results and analysis

When analysing the results of the questionnaires, it is important to mention the distribution of students and subjects where the flipped methodology was used. Thus, of the 96 students, aged between 15 – 18, 13 were engaged in a Physics class (inclusive education), 22 studied topics such as Water Pollution and treatment or Robotics with the aim to use CLIL, 31 students engaged in a career orientation lesson and 29 participated in an educational class where learning strategies were presented as a means to stimulate students' motivation and prevent absenteeism and drop-out.

The feedback obtained from both students and teachers shows clear strengths of using the flipped methodology. 62.5% of students found the lesson easy to understand, grading the lesson highly (scores of 4 and 5); they appreciated the format as being helpful to their learning as it engaged their interest. 68.7% of students felt comfortable in the class and appreciated the pleasant, collaborative nature of the lesson.

In their open feedback regarding the content, delivery, activities and method, over 90% of students mentioned that flipped classes offer a different learning experience from the courses they were used to. They mentioned novelty, the interactive nature of the activities, the dynamism of the lesson, the opportunities to work in teams, collaborate and freely express their ideas as reasons for their appreciation of the method. An important feature that stands out from students' feedback was how much they appreciated the interactive nature of the lessons, which was so different from the traditional, teacher-centred methods they know: 'we all engaged in the activities and had to contribute to the tasks', 'I appreciated having to work in teams, collaborating, which helped us learn from each other and also made learning fun', 'We were directly involved in all stages of the lesson', 'I particularly liked the interactive character of the lesson: we were deeply involved in what was going on; we were not supposed to listen to the teachers as in the other classes.

Several students appreciated the opportunity to exercise their independence in learning and to use technology: 'I really enjoyed the time when we had to do research on our own', 'I liked that we were given the opportunity to express our opinions', 'the use of technology makes learning fun'.

Equally, teachers felt lessons were attractive, commenting on the increased motivation and engagement of their students in the activities.

On the negative side, students' feedback highlighted for us the importance of thoroughly training teachers in creating the videos for the flipped lesson. Given that a condition of the project was for the teachers to create their own videos and that no teacher had prior experience in doing that, we believe that is an area for improvement. 55% of students did not believe that watching the video before the lesson made them learn better.

As regards the teachers, their main concerns were related to the time and the resources required to prepare flipped lessons and to the concerns that students might not watch the videos. This is not uncommon. The 2013 Speak Up survey not only acknowledges these concerns, but also reports a decrease the more teachers use this method [3].

The Sonic Foundry and CDE survey (2013) reports that 75% of the educators engaged in the survey were sharing the same concerns [4], however, research also shows that the time committed to developing a flipped lesson decreases the more teachers use this method [5]. In our project, a teacher reported that it took her a whole day to record her video and as extreme as that sounds, it is understandable given the lack of previous experience in making video materials. Equally, our teachers mentioned that it also took them a long time to organise and design learning experiences that engage students in higher level thinking and problem-solving during class time, as their whole classroom routines and didactic orientation had changed towards a student-centred approach. Lage, Platt & Treglia (2000) in a study about flipped introductory economics lessons at Miami University reported that they spent two hours developing and another two hours recording each video lesson [6].

3. Conclusions

Despite the limitations of the study, related to the small number of students and teachers who participated in the study and the short time covered by the experiment (limited by the project's application), the results are worth considering. They show that the flipped classroom model can offer positive learning experiences in schools and an efficient means of content delivery which could enhance students' motivation to learn: 'the lessons are attractive and students are motivated. We need workshops which promote such innovative teaching methods.'

Teachers agreed that implementing the flipped methodology requires further training and support and a shift in their teaching practice.

The project's implementation is not completed yet and we expect new findings to collect from participants.

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