

## USANDO EL MODELO DE LA CLASE INVERTIDA EN CIENCIAS DE LA EDUCACIÓN – ¿CAMBIAR LAS TORNAS ES EL CAMINO A SEGUIR?

### USING THE FLIPPED CLASSROOM MODEL IN TEACHER EDUCATION – IS TURNING THE TABLES THE WAY FORWARD?

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#### **Resumen**

Este artículo presenta un proyecto de clase invertida que se llevó a cabo en el grado de Educación Primaria en la Universidad de Cádiz. La iniciativa respondía a la necesidad de introducir una nueva forma de trabajo, dado que los alumnos reaccionan con mayor nivel de interés e implicación hacia dinámicas prácticas que hacia la clase teórica tradicional.

Nuestro objetivo era intentar solucionar algunos de los problemas a los que nuestros alumnos se enfrentaban, como la dificultad de mantener su atención durante la clase teórica, intentado asimilar los conceptos mientras toman apuntes y perderse durante las explicaciones por trabajar a un ritmo distinto que el resto del grupo. Estos alumnos se beneficiarían de trabajar con el material antes de clase en casa a su propio ritmo, liberando así tiempo de clase para actividades colaborativas y prácticas que ejemplifiquen y amplíen conceptos.

Analizamos los aspectos clave de esta metodología, prestando especial atención a las ventajas y dificultades a las que nos hemos enfrentado durante su implementación.

## **Palabras Clave**

*Clase invertida, aprendizaje cooperativo, metodología.*

## **Abstract**

This paper presents a flipped classroom project carried out on the Primary Education degree in the University of Cadiz. The initiative responded to the need to introduce a new way of working as students react with a higher level of interest and involvement to practical dynamics than to the traditional theory class.

Our aim was to try and solve some of the problems that our students were facing, such as difficulty in maintaining their focus during a theory class, trying to assimilate the concepts at the same time as they take notes and losing the thread during the explanations because they work at a different rate than the rest of the group. These students would benefit from working with the material before the class at home and at their own pace, freeing up class time for collaborative, practical activities to exemplify and expand the concepts.

We analyse the key aspects of this methodology, paying special attention to the advantages and difficulties we faced during its implementation.

## **Key Words**

*Flipped classroom, cooperative learning, methodology.*

### **1. Context and identification of the problem**

Teaching practices have changed in recent years as a result of the impact of new technologies but also due to the implementation of the educational model adapted to the European Higher Education Area. This novel teaching and learning model assigns new roles to students who become the protagonists of their learning, while teachers guide the students' work and evaluate not only their knowledge but also their skills and competencies.

Within this context of changing educational models, this paper explores the experience of using the flipped classroom technique with students on the primary education degree programme in the University of Cadiz, Spain.

The study was undertaken in the Faculty of Educational Sciences of the University of Cadiz, where the flipped classroom was used in *Teaching Foreign Languages in Primary*

*Education*, a subject taught in the second year of the degree programme in Primary Education and offered for the teaching of English, French and German. There are three groups of students in the English option, two with approximately 70 students and one with about 15 students.

The students receive two taught 90-minute sessions per week, one session with the whole group in which theoretical aspects of the subject are dealt with, while for the other more practical session the students are sub-divided into three groups of approximately 20 people to facilitate oral practice. The teaching is shared by two lecturers (the authors of this article) with extra support for the practical classes.

The theoretical content is divided into four main blocks – curricular analysis, curricular development, methodology and evaluation. The expected outcomes of this part of the subject are that the students will be familiar with the curricular content related to English language in primary education, as well as the methodology for the teaching and evaluation of English, especially with regard to linguistic components, skills and sociocultural competence. Students are also taught the basic elements of designing a didactic proposal to teach specific aspects of the curriculum, using appropriate resources and promoting the development of the corresponding competences in their pupils.

The classes followed a pattern common to many other subjects on the degree programme – in the theory classes we explained the different aspects of the subject with the support of PowerPoints, which were later made available to the students through the university's online teaching platform, known as the Campus Virtual. The students' role was mainly passive – listening and taking notes – as due to limited class time to cover all the contents and the high number of students in each group, only a few students were able to participate in class and there was very little time left to put the theoretical concepts into practice (Kurt, 2017).

This traditional methodological approach also made it difficult to address differences in students' learning styles and rhythms. While some students were able to follow the classes with little effort, or even found the speed of delivery too slow, others struggled to understand and assimilate the material being presented.

Thus, some of the questions we asked ourselves at this point were:

1. Would it be possible to find a way to allow our students to process the basic contents of the subject at their own pace before our face-to-face lessons?
2. If so, could we transform the classes by designing activities that engaged them in the application of the theoretical concepts of the subject to practical cases, thus encouraging active and meaningful learning?
3. Would this allow us to make better use of class time to solve doubts, give differentiated feedback and develop reflective skills?
4. Would we then be able to address the diversity of learning styles and rhythms of our students?
5. Could we avoid unidirectional instruction, facilitating cooperative learning and peer instruction (Mazur, 1997)?

Consequently, after doing some extensive research on active methodologies, our main question turned into: could the flipped classroom be the solution?

## **2. Flipping the subject**

The flipped classroom is a learner-centered model in which we transfer an important part of our direct instruction from inside the classroom to outside. This instruction is provided in the shape of videos and reading material that are made available to our students before coming to class. This way, students work on this material at their own pace before our face-to-face lessons (Hamdan et al., 2013). At the same time, this option allows teachers to invest in-class time in checking to what extent the students have assimilated the material, sharing and resolving possible doubts, and doing collaborative, practical activities to exemplify and expand the concepts.

In the flipped classroom students are actively engaged in the in-class activities and in the regulation of their own learning at home and are not just passive receivers of the teacher's instruction. They build their own knowledge and for this reason, this methodology is considered to be based on constructivism (Kurt, 2017).

This approach contributes to the development of some of the abilities demanded of learners of the 21<sup>st</sup> century (Trilling and Fadel, 2009): creativity, curiosity, digital competence, critical

thinking, problem solving, collaboration, communication and managing their own learning, namely the skills they need to sustain life-long learning.

The consideration of all these characteristics led us to take the decision to transform our former methodology into the flipped classroom model for the academic year 2016/17<sup>1</sup>. In relation to this, in the present study, we intend to:

- Analyse the changes we made in order to implement this model in our subject.
- Revise the feedback provided by our students at the beginning and the end of the process, in order to gain some insight into their perception of the efficacy of the methodology.
- Identify the challenges we faced during and after the implementation process, reflecting on what caused these difficulties and how we could resolve them in the future.

### 3. New material design

In order to tackle the transformation of the subject for the following year, we started planning the creation of the necessary new material. For every topic in the didactic module, we modified the existing PowerPoint presentations turning each of them into a video. We created the sound track for the videos by taping our voices explaining the topic, as we would do in a traditional lesson. These explanations were read from scripts we had prepared beforehand in which we detailed what we wanted to say in each slide. Taping the videos was challenging and time consuming due to our lack of experience in the recording of audios. It was a process of trial and error in which we even fabricated home-made devices in order to improve the quality of the sound. Despite this, we soon realized it was worth the effort because topics that formerly took us between two and three 90-minute lessons to cover in class (i.e. going through the information of each slide in class with the typical pauses to repeat, allow time for the students to take notes, etc.), were condensed into videos of 20 to 40 minutes. This meant we were able to focus on what we considered more important: using the time available in class to give students the possibility to grasp the knowledge in a meaningful way, applying it to practical cases and developing their skills. This, in turn, leads to a deeper understanding of the concepts. As Johnson et al. (2015, p.38)

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<sup>1</sup> This experience was part of our university's Innovation Projects Programme in the same year.

have stated, “the rearranging of class time gives students in large introductory lecture courses more opportunity to engage and interact with their peers”. In turn, “instructors also make more efficient use of their time by focusing on content that is especially challenging for students”.

The videos were available to the students on the previously mentioned Campus Virtual, our University Moodle platform. All our students are familiar with this platform, so there was no need for training in its use. Each video was made available to the students one week before the topic was dealt with in class.

Among the advantages of the use of video, it is worth mentioning how it can facilitate the learning process as it meets the needs and different rhythms of students:

At home students can work at their own pace taking regular breaks to reduce fatigue and can play a video with their preferred screen size, audio volume, lighting and assistive technologies, pausing or rewinding when necessary to make it easier for them to take notes. (Wald et al., 2014, p.41).

In the second year of our experience with the flipped classroom, we decided to provide students with a printed version of the slides alongside the videos. This way we were incorporating the feedback some of our students gave us after the first year as they considered that this would facilitate the process of taking notes while watching the videos.

Apart from the videos, in every topic several complementary readings or extra videos are available, which students are encouraged to use in order to improve their understanding of the topic. We were well aware of the importance of a careful selection of material, which had to be multimodal in order to address the different learning styles of our students. In addition, every topic finishes off with a self-assessment questionnaire, which allows them to monitor their own progress, thus taking responsibility for their learning process. They are also encouraged to post on the discussion forums and explore some useful links that are provided in our course on the Campus Virtual. These include online dictionaries, relevant TEFL in Primary Education sites and different resources to practise their linguistic skills. This emphasis on providing our students with different ways to experience learning has also helped us to adapt the subject to students with special needs. This has been the case with a blind student and a dyslexic student who enrolled on the course this year (2017/18). Both of them appreciated the possibility of having the material at their disposal in advance to process it at their own rhythm. This in turn would allow them to be at

the same level as their partners in the face-to-face lessons, and therefore more able to apply the contents to practical collaborative activities.

#### 4. Then, what would we do in class?

Once the transfer of information was covered through the material on the platform, the difficult part came for us: how to help our students make sense of that information, how to engage them in the active construction of knowledge. Some examples of the type of activities we designed for our face-to-face lessons were:

- True/False activities in which they need to justify the answers.
- Activities to match concepts with ideas.
- Analysis of Primary education activities in order to identify the approach and method that lie behind them.
- Design of activities that illustrate particular approaches, methods, techniques, etc.
- Problem-solving tasks related to lesson planning and methodology.
- Experimenting in the role of the teacher with “micro teaching practices” in front of the class.

As Bain (2004) points out in his study about good teaching practices in higher education, our activities were intended to find:

(...) signs the students developed multiple perspectives and the ability to think about their own thinking; that they tried to understand ideas for themselves; that they attempted to reason with the concepts and information they encountered, to use the material widely, and to relate it to previous experience and learning (p.10).

All these activities were done in pairs or groups, which gave them the opportunity to exchange their ideas and work in a cooperative way before checking with the rest of the class, when they were always encouraged to justify their decisions and defend their opinions. We should not forget that engaging students in teamwork and the development of their discursive skills are key aspects in their training as future teachers. It also allows fast learners to help slow learners, facilitating peer instruction. As Acedo (2018) explains, the flipped model: “(...) encourages students to teach and learn concepts from each other with the guidance of their teachers. By

allowing students to partake in their own learning, they are able to own the knowledge they achieve, which in turn builds confidence”. This way, diversity is addressed inside and outside the classroom.

The following example illustrates the type of activity that our students engaged in. Before the class, students saw a video presentation which included an explanation of different techniques that can be used to teach new English lexical items to primary school pupils. We then devoted time in class to a practical activity in which our students, working in groups, were given a lexical item and had to think of four different ways to present the word and convey its meaning to their pupils. Each group then presented their ideas to the rest of the class and justified their choice of techniques. As we can see, these activities engage students in the development of higher order thinking skills, according to Bloom’s taxonomy, because they are applying, analyzing, evaluating and creating, leaving lower order thinking skills (remembering and understanding) to be developed outside the classroom at their own pace (Marqués, 2016).

As Medina points out (2016), it is important to remember that in these activities, the presence of the teacher is indispensable, in order to:

validate their [the students’] learning, provide them with feedback, qualify or expand the provisional understanding that the students have achieved in their previous study task, promote their communicative competences and higher order thinking skills, or help them transfer and apply contents to similar situations in the professional exercise (p.16).

## 5. Feedback from the students

### 5.1 data collection: method and instruments

Apart from direct observation, qualitative and quantitative data also came from an initial and final questionnaire that students were asked to complete.

In the initial questionnaire, which was administered at the start of the first lesson, we aimed to gather information about different aspects:

- A. Whether the students used online audiovisual media as a resource for the preparation of their subjects and, if so, how frequently and what type of resources. In this item, we



intended to check to what extent our students tended towards the use of this type of material and which of them in particular they preferred.

- B. Their level of familiarity with the flipped classroom methodology. This item would let us plan how much guidance we would need to provide our students with about the dynamics of the model and their role in it.
- C. Their perceptions about the degree of difficulty of the subject. This final item would allow us learn about their expectations of failure or success.

ITEMS	ASPECTS
<p><b>1) Do you use on-line audiovisual resources to help you prepare the material for your subjects?</b></p> <p>1. NEVER / 2. HARDLY EVER / 3. SOMETIMES / 4. REGULARLY / 5. ALWAYS</p> <p><b>1.1) If your answer is affirmative, please mark with a X the resources you usually use:</b></p> <ul style="list-style-type: none"> <li>• Videos (YouTube, Vimeo, etc.)</li> <li>• Audios</li> <li>• Images</li> <li>• Mind maps</li> <li>• Online presentations with slides designed by teachers or students</li> <li>• Others (indicate)</li> </ul>	A
<p><b>2) Did you know anything about flipped classroom methodology before this presentation?</b></p> <p>1. NEVER HEARD OF IT/ 2. VAGUELY FAMILIAR/ 3. HAD HEARD OF IT/ 4. QUITE FAMILIAR/ 5. VERY FAMILIAR</p>	B
<p><b>3) Evaluate how difficult you think it will be for you to understand the material and/or acquire the competences associated with this subject.</b></p> <p>1. NOT DIFFICULT AT ALL/ 2. NOT VERY DIFFICULT / 3. AVERAGE DIFFICULTY / 4. QUITE DIFFICULT / 5. VERY DIFFICULT</p>	C

Table 1: Correspondence of items with aspects to analyse in the initial questionnaire.

In the final questionnaire, we mixed both closed and open questions with the purpose of analysing:

- D. The extent to which our students had done their preparatory work before classes, watching and reading the material available for every topic. This item was key to measure their level of compromise with the dynamics of the methodology.
- E. Their level of satisfaction with the methodology used. Our intention here was to assess the reception of the new model by the students.
- F. The positive aspects of this type of instruction. In this item, we were interested in their perceptions of the advantages of the change of methodology.
- G. The negative aspects of the flipped model. That is, what disadvantages they found in it based on their experience.
- H. Their suggestions about possible ways to improve the methodology. Our aim here was to benefit from their valuable perspective in order to collect ideas that could help us refine our approach.

The open questions of the last four items (E, F, G and H) were intended to gain some in-depth understanding of the group's perceptions of and experiences with the flipped classroom and its impact on their learning.

ITEMS	ASPECTS
<b>1) Did you review the material designed for each topic before the theory class?</b> 1. NEVER / 2. HARDLY EVER / 3. SOMETIMES / 4. REGULARLY / 5. ALWAYS	D
<b>2) Indicate how satisfied you are with the methodology used (flipped classroom):</b> 1. VERY SATISFIED / 2. SATISFIED / 3. INDIFFERENT / 4. RATHER DISSATISFIED / 5. DISSATISFIED	E
<b>3) What did you like about this way of delivering the class?</b>	F
<b>4) What didn't you like?</b>	G
<b>5) If you have any suggestions to improve the methodology used, please write them below:</b>	H

Table 2: Correspondence of items with aspects to analyse in the final questionnaire.

## 5.2 Results

### Initial questionnaire

The initial questionnaire was given to a randomly selected control group (N=58) in the academic year 2016/17. Their ages ranged mostly from 19 to 22, with a few exceptions.<sup>2</sup>

#### A. Use of on-line audiovisual resources

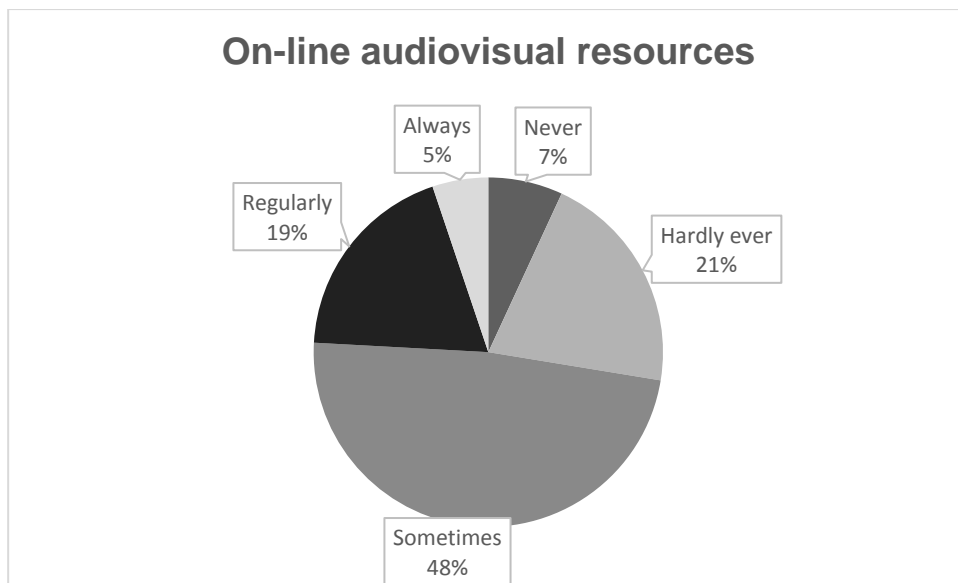


Chart 1: Use of on-line audiovisual resources as a tool in their preparation of subjects

The answers to these questions showed that on-line audiovisual resources were not strange to them, since a considerable percentage of students (48%) claimed that they used them sometimes, 19% used them regularly and 5% indicated that they always recur to these resources.

When we asked them to specify what type of resources they commonly used (chart 2), videos and online presentations stood out as the most used (38% and 27% respectively), followed by images (17%), audios (9%) and mind maps (7%).

<sup>2</sup>Seven of them were between 22-27, three between 27-32 and one between 32-37.

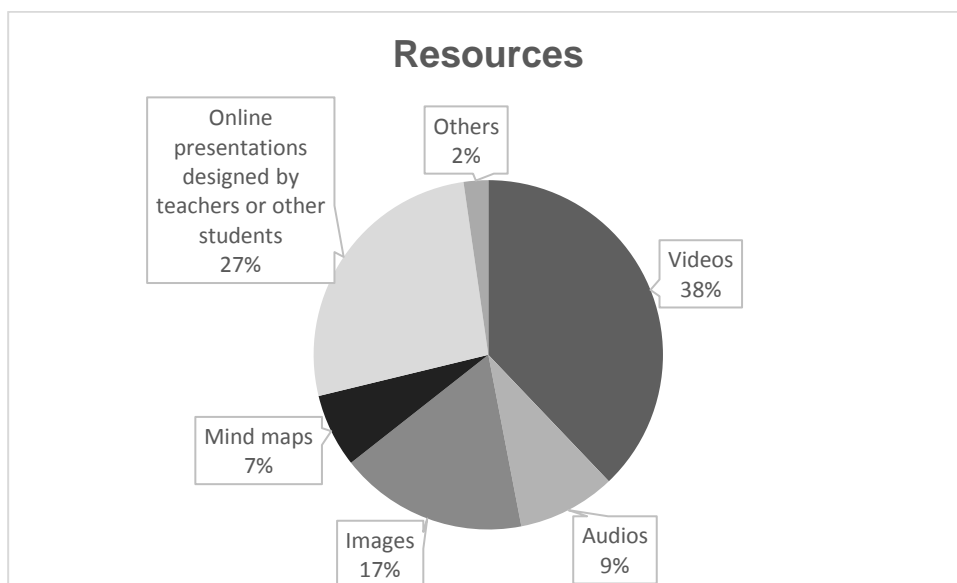


Chart 2: Types of resources most commonly used

### **B. Knowledge about the flipped classroom**

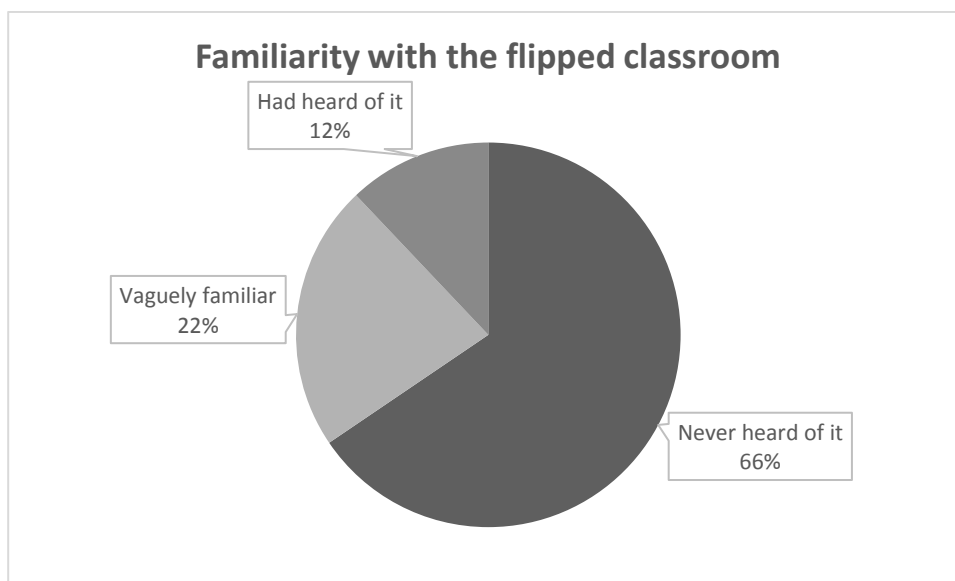


Chart 3: Degree of knowledge about the flipped classroom

As is shown in chart 3, knowledge about the methodology prior to our presentation was nearly non-existent for the majority of students (66%), with 22% who were vaguely familiar with it and only 12% who had heard of it.

### **C. Perceptions about difficulty of the subject**

Findings revealed that more than half of the students (58%) anticipated an average level of difficulty in the study and preparation for the subject, whereas 17% of them regarded it as quite difficult.

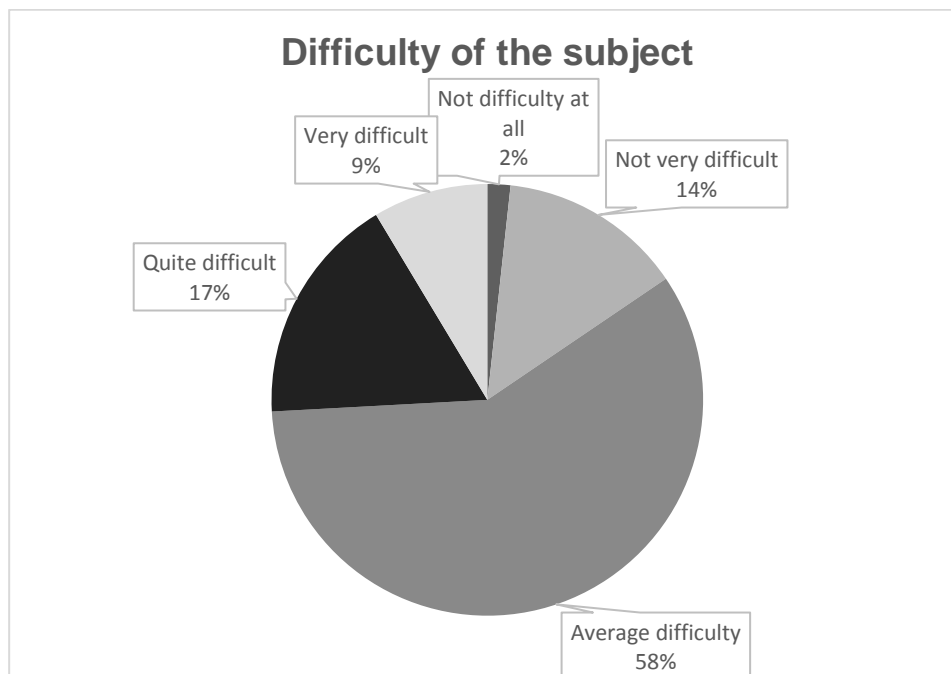


Chart 4: Perceptions of the students about the degree of difficulty of the subject

## **Final questionnaire**

### **D. Revision of material before class**

Asked about the frequency with which they watched the videos of every topic prior to coming to class (chart 5), although only 10% of the students indicated that they always watched them, a considerable percentage (53%) said that they nearly always watched them, followed by 25% who replied that they sometimes did.

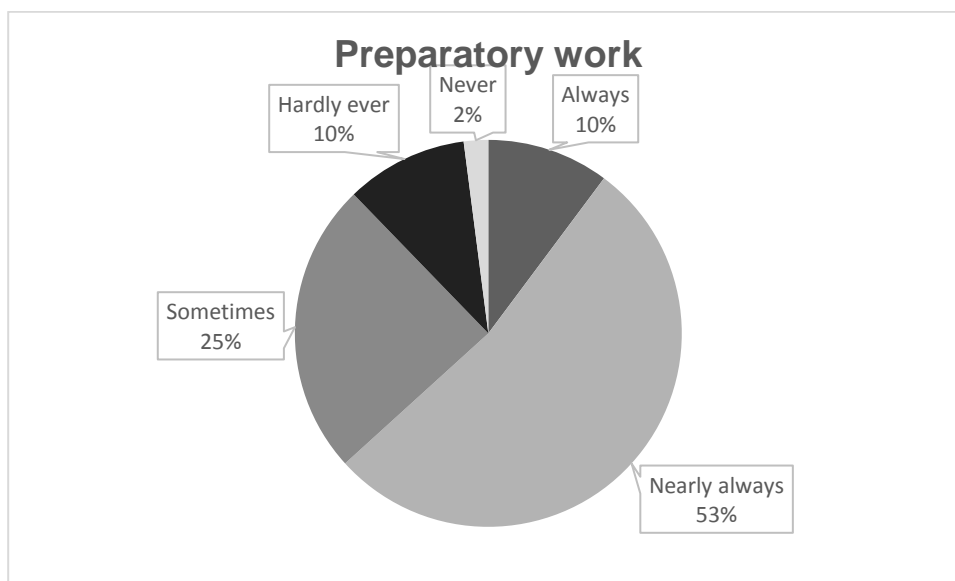


Chart 5: Revision of material before class

### ***E. Level of satisfaction with the subject***

Regarding the students' satisfaction with the methodology (chart 6), the answers to this question show that there was a significant level of satisfaction, as demonstrated by the 66% who confirmed they were satisfied, plus the 28% of students who indicated they were very satisfied. Only a tiny fraction (6%) declared themselves indifferent to the new method.

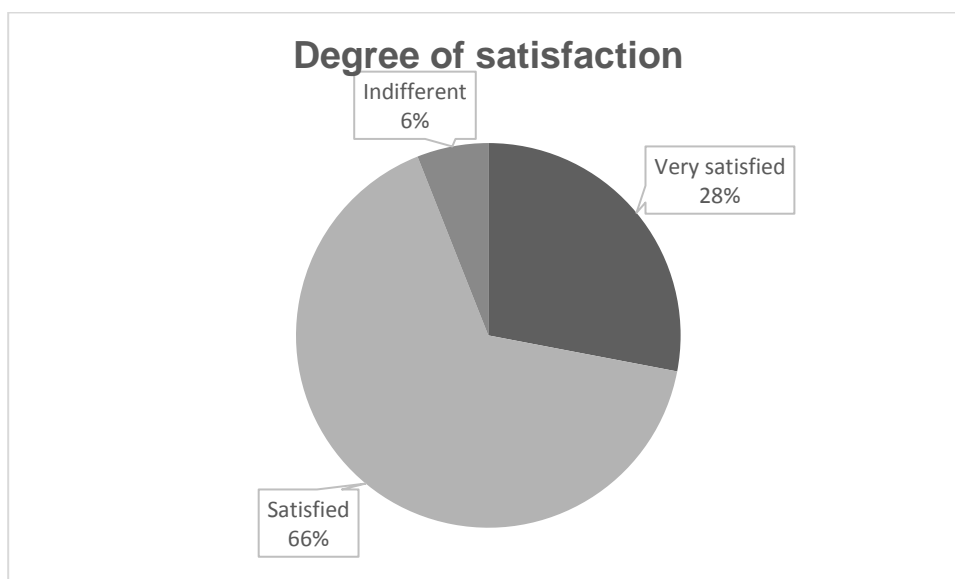


Chart 6: Level of satisfaction with the subject

## 6. Discussion

As we have seen in the results of the questionnaires, we started our experience with the advantage of knowing that most students were familiar with the use of on-line resources for educational purposes. In addition, the fact that the two most popular resources among the students were videos and online presentations made by teachers and other students was especially welcomed, given that they are the main media of instruction in the flipped classroom (Bishop & Verleguer, 2013)

Predictably, very few students had any notions about the flipped classroom, which in turn seemed to raise their curiosity about the new method. It was interesting to hear how some of them voiced their expectations about how it would help them learn better the contents of a subject that they perceived as difficult, as shown in chart 4.

As mentioned before, one of the key items of our questionnaires was included in the final one. The answers to the first question revealed that many students watched the videos before coming to class, although there was still a fraction who only did it sometimes or never. This confirmed the impression we received in class when we tried to elicit their prior knowledge about the contents we were dealing with. Given the fact that classes were very interactive and students were constantly encouraged to defend their positions, it was fairly easy to notice those who had not done the preparatory work.

With respect to the students' level of satisfaction with the method, it was rewarding to see that the new methodology had been well received by the majority of the students. Some of the answers given to the open question nº 3 ("What did you like about this way of delivering the class?") provided us with some insight into their perspective about the benefits of the flipped classroom.

One student said:

I liked having the knowledge in advance because then, in class, we have made the most of our time and we have done many activities which have helped us consolidate our learning. Also, through the video, if something was not clear, you could watch it again.

Concerning the way in which they felt the method met their different needs, another student stated:

What I have enjoyed the most is having been able to work at my own pace without the stress of taking notes in class. In addition, since classes are not theoretical, they are more fun and entertaining, so you are motivated and eager to learn.

For another student, the flexibility of the method was important: “The student prepares the theory at home *with total freedom* [emphasis ours], if doubts come up, they will be solved in class”.

Regarding their role in class, one of them remarked “I liked the participative methodology, that is, we have worked doing activities, not like in most subjects in which we adopt a passive role while the teacher explains”.

Other students highlighted the cooperative learning: “We have worked with the help of our peers so classes have been less monotonous”; “The teacher and the students created a very positive atmosphere in class: we all learned from each other and turned learning into something pleasant”.

However, as much as we welcomed the positive feedback of our students, we were also very keen to learn about what they perceived as the disadvantages of this method. Thus, the following question (nº 4), “What didn’t you like?”, was intended to gather this valuable information.

In answer to this question, one student said:

Although the method has many advantages, it involves doing preparatory work before coming to class, so you need to plan your work carefully in advance. If you come to class without having watched the video, you get lost and it is difficult to keep up.

Many students mentioned the length of the videos (20-40 minutes), and some found them “monotonous”.

A complaint that many made was that: “you need to be constantly pausing the video in order to write everything down”

In line with this, many students remarked on what they perceived as an increase in their workload. Indeed, some of them felt that they had to work double: whereas in the traditional method they took their notes in class, now they had to watch the videos taking notes at home and also come to class. They were annoyed that actually, some notes were taken in class as well:



“Some of the concepts that were explained in class were not included in the videos”, and then “they didn’t know what to study”:

It was interesting to see how some of them found it hard to understand the new purpose of the classes under the flipped classroom: “What I like the least is that the videos *haven’t been explained from beginning to end* [emphasis ours] in class, only some isolated aspects. This is confusing when it comes to studying the subject”.

By contrast, another student stated: “It is sometimes very repetitive. The fact that some concepts were explained in the video and then again by the teacher in class was a bit tiresome”

Another frequent complaint was related to having to read complementary material “as well”. A typical question that came up was: “Is this really necessary to pass the subject?”

Finally, the last item of the questionnaire was intended to ask them for suggestions to improve the methodology used. In this regard, one student proposed providing them with “more activities that help them make sense of the different topics of the subject”.

Another student recommended including “more text in the slides of the videos and less audio”. As we can see, this suggestion arises from their belief, previously stated, that they need to write down every single word they hear in the videos.

With regard to the complementary material, another student suggested that: “if the contents of the subject are transmitted through videos, then the students should only be required to focus on those, instead of having to go through more documents”.

Lastly, some other students proposed reducing the length of the videos and improving the quality of the audio in them.

## 7. CHALLENGES

Our research on the use of the flipped classroom model provided us with many enthusiastic and extremely positive accounts of flipped classroom experiences. However, as we have seen from the analysis above, the method is not without its drawbacks and flipping the classroom is not always a smooth ride. We feel that in order to contribute to body of knowledge and perhaps paint a more complete picture, more time should be devoted to discussing the challenges that the use

of this methodology can pose. We have therefore identified the aspects of flipping the classroom that we struggled with in order to reflect on what caused these difficulties, what we learned from them and how we could resolve these issues in the future.

Some of the challenges we faced when implementing the flipped classroom model were:

- Need of constant revision of material and being up-to-date with new technologies

The initial investment in time (and effort) required to prepare all the new material can be considerable, especially if the technical support available is minimal and the teachers do not have experience in the creation of this type of presentation (as was our case). Moreover, this initial task of preparing all the new material is closely followed by the necessary revision of the material once it is being used. One example from our experience is the need to optimize the quality and length of the videos. Schimdt and Ralph (2016) offer some useful tips on this matter:

short videos are key to a successful conversion of course material if utilized appropriately. Use short precise videos to cover the material. Segment the material if possible to deliver it in chunks to the students. Students also indicate that watching videos of the same person whether their teacher or someone else gets boring (p.6).

While revising material is not by any means a task limited to teachers working with a flipped classroom, it can be more time-consuming to make changes to a video, where depending on the format used, you may need to modify not only the PowerPoint but also the sound track. Also, as we were using new material as part of a new teaching model, we were constantly revising and modifying not only the video presentations but also the activities prepared for class as we saw what worked well and what was less successful and adapted the material accordingly.

- Attitude of students who are used to a traditional model and sometimes resist change

It is well known that adapting to change can be difficult and our students are no exception. The majority of subjects in the university follow a more traditional methodology and many of our students have come through an education system which favours mechanical memoristic learning. This led some of the students to struggle with understanding and adapting to some of the concepts involved in the flipped classroom model.

As Johnson et al. (2015) point out, the flipped classroom demands “a lot of autonomous work, which may be disorienting to students who prefer to rely on the teacher as the leading source of information” (p. 38). What is more, this method “requires self-discipline and a change in study habits” (Mason et al., 2013), so getting students to view the material (or do the preparatory work) before class is not always successful. In fact, we realised that some of the students were distributing the work in groups, where they took turns to watch the video and take notes which were then passed on to the rest of the group.

For this reason, we think it is worth devoting more time in class at the beginning of the course to ensuring that they understand some of the basics of this method. These, in our view, are:

- a) that they need to watch the video before the class
- b) that they do not need to transcribe the videos word by word
- c) that they do not need to memorise the explanations of the video but ensure they understand the concept and try to explain it in their own words
- d) that they need to do this individually, because the effort of synthesizing the explanations with their own words makes it more memorable and meaningful.

These basic concepts should also be revisited as the course develops to remind the students what is expected of them and what they can expect from the classes.

- Students and teachers step out of their comfort zone

We have already mentioned that some of our students found it difficult to adapt to the new method of teaching, but it shouldn't be forgotten that the teachers have also stepped out of their comfort zone and their role has also been transformed. Adapting to this change in how they teach can sometimes be difficult and teachers can fall back, perhaps unconsciously, into their former role as the center of the class and primary source of knowledge. This could be prevented by using self-assessment techniques to analyse the teacher's role in the classroom with the aim of avoiding typical mistakes such as explaining aspects that are already in the videos and that students should already be familiar with.

- Teachers do not always have the necessary persuasion skills to get students to “buy-in” to the method

Despite the initial enthusiasm on the part of the students, successful implementation of this model requires the teacher to “sell” it to the students and ensure their enthusiasm endures. As was seen in the answers to the questionnaires, it is common for students to perceive the flipped classroom model as causing an increase in their workload which in turns leads them to have a negative attitude towards it. Developing some sort of incentive scheme to get the students fully on board and help them to see the benefits of using the model may be a way to address this issue.

In addition, rather than waiting until the end of the subject to gather feedback from the students through the final questionnaire, we intend to do at least one mid-term questionnaire to see how students feel about the development of the subject under the flipped classroom model, so that we can, if necessary, make adjustments with regard to aspects they think are not working well. Realising that their opinion is being taken into account may help get their “buy-in” to the method (Talbert, 2014a).

- Students do not always do their preparatory work

The flipped classroom depends on students having viewed the videos before class and if they do not do so, the class dynamics and the successful completion of the activities can be negatively affected. It was curious to see that some students commented in the questionnaires that everyone should be “made” to see the videos, and others suggested limiting the time the videos were available. These rather drastic measures would be difficult to implement and we believe the best way to increase the number of students who view the material at the appropriate time is to convince them that it is in their best interests to do so.

Asking the students who do watch the video and participate actively in the class activities to act as ambassadors and help convince their classmates that it is worthwhile may also help to ensure that more students complete the preparatory work on time. Another measure to encourage students to see the value in watching the video before class could be to prepare online embedded quizzes in Moodle for each topic, so that when students finish a video, they can check their comprehension. The results that they get in these quizzes would, in turn, provide us with feedback on the students’ understanding of the material and therefore which aspects need reinforcement.

This way we would be incorporating “Just in time teaching”, another blended learning model closely associated with the flipped classroom (Medina, 2016).

- Drop in attendance because of a misinterpretation of the flipped classroom learning dynamics

Perhaps due to their previous learning experiences, some students felt that having the videos available on the online platform was all they needed to pass the subject and therefore they considered that attending class was not necessary. They understood the class activities to be an extra rather than an essential part of the course and this obviously limited their learning.

The key to avoiding this lies in adding value to the face-to-face classes, something students would not be able to achieve on their own (Talbert, 2014b). What is that value? The possibility of applying the theoretical contents to the practice in a cooperative and reflective environment.

Other possible measures could be to include more references to the activities done in class in the videos so that students are more aware of what they would miss if they did not go to class, and encourage students to write testimonials about their experiences in the classroom to stimulate attendance by their peers.

- Students pay little attention to the complementary material

As mentioned earlier, we provide complementary material for each topic to help students improve their understanding of the topic. However, our students make little use of this material, limiting themselves to enquiring whether it is necessary to read it in order to pass the subject and indicating in some cases that the information on the videos should be the sole basis of their evaluation.

To remedy this situation, we plan to change the way we refer to this material as we believe the term “complementary” leads students to consider it “non-essential”. Putting this material in a section called, for example, “Expand your knowledge” may be more inviting. We also recognise that we should ensure the material provided is appealing, as some of the extracts we were using were rather dense. It is also important to engage students in the selection of the material by inviting them to select complementary material, not only texts but blog posts, web sites, videos,

etc. that they may have come across and want to share. Giving them a sense of ownership of the material will encourage them to make more active use of it.

## 8. CONCLUSION

As we have mentioned, our experience is part of a wider movement in higher education that was initiated with the development of the European Higher Education Area and which aims to transform obsolete methods of learning and teaching and redefine the roles of the teacher (Medina, 2016). It is no longer about transmitting information to the students, but about facilitating their acquisition and development of competences, providing them with opportunities for active learning.

Our experience with the flipped classroom model has shown us that while the theory behind it is very attractive, this methodology is not without its difficulties. However, we believe that the advantages outweigh the drawbacks and we intend to continue using the flipped classroom model in our teaching, implementing some of the changes we have mentioned in the hope that these will minimize some of the more negative aspects we have encountered.

Hopefully with our study we have contributed to compensate for the lack of research about the implementation and efficacy of this model in the field of teacher training in comparison with findings in other disciplines (Kurt, 2017).

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