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Homework assigned in a flipped classroom as a tool to help secondary education students to improve their study time management

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Abstract

This study sought to analyse the impact of the flipped classroom approach on students' homework time management through its implementation in English as Additional Language in a secondary education school during 8 weeks. The flipped classroom was implemented by creating videos that were uploaded in "Edpuzzle" and that explained the grammar, vocabulary and contents of the units and what was going to be done in the following session. In a first phase of the study, all the participants had to watch the videos before each lesson as homework and the results of their performances were tracked and compared with their previous performances using traditional homework, mainly regarding the frequency with which they completed the tasks. In a second phase of the study, the sample was divided in an experimental and a control group to compare the performances of both groups being taught the same contents, but only in the experimental group videos were assigned as homework. The objective was to analyse if the flipped classroom approach had helped the students to incorporate the homework to their daily routines (especially to their usual screentime) and if it improved their frequency of doing the homework as a tool of student time management. The results showed that this approach helps the students that do the homework with their study time management. In the study the overall performance of the participants also improved with regards to the frequency with which they did the homework; however, used alone it is not the tool to solve the problem of the students that do not *want* to do the homework.

Keywords:

homework, flipped classroom, student time management, English as Additional Language, secondary education

Resum

L'objectiu d'aquest estudi és analitzar l'impacte de les classes invertides (en anglès, *flipped classroom*) en la gestió dels alumnes del seu temps per fer deures amb la implementació d'aquest enfocament a les classes d'anglès en un institut d'educació secundària durant 8 setmanes. Per tal d'implementar la *flipped classroom*, el professor-investigador va crear vídeos que explicaven la gramàtica, el vocabulari i continguts de les unitats o allò que es faria a la propera sessió. Els vídeos van ser pujats a la plataforma en línia "Edpuzzle" per tal que els alumnes hi tinguessin accés abans de cada classe. A la primera fase de l'estudi, tots els participants havien de veure els vídeos abans de les classes i la freqüència amb què van fer els deures així com el nombre de tasques completades van ser enregistrats per tal de comparar-los amb les dades prèvies a l'inici de l'estudi (metodologia tradicional). A la segona fase de l'estudi, la mostra va ser dividida en un grup experimental i un grup de control per tal de comparar els resultats dels dos grups, als quals s'explicaven els mateixos continguts però amb vídeos assignats com a deures en el grup experimental i de manera tradicional (a l'aula) en el grup de control. L'objectiu és analitzar si la *flipped classroom* ajuda els estudiants a incorporar els deures als seus hàbits, concretament al seu temps diari d'exposició a les pantalles (mòbil, ordinadors, etc.) i si això fa que la freqüència amb què fan els deures augmenti. Els resultats indiquen que la *flipped classroom* ajuda els alumnes que fan els deures amb la gestió del temps d'estudi o deures. La freqüència amb què els participants van fer els deures també va millorar respecte a la mostrada amb la metodologia tradicional. No obstant, la tipologia de deures de la *flipped classroom* no és l'eina per solucionar el problema dels alumnes que no *volen* fer els deures, sinó que caldria estudiar més variables de manera conjunta.

Paraules clau:

deures, *flipped classroom*, classe invertida, gestió del temps de l'estudiant, anglès com a llengua addicional, educació secundària obligatòria

Table of Contents

1. Introduction	3
2. Objectives and hypothesis	4
2.1 Objectives	4
3. Theoretical framework	5
4. Methodology	8
4.1 Method	8
4.2 Participants	8
4.3 Instruments	10
4.3.1 Tests	10
4.3.2 Students questionnaires	11
4.3.3 Students' previous performance record (archive)	12
4.3.4 Students' performance grid	12
4.3.5 Experimental and control group	13
4.3.6 Students' diary:	13
4.3.7 Interviews with experts	14
4.4 Procedure	14
5. Results and discussion	17
5.1 Homework	17
5.1.1 Frequency with which the students did the homework	17
5.1.2 Main reasons why homework was not done	18
5.1.3 Main variables that contributed to the students doing the homework during the flipped classroom implementation	20
5.1.4 Integration of homework (flipped classroom) in the daily routines	20
5.1.4 Student's perceptions	21
5.1.4 Student's routines	22
5.2 Students' screentime and routines	23
5.2.1 Use of devices	23
5.2.2 Videos	24
5.3 Flipped classroom approach	24
5.3.1 Students' perceptions	24
6. Conclusion	26
6.1 Results	26

6.2	Achievement of objectives.....	27
6.3	Contributions and new lines of research.....	27
6.4	Limitations	27
7.	References	29
8.	Annexes.....	31
8.1	Annex 1: Placement test	31
8.2	Annex 2: Pre-study questionnaire.....	34
8.3	Annex 3: Post-study questionnaire	35
8.4	Annex 4: Tables and figures	37
8.4.2	Homework: Main reasons why homework was not done.....	43
8.4.3	Homework: Students' perceptions	47
8.4.4	Screen time: Use of devices.....	49
8.4.5	Flipped classroom: Students' perceptions.....	52
8.5	Annex 5: ICF given to the participants before the beginning of the study.....	57
8.6	Annex 6: Interview with Professor Helen Ruiz	58

1. Introduction

Time management is one of the keys of academic achievement (Babayi Nadinloyi et al., 2013) and during the stage of secondary education the students start to face greater difficulties in the learning process and in their academic achievement due to an “inappropriate self management of extracurricular time” (Barberá Cebolla, 2016). In most studies, when students’ time is analysed (Barberá Cebolla, 2016), screentime is not usually considered part of the academic student time, but it is only included in students’ free time. However, there is an approach that allows teachers to take profit of the students’ screentime to expand the lessons (Al-Harbi and Alshumaimeri, 2016). In the flipped classroom, part of the contents of the lessons are assigned as homework, which allows the use of multiple formats and tools, such as video recording, to have the students prepared at home for the following session, although the material could be provided in other formats and still be considered flipped classroom approach (Bergmann and Sams, 2012). With the contents learned at home, there is more time in class to practice (Bergmann and Sams, 2012), what is reflected in an improvement of class time management (Bergmann and Sams, 2012; Gariou-Papalexiou, et al., 2017; Xu, et al., 2014). Many studies focus on this fact as well as on the motivation (Gariou-Papalexiou, et al., 2017; Xu, et al., 2014) and effectiveness of this approach (Al-Harbi and Alshumaimeri, 2016; Barao Moreno, 2016), but few of them (Barao Moreno, 2016) consider or focus on student time management at home. However, the characteristics of this approach could potentially improve students’ time management as well.

Therefore, this study wanted to examine if the flipped classroom approach can help secondary education students to maximize their extracurricular time and to improve their study time management in the context of English taught as Additional Language and to gather useful information that could help apply the flipped classroom in Catalonia, where very few research has been conducted on the topic. To fulfill these objectives, the flipped classroom was implemented in teaching English as Additional Language in a Catalan school with a sample of 43 students of 4th grade of compulsory secondary education (*educació secundària obligatòria*, ESO). The study was divided in two phases: the first one, to analyse the results of all the participants and to compare them with the previous performance of the same students. The second phase was conducted to establish an experimental and a control group and compare their results.

2. Objectives and hypothesis

Is there a need to try a new approach to improve the students' academic time management in Catalan schools?

Is the homework assigned in a flipped classroom easier to be integrated in the students' daily routines and usual screentime?

Does the kind of tasks assigned as homework in the flipped classroom approach help increase the frequency with which the students do their homework?

2.1 Objectives

To implement the flipped classroom in 4th of ESO students of English as Additional Language in order to collect data regarding the frequency with which the homework is done with this approach.

To compare the performance of 4th of ESO students regarding the tasks to be done at home using the flipped classroom and the traditional approach.

To investigate if the tasks usually assigned in the flipped classroom approach help the students in the management of their study or homework time.

To investigate if the tasks usually assigned in the flipped classroom approach can be integrated more easily in the students' usual screentime and routines.

To investigate if the tasks usually assigned in the flipped classroom approach help the students with a lower frequency of doing the homework.

3. Theoretical framework

Learning at school age is linked to a high degree to the time spent at school (or school time) and the educational institution establishes what the students have to do during most of the day, inside but also outside school (Barberá Cebolla, 2016). Study time or student time management appear as crucial variables responsible of academic achievement in several studies and research (Barberá Cebolla, 2016; Carroll, 1963; Marchesi, 2003; Wang, et al., 2010). According to Carroll (1963), the degree of learning is proportionally related to the time spent on the learning task. Four types of time can be differentiated according to Carroll (1963) in the learning process: real time that is necessary to learn, real time used to learn, time allowed for the task of learning and time assigned for the task (Barberá Cebolla, 2016). It is to be highlighted that sometimes the time used and the productive time used for the tasks are not the same (Barberá Cebolla, 2016). According to Levin and Tsang (1987), the variables that are part of the academic achievement are: the ability of the learner, the efforts or use of this ability in the tasks required by learning, time (spent on a specific task) and the level or resources available for the learning task (Barberá Cebolla, 2016). Other studies also highlight that learning during extracurricular time can also be responsible of academic achievement (Barberá Cebolla, 2016).

Time management is very important and, as a result, during the stage of secondary education the students start to face greater difficulties in the learning process and in their academic achievement due to an “inappropriate self management of extracurricular time” (Barberá Cebolla, 2016). According to the previous statement, extracurricular time and homework are important variables inside the variable of time. Some studies also revealed that, at the class level, time management was positively related to time spent on homework (Xu, et al., 2014). However, very few studies have examined the effects of completed or assigned homework in high school (Kalenkoski and Pabilonia, 2017) and the results provided by Kalenkoski and Pabilonia (2017) do not show a significant link between tasks done at home and academic achievement.

Limited time is a common situation that some classroom teachers face, and it can have a significant effect on the learning process (Gariou-Papalexou, et al., 2017). However, there is an approach that has been proved to improve time management, especially classroom time management (Bergmann and Sams, 2012), widely known as the flipped

classroom approach. The fact of flipping the lessons (asking students to prepare before class time) has existed for years (Al-Harbi and Alshumaimeri, 2016). However, this approach started to be popular and to become what nowadays is known as the flipped classroom in the spring of 2007 (Bergmann and Sams, 2012), when Bergmann and Sams, two rural Colorado chemistry teachers, started to use videos in the classroom as an instructional tool because they had noticed that many students missed their lessons frequently (Bergmann and Sams, 2012). Their videos were posted online and they became the first ones who popularized this method (Hoffman-Miller, 2013). Through these videos, the teachers wanted to help their students, but they also earned the time that they usually spent repeating and reteaching the previous lessons to the missing students. Then, students that attended the lessons started to use the videos to revise before the exams and later, students and teachers from other parts of the world started using them as well (Bergmann and Sams, 2012). Bergmann and Sams' (2012) flipped classroom was born when they realised that all the students could use that same system and then use the time in classroom where the teachers were "physically present" to provide the students with individual help (Bergmann and Sams, 2012).

"Clearly, this model was more efficient than lecturing and assigning homework."

(Bergmann and Sams, 2012)

Before the expansion of the popularity that this approach gained with Bergmann and Sams, the origins of the flipped classroom could be related to the "peer instruction" popularized by Mazur; the Khan Academy (founded by Salman Khan) or the "inverted classroom" presented by Lage, Platt and Treglia (Borao Moreno, 2016; Stöhr and Adawi, 2018); or even to 1982, when Baker worked on the improvement of memory with electronic tools (Borao Moreno, 2016).

Bergmann and Sams (2012) already claimed that "there is no such thing as *the* flipped classroom" and nowadays there is no unified definition of the flipped classroom. Different researchers highlight different aspects as central to the concept (Stöhr and Adawi, 2018). It is also referred to as "strategy" (Al-Harbi and Alshumaimeri, 2016), "model" (Ekmeçci, 2017) but experts interviewed on the topic agreed on the term "approach" due to its flexibility and the different and numerous possibilities that can be included within the concept of the flipped classroom.

Some consider the use of video as pre-teaching tool an essential part of the flipped classroom (Al-Harbi and Alshumaimeri, 2016) while for others there is no need to use videos to have students prepared before the lesson (Bergmann and Sams, 2012). According to some researchers (Bishop and Verleger, 2013), the tasks assigned as homework require the format of videos because “students tend to not complete assigned readings” but other authors (Stöhr and Adawi, 2018) state that the same problem has to be faced with videos and that “this issue represents a larger problem of self-directed learning that is not per se dependent on the medium of transmission” (Stöhr and Adawi, 2018).

Despite the lack of unified descriptions, this approach has gained interest in recent years (Stöhr and Adawi, 2018) but at the same time it has been criticised by bloggers and educators (Bergmann and Sams, 2014) and, overall, there is a growing body of research on the topic (Stöhr and Adawi, 2018). At the same time, according to many studies carried out, in order to improve the results in secondary education, the lessons require the use of ICT and a perspective based on constructivism (Borao Moreno, 2016), which are both boosted by the flipped classroom (Bergmann and Sams, 2012).

Technology has changed the world and the new generations (Twenge, 2006), today’s students have grown up with technology and they use it in their daily lives (Chi Cheung Ruby, 2017) and also as an immediate source of knowledge. “The traditional teacher-centred approach is not appropriate for today’s learners who are ‘digital natives’ (Prensky, 2005) and have grown up with computers, video games and the Internet” (Chi Cheung Ruby, 2017). Moreover, the way these students do their homework has changed: according to recent studies they usually do other things at the same time, and homework is not usually done as a single task (Kalenkoski and Pabilonia, 2017).

4. Methodology

4.1 Method

This research was based on a case study where qualitative and quantitative data were collected. In order to ensure the validity of the research, the study was designed with data triangulation and methodological triangulation. For this purpose, the study was divided in two phases. The quantitative and qualitative data was collected through student questionnaires, student diaries and two interviews with experts on the topic to evaluate the students' performances and routines, and their perceptions regarding the usefulness of the homework, their motivation, their participation in class and how they managed their homework time outside of school hours.

In the first phase of the study, all the students in the 4th grade of ESO in the school participated, i.e., 43 students, which were divided in three groups. The groups will be referred to as "41", "42" and "43", according to their level (from higher to lower). The statistical results of the sample using the flipped classroom approach were analysed as a whole and compared to their previous performances kept in the school records regarding their habit of doing the homework. The results were analysed globally as a whole sample, but at the same time, the differences between the three groups were considered to observe if there was a significant impact of these differences in the results of the study.

In the second phase of the study, the same kind of data was collected but using a different technique: an experimental group and a control group were established and the different performances of both groups were compared. In this case, only the biggest groups (41 and 42) participated, i.e., 36 students.

4.2 Participants

This study used a sample of 43 students aged between 15 and 17 that were in the 4th grade of secondary education at a State high school in "El Bages", an area (*comarca*) of Catalonia. The centre, which gathers between 90-95% of the children in the area, is located in the second area of poverty of Barcelona, the unemployment rate is over the 50% and the sociocultural level is very low. The participants represented the total number of pupils studying this level at the school. Most students, 41 (95.35%), spoke Catalan and Spanish, 2 (4.65%) were also Arabic speakers and 2 (4.65%) of them spoke

Spanish only. All the students took 3 weekly hours of English as Additional Language as a compulsory subject at school and some of them also learned French in the centre. According to the results of the “*competències bàsiques*” (basic competences) carried out two months before the beginning of the study, the linguistic competence in English was very close to “low” (*baix*) and lower than the average results in Catalonia (see *Figure 1* below).

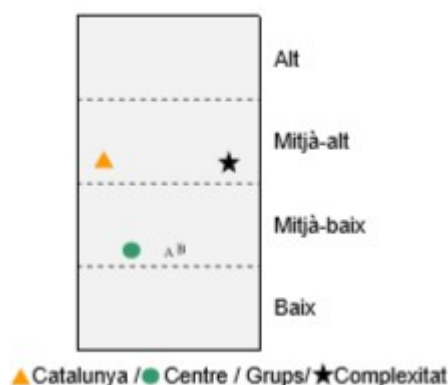


Figure 1: position of the centre in competències bàsiques compared to average results in Catalonia.

**Alt=high; Mitjà-alt=Average-high; Mitjà-baix=Average-low; Baix=Low. Catalunya=Catalonia; Centre=Centre; Grups=Groups; Complexitat=Complexity.*

The lowest results were obtained in the written expression competence, which was “low” for 70.70% of the students. If the three competences involved are considered globally (oral comprehension, reading comprehension and written expression), the competence of 46.3% of the students was “low”. According to the report from the Generalitat de Catalunya [Government of Catalonia], “low” means that the competence has not been achieved.

The school had eight computers in the library that could be booked by students and used during the breaks. The library was also used as computers room for ICT lessons. The classrooms were equipped with a laptop, a digital screen, a traditional blackboard and speakers, and the Spanish Language teacher was in charge of solving any ICT issues that could arise during the lessons. All the students had mobile phones, although not all of them brought them to class and 25% of the students also brought their own laptop to school. They had never used the online platform “Edpuzzle” before, where the videos assigned as homework during the study were uploaded.

The participants were distributed in 3 different groups according to their levels during their lessons of English as Additional Language. Therefore, the groups were not exactly heterogeneous; each group was supposed to be slightly different in terms of proficiency. To determine these differences a placement test was carried out at the beginning of the study. According to its results, the groups showed differences as expected. The average scores (out of 10) in the placement test were: 5.05 in group 41; 3.72 in group 42 and 1.75 in group 43.

In order to obtain more reliable data, the study was divided in two phases and several instruments were used. In the first phase of the study the sample was considered a whole single heterogeneous group, instead of being spilt in focus and control groups. Therefore, the results were compared to the previous performances of the same students using a traditional teaching style, which were filed in the school records. At the same time, the results of each group were also analysed separately in order to show and observe how significant the difference between the groups could be in the framework of the study.

In the second phase, only the two biggest groups that participated in the previous phase of the study participated as experimental and control group respectively. There were 19 students in the experimental group (one student had abandoned school before the end of the study) and 17 students in the control group. Both groups were taught by the same teacher and the lessons were based in the same contents. As explained before, a placement test showed that the levels of the groups were significantly different, so it was taken into account in the analysis of the results.

4.3 Instruments

4.3.1 Tests

Placement test

Before starting the study, the students took a placement test in order to confirm that the levels of the groups were different and also to consider and measure the importance of this difference. The test had been used in other studies (Al-Harbi and Alshumaimeri, 2016) and was created by Macmillan publishers.

End of study test

The end of study test included 10 grammar questions based on the videos assigned as homework during the didactic sequence and was completed by 40 (93.02%) students at the end of the study. Its main objective was to observe if the students would watch some videos again before a grammar exam and therefore had more data on students' time management. It was also used as an extra tool to have more information regarding the different levels of the groups participating in the study and confirm again that the groups were different. Extra data could also be collected on the acquisition of the contents from the students's side and to compare it with their previous performances. However, this information was not relevant for this research, because the effectiveness of the flipped classroom, which was not questioned, was not part of the investigation of this study.

4.3.2 Students questionnaires

4.3.2.1 Pre-study questionnaire:

Before the beginning of the study, a qualitative and quantitative questionnaire (see Annex 1) was given to the sample. It was filled in by 42 (97.67%) of the participants.

The questionnaire was aimed to determine the characteristics of the sample regarding their daily homework routines, screentime and use of electronic devices as long as their perception towards their usual homework. To achieve these objectives, five closed questions were asked mainly to investigate on students' homework time management, their perceptions towards the homework they were usually assigned (traditional homework) and its usefulness, and their screentime routines. One semi-closed question was included to enumerate the most useful homework according to the students' perception. And, finally, five open questions were also included in order to discover the main reasons that lead students to not complete or deliver their assignments, the time the participants invested on homework, on screentime and on videos and the characteristics of these videos.

4.3.2.2 Post-study questionnaire:

This questionnaire (see Annex 2), which included qualitative and quantitative items, was filled in by 38 students (88.37% of the total sample) after the first phase of the study.

The questionnaire was aimed to discover the main advantages and disadvantages that the students came across with when they had to do their homework from the flipped

classroom approach, and to what extent these had been different respect to their experience with the traditional assignments. The factors that were more relevant for students to do their homework and how they performed during their tasks were also considered. Finally, the questionnaire was aimed to discover if the students had been able to incorporate the tasks to their daily screentime and to collect more information on their perceptions regarding time management and the approach used during the study.

To achieve these objectives, eight closed questions were asked mainly to investigate on students' homework time management, their performances when watching the videos and also their perceptions towards the homework assigned in the flipped classroom and the consequences of the extra time to practice in class. Two semi-closed questions were included to enumerate the devices they had used and the most important factors that contributed to students doing the homework. Finally, five open questions were also included in order to discover the main reasons in the cases when homework had not been done, the moment and place where the homework had been done and if this approach had facilitated the incorporation of the homework to the students' daily screentime.

4.3.3 Students' previous performance record (archive)

The school records on students' performances regarding their usual frequency of doing the homework were analysed and data was extracted in order to compare these previous results (obtained during a traditional teaching approach) with the data collected during the first phase of the study (with all participants learning English through the flipped class approach). These records had been kept by the students' usual English teacher during the 7 months prior to the study.

4.3.4 Students' performance grid

During the first phase of the study, the performances of the students regarding their routines of doing the homework were tracked in a performance grid. Specifically, it was recorded if the task (video) assigned as homework had been done (watched) or not, and if it had been done in time (before the lesson) or late. This grid was filled-in during the 6 weeks that the first phase of the study lasted. There were 9 assignments in total and the students had two extra weeks at the end of the unit to watch the missing videos, but these would be recorded as a "late" delivery of the task.

4.3.5 Experimental and control group

The participants of the study were usually taught their English as Additional Language lessons divided in three different groups. These groups had been set by the school at the beginning of the year according to the students' level. The placement test carried out at the beginning of the study confirmed that the mean score of group 41 was higher than the results obtained by students in group 42. The last group, 43, was not part of the second phase of the study because the lower amount of students made the group too different to be compared with the other two. As a result, the two biggest groups (41 with 17 students and 42 with 19 students) were chosen to be compared as control and experimental group respectively.

For this phase, a micro unit of 5 sessions based on a grammar topic was designed. In the control group, the explanation of the grammar contents was taught in class. After three of the lessons, the students were assigned a worksheet with different activities based on the grammar explanations from class. In the experimental group, the same grammar explanations were recorded and assigned as homework to be watched before three of the lessons, which would be used to put the contents from the videos into practice.

The experimental and control groups as instrument allowed the collection of similar data in terms of time and context (contents taught). With these conditions, the different teaching approaches used in each group became the most significant variable that could be compared at the analysis of the students' performances. The main objective was to observe if the different kinds of homework assigned had an impact in the results and performance of the students. More specifically, the research sought to investigate if with one of the methods the students did the homework more frequently than with the other one.

4.3.6 Students' diary:

In the second phase of the study, the students had to fill in a participant diary linked to each of their three tasks assigned as homework. The students had to explain when and where they had done the homework, how long it took and what they were doing when they did the homework. At the same time, the students that had not done the homework had to explain why they could not do the task.

With this instrument, the main objective was to compare the performances and time management of students that were assigned videos and of students that were assigned

traditional homework. The main focus was placed on the students' daily routines and on the hypothesis that videos would help them integrate the homework in their usual screentime. Similar data was also collected through a questionnaire at the end of the first phase of the study as a triangulation tool.

4.3.7 Interviews with experts

After the implementation of the study, two interviews with experts on the flipped classroom approach were carried out. The experts that collaborated were Helena Ruiz Laiseca and Elena Sofia Ojando Pons, both teachers at FPCEE (*Facultat de Psicologia, Ciències de l'Educació i de l'Esport* [Faculty of Psychology, Education and Sport Sciences]) Blanquerna, Universitat Ramon Llull [Ramon Llull University]).

The interviews were aimed to contrast the results of the study and to have a wider view of the current situation of the approach and its implementation in Catalonia. It was also devoted to expose the main limitations and concerns arisen during the study. (See Annex 6)

4.4 Procedure

Before the beginning of the study, the researcher asked for the headmistress' permission in order to carry out the research in the school as it involved an approach that had not been used before in the centre. The process was explained as well as the tools and methodologies that would be used. At the same time, permission and conditions were also checked with the students' usual English as Additional Language teacher, who approved them before the beginning of the study, in order to integrate the research in the students' lessons and disrupt their plan at the minimum.

Two months before the beginning of the study, the students were explained and given an informed consent form (ICF) (*see Annex 5*) that they had to sign expressing their decision to participate or not in the research (give their consent regards to the collection and analysis of their results as part of the study data). The students that were aged 16 or older could sign their own ICF but the participants younger than 16 years old had to bring the ICF home and have it signed by a parent or legal guardian. All the students agreed to participate.

Once the contents to be taught and the timing was agreed with the school, two didactic sequences were designed to incorporate part of the contents that were included in the

syllabus of the year but that were still to be taught to the students. According to these two didactic sequences, the study was divided in two phases.

To compare the English grammar proficiency levels between the groups, the participants took a placement test before the first phase of the study. The students had already been split into different groups by the school according to their levels, and they could not be mixed randomly for the study. So the test was used as an extra tool to confirm that the levels were different and that even though it was not the ideal situation for the study, it was taken into consideration and analysed.

A questionnaire was also handed to the students in order to contextualise the sample and determine the routines and characteristics of the participants regarding their usual screentime, the time they spent watching videos every day, their homework routines and their perceptions towards the traditional English homework they were usually assigned.

The first didactic sequence (first phase of the study) was designed in order to have the contents explained in videos, and the class time aimed to solve the doubts from the videos and put its contents into practice. For that purpose, thirteen sessions were designed and nine videos that would be used as homework were created by the teacher-researcher, who appeared in all of them. Of these videos, which lasted between 3 and 6 minutes, three had grammar explanations and the other clips explained other types of content (vocabulary), the projects or activities that were going to be performed in class or opened the debate on topics that would be discussed in class. Overall, the videos were aimed to prepare the students for the following lesson. During this first phase, thirteen sessions were carried out and the participants were assigned homework before nine of the sessions. The performance of the students was recorded after each session, keeping track of the delivered assignments (late and on time) as well as the number of students that did not do the tasks. These records were compared with the previous performance of the students before of the study, which was analysed through the tracker that the usual teacher of the students had kept during the 5 months previous to the beginning of the study. With this objective, the teacher-researcher used and analysed such records.

During this phase of the study, the three groups into which the sample was divided by the school were assigned exactly the same videos (as homework) and the same classroom activities were performed in order to compare the impact of the methodology through the different students. The results were analysed considering the total sample as

a whole single group in order to maximize the data collected to be compared with the previous performances but also individually in order to detect any significant difference if applicable.

After the implementation of the first unit, the participants filled-in a questionnaire regarding their perception of the flipped classroom approach regards to class time and the kind of homework assigned. The students were also asked about their homework routine during these days and the main reasons that caused them not to do some of the assignments.

A second shorter didactic unit based on grammar contents was implemented in the second phase of the study. The teacher-researcher designed five sessions to be implemented with the flipped classroom approach only in one (experimental) group and five teacher-centred sessions for the control group based on the same grammar contents. However, the sessions were designed to be as similar as possible and the main difference was found in the delivery of grammar contents. The activities performed in class were as similar as possible even though in the experimental group (flipped classroom) there was more time for dynamic and assessed practice.

During these sessions, all the participants filled-in a student diary after doing their assigned tasks and indicating when and where they did the homework, how long it took and, in case the task had not been done, explaining the main reasons for not doing the homework.

5. Results and discussion

5.1 Homework

5.1.1 Frequency with which the students did the homework

Before the study (traditional approach)

In this case, to analyse the results and the data collected, the number of students that attended the class was considered as 100% (the missing students were not taken into account) due to the nature of the delivery of this kind of homework. The data collected was based on writing compositions and workbook activities that, if the student was not in class the day of the corrections, could not be delivered later. It is to be highlighted that the 13 tasks on which the data collection was based were assigned during 5 months, so the frequency of the assignments was of less than one task weekly. However, during the implementation of the study, in order to collect more data, the assignments were more frequent (2/3 per week) which could affect the results. It is also to be noticed that the track kept of this performance was also less reliable because the tasks were not handed in, but corrected in class and the record was kept as per the students' own confirmation that the homework had been done.

With the traditional approach and taking all these drawbacks into account, the students in 41 completed 55.19% of the assignments and the students in 42 completed 47.85% of the assignments. In group 43 only 4 assignments had been set and 10.71% had been completed. (See Annex 4, Table 1 and Figures 1-6)

During the first phase of the study (flipped classroom approach)

All the participants were assigned 9 videos during 13 sessions. To keep the record of their performances, only the completed task were taken into account, i.e., the videos that had not been watched completely were not considered. However, the late deliveries were included because the frequency of the assignments was significantly higher to that of their traditional homework.

With the traditional approach and taking all these drawbacks into account, the students in 41 completed 72.55% (on time: 35.30%) of the assignments, the students in 42 completed 53.33% (on time: 40%) of the assignments and the students in 43 completed 40.74% (on time: 25.93%) of the assignments. Considering the global performance as a

whole sample, the students completed 58.92% (on time 35.92%) of the assignments. (See Annex 4, Table 2 and Figures 7-10)

The performance improved in all the groups. However, even though group 42 was not the best at frequency as per the records previous to the beginning of the study, their deliveries on time were the most significant within the three groups.

During the second phase of the study (experimental and control groups)

The results of the experimental group (42) were almost the same as in phase 1 (52.63% completed assignments). Their performance was still better than the “previous performance” recorded before the beginning of the study (traditional approach).

In the control group (41) the results during phase 2 (traditional homework) were exactly the same as in phase 1 (flipped classroom approach): 72.55% of the assignments were completed. These results indicate that the huge difference with the students’ previous performance (traditional approach) could depend on other factors and variables that were not considered during the study. According to the unit implemented, these variables could be the implementation of dynamic activities in the time left for practice in class and the incorporation of ICT in the classroom. (See Annex 4, Table 3 and Figures 11-13)

5.1.2 Main reasons why homework was not done

Before the study (traditional approach)

Some students provide one main reason, while others gave two reasons. In this latter case, the incidence of both reasons was divided when analysing the results.

33 students (78.57%) claimed that they forgot about the task (for 13 of them it was the main reason while for 20 of them it was 1 of two reasons provided). 8 students (19.05%) said that they felt too lazy to do the homework (for 1 of them it was the main reason while for 7 of them it was 1 of two reasons provided). It is to be highlighted that this reason was never given by any student when the flipped classroom results were analysed. 7 students (16.67%) explained that they did not understand the task (for all of them it was 1 of two reasons provided). It is to be highlighted that this reason was never given by any student when the flipped classroom results were analysed. 6 students (14.29%) said that they had no time (for 1 of them it was the main reason while for 5 of them it was 1 of two reasons provided). 5 students (11.90%) explained that they were

not aware of the task because they had not attended the previous lesson (for 2 of them it was the main reason while for 3 of them it was 1 of two reasons provided). 3 students (7.14%) argued that they had left the material (workbook) at school or at home (for 1 of them it was the main reason while for 2 of them it was 1 of two reasons provided). It is to be highlighted that this reason was never given by any student when the flipped classroom results were analysed. 2 students (4.76%) that they were not at home to do the task (for all of them it was 1 of two reasons provided). Finally, 1 student (2.38%) said that he/she just “could not do them” (as 1 of two reasons provided) and 1 student (2.38%) added “other” (to 1 additional reason provided). (See Annex 4, Figures 14-15)

During the first phase of the study (flipped classroom approach)

18 students (47.37%) claimed that they forgot about the task. 6 students (15.79%) said that they had no time. In this case, the incidence of lack of time was increased with the flipped classroom approach, which could only be explained in case that the students did not have IT resources to access the videos and their moments or places to do the homework were more limited. 1 student (2.63%) explained that he/she was not aware of the task, being the incidence of this reason significantly lower than in the previous analysis. 1 student (2.63%) claimed that it was due to his high rate of absentism. 1 student (2.63%) argued that he/she was not at home to do the task. 2 students (5.26%) said that they just “could not do them”. The incidence of this reason, which is very vague, had increased with the flipped classroom approach. 1 student (2.63%) explained that it was due to family problems at home, which would have had an impact on any kind of task assigned. Finally 2 students (5.26%) did not answer, and 6 (15.79%) argued that they had IT issues although some of them had been offered the opportunity to watch the videos at school during the unit and they had rejected this opportunity, always saying that they would manage to do them at home (late delivery), and none of them used the school library, that had computers available for the students during the breaks. It is to be highlighted that this reason was never given by any student when the traditional approach results were analysed. (See Annex 4, Figures 16-17)

During the second phase of the study (experimental and control groups)

The main reasons provided by the students in their diaries were: they forgot about the task, lack of time, they were not aware of the task, IT issues and “other”. The cases when a participant did not hand in the diary were also included in “other”.

The most significant differences were found in the incidence of the memory problems, which was more significant in the experimental group (10.53% of the students) than in the control group (5.88%); the lack of time was significantly higher in the control group (11.76%) than in the experimental group (3.51%) and the IT issues, that only appeared in the experimental group (by 5.26% of the students). (See Annex 4, Table 4 and Figure 18)

5.1.3 Main variables that contributed to the students doing the homework during the flipped classroom implementation

The students were asked to rate the different factors that had contributed from a greater to a minor extent to their motivation in completing the tasks assigned as homework during the unit implemented with the flipped classroom approach. According to the students' punctuations, the factors from most important to least important were: to pass the unit, the fact that they were short, the teacher, the fact that they were easy, being able to do them with the mobile phone or the computer, to learn more, the video format, the topic and finally, that they could be done outside home.

5.1.4 Integration of homework (flipped classroom) in the daily routines

During the first phase of the study (flipped classroom approach)

Did you do the homework in the same place and moment as if they had been traditional tasks?

13 students (34.21%) answered "yes", 3 students (7.89%) did not reply and 22 students (57.90%) said "no", which means that for them this kind of homework was performed in a different way and changed their usual routine.

The students that replied "no" were also asked to explain what had changed mainly.

8 students said that they could do the homework easily in the sofa or bed, 8 students said that the most important was that they could do the homework anywhere (of these, 1 specified "in the school playground" and 4, "outside home" and 2 "in the street"). 6 students highlighted the use of computer and 1 the use of mobile phone, 1 the IT issues, 1 the shortest time to complete the tasks and, finally, 1 the free time earned with this approach.

Could you incorporate this kind of assignment to your usual routines or usual screentime?

21 students (55.26%) answered “yes”, 2 students (5.26%) did not reply and 15 students (39.47%) said “no”.

The students that replied “yes” were also asked to explain in which routines they had been able to incorporate this kind of homework.

5 students explained that they took profit when they spend their usual time watching *youtube* or series, either right before or right after them, or combining both things. 4 students confirmed that the videos were incorporated to their usual mobile phone routines and 2 students to their usual computer time. Others highlighted the short time required for the tasks, which made it easier to incorporate them in their routines or the flexibility provided by the formatting (possibility to do the task outside home).

During the second phase of the study (experimental and control groups)

According to the diaries filled in by the participants, the most significant differences were found in the homework that was done in other classes (at school) and the tasks that were done at home together with the homework of other subjects. In the control group (traditional homework), in 15.67% of the instances, the students completed their tasks at school, during other lessons, while it was only done in 5.26% of the instances by the students in the experimental group. In 17.65% of the instances in the control group (traditional homework) the homework was incorporated by the students to their usual homework routine, doing the English task together with the homework of other subjects, while in the experimental group, which used flipped classroom, only in 5.26% of the instances these students did the homework at the same time that the traditional homework. Finally, the percentage of instances when the students did the homework outside home and outside school was similar in both groups and the incorporation of the homework to their usual screentime was slightly higher in the experimental group (flipped classroom), where in 14.04% of the instances the students incorporated the homework to their usual screentime, while in the control group it was done in 11.76% of the instances. It is to be noticed that the percentage of students that completed the homework was lower in the experimental group anyway. (See Annex 4, Table 5)

5.1.4 Student’s perceptions

How would you describe the homework that you are usually assigned? (traditional approach)

For 26 students, the traditional homework were “useful”, for 23 students they were “boring”, for 20 students the homework were “necessary”, for 19 they were “repetitive”, 13 students considered them “time-consuming” and “useless”, 2 students considered them “easy” and only 1 student considered them “fun”. (See Annex 4, Figure 19)

Usefulness of the homework

Before the implementation of the study, the traditional homework was considered “useful” for 35 of the students (83.33%), “useless” for 6 students (14.29%) and they were useful “sometimes” for 1 student (2.38%). (See Annex 4, Figure 20)

After the first phase of the study, 38 students were asked about the usefulness of the videos. 36 students (94.74%) answered that the videos had been useful and 2 students (5.26%) did not reply. These results indicate that the students found the videos more useful and that this task was more meaningful for them. (See Annex 4, Figure 21)

Which kind of homework is more useful for you?

Before the implementation of the study the students were asked which kind of tasks they considered to be the most useful homework regardless of the fact that they were usually assigned this kind of task or not. According to the students’ answers, and from most to least important, these tasks were: watching films, preparing oral presentations, workbook exercises, watching short videos (<20 min.), short readings (≤10 pages), writing (composition), preparing projects (at home), reading (books), watching video tutorials and “other” (speaking). (See Annex 4, Figure 22)

Would the readings or videos/films be more useful with a comprehension questionnaire?

34 students (80.95%) replied “yes”, only 1 (2.38%) replied “no”, 6 participants (14.29%) did not reply and 1 (2.38%) said that it depended on the difficulty of the questionnaire. (See Annex 4, Figure 23)

5.1.4 Student’s routines

Before the study (traditional approach)

When you do your English homework, how long does it take every time as average?

The average time was 33 minutes. 6 students didn’t provide an exact amount of time (they replied “I don’t know” or “little/much time”), so the results were based on 36 quantitative answers:

During the first phase of the study (flipped classroom approach)

With which device did you watch the videos?

The videos were watched by the students using their mobile phones (15 students; 39.47%), computers or laptop (8 students; 21.05%) and iphone (1 student; 2.63%). Some students used two different devices: the mobile phone sometimes and also the computer (8 students; 21.05%). Finally there was 1 student (2.63%) that did not use any device because he did not see any of the videos.

Moreover, 26 students downloaded the application to watch the videos from their mobile phone.

Have you watched any of the videos outside home?

13 students (34.21%) did all the tasks at home, 1 student (2.63%) did not reply and 24 students (63.16%) confirmed that they had watched some of the videos outside home. Of the latter, 11 students (28.95%) had watched the videos in the school, 7 (18.42%) at relatives or friends' house, 5 (13.16%) in the street, 1 (2.63%) at their father's work, 1 (2.63%) in a football training, and 1 (2.63%) in the library.

Did you take notes on the grammar explanations or of your doubts while watching the videos?

Only 9 of the students (23.68%) answered that they had taken notes, 24 (63.16%) said that they did not take notes, and 5 students (13.16%) did not reply.

Did you watch any of the videos more than once?

Only 4 of the students (10.53%) answered that they had taken notes, 24 (63.16%) said that they did not take notes, and 5 students (13.16%) did not reply. They explained that they had watched the grammar videos again to prepare for the exam.

5.2 Students' screentime and routines

5.2.1 Use of devices

The students were asked how many hours they used the mobile phone or computer at home. 1 student (2.38%) answered that he never used them at home, but he did use the mobile phone in the street. 1 student (2.38%) used them between 0 and 1 hour, 4 students (9.52%) between 2 and 3 hours, 3 students (7.14%) between 3 and 4 hours, 3 students (7.14%) said that they used them 5 hours and 22 students, more than 5 hours.

8 students were included in “other” because they replied “as much as I can”, “a lot” or “sometimes”, which could not be quantified. (See Annex 4, Figure 24)

5.2.2 Videos

The students were also asked about their routines regarding videos. According to the results, 40 students (95.24%) usually watched videos at home with their mobile phone or computer and only 2 students (4.76%) never watched videos at home. Moreover, 30 students (71.43%) answered that they also watched videos outside home, and 12 students (28.57%) never watched videos outside home.

Regarding the main characteristics of the videos, the students were asked about the length of the videos that they usually watch, and the length of the longest videos they watch. The first question (length of the usual videos) was not replied by 4 of the students, so the average was based on 38 answers. The average was 20 minutes. (See Annex 4, Figures 25-26)

The second question (length of the longest videos) was not replied by 1 of the students, so the average was based on 41 answers. The average was 53 minutes. (See Annex 4, Figures 27-28)

5.3 Flipped classroom approach

5.3.1 Students' perceptions

What do you think about having more time for assessed practice in class?

6 students (15.79%) replied that it was “better”, 13 students (34.21%) replied that it was “great” or “very good”, 12 students (31.58%) said that it was “good”, 2 students (5.26%) said “a lot better”; for 1 student (2.36%) it was “important”, for 4 students (10.53%) it was “easier to learn” like this. Moreover, 6 of the students also added that it was good to sort out their doubts and 3 added that it was fun.

Perceptions of the flipped classroom approach compared to the previous (traditional) methodology with which the students were taught

The answers of the sample were analysed and provided separately in the statistics (in case any significant difference was detected) and they were also analysed as a whole. The students were asked about their involvement in the unit, their motivation, their contents acquisition, having fun, their organisation of homework, the help they received

from the teacher during class time, interaction with their classmates, active learning, if the sessions seemed longer or shorter, if they thought that time had been used better, if they received. Overall, the answers were positive, and the main problems were found in the organisation of the homework. (See Annex 4, Figures 29-38)

6. Conclusion

6.1 Results

Even though the performance of the students regarding their frequency of doing the homework was increased with the implementation of the flipped classroom methodology, compared to their previous performances, the results also indicate that this improvement can be linked to how the time was spent in class (using ICT, implementing more dynamic activities, boosting peer interaction, etc.) more than the fact of assigning tasks in video formatting as homework. Although providing videos (or even readings or other material) that could be done with the mobile phone or laptop is a flexible way to improve the students' routine of doing the homework, their intrinsic motivations for doing the assignments involve and require more actions.

Homework is always seen as “work” for the students and during the implementation of the study, the same problems that can occur to have students performing tasks at home with a traditional teaching arose with the flipped classroom approach. In the latter case, if the contents of the lesson are only taught in the homework assignments, the students that do not do the homework could moreover feel lost during class time and miss the opportunity to put the contents into practice. To avoid this, the students that do not do the task at home have to be allowed a space and time in class to watch the videos, which could disturb the normal functioning of the class during the first 10 minutes of the lessons that are already short in the Catalan educational system. It is also to be taken into account that some students still have problems to afford devices or access internet connection outside school and, as observed during the study, they mainly refuse to ask for the resources of the school (library or computers room).

The flipped classroom has been proved to improve the classroom time management but at the student level, the focus of study time management should be put in the improvement of students' ability in learning to learn than in the place, moment or material through which the learning occurs. Nowadays' students use mobile phones, laptops and all kind of devices daily and through an impressive amount of time (in the questionnaires, most students literally wrote that they used their mobile phones 24 hours a day). But still, they are not instructed at school on how to maximize their use as learning tools.

The flipped classroom is an approach that allows an assessed but at the same time self-directed learning through ICT. It is the best tool to instruct students on learning to learn competence because most of the knowledge outside of the school time and walls is available today through the use of these devices. Its best implementation in Catalonia, where few studies have been conducted so far, would require first of all a period of adaptation from the students. But also, as the problems with most of the students that did not do the homework usually were not addressed, and taking profit of the extra time earned in class with this approach, an option could be to implement this approach letting the students do their assignments during school time. Like this, homework issues could be addressed, students that do not do the assignments at home would not be lost or left behind, and the students would have an assessed study time added to their assessed practice. According to the experts, for that, the schools should be prepared and provide spaces that boost this kind of learning.

6.2 Achievement of objectives

Although a wide range of new questions appeared during the implementation of the study, the main questions were answered and all the instruments could be used. First of all, the results showed that the flipped classroom approach helped the students that did their homework to save time (or, what is the same, earn free time), incorporate the homework to their usual screentime and provide a flexible way to perform the task. However, according to the data collected during the procedure, the flipped classroom is not the solution for students that are not into the habit of doing the homework or for those who just do not want to do them. Moreover it could also be confirmed that the class time management and the motivation from students improved significantly.

6.3 Contributions and new lines of research

In Catalonia there are still few studies conducted on the topic, specially the implementation of the flipped classroom in high schools. At an international level there is also a lack of studies focusing on student time management or on student learning to learn competence and how to implement it to promote this competence, where new lines of investigation could be opened.

6.4 Limitations

The participants of the study had never been taught with the flipped classroom approach, they had never used the platform “Edpuzzle” and they were not trained to watch the videos effectively. For that, an amount of time is required that was one of the main limitations of the study.

The study used a sample of one single school. A randomised macro sample from different high schools and areas of Catalonia would have provided more reliable data. Moreover, the students were divided in different groups according to their level of English, which made the control groups non-comparable.

7. References

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8. Annexes

8.1 Annex 1: Placement test

1 () 's your name? **Thomas**

- a- How b-Who c-What d- Where

2 **This is Lucy and her brother, Dan. () My friends.**

- a-We're b-I'm c-You're d-They're

3 ()? **I'm from Italy.**

- a- Where are you from? b- Where you are from? c- Where from you are? d- From where you are?

4 **I'm from Milan. () is in Italy.**

- a- They b-It c-He d-She

5 **Excuse me, how () your last name? R-I-L-E-Y**

- a- spell b-you spell c- do you spell d- spell you

6 **Oh, () are my keys.**

- a- This b-These c-That d- It

7 **I'd like () omelette, please.**

- a-a b- c-an d-Wo

8 **And here is your ().**

- a- desk b-desks c-a desk d-an desk

9 **My name's Pete and this is Sylvia. () doctors from france.**

- a-I'm b-We're c-She's d-They're

10. **Sorry, (). My name's Eric.**

- a-I isn't b- I is not c- I aren't d- I'm not

11 ()? **No, he isn't.**

- a-Are they teacher b-Are your from Italy c-Is Mr Banning a teacher d-Is this your phone

12 () **is the school? It's 50 years old.**

- a-How many year b-How much years c-What year d-How old

13 **What is ()?**

- a-Job Mary b-Mary Job c-Mary's job d-Job's Mary

14 **Your bag is next () the table.**

- a-on b-to c-in d-of

15 () **are the keys? On the table.**

- a-What b-When c- Where d-Who

16 I go to work () train.

a-with b-by c-for d- in

17 She () a dog.

a-not have b-don't have c-don't has d-doesn't have

18 Stephen () in our company.

a-work b-works c-is work d-working

19 () he live in London?

a-Are b-Is c-Do d-Does

20 () to the cinema.

a-We not often go b-We don't go often c-We don't often go d-Often we do't go

21 When do you play tennis? () Monday.

a-On b- In c-At d-By

22 What time () work?

a-start she b-do he starts c-does she starts d-does he start

23 () two airports in the city.

a-It is b-There is c-There are d-This is

24 There aren't () here.

a-a resturant b-any resturants c-any restaurant d-a restaurant

25 I'm afraid it's ().

a-a hotel expensive b-expensive hotel c-expensive a hotel d-an expensive hotel

26 They () popular TV programmes in the 1980s.

a-are b-were c-was d-is

27 () at school last week?

a-Do you where b-Was you c-Were you d-You where

28 Brat Pitt is a popular actor but I don't like ().

a-him b-his c-her d-them

29 We () the film last week.

a-see b-saw c-sees d-were see

30 He () tennis with me yesterday.

a-doesn't played b-didn't played c-not played d-didn't play

31 She was born () May 6th, 1979.

a-in b-at c-on d-from

32 Where () last summer?

- a-you went b-did you went c-did you go d-do you went
- 33 Were you at the shop at 5 p.m. yesterday? No, I ()**
- a-didn't b-am c-wasn't d-weren't
- 34 Excuse me, () is the T-shirt? It's £25.99.**
- a-what expensive b-How much c-How many d-How price
- 35 She is only four but she ()**
- a-can read b-cans read c-can reads d- cans reads
- 36 This part is boring. We () a goodtime.**
- a-don't have b-aren't having c-don't having d-aren't have
- 37 Sorry, I () you at the moment.**
- a-can't help b-don't can help c-can't helping d-can't helps
- 38 I () my computer very often.**
- a-am not using b-don't use c-doesn't use d-am not use
- 39 It's my mum's birthday next week. I () her a present.**
- a-buy b-buys c-am going to buy d-buying
- 40 What () do after school today?**
- a-are you going to b-are you c-do you d-you

8.2 Annex 2: Pre-study questionnaire

When you don't do the homework, which is the main reason? _____

Do you find doing the English homework useful? Yes No

Which kind of homework is more useful for you? (kindly cyrcle your answers)

Workbook exercises	Reading (books)*
Writing (composition)	Short readings ≤ 10 pàgs.*
Watching films*	Preparing projects (at home)
Watching video tutorials*	Preparing oral presentations
Watching short videos < 20 min.*	Other (speaking)

*would it be more useful with a comprehension questionnaire? Yes No

How would you describe the homework that you are usually assigned?

Useful	Boring
Useless	Easy
Tough	Repetitive
Fun	Time consuming
Difficult	Necessary

When you do your English homework, how long does it take every time as average? _____

How much time do you use your mobile phone or computer **at home** every day? _____

Do you use your mobile phone or computer **at home** to watch videos (series, tutorials, *youtubers*, etc.)? Yes No

And in other places? Yes No

How long are the videos that you usually watch? _____

How long are the longest videos that you usually watch? _____

8.3 Annex 3: Post-study questionnaire

Which were the most important factors that made you do the homework?

Most important = 1/ Least important = 10

To pass the unit		They were easy	
The video format		The teacher	
They were short		They could be done with mobile phone/computer	
The topic		They could be done outside home	
To learn more		Other:	

Which was the main reason for the videos that you didn't watch or the ones that you watched later? _____

With which device did you watch the videos? _____

Did you download *Edpuzzle* Application?

 YES

 NO

Have you watched any of the videos outside home?

 YES

 NO

If "YES": Where? _____

Do you think that the videos were **useful**?

 YES

 NO

What do you think about having more time for assessed practice in class?

Did you do the homework in the same place and moment as if they had been traditional tasks?

 YES

 NO

If "NO": What changed? _____

Could you incorporate this kind of assignment to your usual routines or usual screentime?

 YES

 NO

If "YES": Kindly explain in which routines: _____

Could you incorporate this kind of assignment to your usual routines or usual screentime?

 YES

 NO

If "YES": Kindly explain in which routines: _____

Did you take notes on the grammar explanations or of your doubts while watching the videos?

 YES

 NO

Did you watch any of the videos more than once?

 YES

 NO

If "YES": Which and why? _____

Which of these phrases describe your perceptions about this methodology? (compared to the traditional one)

I got more involved with the unit	<input type="checkbox"/>	I felt that time ran faster	<input type="checkbox"/>
I got less involved with the unit	<input type="checkbox"/>	I felt that time ran slower	<input type="checkbox"/>
I felt more motivated	<input type="checkbox"/>	I took more advantage of class time	<input type="checkbox"/>
I felt less motivated	<input type="checkbox"/>	I took less advantage of class time	<input type="checkbox"/>
I learned more	<input type="checkbox"/>	I had more help (and corrections) from the teacher	<input type="checkbox"/>
I learned less	<input type="checkbox"/>	I had less help (and corrections) from the teacher	<input type="checkbox"/>
I had more fun	<input type="checkbox"/>	I could interact more with my classmates	<input type="checkbox"/>
I had less fun	<input type="checkbox"/>	I could interact less with my classmates	<input type="checkbox"/>
I could organise homework more easily	<input type="checkbox"/>	I learned through a more active way	<input type="checkbox"/>
I had more difficulties to organise homework	<input type="checkbox"/>	I learned through a more passive way	<input type="checkbox"/>

8.4 Annex 4: Tables and figures

8.4.1 Homework: frequency with which the students did the homework

Before the study (traditional approach)

Table 1: Number of students that completed the assignments (previous performance)

Assignment #	41 (Nr of students)		42 (Nr of students)	
	Done	Not done	Done	Not done
1	14	3	2	8
2	5	3	5	8
3	2	6	4	8
4	13	3	11	4
5	6	7	3	14
6	4	12	12	5
7	4	12	10	7
8	5	9	7	10
9	9	3	10	8
10	5	12	7	11
11	11	6	11	6
12	10	3	10	10
13	13	3	8	10

Figure 1: Number of students that completed the assignments (previous performance) in group 41

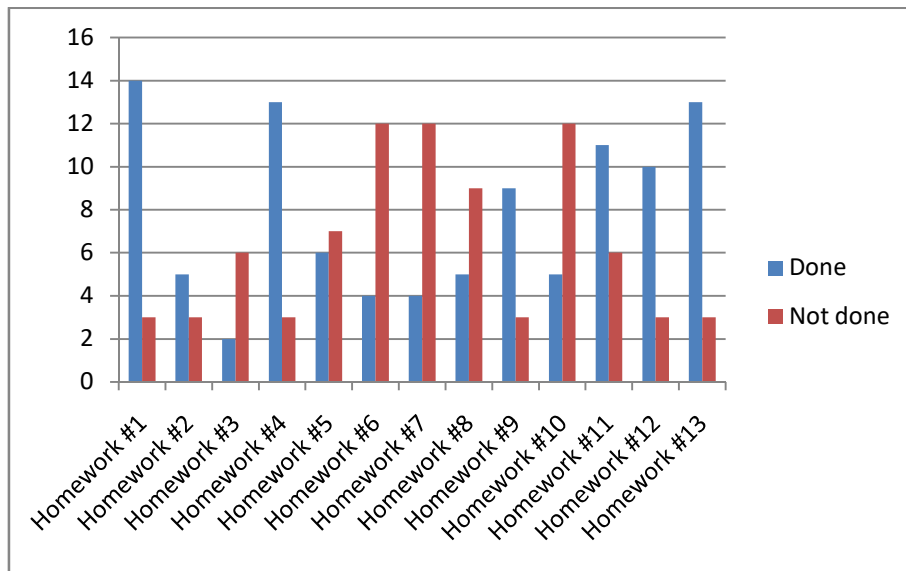


Figure 2: Number of students that completed the assignments (previous performance) in group 42

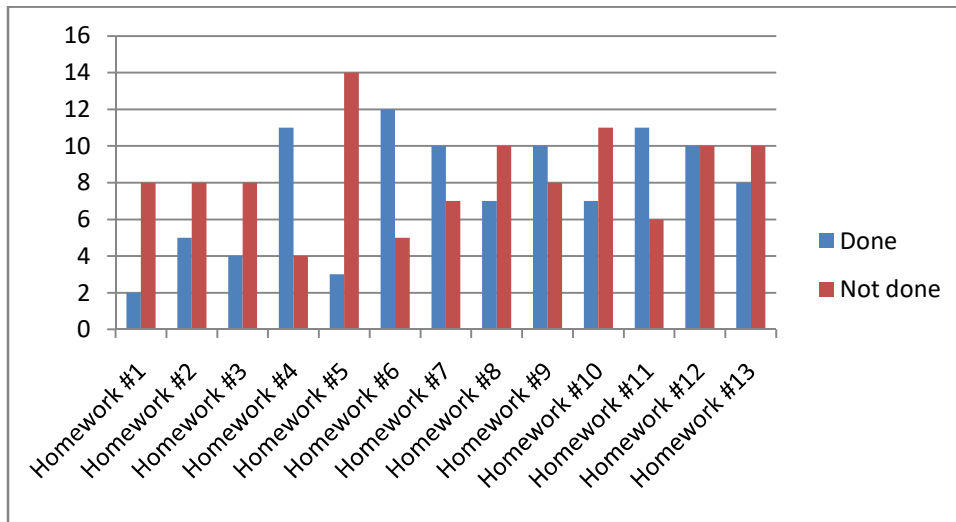


Figure 3: Number of students that completed the assignments (previous performance) in group 43

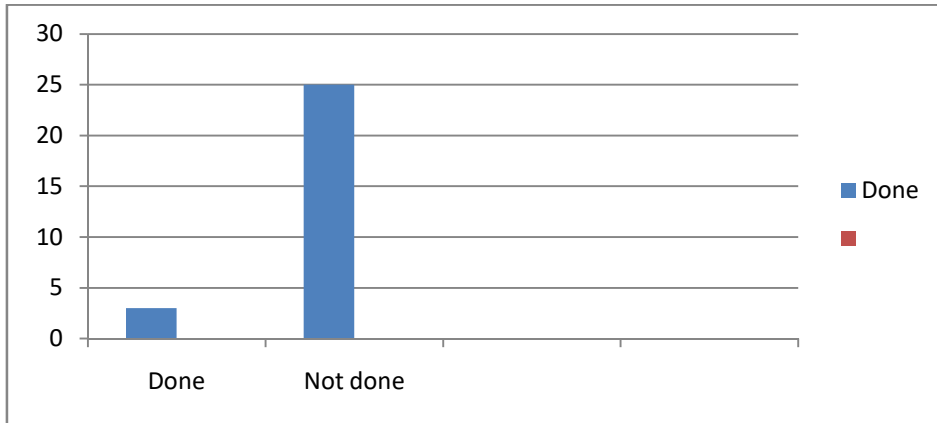


Figure 4: Percentage of completed assignments (previous performance) in group 41

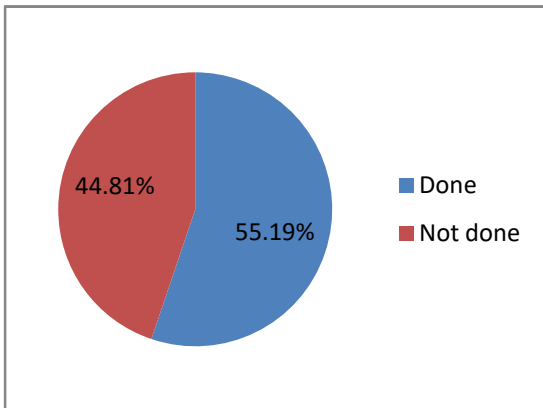


Figure 5: Percentage of completed assignments (previous performance) in group 42

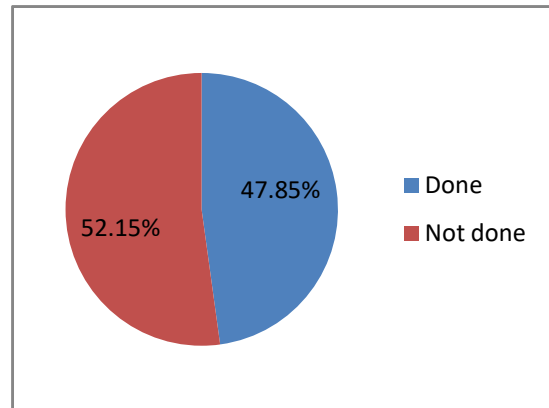
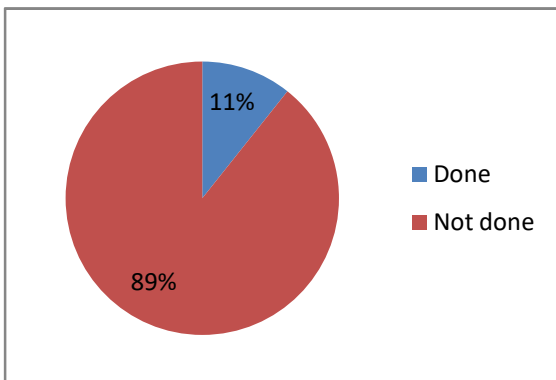


Figure 6: Percentage of completed assignments (previous performance) in group 43



During the first phase of the study (flipped classroom approach)

Table 2: Number of students that completed the assignments (performance during the first phase of the study)

Assignment #	41 (Nr of students)		42 (Nr of students)		43 (Nr of students)	
	Done	On time	Done	On time	Done	On time
1	15	8	13	8	5	3
2	15	6	11	8	5	3
3	15	15	14	9	1	0
4	11	8	9	8	3	3
5	11	6	9	8	2	1
6	14	2	11	8	2	0
7	10	1	10	8	2	2
8	12	5	10	8	2	2
9	8	3	9	7	0	0

Figure 7: Number of students that completed the assignments (flipped classroom) in groups 41, 42 and 43

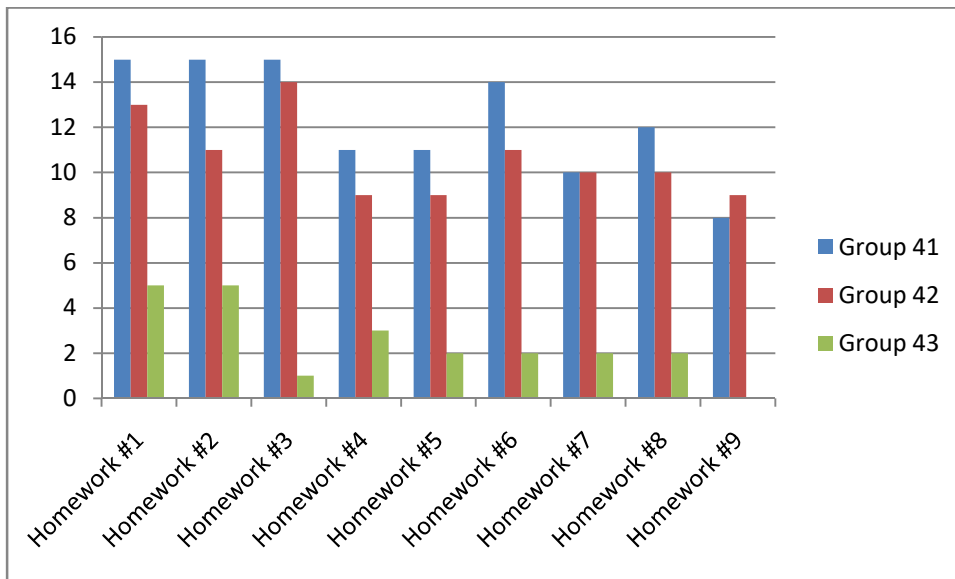


Figure 8: Percentage of completed assignments (flipped classroom) in group 41

Figure 9: Percentage of completed assignments (flipped classroom) in group 42

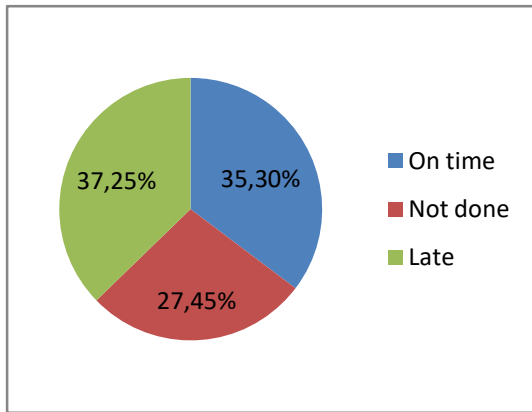


Figure 10: Percentage of completed assignments (flipped classroom) in group 43

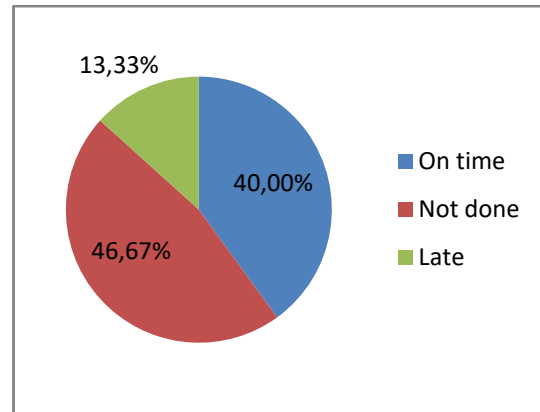
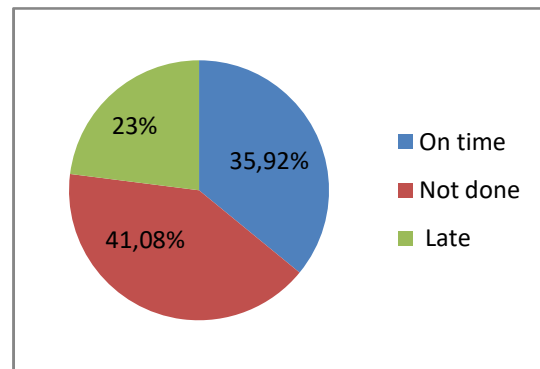
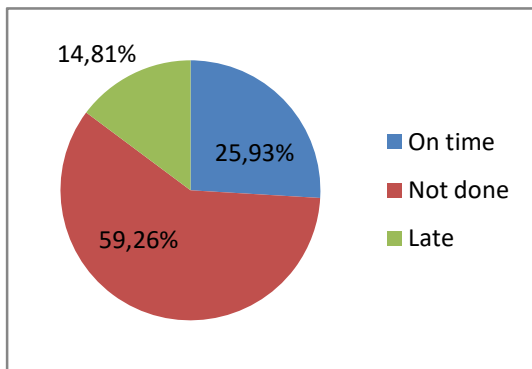


Figure 10: Global percentage of completed assignments (flipped classroom)



During the second phase of the study (experimental and control groups)

Table 3: Number and percentage of students that completed the assignments (performance during the second phase of the study)

Assignment #01	41		42			
	Done	Not done	Done			Not done
			On time	Late	Total	
	14 (82.35%)	3 (17.65%)	5 (26.315%)	5 (26.315%)	10 (52.63%)	9 (47.37%)
Assignment #02	41		42			
	Done	Not done	Done			Not done
			On time	Late	Total	

	11 (64.71 %)	6 (35.29%)	7 (36.84%)	3 (15.79%)	10 (52.63%)	9 (47.37%)
Assignment #03	41		42			
	Done	Not done	Done			Not done
			On time	Late	Total	
	12 (70.59 %)	5 (29.41%)	8 (42.11%)	2 (10.53)	10 (52.63%)	9 (47.37%)

Figure 11: Percentage of students that completed the assignments (flipped classroom) in groups 41 (control group) and 42 (experimental group)

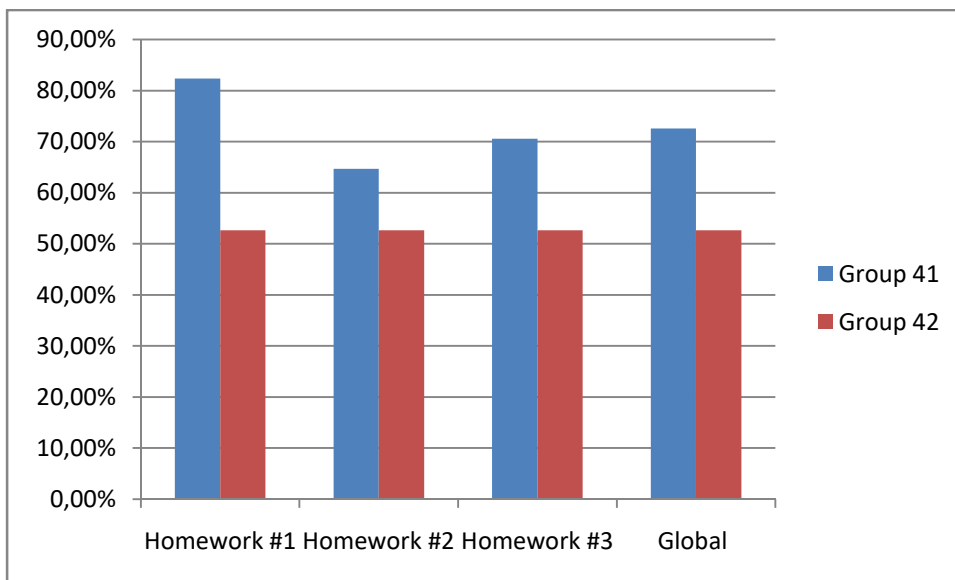
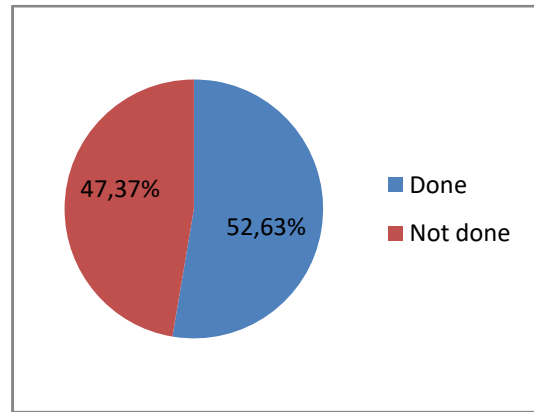
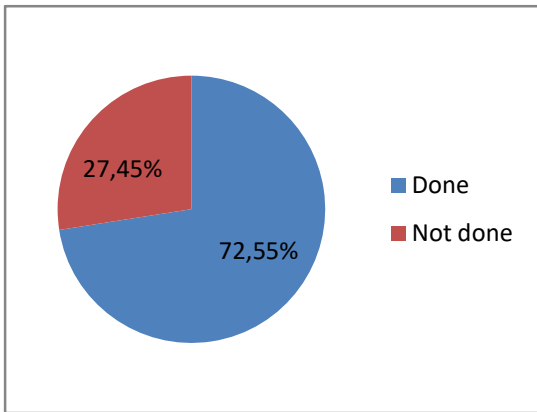


Figure 12: Percentage of completed assignments (flipped classroom) in group 41 (control group)

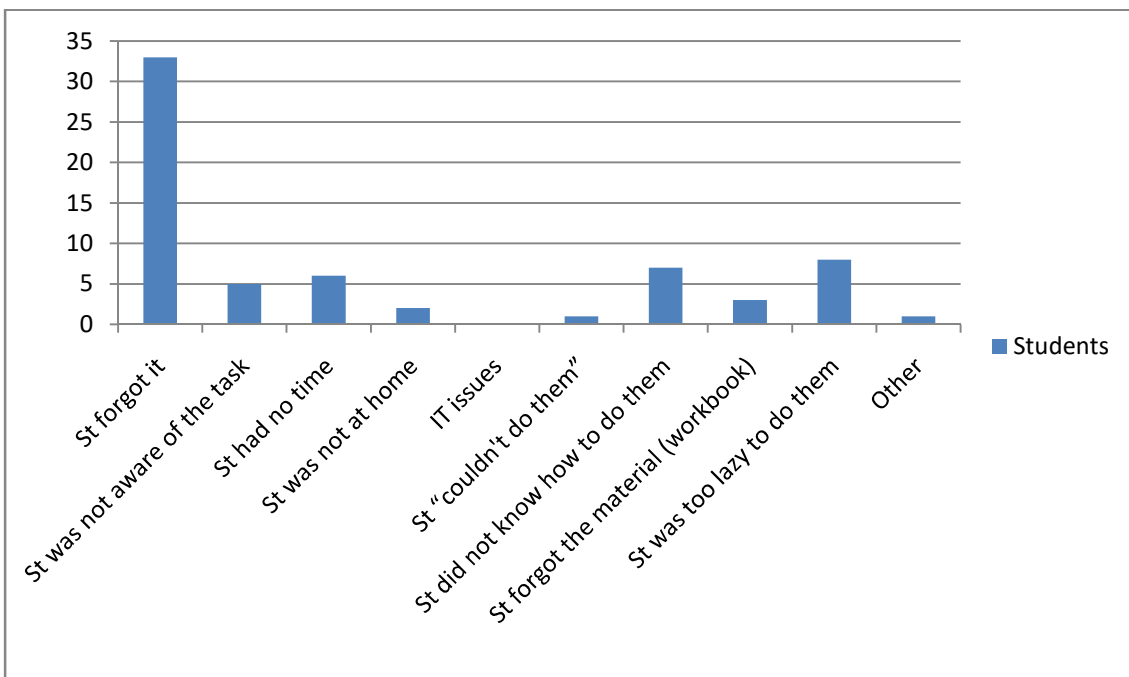
Figure 13: Percentage of completed assignments (flipped classroom) in group 42 (experimental group)



8.4.2 Homework: Main reasons why homework was not done

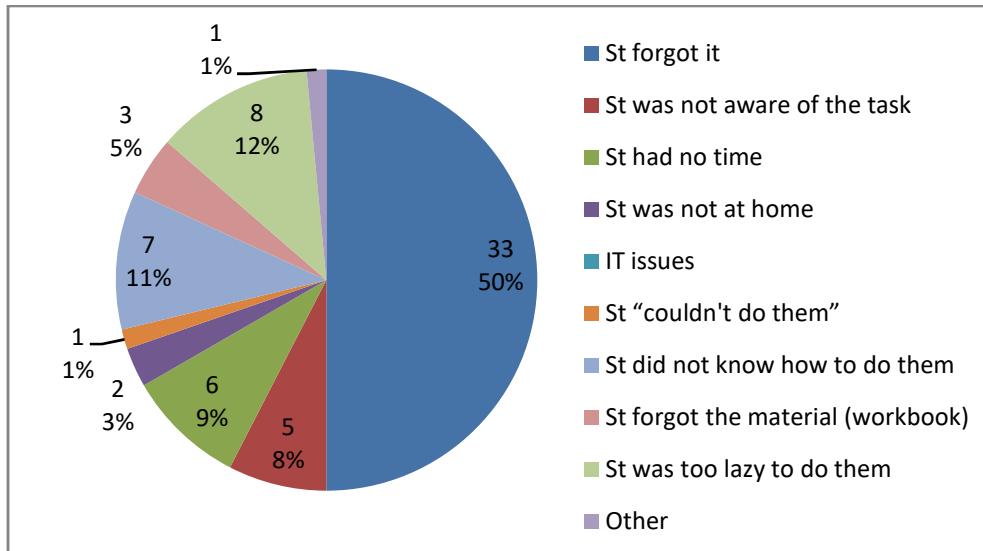
Before the study (traditional approach)

Figure 14: Main reasons why the students did not do the homework, per number of students (traditional approach)



St = Student

Figure 15: Percentage of the incidence of the main reasons why the students did not do the homework and number of students that gave these answers (traditional approach)



During the first phase of the study (flipped classroom approach)

Figure 16: Main reasons why the students did not do the homework, per number of students (flipped classroom)

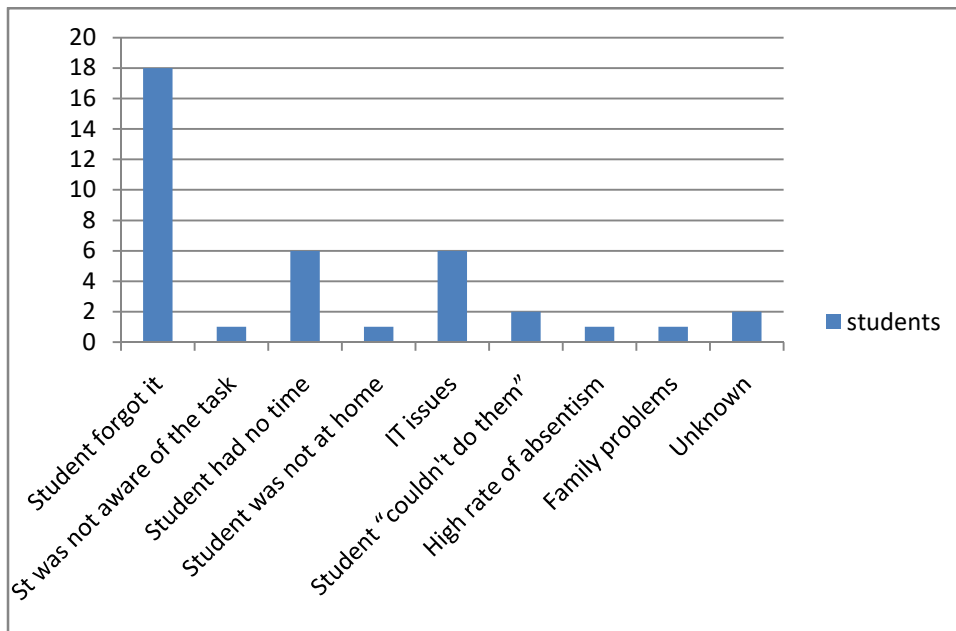
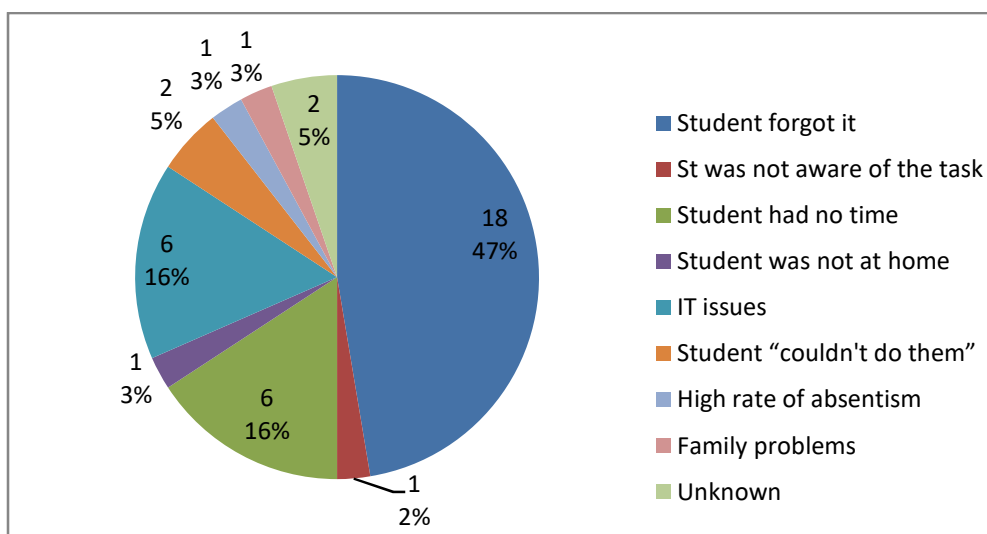


Figure 17: Percentage of the incidence of the main reasons why the students did not do the homework and number of students that gave these answers (traditional approach)



During the second phase of the study (experimental and control groups)

Table 4: Incidence of reasons provided by the students when they did not do the homework (experimental and control groups)

	41	42
Forgotten:	3 (5.88%)	6 (10.53%)
Time:	6 (11.76%)	2 (3.51%)
Did not know:	1 (1.96%)	3 (5.26%)
Other:	4 (7.84%)	13 (22.81)
IT issues:	0 (0%)	3 (5.26%)

Figure 18: Percentage of students according to the reasons provided for not doing the homework

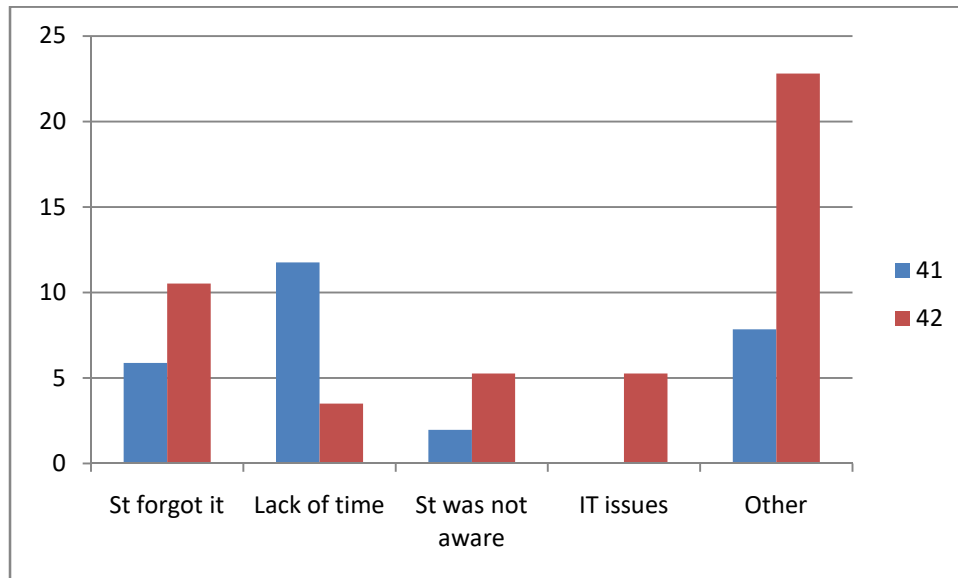
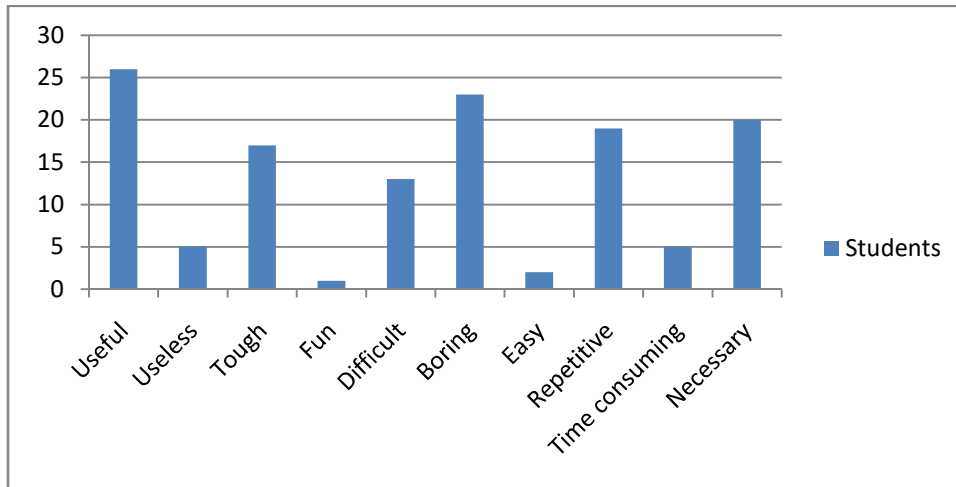


Table 5: Incidence of places and moment provided by the students when they did homework (experimental and control groups)

	41	42
Other classes:	8 (15.67%)	3 (5.26%)
Other homework:	9 (17.65%)	3 (5.26%)
Outside home/school:	1 (1.96%) –car-	1 (1.75%)
Screentime:	6 (11.76%)	8 (14.04%)
Other:	13 (25.49%)	26.31%

8.4.3 Homework: Students' perceptions

Figure 19: Adjectives that describe the traditional homework, per number of students



Usefulness of homework

Figure 20: Usefulness of traditional homework according to students' perceptions, per number of students

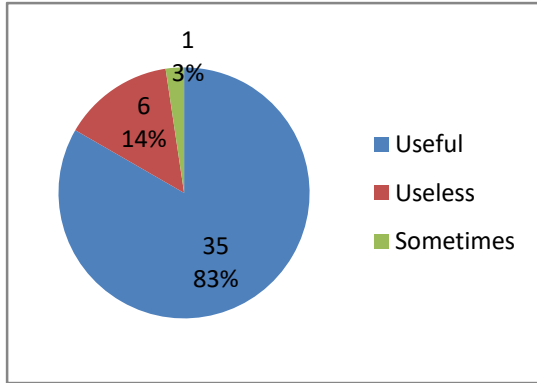


Figure 21: Usefulness of the videos assigned during the flipped classroom approach according to students' perceptions, per number of students

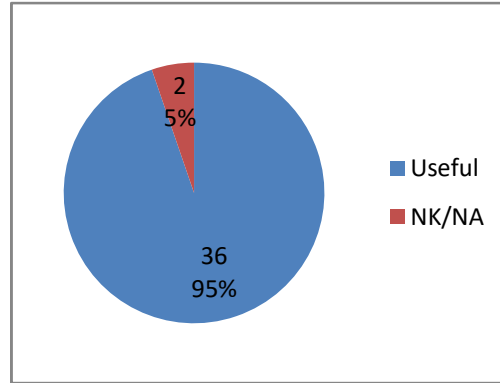


Figure 22: Most useful kinds of homework according to students' perceptions, per number of students

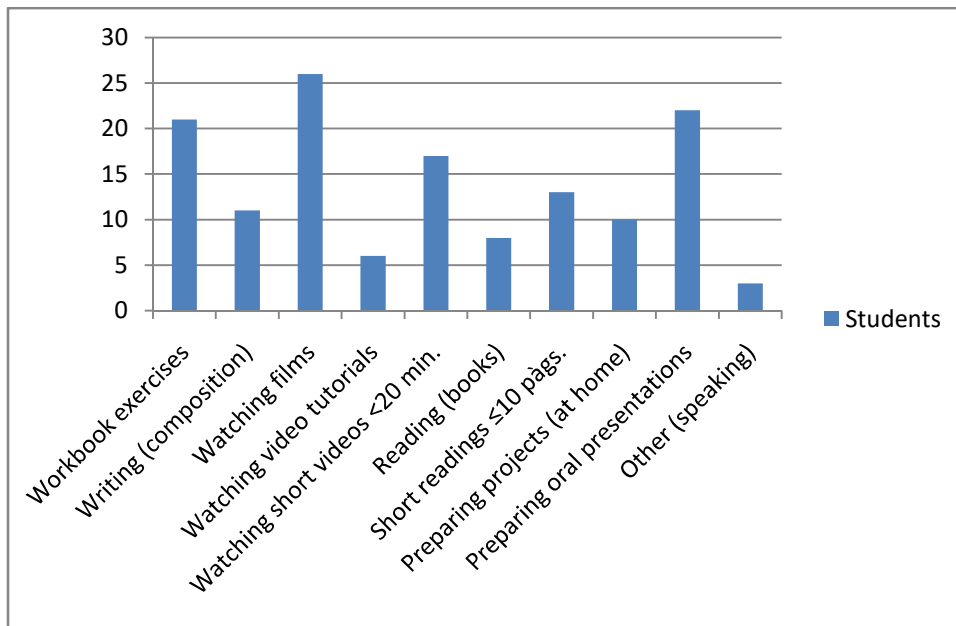
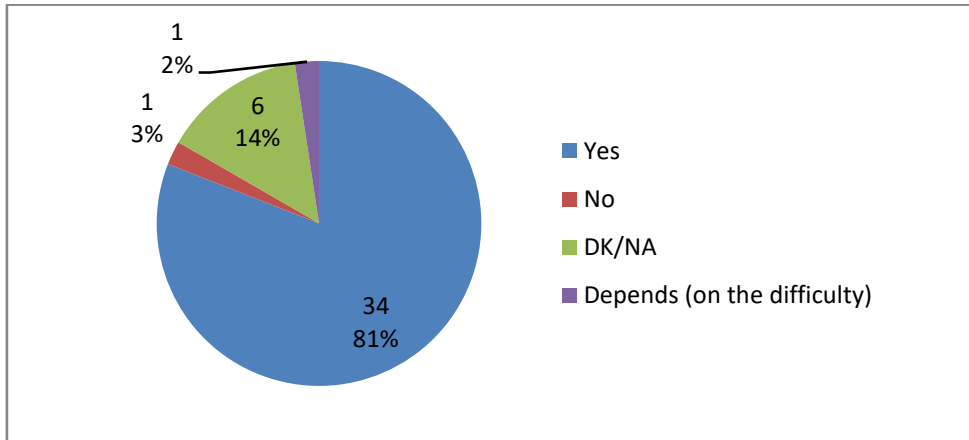


Figure 23: Usefulness of questionnaires in audiovisual and reading material according to students' perceptions, per number of students



8.4.4 Screentime: Use of devices

Figure 24: Students' use of devices at home, in hours, per number and percentage of students

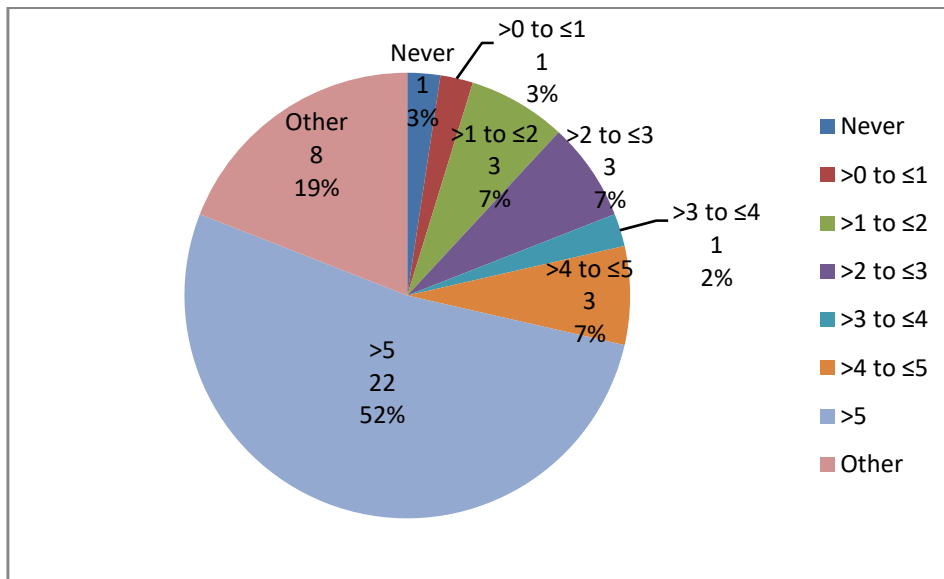


Figure 25: Length (in minutes) of the usual videos watched by the students, per number of students

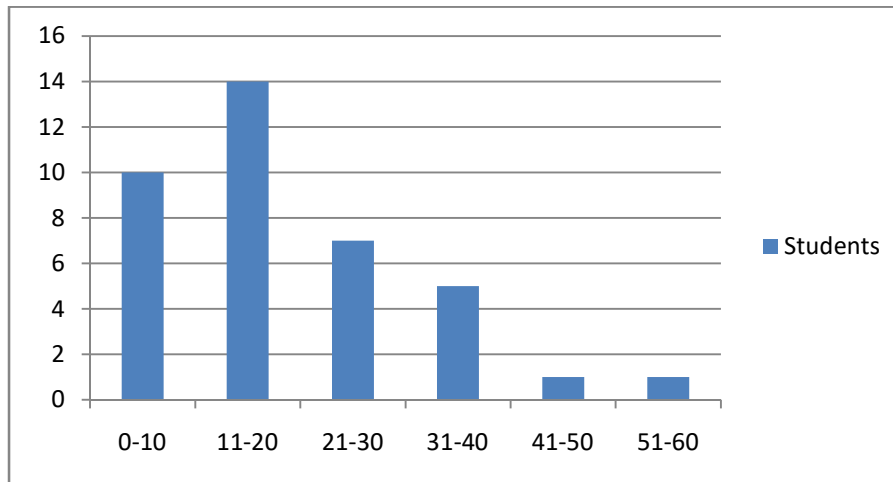


Figure 26: Length (in minutes) of the usual videos watched by the students, per number and percentage of students

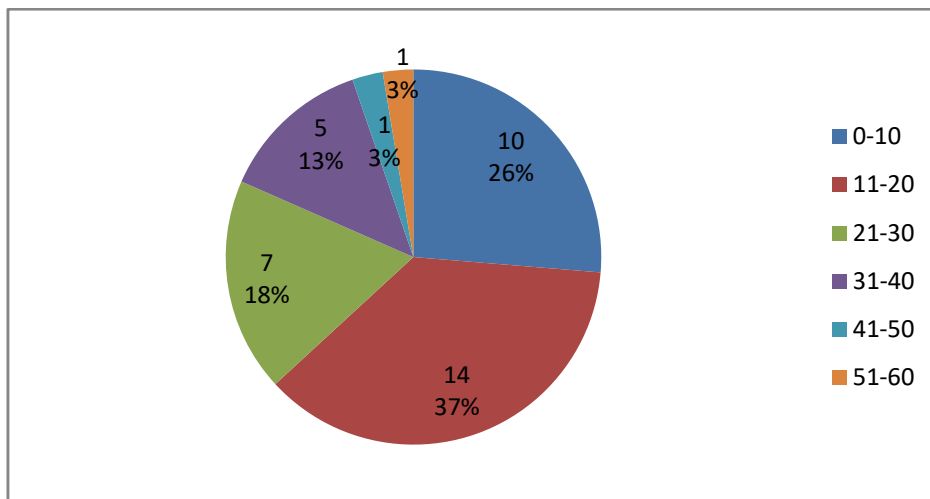


Figure 27: Length (in minutes) of the longest videos watched by the students, per number of students

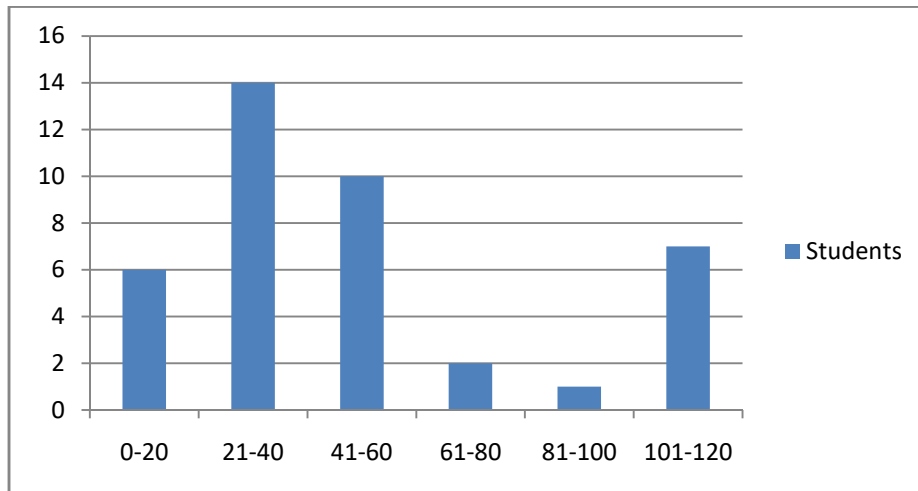
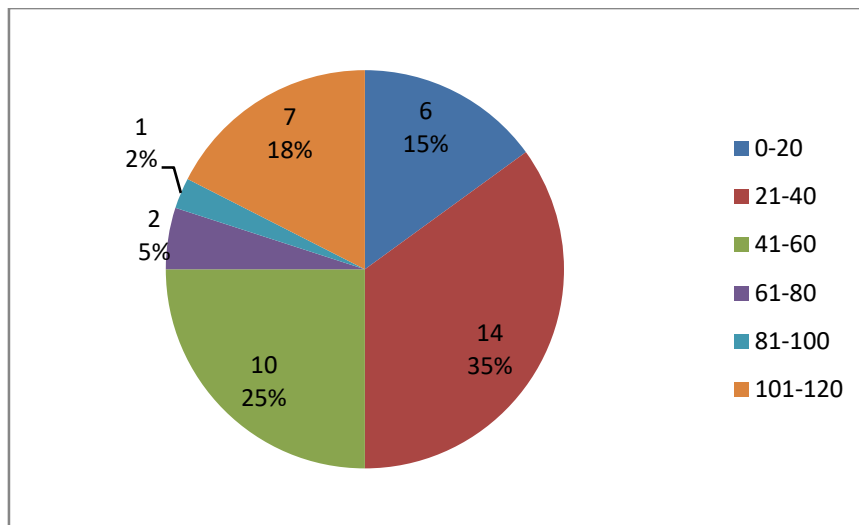


Figure 28: Length (in minutes) of the usual videos watched by the students, per number and percentage of students



8.4.5 Flipped classroom: Students' perceptions

Figure 29: Students' perceptions about having fun (compared to the traditional approach), in percentage of students

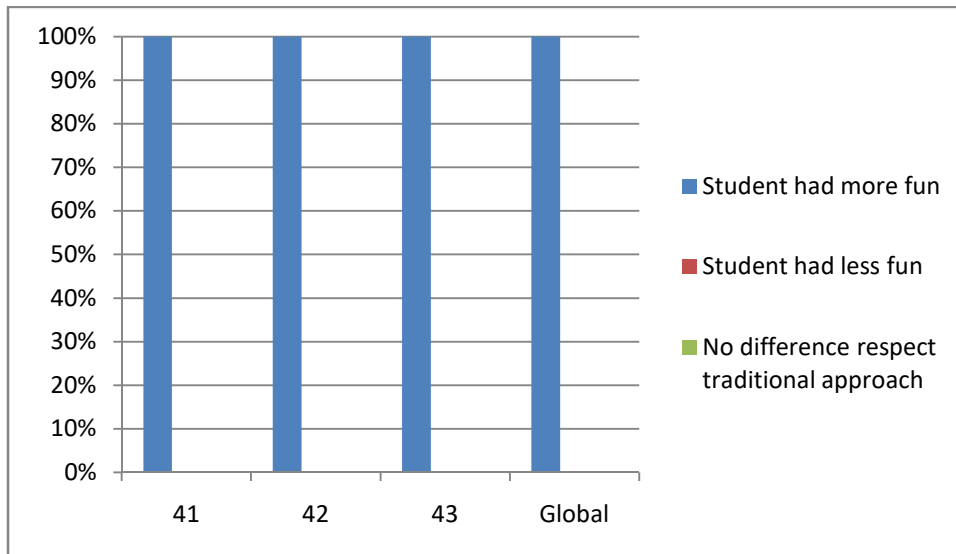


Figure 30: Students' perceptions about their own involvement and participation (compared to the traditional approach), in percentage of students

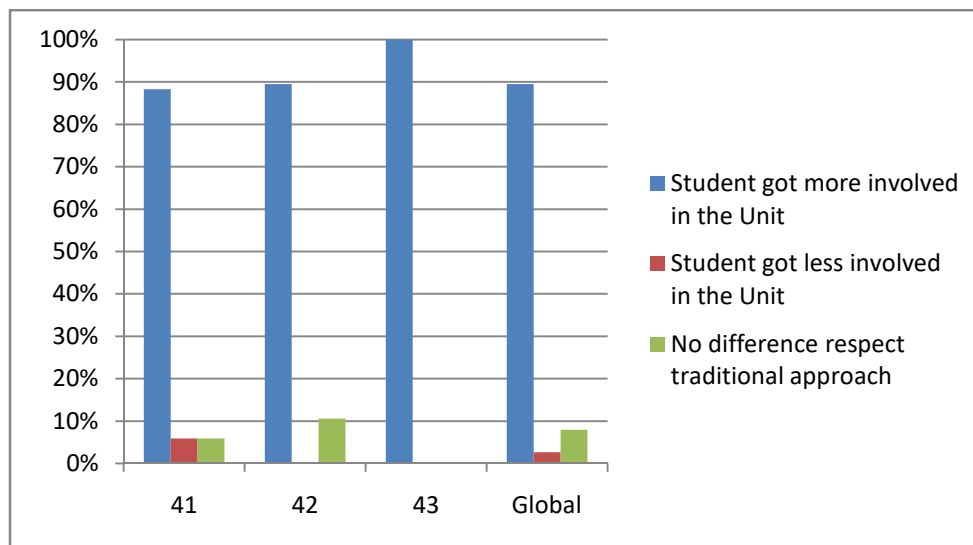


Figure 31: Students' perceptions about their own motivation (compared to the traditional approach), in percentage of students

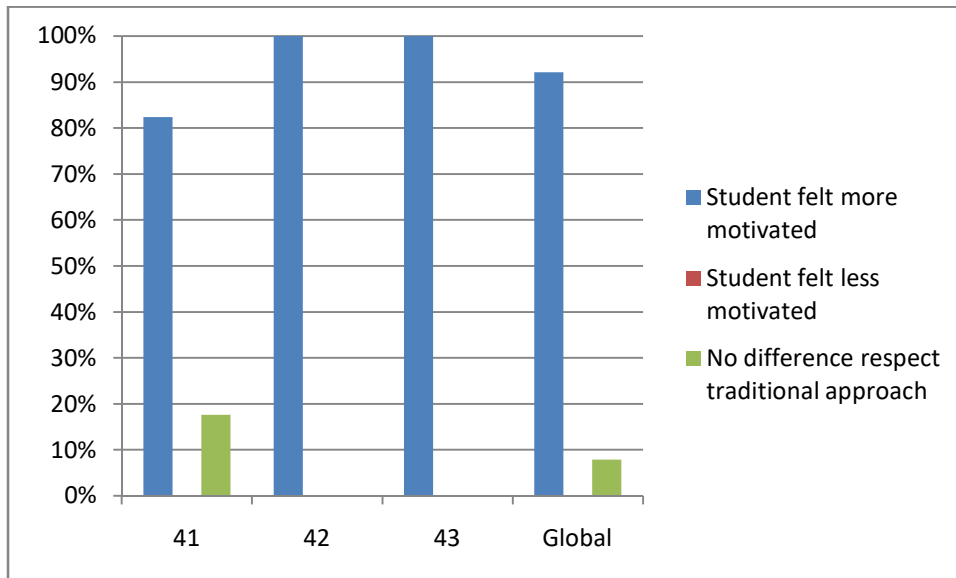


Figure 32: Students' perceptions about their own learning and acquisition of contents (compared to the traditional approach), in percentage of students

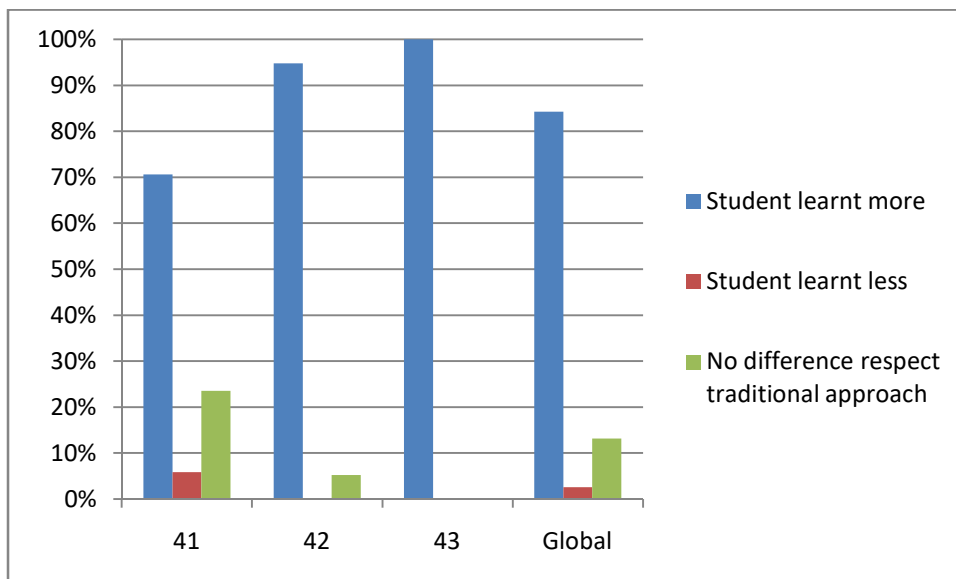


Figure 33: Students' perceptions about their organisation of homework (compared to the traditional approach), in percentage of students

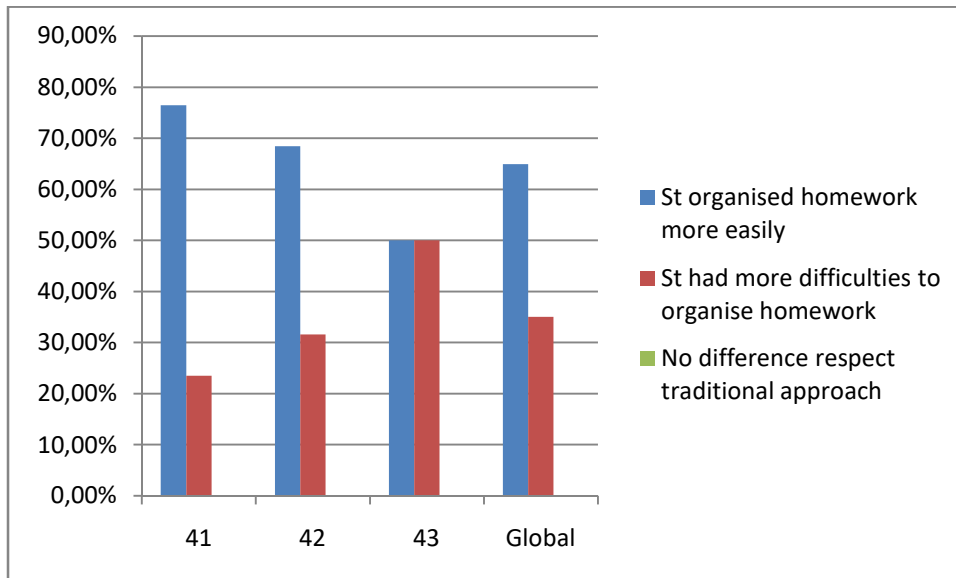


Figure 34: Students' perceptions about time in class (compared to the traditional approach), in percentage of students

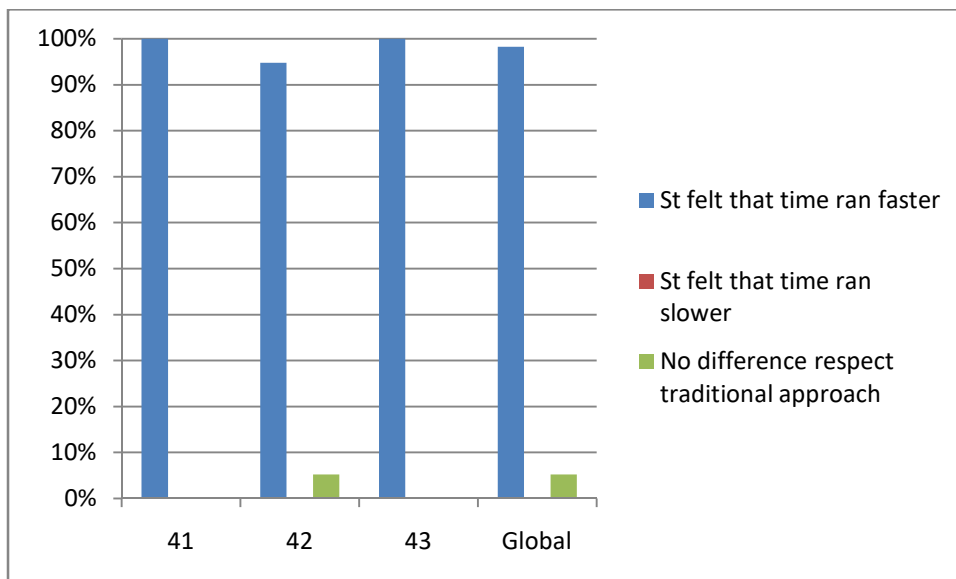


Figure 35: Students' perceptions about time how they took profit of the class time (compared to the traditional approach), in percentage of students

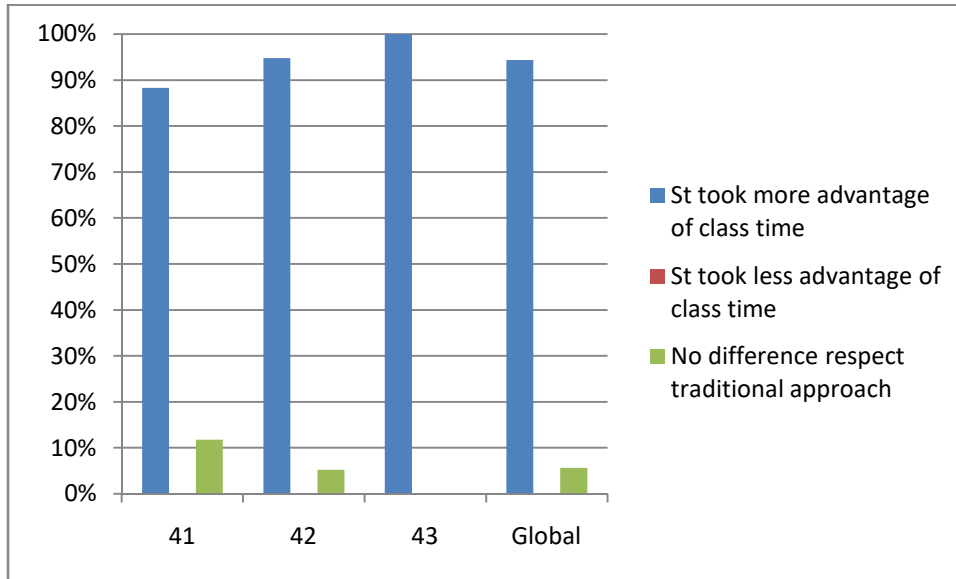


Figure 36: Students' perceptions about help received from the teacher (compared to the traditional approach), in percentage of students

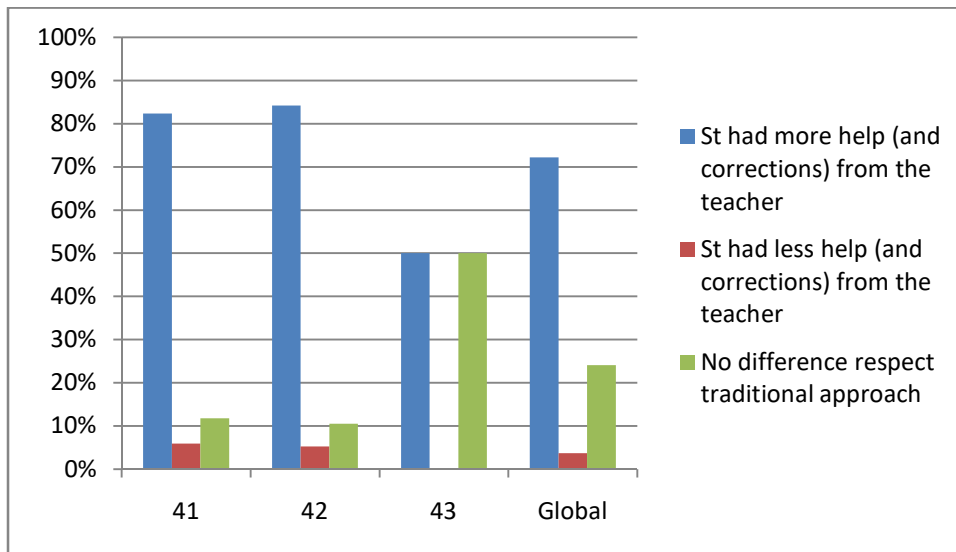


Figure 37: Students' perceptions about interaction with classmates (compared to the traditional approach), in percentage of students

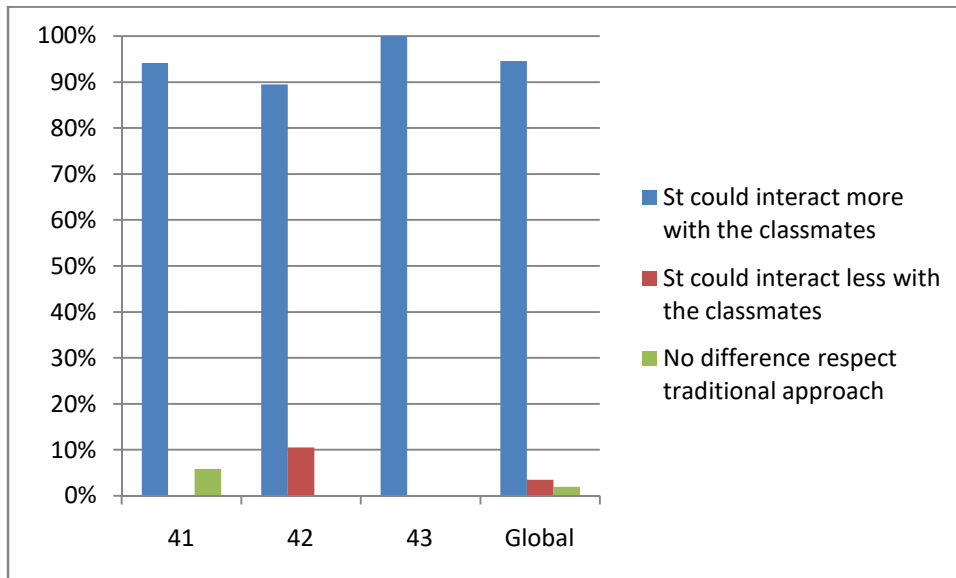
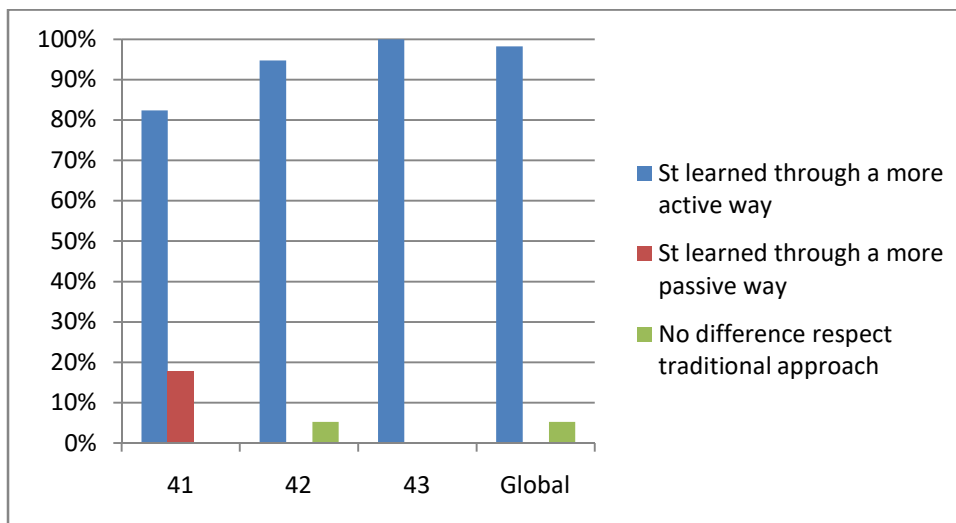


Figure 38: Students' perceptions about the way they learned (compared to the traditional approach), in percentage of students



8.5 Annex 5: ICF given to the participants before the beginning of the study

CONSENTIMENT INFORMAT PER A LA PERSONA PARTICIPANT

Títol del Treball de Recerca: *Homework assigned in a flipped classroom as a tool to help secondary education students to improve their study time management*

(Les classes invertides [*flipped classrooms*] tenen un impacte en la freqüència amb què els estudiants d'anglès fan els deures?)

Investigador responsable: Eva Corrales

INFORMACIÓ BÀSICA del Treball de Recerca

Els participants gaudiran de la metodologia innovadora pròpia de les "*flipped classrooms*" (classes invertides) al llarg d'una de les unitats didàctiques del curs. Els resultats i la freqüència amb què s'hagin realitzat els deures durant l'estudi s'analitzaran i es compararan per dur a terme els objectius de la investigació. Els participants rebran una enquesta a l'inici i una a la finalització de l'estudi. No s'analitzarà cap dada de manera individual, sinó que s'estudiaran els resultats de tota la classe com a grup.

El material i/o les dades obtingudes gràcies a la seva participació en aquest Treball de Recerca seran d'ús exclusiu intern de la Facultat de Psicologia, Ciències de l'Educació i l'Esport-Blanquerna. En el cas que fossin incloses en una publicació dins de l'àmbit acadèmic i científic complirien estrictament les condicions ètiques de **confidencialitat** exigides en una recerca d'aquestes característiques.

La persona participant ha de **llegir i contestar les següents preguntes** amb atenció (encerclar la resposta correcta):

Ha llegit tota informació que li ha estat facilitada sobre aquest projecte? SÍ/NO

Ha tingut l'oportunitat de preguntar i comentar qüestions sobre el projecte? SÍ/NO

Ha rebut suficient informació sobre aquest projecte? SÍ/NO

Ha rebut respostes satisfactòries a totes les preguntes? SÍ/NO

Està d'acord a participar-hi? SÍ/NO

Autoritza la seva participació en el projecte? SÍ/NO

Autoritza la participació de les persones de les quals és responsable (en el cas d'una representació institucional)? SÍ/NO

Data:

Signatura de la persona participant (NOM I COGNOMS entre parèntesi):

Signatura del pare/mare/tutor legal de la persona participant menor de 16 anys (NOM I COGNOMS entre parèntesi):

.....

.....

Exemplar per al participant / Exemplar per a l'investigador

8.6 Annex 6: Interview with Professor Helen Ruiz

(Kindly note that the contents have been summarized and adapted)

We can find different articles that refer to the flipped classroom as an approach, a method, a strategy... Which is the correct terminology?

There is no consensus, but for me, the flipped classroom is an *approach*. A method is too structured, there is a specific timing, and everything is specified. The flipped classroom is a way of approaching a content or subject. It is flexible.

Which is the difference with “blended learning”? Its definition is also ambiguous depending on the researcher.

The flipped classroom is a type of “blended learning”, but flipped classroom goes further. In the “blended learning” the student could do a part of the contents on their own, or at home, and some other contents or units in class, but they don’t have to be connected. However, in the flipped classroom, the part that is done at home is connected with the part that is worked on in class and the role of the student and the teacher are linked.

Bergmann and Sams said that there is nothing such as “THE” flipped classroom. But is ICT a necessary requirement to talk about flipped classroom?

ICT is not necessary, but it helps you. And thanks to technology, the flipped classroom has become more popular. Teachers have been using flipped classroom for years but they didn’t call it “flipped classroom”. But assignments previous to a lesson to have students ready for the lesson have always been used.

Is it needed in Catalonia’s context (were students usually have 3 hours/week of English as Additional Language maximum)?

This time is necessary to realise if the students understand the contents, to solve problems, to practise. Activities such as irregular verbs tests can be done at home and this precious time can be used for assessed practice in class.

Why the flipped classroom has not succeeded in Catalonia’s context?

The word “technology” is the key. The use of computers... There are still a lot of teachers that are reluctant to trust in technology in the classroom. Moreover, most school facilities are not prepared for collaborative work and use of technology in class. We need diferent designs of classrooms. On another hand, preparing videos or material for flipped classrooms is a lot of work. Although once done, this can be used in the future.

Do flipped classroom mean... extra homework?

If students don’t do the assigned tasks, the flipped classroom cannot work. It is very important that the students watch the video. There is an idea that is still being developed

to solve this problem. Some researches suggest leaving a space and time at the beginning of the lesson for the students who haven't been able to watch the video at home while the classmates do a specific or warm-up activity.

Then if we could integrate the “previous assignments” in the class there wouldn't be a need to assign homework...

Of course. The videos could be watched in class or at school. There could be a specific space or time booked for this purpose. Students could watch the video before starting, or read an article, work on a listening... It doesn't have to be always a video.

Because I read that spending time at home doing homework is related to the student's results...

This is not true. There is no way to justify it. One clear example is Finland, where students are not assigned homework, or a minimum amount of them, and their results in Education are within the best.

The students already spend hours of screentime during the day... Should we protect them from this abuse of “new technologies” in the classroom?

The mobile phone is not really necessary in the classroom. The students just need the mobile phone or computer during the 2-3 minutes to watch the videos. Then, in class, there is time for speaking, working in groups... and they don't really need a phone.

How should be the videos to be engaging?

The video should last between 2-3 minutes, maximum 5 minutes. If it lasts 10 minutes, it's too much for most students. In the end, it is homework. It is also more engaging if the teachers record their own videos.

Most of my students did not take notes when they watched the videos... What should we do?

The problem is how to engage them... But this problem is the same that we have with traditional teaching. It is not the fault of the videos or the flipped teaching... What could we do? Penalise them? For example, we could tell them that they have to take notes and that these notes will be checked the following day in class. Maybe put a negative point if they haven't done them. It is sad but most of the students are not bothered if there are no consequences in the marks. It is part of the way human beings work.

How many videos should we incorporate in a unit?

It is more about having a clear idea on what you want to teach. For example, a unit based on present simple may only need one video of 2-3 minutes with the explanation of the present simple. The key is how the video can be useful for that specific unit. And

it doesn't always need to be a video; it could be a text or a listening about the present simple (in this case).

Today's students usually do their homework as one of several tasks that they do at the same time. Does the homework assigned in the flipped classroom promote this multitasking that could make the students focus less on the task?

It is true that if there's a video assigned, or a reading, the student should be concentrated on that in order to be effective. I am not sure if multitasking homework could work in the case of flipped classroom assignments. However, it is true that it is a characteristic of the new generation that they are doing multiple things at the same time and checking *whatsapp* and several devices while they read or write.

There were students that never watched the videos. Although they were offered support or extra help, they didn't even try.

It would happen with any kind of homework... It is a problem of students' routines and it is not easy to solve it. The collaboration of the parents, the student's tutor would be needed in these cases.