



Co-funded by the
Erasmus+ Programme
of the European Union



Flipping First Project

2016-1-ES01-KA202-025410

Flipclass Handbook

Date: October 2018

Version: v1.0

The European Commission support for the production of this publication does not constitute an endorsement of the contents, which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Document Info

Document Name: Flipclass Handbook

Initial version & date: Version 0.5 – 31/01/2018

Authors: John More. Exponential Training
Saturio Rodríguez Fernández. JAITEK
Mariano Sanz Prieto. JAITEK
Omar González López. JAITEK

Editors: JAITEK

Distribution List

Organisation	Person
	JAITEK Tecnología y Formación S.L. Mariano Sanz Prieto Saturio Rodríguez Fernández
	INNEO Studio Twórczego Rozwoju Michał Ceglinski
	Stichting Kenniscentrum PRO WORK Tessa den Bakker
	SZÁMALK Szalézi Szakgimnázium Krisztina Juhász
	Arteveldehogeschool Lut de Jaegher
	Exponential Training & Assessment Limited John Moore

1 Flipping Framework Design

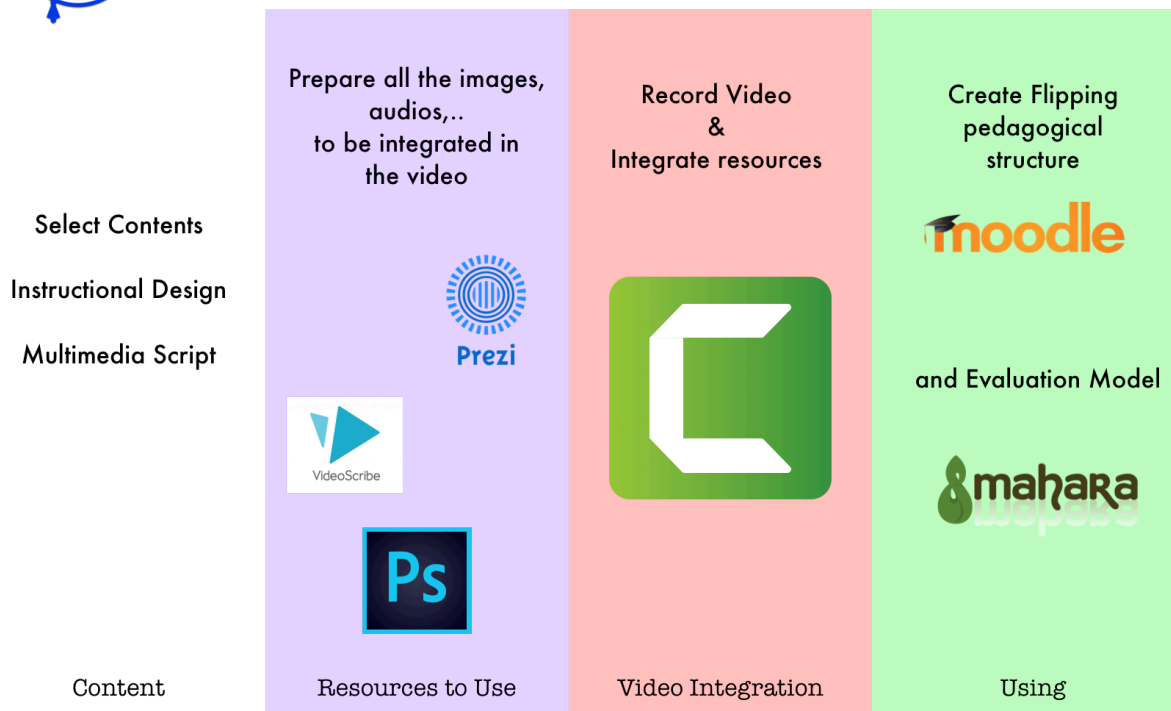
The Flipping First project is creating an environment for the creation of resources to be used in Flipped Class.

This involves 2 different phases, the first one for the creation of the resources themselves and the use of the resources.

The following image compiles the whole process:



Flipping First Environment



First you create the content, on a concrete subject. The best is considering writing a script where all the information (text, audio, animation, ...) that is going to be included is organized and described.

Then you prepare all the files you need:

- ✓ images using photoshop or a different image editor
- ✓ audios using Audacity
- ✓ animations with Videoscribe
- ✓ presentations with Prezi, PowerPoint, Keynote or Impress
- ✓ other possible resources using web 2.0

After that you integrate everything in a video, using Camtasia, or other video editor. And then you upload it to your YouTube Channel, from where you will use them.

These videos can then be used in a LMS (Learning Management System) like Moodle, which is the project selection. We recommend uploading videos in YouTube and not directly in Moodle or your LMS because that way the process will be lighter for your server.

In the project then, we have a use framework, composed by Moodle and Mahara, and ePortfolio that allows some social interaction, together with new ways of evaluating our students work

In the following infographic the flipping class process can be seen:



WHAT IS FLIPPING THE CLASSROOM

1

SELECT OR DESIGN THE CONTENT

Usually, it will be videos which could be placed in YouTube and compiled in a LMS as Moodle

2

learning@home

Students are introduced to the learning content out of the classroom



3

CREATE ACTIVITIES FOR THE CONTENT

What do I do in the classroom if the content has been studied at home?

4

homework@classroom

Practice is done into the classroom



TOOLS TO CREATE:

video editing, eportfolio, learning management systems, web 2.0



Co-funded by the Erasmus+ Programme of the European Union



FLIPPINGFIRST.EU

2 Flipping First Use

Before going deeper in how to create our flipping environment and tools to create flipping resources, let's have a view of what flipping the class means.

2.1 Understanding 'Flipped learning'

This section explores what 'flipped learning' is and looks at some of the resources that are available to support your approach to 'flipped learning'.

What is Flipped Learning?

Flipped learning is not complicated. However, to be effective you need to understand what it is and the differences between the flipped classroom and the traditional classroom.

Flipped learning involves the use of technology to maximise the time spent on active learning within the classroom. Part of the learning process, which often includes the use of video-based resources, is completed by students outside of the school day. This frees up classroom-time for other activities, including one-to-one support for students, students working on problem-solving activities, students participating in team-based and action learning exercises and practising and applying newly acquired knowledge and skills. Flipping First has adopted the following definition of flipped learning:

In flipped learning, delivery of content is undertaken via video instruction accessed online. Class-time is focused on supporting students in working out problems themselves, practicing using new knowledge and skills and working together.

A flipped classroom literally 'flips' the traditional structure of a classroom. In a typical traditional classroom, students listen to lectures or knowledge input sessions in class and perform other learning activities, such as solving practice problems, after class. In this traditional structure, students are taught content in class via lectures and knowledge input sessions, and they attain deeper knowledge after class via various forms of homework.

In a typical flipped classroom, students listen to pre-recorded video lectures before class and perform other learning activities in class. In this flipped structure, students are taught content before class via videos and readings, and they attain deeper knowledge in class via activities. In flipped classes, students may also have homework problems to solve independently after class.

Many variations of learning environments are used in current classrooms, and many of the terms used to describe these learning environments (e.g., blended and hybrid) are used inconsistently in the literature.

There are many misconceptions about what constitutes a flipped class.

A Flipped Class is NOT:

- A synonym for online videos. Often when people think about the flipped class, they associate it purely with videos. The flipped classroom is more about the interaction and the meaningful learning activities that occur during the face-to-face time.
- About replacing teachers with videos.
- An online course.
- Students working without structure.
- Students spending the entire class staring at a computer screen.
- Students working in isolation.



A Flipped Class IS:

- An environment where students take responsibility for their own learning.
- A classroom where the teacher is not the expert, but a facilitator'.
- A blending of direct instruction with problem-solving and experiential learning.
- A classroom where students who are absent for any reason, do not get left behind.
- A class where all students are engaged in their learning.
- A place where all students can get a personalized education.



The Traditional Classroom Versus the Flipped Classroom

Here are some of the main differences between a 'traditional classroom' and a 'flipped classroom'.

Traditional Classroom

- Teacher prepares and delivers instruction on concept/topic, to the whole class.
- Students listen in class and make notes.
- Students complete tasks to develop their understanding.
- Homework is assigned mainly to consolidate knowledge.
- Teacher's role is to lead the lesson/pass on knowledge.
- Learning activities are predominantly offline (textbooks and worksheets).



Flipped Classroom

- Teacher prepares/selects materials for students to access instruction on concept/topic outside of class.
- Students watch online/digital videos/do exercises as part of homework, to prepare for lesson.
- Class time is devoted to active learning, extension activities and supporting individual students.
- Students receive support from teacher and peers as needed.
- Teacher's role is mainly to facilitate student-led learning.



What are Benefits of Flipped Learning?

The main benefits or impacts on teaching and learning practice, and on students, of using flipped learning, are varied.

Impact on teaching and learning practice

- With students learning at home, teachers do not need to spend as much time on explaining during lessons. This time can be used to engage and support students in a range of practical, interactive activities.
- It enables more time to be spent on peer-to-peer and collaborative learning as students come to lessons with prior learning, prepared, and more confident to participate in paired, group and whole-class activities, and to work together.
- More time in lessons can be spent on: students practising and applying knowledge and skills, as well as questioning and higher-level discussions. Teachers can also focus more on addressing misconceptions, consolidating learning, and setting extension activities.
- Flipped learning enables teachers to facilitate more opportunities for independent and student-led learning, with students working through the videos and exercises at their own pace at home. The approach puts the onus on students to take responsibility for their own learning rather than relying on their teacher to impart all the information.
- The approach allows teachers to take more of a coaching role and spend more time providing individual support to students or supporting students in small groups. This can include both supporting students who are struggling as well as moving students who have grasped the concept on to extension activities. Feedback on students' performance in online activities (e.g. provided by Khan Academy) can inform teachers' lesson planning, helping them to understand the stage that each student is at and to plan more individualised support.
- Flipped learning also enables teachers to gain a better understanding of students' preferences for different approaches to learning and provides an opportunity for them to see which students respond well to independent learning.

Impact on student engagement, learning and skills

- Flipped learning can be engaging and ‘fun’ for students because of it being a new and fresh approach and a change from traditional teaching approaches that use technology less frequently. In turn, students’ increased enjoyment of lessons and homework can positively impact on their attitudes towards subjects.
- The approach can help students to develop a deeper knowledge and understanding of topics. This is because of students having more time to absorb the information at their own pace out of lessons and then having more time in lessons to: practice and apply skills; participate in discussions and peer-to-peer learning; and receive more individualised support to further extend and consolidate their knowledge.
- Another important impact is students’ increased confidence in a subject matter. This is related to their increased knowledge and understanding gained through regular homework and independent learning, which can result in a realisation that they can be successful in the subject.
- Flipped learning can result in students’ increased understanding of their strengths and areas for development. Through the process, they become more accurate and detailed in identifying these areas, and online feedback on how they are doing can increase their awareness.
- The approach encourages and supports students in developing skills as more independent learners through encouraging them to work through the resources at home without the support of a teacher.
- Flipped learning can increase students’ progress and has the potential to improve attainment. Lessons move more quickly onto task, they progress at a faster pace, and students have more time to consolidate and extend their learning and be supported with misconceptions.
- Flipped learning can be engaging and ‘fun’ for students, as a result of it being a new and fresh approach and a change from traditional teaching approaches that use technology less frequently. In turn, students’ increased enjoyment of lessons and homework can positively impact on their attitudes towards the subject.

2.2 Designing Your Own Flipped Class

This section will help you design the many aspects of planning and delivering your own flipped learning. The materials will help you to make your plans right from the moment you decide to flip your class to the evaluation and assessment of students.

2.2.1 Structure of Flipped Classrooms

The structure of the course is what determines if it is a flipped classroom. There are four phases of the class which needs to be planned.

Before class:	
Students watch video lectures or perform other activities to expose them to content.	Tip: Breaking lectures or knowledge input sessions into smaller conceptual chunks can help students manage content.
During class:	
Students participate in active learning activities to deepen their understanding of the content.	Tip: Brief quizzes to check for understanding, helps students and teachers to identify misunderstandings and ensure that students are prepared for class.
After class:	
Students complete homework assignments independently to practice mastery of learned concepts.	Tip: Because part of the students' homework is learning the content for the next class, assign students less traditional homework than in a normal class.
Intermittently:	
Students complete assessments and provide instructor feedback about course and learning activities.	Tip: Request student feedback before major assessments to address issues.

2.2.2 Potential Pitfalls of Flipped Classes

There are many common pitfalls in flipping classrooms. Consider each potential pitfall to ensure you do not make the same mistakes as others.

- **Teachers do not "sell" the flipped classroom.**

It is important to be transparent about why you chose to flip the class and the benefits of flipped classrooms. You might want to avoid using the word "experimenting" when describing the class. Additionally, make sure students know how to use the online environment to avoid frustration.

- **Physical classroom is not conducive to flipping.**

Make sure the room you will be using for class can support the active learning activities you want to offer during class time.

- **Students don't come to class.**

While flipping a class can increase attendance, some students feel they do not need to come to class because they can access the lectures online. Make sure you explain the benefits of attending class, use in-class quizzes to boost attendance, or make class participation part of the grade.

- **In class activities are not relevant to lectures.**

Make sure you match in-class activities to the content of pre-recorded lectures.

- **Teachers have difficulty accommodating the varying ability levels of their students during in-class activities.**

Students will complete activities at different paces. Creating small groups of students with similar abilities can help students work with others at their own pace. Consider if you will allow faster students to leave class early if they finish activities before the end of class.

- **Teachers assign students too much work.**

It is important for teachers to adapt homework assignments to accommodate the extra homework that students perform during the video lectures. Use student feedback to ensure the course isn't too time-intensive.

- **Teachers are unable to successfully flip large classes.**

For large classes, teachers might need help to facilitate in-class activities. Using multiple TAs can address this issue.

- **Teachers don't realize the amount of preparation necessary for the class.**

Some teachers mistakenly think that taking a "guide on the side" role instead of a "sage on the stage" role, reduces the amount of preparation needed for in-class activities. Developing learning activities and preparing to guide students through those activities takes time.

- **Teachers don't collect feedback from students.**

There is not flipped formula that works for every classroom, and you can't get your flipped class perfect the first time. It is important to use feedback to evaluate newly-flipped classes. Use assessment performance as well as qualitative feedback from the students to evaluate the course both during the course and the end of the course.

- **Teachers don't engage fellow teachers about their flipped experiences.**

Though flipped classrooms are not the same, get pointers and ideas from teachers who have already flipped their classroom or are preparing to do so. Other teachers are often your best resources for designing and implementing an effective flipped classroom.

2.3 Evaluating Your Flipped Class

This section will help you evaluate your flipped class. While it is important to measure student performance, it is also important to measure the success of the flipped class to identify possible improvements and better serve future students.

2.3.1 Evaluation of Your Flipped Classroom

When examining the effects of your flipped classroom method, you will want to establish effective procedures for evaluating whether your teaching is succeeding. In order to do this, you must consider what students are able to do, what they have learned, what their perceptions of their course experiences are, and how their behaviours have changed overtime.

2.4 What are the key considerations in implementing flipped learning?

This section explores some considerations when implementing a flipped learning approach.

Technology

- Check that the school's broadband speed is suitable for accessing resources in lessons and that the IT suite/laptops/iPads are free when needed.
- Check that students have access to reliable broadband and a PC/laptop/tablet/smart phone at home, or can access the school's resources regularly outside of lesson time.

Homework

- Ensure that the flipped learning approach fits with the school's homework culture and policy, to ensure high levels of student engagement with completing homework. If this is not in place, consider how you will gradually develop this culture or how the resources will be accessed by students during school time.

Teaching

- Consider whether the flipped learning approach fits with your teaching style and approach - it suits an open ended, coaching role best, and this would need to be adopted to make the most of the approach.

Learning

- Consider whether this type of independent learning will suit your students and what preparation they will need. For example, you might want to run some pilot sessions in class, in which students are introduced to, and guided through, the approach. This will help you prepare them for flipped learning homework, as well as gauge how they are likely to get on working independently at home.
- Prepare students for the approach, explaining clearly that viewing the materials for homework is an expectation and a necessity, and that not doing it will result in sanctions that will be consistently followed up.

Parents/Carers

- Consider informing parents/carers and asking for their support with your chosen approach.

Resources

- Carefully select the materials you are going to use for flipped learning. You need to ensure that the content:
 - relates closely to the topic being covered
 - uses terms and language that match that used in class and which can be accessed by the whole class i.e. all ability levels (there may be different videos catering for various levels)
 - allows for differentiation - learning needs to be scaffolded, allowing students to access increasing levels of challenge as they progress
 - provides video explanation that closely relates to follow-up exercises to test understanding
 - provides students with feedback and a sense of progression and achievement (content that is too challenging to start with can lead to a drop-in confidence)
 - allows the teacher to access the questions that students will work through and get a feel for what is being asked of them.

When implementing a flipped approach to learning, teachers should:

1. Set and review homework

- Set students homework where they watch a video that closely relates to and prepares them for the next lesson
- (If available from the resource used) review the data on which students are viewing the material, how long they are spending, how they are progressing and what areas they are grasping and having difficulties with so that this understanding can feed into your lesson

2. Follow-up during lesson time

- Review and recap on the video at the beginning of the lesson and check students' understanding so you know which students are struggling with concepts and which require extension activities
- Have a clear strategy for how you will help students in lessons with difficulties, both in understanding content and practising skills taught via flipped learning, in order that students do not become frustrated and lose confidence
- Have a strategy in place that you can revert to when students have not completed their homework or have found it difficult to grasp
- Plan for how you will use any additional class time as students come to lessons prepared (e.g. extension activities, questioning, discussion, collaborative learning, independent learning, providing 121 or group support)

3. Encourage peer-to-peer learning

- Consider how students who are more confident and further on in their understanding might support those who are struggling to grasp concepts e.g. using 'peer-to-peer' learning to pair more able and less able students and/or identifying 'student champions'
- (Where needed) consider pairing students who have and have not undertaken the homework to help pupils catch up and to help pupils refine their understanding

4. Encourage independence

- Encourage students to take responsibility for their own learning by working through online resources at their own pace at home and undertaking extension activities at home and at school
- Consider asking individual students to 'lead' aspects of lessons to demonstrate their learning from their homework and reading around the topic
- (Where needed) pilot flipped learning in school

5. Review and make changes if necessary

- Be prepared to tweak and alter the approach in response to student feedback and your own observation of how flipped learning is working

2.5 What are the challenges to using flipped learning?

In this section, we summarise the challenges and barriers that teachers may encounter in implementing flipped learning. The range of challenges and barriers include:

Access to Technology

- A lack of student access to equipment and internet at home, within lessons, and at school can be a barrier to success.

Identifying Appropriate On-line Resources

- Some teachers face difficulties sourcing suitable resources because:
 - the level and type of content does not match lesson requirements
 - they do not incorporate scaffold learning effectively, but start with more complex concepts and exercises and worked backwards – some students can find this approach demotivating and it can reduce confidence
 - they find it difficult to develop practice questions and activities linked to the content of the video
 - they use different terminology to that used by teachers.

Students not completing preliminary homework

- If there is not a strong culture of homework and students cannot be relied upon to complete homework, this can be a barrier to the success of flipped learning. Students will struggle with classwork which is based on them having gained a preliminary level of knowledge and understanding at home, when they have not done so.

Students preferences for traditional modes of learning

- Some students may not respond well to taking responsibility for their own learning by undertaking online learning at home and may prefer face-to-face contact with a teacher. Others may prefer a permanent written record of the work they have completed which online learning does not always provide without additional note taking.

Teacher role and management of the change process

- Teachers who view the direct instruction element of teaching as central to their practice may not be comfortable delegating this aspect to technology (or a remote, online teacher).
- In addition, the approach requires a culture shift in schools to an alternative way of working, as well as flexibility to adapt and refine the approach in line with feedback, and to overcome the barriers that emerge. This approach may not suit some teachers or be compatible with the culture of some schools.

2.6 Flipping in Action

This section presents three approaches to flipped learning which you might consider implementing in your school. These are: whole class model, carousel model and managed homework model.

2.6.1 Approach 1: The Whole Class Model

Key features

- School has a homework policy and students are conscientious in completing homework.
- School aims to develop active approaches to learning, giving responsibility to students.
- Students are prepared to take some responsibility for their learning.
- Teachers are prepared to take a student-centred, personalised approach where different students may be at different stages of learning at any one time.
- Teachers take on a coaching role, diagnosing and addressing student needs, misconceptions and developing capacity for further challenge.
- Students take on an active role, taking responsibility for their learning and developing an understanding of their strengths and weaknesses.

Processes

- Students undertake preparatory learning for homework via video and exercises, focusing on new concepts they have not yet covered in class.
- Teacher views feedback data on student progress (if resources have this feature) to help with lesson preparation and planning for differentiation.
- Teacher may start the lesson with a discussion of the video content and recap, but this will be brief and serve to orient the students to the area of focus rather than directly teach new content.
- Teacher may start lesson with practice exercises with whole class feedback using tools such as whiteboards to assess how well students have grasped concepts at home.
- Students spend lesson time working actively on exercises, supporting each other, independently solving more complex problems, and posing questions to the teacher based on their prior learning or areas of difficulty.
- Teacher uses a coaching and student-centred approach within lessons to address misconceptions and gaps in understanding, as well as to consolidate and extend learning.
- Students may progress through content at different rates, with the teachers setting up an individually personalised approach to learning.

Evaluative view

- Can lead to increased student learning as students come to lessons prepared and can progress at their own pace, and the teacher can support individuals who are struggling as others continue to progress and extend their learning.
- Student access to technology outside of lessons is crucial to this approach. This can be either at home or through opening access to school facilities before the school day, at break and lunch-times and after school.
- A strong culture of completing homework is important, as engagement with lesson activities depends on having completed learning at home.

2.6.2 Approach 2: The Carousel Model

Key features

- School has a homework policy and students are conscientious in completing homework.
- The school's approach to teaching is small group and paired work.
- This model allows for the fact that some students may not watch the online videos as part of homework.
- Uses a blended approach (a combination of paper and computer-based activities) during lesson time.
- Works best with students who have developed skills to be independent learners.

Processes

- Students undertake learning for homework via video and online practice questions.
- Teacher reviews feedback on what students have done at home and/or recaps at the beginning of the lesson to gauge understanding and which students will need support.
- Lessons focus on developing understanding through: [a] carousel of activities – students work in groups and rotate around different activities (including a work station in which they can view the video set as homework and undertake associated exercises on iPads/laptops); [b] paired work in which students who have grasped the concept, support those who have not to 'get them up to speed' (peer-to-peer learning).

Evaluative view

- Encourages student collaboration and allows more time for student discussion and questioning.
- Increases student progress as students have undertaken preparation outside of lesson time.
- Encourages independent learning.
- Students can work at their own pace.
- Blended approach acts a failsafe (in case the technology component fails).
- Carousel approach maintains student interest and results in a fast-paced lesson.

2.6.3 Approach 3: The Managed Homework Model

Key features

- Lack of homework culture in school; some students take seriously and others do not, despite parent support.
- Lack of student access to technology at home.
- Students use flipped learning resources to receive introduction to a topic as part of managed homework sessions, outside of normal lessons, but within the school.

Processes

- Students use flipped learning resources in a managed homework slot as preparation for beginning a new topic in class lessons.
- In the managed homework session, students are supervised to work on individual computers/laptops/iPads and to undertake online and digital activities set by the teacher.
- In the managed homework session, students working on the same activities may work together in pairs or small groups to help each other.
- Students come to subsequent lessons with an initial level of understanding of the topic, allowing for more extension work during class, freeing the class teacher to support those who are struggling and students' questions drive the lesson direction.
- Students are encouraged to view videos of their own volition for homework, although the teacher is realistic that not all will do this, and so plans a more structured and supervised opportunity for this.

Evaluative view

- Allows for some of the benefits of The Whole Class Model of flipped learning and maximising of class time with the specialist teacher.
- Ensures all students come to lessons with a basic introduction to a topic.
- Allows for independent learners to consolidate and progress in their understanding while not disadvantaging those who cannot, or chose not to, access resources at home. All students are provided with the opportunity to engage with materials in the managed homework session to prepare them for subsequent lessons taught by the specialist subject teacher.
- Personalised and independent learning is encouraged both at home and in the managed homework session, as students can work through online videos and activities at their own pace and begin to take responsibility for their own learning.
- As some students come better prepared to lessons, the teacher has more time in class to support students who are struggling and to consolidate and extend the learning of others.
- Organising access to school computer facilities and a member of staff to supervise a managed homework session may be challenging

3 Lights & Shadows



Flipping Framework Including VET Resources for Social Training Lights & Shadows

MAIN LIGHTS

Lights were mainly for Students

Students motivation gets higher with Flipped Classroom. It involves technology, and students enjoy that.

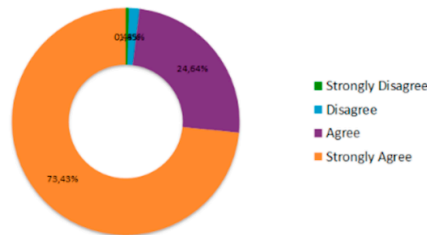
Learning becomes easier.

Teachers find it interesting to use



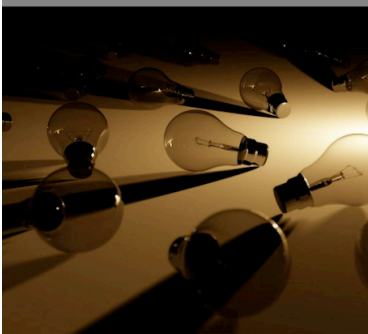
Students are usually well-familiarized with technology. Using it Learning becomes a more familiar and even easier task.

I like watching the videos at home as homework



Around 95% of students enjoy watching the videos at home as homework. And they get better understanding after doing problems in the class with the teacher.

MAIN SHADOWS



Shadows were mainly for teachers ...

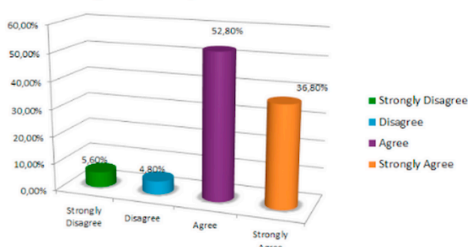
- More knowledge of the technology.
- Extra time needed if they need to record and edit video.
- And if possible a Youtube channel.

... but some for students

- More responsibility at student side.
- Learning to manage time

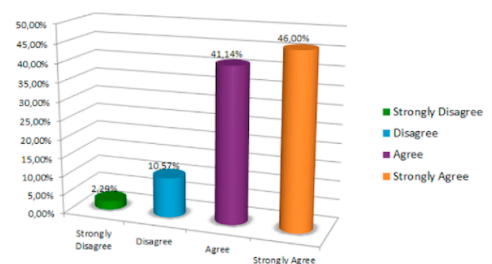
.....anyway this will finally become a light in their future working time.

The material you have seen motivates you to integrate it into your educational methods



Both, teachers and students using the method for a more motivated learning process.

I always watch flipped videos on time

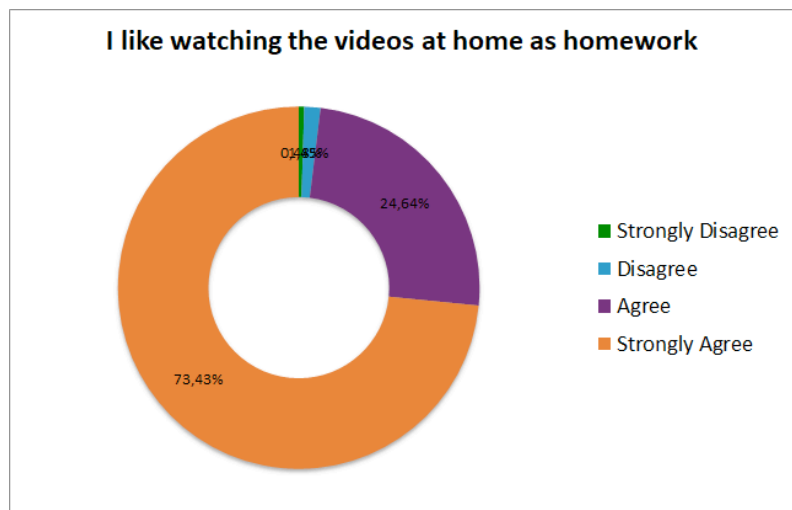


The main lights of the project are related with students, and has to do with the direct relation of the Flipped Classroom method and the technology. Technology improves motivation in the student and this can be seen in the students results.

However, there are also shadows, which are mainly related with teachers. Teachers need to be familiarized with technology. Making video resources need video editing skills, video recording habilities and a Youtube channel most of times. This method also need extra time for making the resources.

We can also mention some shadows for students, about responsibility. Watching videos at home needs extra responsibility, and this can be an invitation for the student to not to make his/her homework. This shadows at the end will also be lights, because this attitude will be needed for the student for his/her own life.

The general feeling of the students is quite positive, although several proposals have been found that show that only using *Flipped Classroom* is not a perfect method either. A student from UK said “I don’t know if all the classroom will watch the videos on time. Also, if I have some questions, I can’t ask them until next morning.”



Questions like “How could I ask the teacher a question if I'm watching the video at home?” or “How can I make sure that my students will maintain interest with this method?” show that this is not a perfect and seamless method and a combination of different methods is in this case the most suitable option.

Especially because each person learns differently, and it is difficult to adapt the videos to the needs of each student. Here we have seen that students have to maintain a more adaptive behavior compared to face-to-face classes, where the teachers can adapt the explanations and their lessons according to the needs of their students.

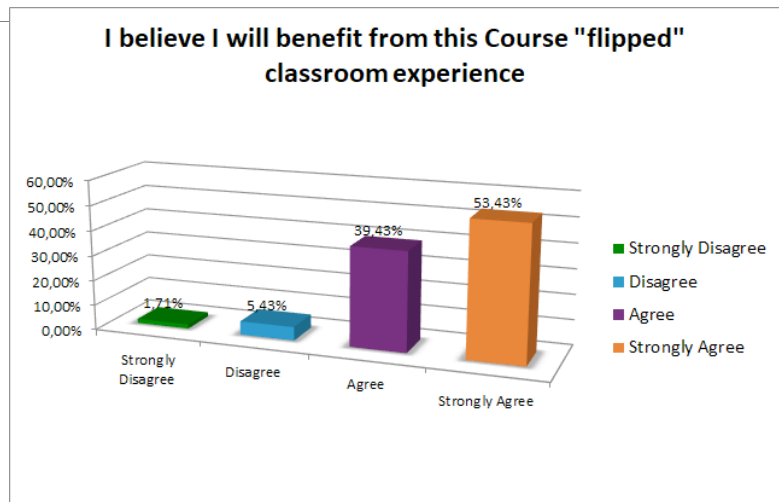
The **interest** of the students is essential in this case. A student will not learn properly if he or she does not watch the videos carefully. It is necessary that students maintain the right interest and the way of working at home is adequate for the method to work as expected.

Although the student body for which this method has been thought of is *VET*, it is also valid for other educational levels, such as early childhood or secondary education.

It is not directly related that students improve their grades with *Flipped Classroom*, but what has been proven is by giving greater freedom with regard to time and place to the student when learning a topic, the results **improve** significantly.

By making e-learning a fundamental pillar for learning with this method, students are helped to become familiar with *LMS* environments and different online technologies.

Regarding teachers, flipping the class requires certain technical knowledge that is not needed really in traditional class. Creating videos, uploading them to the Internet or creating classes with Moodle or another LMS requires an structure and extra work from the teacher compared to the traditional class.



Regarding teachers, the positive feeling about the *Flipped Classroom* proposal predominated, although proposals and doubts have been raised that show that this is not a perfect method. Before applying it, it must taken into account certain issues that are not been think of at first, even if they are of high preference (like the extra time needed or the need of technology habilities). A Spanish teacher said: "This help my students to come more motivated to class". Another teacher said "I don't like this because I have to work in home before going to my 'real work' in class".

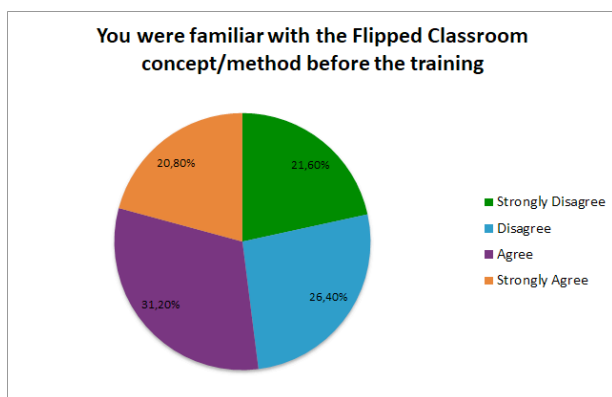
Regarding the general satisfaction at the time of contemplating if the teaching staff would apply this method in their classes, there are varied answers. Some teachers have taken a positive view of *Flipped Teaching*.

Some answers have defined traditional teaching as "very flat", and suggest that the use of technology can make students feel an important part of the educational process, increasing their motivation and participation. Dosing technology can encourage students to learn more actively.

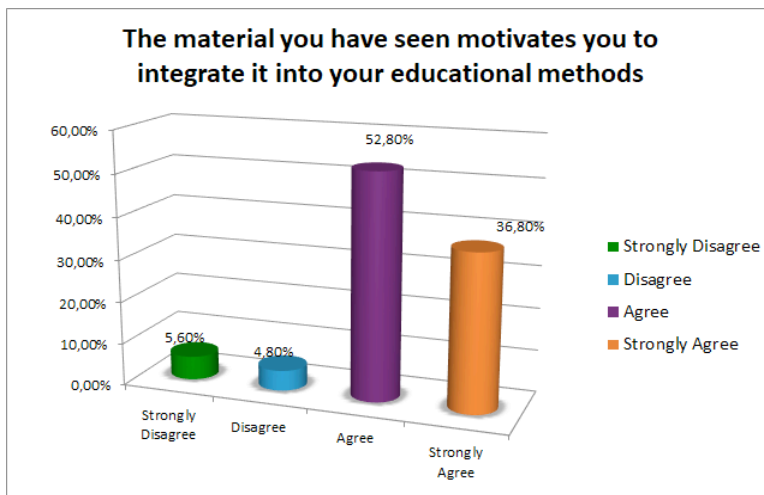
A Spanish teacher indicated for example: "*When learning the lesson at home, it helps the students to be more motivated in class and come with a desire to work*", concluding that, if the student receives the theory in class, he can disconnect and waste time unnecessarily.

This method may even, at certain times, accelerate the learning process by allowing the student to receive the lesson in the right place and at the right time for him. This can encourage concentration and a willingness to learn.

It has been possible to see in the answers the warning that flipping the class can only work in higher academic contexts, since for younger students this may be an invitation to not be up to date with their lesson.



The *Flipped Classroom* is a great help for students who need to combine work and study. The freedom of time to receive a lesson facilitates the educational process of all level students who need to work by not needing a fixed time for studies.



From the point of view of the teaching staff when it comes to flipping their class, it is important to keep in mind that it will take more time than what is needed in a traditional class, as a rule. Preparing the contents, recording them, uploading them, sending them to the students etc... all of this requires additional time, and the *Flipped Classroom* may not convince certain teachers for that reason.

The application of the flipped class requires previous training dedicated to this method. Some prior knowledge is required, such as the use of a computer, a *LMS* environment, Camtasia or another video recording and editing program or YouTube, among others.

In conclusion on this question, it has been highlighted that the general feeling about traditional education can be defined as “demotivating” and “flat”. The *Flipped Learning* proposal facilitates the entire educational process from the student's point of view, providing them with freedom of time and place when receiving their classes. This creates an additional motivation in them when facing the learning process. On the other hand, for the teaching staff, this method requires more dedication than in traditional teaching.

Next to that, teachers have been asked about the tools they use regularly. The main tools mentioned have been YouTube, Camtasia, Kahoot, Google Drive and Prezi.

- YouTube is a website dedicated to sharing videos. It presents millions of videos of any subject and raises the possibility of uploading own videos. It has additional tools such as subtitle control or grouping videos in playlists.
- Camtasia is a video recording and editing program. Its main feature is the record of the screen, allowing to make tutorials and guides step by step showing the screen itself. Besides, this program allows you to edit the video including other images, sounds, videos, effects, etc. It is the most used option when recording videos for the *flipped classroom* for its simplicity and effectiveness.
- Kahoot is a free web platform that allows the creation of evaluation questionnaires in a dynamic and visual way. It is a tool in which the teacher creates contests in the classroom where the students are the contestants, reinforcing the learning.
- Google Drive is a file hosting service in the cloud. Through this platform, teachers can upload files for free to the cloud so that their students can access them from any place at any time.
- Prezi is a presentation program to explore and share ideas with a document in the cloud. The main feature of this application is the infinite zoom, which allows users to have a closer and specific view or a more distant and general view on the set of ideas.

In this question it has been observed that Moodle is mentioned mainly in questionnaires of Spanish teachers, while in the UK Google Classroom is preferred.

Kahoot is the most mentioned tool in teacher questionnaires due to the dynamism and the "*contest*" environment that is generated in the classroom.

Appendix 1: Developing Flipped Classes: A Checklist

The following fourteen questions provide a structured checklist which should be used when designing your flipped classroom.

1.	What should students and I get out of flipping the class?
2.	What pedagogy and learning strategies will I use in my class?
3.	What are the learning objectives for the class (i.e. what do I want students to be able to do with the information that they learn)?
4.	How can I use learning activities to fulfil the learning objectives?
5.	What types of activities are best performed inside and outside of class?
6.	Will students work on activities in groups or individually?
7.	What is the role of the teacher during activities?
8.	What is the role of the student during activities?
9.	What resources will be available to students inside and outside of class?
10.	What is the structure of the flipped class (i.e., what do students do before, during, and after class)?
11.	How often does the class need to meet?
12.	How will students be assessed?
13.	What technology will be used inside and outside of class?
14.	How will technology be used to support learning?

Appendix 2: Flipped Lesson Plan Template

Lesson Title:	
Subject:	
Level:	
Prerequisite skills or knowledge (connect to prior lesson):	
Time Requirements for First Exposure:	
Time Requirement for In-Class Activity:	
Time Requirement for Post-Class Activity:	

Appendix 3: Worksheet for preparing what students will do before, during, and after the lesson

The success of your flipped class depends on the alignment of the what you want your students to accomplish before, during and after the class.

Step 1: Define Content Scope, Learning Objectives, & Instructional Strategies

- ***What is the scope of your topic?***

Define the scope of your topic is important in terms of providing your students with relevant and connected content that is not too broad, otherwise students will have difficulty connecting content.

- ***How will students use or apply the material?***

Draft clear learning objectives and outcomes that align with the activities students will do before, during, and after the class. It is not enough to for students to just read, listen, watch, and take notes. They need to use it to really learn it. Creating and communicating the learning objectives will help you to align your lesson and clearly define what you want your students to accomplish before, during, and after the class. When writing the learning objective, describe what students will need to be able to know and do using active verbs from Boom’s revised taxonomy. Use the chart below to fill out each goal.

Goal 1: <insert>

Content Type	Learning Objective	Task, Question, or Activity

- ***Which instructional approach fits best for the main learning activity?***

Select the most appropriate instructional approach which will fit the main learning activity (i.e.: direct or indirect instruction, peer-instruction, team-based learning, case-based learning, process-oriented guided inquiry learning)

Step 2: Students gain familiarity with new material before class

- ***What instructional materials and resources will you use for students to familiarise themselves with the content prior to class?***

The pre-class work should set the scene for the in-class activity. Plan through how you will communicate the new instructional ideas. Would students benefit more from watching a video demonstration outside of class at their own pace and as often as needed or would some other media type (i.e.: text, animation, graphic) serve the presentation of instructional content more effectively?

Step 3: Activities that motivate students to prepare before class

- ***What kinds of activities will motivate students and prepare them for class?***
- ***What questions will I ask students?***
- ***What should students be able to do to prepare?***

Align and match these activities with the learning objectives. Identify the kinds of incentives or motivations that will engage students in the new instructional material and prepare for the in-class activity. Determine how you can provide feedback to students about what they know and do not know prior to class.

Step 4: In-class activities that provide students opportunities to deepen understanding

- ***What kind of in-class activities will focus students to attain higher-level cognitive abilities?***

Take time to ensure that in-class activities align and match activities with the learning objectives and the abilities of students.

Step 5: Post-class activities that extend student learning

- ***How will students continue the learning experience from the inside class activity to outside of class?***

Align and match post-class activities with the learning objectives. Be aware that students will not retain everything they learn simply from just one exposure to the materials – plan to expose them to the same content over an extended period of practice.

Step 6: Ongoing Evaluation and Assessment

- ***How will you evaluate students' learning and progress?***

Evaluation and assessment need to take place throughout the process. Plan how you will evaluate the effectiveness of the flipped experience and how you will assess student understanding at all stages. Finally, review your plan to ensure everything is well connected and that the lesson coherent?

Appendix 4 Popular Flipping Tools and Technology

Screencasting Software Options

Product/Tool	Comments/Notes
<ul style="list-style-type: none"> • Camtasia Studio (PC) or Camtasia for Mac 	<ul style="list-style-type: none"> • Education-friendly with significant educator discounts available • Unlimited time, lots of editing options and saves in different formats • Lots of free tutorials on how to use it.
<ul style="list-style-type: none"> • Jing 	<ul style="list-style-type: none"> • It is FREE but requires a download and registering for www.screencast.com • Works on both Mac or PC • Record up to five minutes of screen capture video • No editing option.
<ul style="list-style-type: none"> • Snagit 	<ul style="list-style-type: none"> • Like Jing, but with more options • Unlimited recording time being one of them.
<ul style="list-style-type: none"> • Screenflow 	<ul style="list-style-type: none"> • Mac Only. Similar to Camtasia

Online Whiteboards

Product/Tool	Comments/Notes
<ul style="list-style-type: none"> • A Web Whiteboard 	<ul style="list-style-type: none"> • A whiteboard that works on all Internet browsers. • No screen casting options unlike Scriblink.
<ul style="list-style-type: none"> • Scriblink 	<ul style="list-style-type: none"> • Whiteboard, but with no screen casting option: if you want to create a video it requires a screen casting tool such as Jing. • Requires Java and produces up to five “slides”. • Includes annotation options (e.g. pen width and choice of colour). • Includes other extras (e.g. lines, shapes, text boxes, grid, import images, background colour, characters/symbols, equations).
<ul style="list-style-type: none"> • Educreations 	<ul style="list-style-type: none"> • Free registration. • It allows you to make screencasts, but they are available only to registered students in your class – it can be used with Jing for wider audiences. • Allows multiples slides. • Only annotating option is the pen colour. • Includes other extras: (e.g. importing images, recording audio).

ScreenCast/Video Hosting Options

Product/Tool	Comments/Notes
<ul style="list-style-type: none"> • Screencast.com 	<ul style="list-style-type: none"> • 2GB of free storage, more available for paid version
<ul style="list-style-type: none"> • Youtube 	<ul style="list-style-type: none"> • Students are familiar with using YouTube.
<ul style="list-style-type: none"> • Vimeo 	<ul style="list-style-type: none"> • Less commercialised alternative to YouTube although there are upload limits for free accounts. • Be aware that some content Vimeo views as “artistic” is not safe for school or work.
<ul style="list-style-type: none"> • TeacherTube and SchoolTube 	<ul style="list-style-type: none"> • Like YouTube, but on a much smaller scale. • Education related videos only. • Any uploaded videos must be approved before becoming available – the time frame for approval can last anywhere from a few hours to days.
<ul style="list-style-type: none"> • Dropbox 	<ul style="list-style-type: none"> • Dropbox is a cloud storage site. • It is possible to have a free 2 GB account and to get extra storage by getting other people to sign up. • Each uploaded file has a unique URL for students to watch online and can be downloaded for watching offline.
<ul style="list-style-type: none"> • Google Drive 	<ul style="list-style-type: none"> • Google’s version of Dropbox. • A Google Account is required and comes with 5 GB free storage when you sign up.

Learning Management Systems

You will need one place where your students can go for class content whether they are in your class or not. Here are a few options:

Product/Tool	Comments/Notes
<ul style="list-style-type: none"> • Moodle 	<ul style="list-style-type: none"> • Open source LMS (free), but you will need a dedicated server to host it. • Many schools host their own Moodle server, but if yours does not there are companies that will host your Moodle site for you for a small fee. • Includes lots of options from quizzes, to grading, to SCORM.
<ul style="list-style-type: none"> • BlackBoard 	<ul style="list-style-type: none"> • Like Moodle but a more polished version. • Used more at the university level. • Need to pay to use BB - usually per student and that can get very expensive.
<ul style="list-style-type: none"> • Edmodo 	<ul style="list-style-type: none"> • Only people that can view content are those who are members of your class. • Set up like Facebook. • Includes a calendar, post links, documents, polls, and create quizzes. • Free.

Curating Content

A flipped classroom content consists of more than just a library of videos, but will include all sorts of digital media. How do you keep it all arranged? Here are a few tools I've used:

Product/Tool	Comments/Notes
<ul style="list-style-type: none"> Pinterest 	<ul style="list-style-type: none"> This may be blocked in your organisation. It is increasingly being used by more and more educators to collect ideas ranging from pedagogy, classroom management to content.
<ul style="list-style-type: none"> Learnist 	<ul style="list-style-type: none"> Like Pinterest, but designed specifically for learning Check out: https://goo.gl/VdMgDx.
<ul style="list-style-type: none"> EDPuzzle 	<ul style="list-style-type: none"> Take any video from YouTube or upload you own and create a flipped lesson. Crop it and take only what you need, complete it with questions or make it more personal with audio notes. Check out: https://goo.gl/8EpHqI .
<ul style="list-style-type: none"> MentorMob 	<ul style="list-style-type: none"> MM lets you create "Playlists" of links, files, and/or text from your content. Here's an example of a playlist I've made for my Flipped Classroom presentations.

Content That's Already Created

Product/Tool	Comments/Notes
<ul style="list-style-type: none"> Khan Academy 	<ul style="list-style-type: none"> We are really conflicted about putting Khan Academy as a resource for precreated content. Please, please, please, make sure you watch anything you assign from KA first to make sure it's right for your students and promise me you'll only use it for good instead of evil when it comes to attaching the words "flipped" and "Khan" in the same sentence.
<ul style="list-style-type: none"> Brightstorm 	<ul style="list-style-type: none"> Seems to be aimed at high school subject areas (math, science, ELA, and test prep). Videos are short (2-5 minutes) and taught by teachers. Freemium based (some resources are free but they really want you to pay for full access)
<ul style="list-style-type: none"> iTunes and iTunesU 	<ul style="list-style-type: none"> iTunesU! It's free. Content is from educators and there is a lot of it. If you go to the K-12 category (upper right hand corner of iTunesU) you'll be able to search from the libraries of dozens of educational institutions. My personal favorite is Michigan's MI Learning. One caveat on iTunes, if you want to get to the resources you have to download iTunes onto your computer and have an Apple account. To download iTunes go here. There is also an iPad app.

Product/Tool	Comments/Notes
Mathispower4u - Tutorials by James Sousa	<p>We love people who share and are a huge fan of content licensed under Creative Commons. James Sousa has created thousands of math videos that are free to use as long as we attribute the work to him, use it only for non-commercial purposes, and promise to let others use anything we create based on his work. Even better, James is promoting open source materials, textbooks, and resources.</p>
<ul style="list-style-type: none"> • TED Talks and TED-Ed 	<ul style="list-style-type: none"> • Looking for real-world applications to just about any topic? Check out TED's "ideas worth spreading". Get 5-17 minute talks by experts in a wide variety of fields. Here's one of my favorites about the brain, electricity, and a cockroach beatbox. • TED-Ed takes some of the best TED talks and teacher lessons and animates them specifically for classroom use. Videos are typically 3-5 minutes long. Teachers can also add questions to create flipped lessons. Here's one of my favorites on logarithms and red eyes by math teacher Steve Kelly.
<ul style="list-style-type: none"> • YouTube and YouTube EDU 	<ul style="list-style-type: none"> • There's a lot on YouTube - good, bad, and everything in between. Sift carefully.