Flipping the Classroom in Political Science: Student Achievement and Perceptions[1]

La clase invertida en Ciencia Política: resultados y percepciones de los estudiantes

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ABSTRACT

The flipped-classroom method is acquiring importance as a pedagogical technique to improve the learning performance of students. So far, most studies have examined the possible applications of the flipped-classroom method in the natural sciences realm, with most analyses certifying its positive impact. Its has been applied much less frequently in the social sciences realm, particularly in political science. Our project aims to generate data about active learning in political science by conducting an experiment in a class entitled "Regional Studies: Latin America." Using quantitative analysis, we study academic performance in a flipped class, and through qualitative analysis, we explore student perceptions about the flipped classroom and other active-learning techniques.

Keywords: Teaching Innovation, Political Science, International Relations, Active Learning

RESUMEN

El método de clase invertida está adquiriendo importancia como técnica pedagógica para mejorar el desempeño de los estudiantes. La mayoría de los estudios hasta la fecha han examinado las posibles aplicaciones de la clase invertida en el campo de las ciencias naturales, detectando un impacto generalmente positivo. Su aplicación ha sido mucho menos frecuente en el campo de las Ciencias Sociales, en particular de las Ciencias Políticas. Este proyecto tiene el objetivo de generar datos sobre el aprendizaje activo en las Ciencias Políticas, a través de un experimento en una clase de "Estudios Regionales: América Latina." A través de un análisis cuantitativo, estudiamos el desempeño de los estudiantes en una clase invertida, mientras que, a través de una serie de grupos focales, exploramos sus percepciones sobre la clase invertida y otras técnicas de aprendizaje activo.

Palabras clave: *enseñanza, Relaciones Internacionales, Ciencia Política, aprendizaje activo*

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I. INTRODUCTION

Many scholars and educators are increasingly taking issue with the traditional teaching method, which involves "the continuous exposition of material by the teacher, with students passively listening and taking notes" (Lambach et al. 2017: 566). The debate about how to improve teaching in higher education is not new. In the early 1990s, Alison King famously criticized traditional teaching formats, in which the professor is "the central figure, the sage on the stage." Instead, the professor should become "a guide on the side," capable of motivating active learners and preparing them for a twenty-first century in which individuals "will be expected to…pose and solve complex problems" (1993: 30). This implies a shift from "dependent learners," who require "a large amount of direction from the teacher," to "independent learners," who "learn best when left to [their] own devices" (Lage et al. 2000: 31). These ideas have acquired special relevance due to the impact of technology in education, which has generated possibilities for devising new teaching techniques (for example, related to e-learning [Frederickson et al. 2005]) and imagining new ways of "active learning" (Prince 2004) for students with different demands. One of the most recent examples of active-learning techniques is the Flipped Classroom (FC).

The FC has multiple origins, including Eric Mazur's research at Harvard University, contributions by Glenn Platt, Maureen Lage, and Michael Teglia at Miami University, work by Wesley Baker at Cedarville University, and the experiences of two high school teachers, Jonathan Bergmann and Aaron Sams (Talbert 2017: chapter 2). At the basis of these different contributions is the idea that, "that which is traditionally done in class is now done at home, and that which is traditionally done as homework is now completed in class" (Bergmann and Sams 2012: 13). By substituting traditional lectures with explanatory videos that students must watch before class, the professor can save time in class to answer students' questions and manage practical exercises. This way, the professor makes sure that students receive "a personalized education tailored to their individual needs" (Bergmann and Sams 2012: 6). The diffusion of the FC (O'Flaherty and Phillips 2015) at the university level has also generated a large demand for studies that measure the impact of this technique on students' learning achievements and perceptions. Being a relatively recent technique, the number of studies that have scientifically tested its impact is still limited. Moreover, its application in the realm of social and political sciences is even more limited, especially outside Anglo-Saxon countries.

In the first section, we review the main contributions to the FC literature, with specific reference to higher education and social sciences. In the second section, we describe our empirical study, which consists of a quantitative analysis of students' achievements and a qualitative analysis of students' perceptions about the FC. In the last two sections, we present and discuss the main results of the empirical analysis.

II. FLIPPED CLASSROOM: THE STATE OF THE ART

The FC finds its origins in a series of concepts developed in the field of education, which share a similar concern with improving teaching quality and students' learning capacities. One of these concepts is "student-centered learning," inspired by the writings of various philosophers, such as John Dewey and Jean Piaget (Bishop and Verleger 2013). The main goal of a "student-centered approach" is to "engage students in actively constructing knowledge" (Hamdan et al. 2013: 7). According to Joel Michael, this approach "places the student[s]…in the center of the learning process" by providing "opportunities to learn independently and from one another" (2006: 160). This can include different activities, such as "exploration of real-world problems and solutions, concept analysis…class debates and oral presentations" (Mazur et al. 2015: 5). The idea was associated with the concept of "cooperative learning," a process through which students work in teams and "take responsibility for a different sub-goal" (Bishop and Verleger 2013: 7). A classic example of cooperative learning is "problem-based learning" in which students learn through the discussion of a real problem, whose main goal is to provide them with effective problem-solving skills (Hmelo-Silver 2004). This allows students to be involved directly in the process of learning and to "regularly assess their own degree of understanding and skill at handling concepts or problems" (Michael 2006: 160).

The dramatic changes in communication and information technology have allowed an expansion of these ideas. Active learning techniques can now take advantage of more sophisticated devices, such as smart phones or tablets that exponentially increase the possibilities of involving students in the learning process, for example, in case they have difficulties with being physically in a classroom. Terms, such as "blended learning" or "hybrid learning" have now gained large popularity and are intended as the "integration of classroom face-to-face learning experiences with on-line learning experiences" (Garrison and Kanuka 2004: 96). A part of the content is delivered in class, while the rest is delivered online, with the proportions between the two dimensions variating depending on the necessities (Osguthorpe and Graham 2003).

These developments provided the background for what Wesley Baker called the "classroom flip." At the basis, there was a perceived necessity to "reduce the amount of time spent in class on lecturing" and "focus more on understanding and application" (Baker 2000: 11). The appearance of devices, such as multimedia computers, presented a wonderful opportunity to enhance the effectiveness of teaching: "events that have traditionally taken place inside the classroom now take place outside the classroom and vice versa" (Baker 2000: 32). FC means a redefinition of the concept of time and space in education, wherein the class is transformed "into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter" (Berge and Nederveld 2015: 163). The FC removes frontal lecturing from the classroom by assigning recorded lectures and

other materials as home activities. This creates time for more active learning activities in the classroom. Videos are not the only mechanisms through which to deliver instruction in a FC model. What matters is the provision of content to students outside the classroom, which can take other forms, such as texts or interactive platforms. The most important element is that "with content provision moved outside the class, in-class time is devoted to other activities, such as…critical thinking and problem solving" (Jenkins 2015: 607).

Flipped Classroom in Higher Education

In the last 20 years, scholars from different disciplines have published several studies on the impact of the FC on university education. Some have explored practical issues related to its implementation (Roehling 2018; Lambach and Karger 2019; van de Zwan and Afonso 2019). Others have analyzed the efficacy of the technique by focusing on the perceptions and performance of teachers (Flores et al. 2016; Gough et al. 2017). With the FC being especially devoted to the improvement of students' learning, several studies have analyzed the perceptions and performance of students (O'Flaherty and Phillips 2015; DeLozier and Rhodes 2016; Talbert 2017; Roehling 2018).[1] Studies on the influence of the technique span from the natural to the social sciences, with a special attention being given to the fields of education (Abeysekera and Dawson 2015; Yen et al. 2018), engineering (Mason et al. 2013), and languages (Al-Harbi and Alshumaimeri 2016; Lin and Hwang 2018).

In terms of results, scholars across different disciplines have discovered that students have a general preference for the Flipped Classroom "compared with a traditional class" (Gilboy et al. 2015: 110). Students tend to appreciate this technique because it allows for study "at one's own pace" (Flores et al. 2016: 7). Among other advantages, studies indicate an "increase in [students'] engagement" (Clark 2015: 91). Other studies have found positive results as to students' achievement, measured in terms of grades. Groups that were subjected to the flipped class methodology outperformed students who were exposed to more traditional teaching formats (Missildine et al. 2013; Lin and Hwang 2018).

Nevertheless, a minority of studies did not find any specific effect of the FC, in terms of either student perceptions (Welsh 2012; Yen et al. 2018) or achievement (Clark 2015 Blair 2016 et al.; Al-Harbi and Alshumaimeri 2016). For example, Scott Jensen observed that learning outcomes were substantially similar in traditional and online video lectures, with students expressing a slight preference for traditional lecturing (Scott 2011). Critics have also emphasized the difficulty

[1] A complete list of the publications on students' perceptions and performance with the Flipped Classroom across different disciplines would go beyond the scope of this paper. The in-text citation provides some examples of literature reviews on the subject.

for many professors at mastering the necessary technology to implement the technique (Davies et al. 2013; Gough 2017; Yen et al. 2018).

Flipped Classroom in Political Science

In the field of Political Science (PS), there are few studies that have tested the use of active learning techniques, such as hypertexts (Bonham and Seifert 2000), problems (Burch 2000), or simulations (Starkey and Blake 2001). Nevertheless, the use of the FC has been so far more limited. PS scholars who have implemented this methodology in their classes have generally observed a positive impact. However, while Michael Touchton found positive effects for the technique in both students' perceptions and performance (2015), other political scientists have expressed skepticism about the capacity of the FC and other active learning techniques to maintain their promises (Jenkins 2015; Lawrence and Lester 2018).

In light of these insights, our study has two main goals. First, we would like to contribute to the emerging literature on the potential contribution of flipped learning in PS. Although there are few empirical studies that have tested its efficacy, we think there is a need to generate more data in order to understand the utility of a technique which is relatively new to this field. For this reason, we conducted a qualitative and quantitative analysis to test the perceptions of students with the flipped format and their academic performance.

Previous studies have explored the impact of active learning methodologies on either low-order or high-order knowledge. Some found a positive impact of active learning methodologies with the former, such as "knowledge of facts" (Omelicheva and Avdeyeva 2008: 605), capacity to respond "short answers" (Powner and Allendoerfer 2008: 75), or "memorizing a definition or calculating a numerical value" (Touchton 2015: 1). Other studies have preferred to measure the impact of active learning on high-level knowledge acquisition, such as the capacity of creating interdisciplinary links (Bonham and Seifert 2000), engagement (Baranowski and Weir 2011), or analysis, synthesis, and critique (Lambach et al. 2017). Our quantitative study measures the effects of the FC on low-level knowledge, understood as the capacity to recall and understand concepts.

Second, we noticed that most studies compare the FC with traditional teaching methods, such as frontal lectures with students taking notes and learning at home (Jenkins 2015; Touchton 2015; Lambach et al. 2017). This is similar to studies that compare traditional teaching formats with other types of active-learning techniques, such as hypertexts (Bonham and Seifert 2000), debates (Omelicheva and Avdeyeva 2008) or presentations (Baranowski and Weir 2011). This is understandable if we consider that PS historically tended to make use of a series of "standard educational practices" (Connery and Leach 1958: 125) centered on the figure of the professor who teaches a *lectio magistralis.*

Although comparing traditional and flipped teaching has provided important insights, we believe that these types of comparisons risk making a straw man. The potential efficacy of inverted learning should be tested against other active-learning techniques and not simply against traditional, and often discredited, methods. In a society that is increasingly criticizing traditional methods, these comparisons could lead to partially biased results. For this reason, some studies have proposed comparisons between traditional teaching formats and more than one type of active-learning technique, such as role play and discussions (Powner and Allendoerfer 2008), or between the FC, a traditional teaching format, and other types of active learning, for example online classes (Cobb 2016). Flipped learning is only one of many active learning techniques. Given the large presence of active learning techniques in many university classes, including PS, and their "well documented improvement over the traditional lecture approach," we think it is fruitful to compare a flipped class with a "a control model that uses active learning" (Jensen et al. 2015: 11).

The main challenge is to design comparisons among formats that do not present too many differences between treatments. Jensen et al. have tried to solve this problem by proposing a comparison between two active learning classes, taught with the same 5-E learning cycle, with the only difference being that one class was flipped while the other was not. According to the authors, this can reduce the risk of comparing too different teaching formats, which can make it more difficult to "parse out the effects and pinpoint a specific causal factor" (Jensen et al. 2015: 2). Due to financial limitations, it was not possible to design our experiment this way. Nevertheless, to limit the risk of having two non-homogenous formats, we partially followed Jensen's suggestion. Instead of comparing a FC with a fully traditional class, we compared a flipped class with a non-flipped class based on a combination of traditional teaching and other active learning techniques. The traditional teaching format in political science, and in the social sciences more generally, is in the middle of a process of revision based on the inclusion of innovative techniques. In this context of change, a comparison between a FC and a traditional lecture integrated with active learning techniques seems to fit well with the current pedagogic landscape.

III. DATA AND METHODS

Our goal is to measure and explore the achievement and perception of students following the implementation of the FC. Our study compares the academic results of students in terms of grades achieved in an exam. Moreover, it explores the perceptions of students about the use of the FC. For this reason, we rely on a "mixed method" approach (Bryman 2012: 627-652), which involves the collection and analysis of both quantitative and qualitative data. Our choice is based on the necessity of dealing with two partially different research questions: one about students' perceptions about the impact of the FC on the learning process and the other about its impact on academic achievement. We believe that

a mixed method exploring both achievement and perceptions can provide a better comprehension of the phenomenon (Bryman 2012: 645) and that this is likely to improve the academic and practical impacts of the study. Our goal is not one of triangulating in order to "check the integrity of, or extend, inferences drawn from the data" (Ritchie and Lewis 2003: 43) because our two research questions have a different nature.

These are the research questions that guided our study:

Q_1: Does the FC improve students' academic performance?

> *$Q_{1.1}$: Do students who use the FC acquire higher knowledge[2] than those who do not?*
>
> *$Q_{1.2}$: Do students who use the FC methodology have better academic results than those who do not?*

Q_2: How do students perceive the impact of the FC on the learning process?

Ethics Statement

At the beginning of the study, all the participants signed a form consenting to participate in this study voluntarily. Moreover, we gave participants full information about the rationale, design, and purpose of the surveys and the focus groups. Students also had full access to the transcript and analysis of the data. Finally, we guaranteed confidentiality as no private data was diffused, with interviewees being anonymized in the text.

Participants

We conducted an experiment with two groups of students. The intervention occurred across several class meetings that were part of one module of a larger, non-flipped course. In the first group – the control – the class structured in a semi-traditional way, through a combination of frontal lectures and active learning activities in class, such as student's presentations, teamwork, and problem-based debates. Two hours per week focused on traditional professor's lecturing, while the other two hours were devoted to the active learning activities. In the second group – the experiment – we flipped the teaching. Instead of dedicating two hours per week to frontal teaching, we provided students in advance with a series of self-produced video lectures on the fundamental contents of the class. This way, we could dedicate the entire four hours per week to active learning activities, such as debates, presentations, teamwork,

[2] Conceptual content acquired by students after the application of the methodology under analysis. This knowledge was identified using a closed-ended survey.

and especially to the clarification of students' doubts. The online applications used to disseminate the content to students before the class were *Kaltura* (to assign the videos), while several exercises were performed through *Poll Everywhere* (to manage different types of surveys). After disseminating the content, we generated specific exercises that students had to solve in class by working individually or collectively.

To answer $Q_{1.1}$, and $Q_{1.2}$, we relied on a quantitative approach, using a quasi-experimental design. These types of experiments do not use random placements. However, they give "treatment, impact measurements and experimental units" (Harmaini 2019: 347). The 63 participants were third-year students enrolled in the mandatory core course "Regional Studies: Latin America," for the International Relations (IR) degree. Following Jacob Cohen (1988), "for a two-group comparison to detect an effect size of 0.7 (α=0.05 and power=0.8), a sample size of 25 subjects per group is required" (2014).

The course is organized around thematic blocks, with the experiment being conducted in one called "Latin American Politics." Students were distributed in two groups, 0 and 1, organized in alphabetical order. Both groups were similar in terms of observable conditions, and the only difference was the type of pedagogical methodology that students were exposed to. The experiment aimed to compare students' grades in a pre-test, a post-test, and the exam, which were all designed to measure students' low-order knowledge, such as recall and understanding.

The two groups were taught the same material with the same professor, except for the "Latin American Politics" block. In this block, group 0 was taught through a semi-traditional methodology, as described in the previous section. Group 1 was taught through the FC model. Table 1 describes the sample by gender.

Table 1. Description of the sample by gender differences

	Number of students
Group 0 Control	32
Men	7 (21.9%)
Women	25 (78.1%)
Group 1 Experiment	31
Men	17 (54.8%)
Women	14 (45.2%)
TOTAL	63
Men	24 (38.1%)
Women	39 (61.9%)

To answer Q_2, regarding students' perceptions, we conducted two focus groups, one with the control and the other with the experiment group. The main goal of a focus group is to "collect data through group interaction on a topic determined by the researcher" (Morgan 1996: 130; Barbour 2007). The FC is a methodology that aims to improve students' learning, so that it is essential to "give a voice" to students who are the main actors in this process (Morgan 1996: 133). This is particularly important if we take into consideration that the FC is still mostly an experimental technique in search of academic legitimacy. In this way, focus groups are useful to understand the meanings that students assign to the FC. We did not use focus groups to develop survey questions (Wilkinson 1998: 184-5), understand how students viewed the survey (Morgan 1996: 134), or triangulate the data, but only to improve our knowledge of students' acceptance or rejection of the FC.

We initially selected participants for the focus groups by following a "purposive sampling" criterion, which means not on a random basis, but in a strategic way to ensure that "there is a good deal of variety in the resulting sample" (Bryman 2012: 418). We selected students who had achieved different academic results in their previous classes, so that we could count on a more comprehensive range of opinions. Unfortunately, not all the students answered our call. Due to the difficulty to convince students to participate in a focus group that was not part of their curricular activities and did not allow them to earn extra credit, in the end we had to rely on a "convenience sampling." This means that we selected participants depending on their availability and desire to be involved (Miles et al. 2017: chapter 2).

Our initial goal was to have between six and eight members for each group. Seven students from the control group and four students from the experiment group ultimately agreed to participate. In the first group, there were seven women (21.9% of group 0),[3] while in the second there were three men and one woman (12.9% of group 1). This was mostly the result of the convenience sampling and the random way in which students responded to our call. Although the gender distribution could have been more balanced, we do not consider this a major bias because gender is not a relevant variable in any of the studies that we have analyzed on students' perceptions with active learning techniques.[4]

The moderator of the focus group was also one of the professors responsible for the class. Due to financial limitations, we could not hire an external moderator. We are aware that this could reduce the objectivity of the collected data since students could feel less motivated to participate in the focus group or to express critical opinions. The literature on qualitative interviews and focus

[3] This sample of women in group 0 is due to the high percentage of women in the total of the group, as can be seen in Table 1 (more than 75%).

[4] The focus groups took place in the premises of the University where students are enrolled. The content of the groups was recorded. Before the group, students, who were of legal age, signed an authorization to be recorded. After the group, we assured confidentiality with their answers and gave them a small gift for their participation.

groups has extensively debated this issue. For example, Gloria Bader and Catherine Rossi have identified both the pros and cons of having an external or an internal moderator (Bader and Rossi 2003: 18). Others have argued that the use of an external moderator does not fully solve the problem of the power asymmetry between the researcher and the participants since an interview is not "a completely open and free dialogue between egalitarian partners" but a "professional conversation" over which the researcher has a "monopoly of interpretation over the subject's statement" (Brinkmann and Kvale 2015: 37). In our focus groups, participants did not show any lack of will to express critical judgments. However, in a future study, hiring an external moderator will be one of our goals.

Analysis of the Results of the Quantitative Study[5]

Data collection for the quantitative study took place in three different phases during the classes. First, at the beginning of the "Latin American Politics" module, we administered a preliminary survey composed of 28 multiple-choice questions about its content, which we discuss below, with the goal of evaluating students' knowledge prior to the class. This survey did not have any impact on students' final evaluation. The goal was only to measure their previous knowledge of the subject. The main results of this preliminary survey are presented in Table 2. The numerical scale goes from 0 (no correct answer) to 10 (all correct answers). The minimum grade to pass a class in the Spanish university system is 5. As can be noticed, the mean of the scores obtained by group 0 is about half a point higher than the mean of those obtained by group 1. This means that, before starting the "Latin American Politics" module, the knowledge of group 0 was higher than the knowledge of group 1 in average terms. In neither group did the mean of the scores before the start of the class reach the minimum 5 points needed to pass.

Table 2. Description of the scores of the preliminary survey

	Minimum	Maximum	Mean	Standard Deviation
Group 0 = 32 students	2.86	7.14	4.79	1.03
Group 1 = 31 students	2.50	5.71	4.39	0.83
Total = 63 students	2.50	7.14	4.60	0.95

[5] For the study of data series, we tested the Normality (Kolmogorov-Smirnov test, or Shapiro-Wilk test, depends on size of the sample) and Homocedasticity (Levene test) conditions, to choose parametric or non-parametric tests. The confidence interval used to establish statistical significance is 95%.

Second, at the end of the "Latin American Politics" module, we administered the same survey to assess students' knowledge after the explanation of the main concepts and the activities in class. Since the result was not part of their class evaluation, students did not see the survey as an "exam," but, rather, as a control measure of the concepts taught through one or the other methodology, which students acquired before a formal and organized process of studying. We administered the survey without prior notice, so that students did it without any specific preparation. The scores of this second survey are presented in Table 3. The means of the scores obtained by the two groups are roughly similar. This means that the knowledge acquired is almost the same. Both groups would have passed the final survey. However, group 1, which was taught using the FC, showed a more positive evolution (19.2% vs. 9.1%), considering that it had scored less than group 0 in the preliminary survey.[6]

Table 3. Description of the scores of the final survey

	Minimum	Maximum	Mean	Standard Deviation
Group 0 = 32	2.50	7.14	5.23	1.26
Group 1 = 31	2.50	7.86	5.23	1.30
Total = 63	2.50	7.86	5.23	1.27

Finally, students did an exam at the end of the class that included a specific section about the content of the "Latin American Politics" module. This exam represented 50% of the official grade for this class. This exam was announced in advance, giving students time to prepare for it properly. Table 4 presents the descriptors of the scores included in the final exam. The mean of the grades obtained by the two groups is higher than 8 out of 10, much higher than the mean of the grades obtained in the two previous surveys.

Table 4. Results of the final exam

	Minimum	Maximum	Mean	Standard Deviation
Group 0 = 32	1.88	10.00	8.20	1.95
Group 1 = 31	4.38	10.00	8.00	2.04
Total = 63	1.88	10.00	8.10	1.98

[6] We applied a T-test for related samples: for group 0 preliminary and final survey (t = -2.045 and p-value = 0.049), and for group 1 preliminary and final survey (t = -3.801 and p-value = 0.001). The differences were significant in both cases. This means that, regardless of the methodology, the results of the final survey improve in a statistically significant way.

Based on these results, on average terms, group 0 started with a greater pre-course knowledge of "Latin American Politics" than did group 1, although knowledge was low for both groups. In the second survey, which was administered without prior notice, the two groups obtained similar scores. In the exam, both groups obtained relatively high scores, in comparison with the scores of the preliminary and final surveys. However, group 0's average exam score was slightly higher than group 1's. These results indicate that students from both groups, regardless of the methodology used, studied and prepared for the exams, improving their average scores by almost 3 points compared with the final survey, and by almost 4 points compared with the preliminary survey.

All the data collected can be observed in Figure 1, which illustrates the evolution in students' grades in the different phases of measurement. The preliminary survey showed the lowest levels of knowledge for both groups, while the final survey showed improvement in students' knowledge after having attended the class. Finally, the exam shows better grades for both groups.

Figure 1. Scores obtained by group and by type of survey and exam

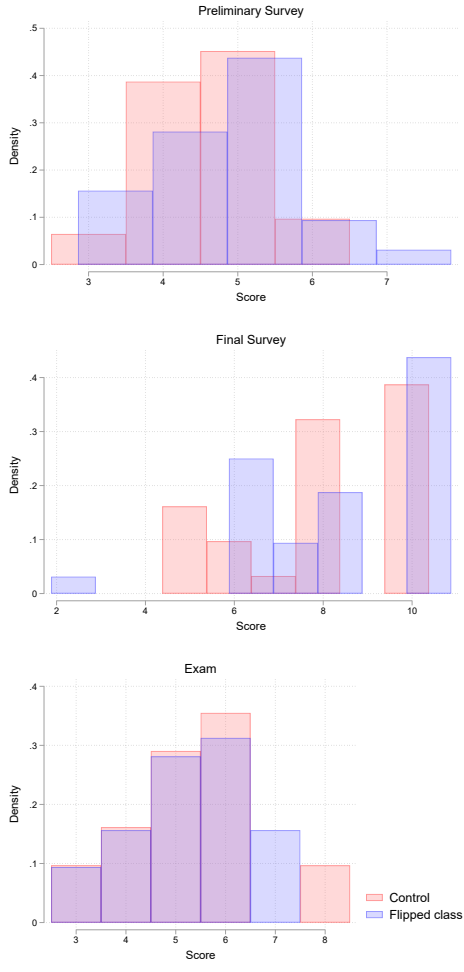

Table 5 sums up the data presented in this section, with specific focus on passed and not-passed results. In percentages, students' knowledge improved immediately after the class with both methodologies, with a substantial reduction of Not-Passed, even though group 1 started with lower initial scores. The scores of the exam are clearly better in both cases.

Table 5. Scores (% total of the group)

	Preliminary Survey	Final Survey	Exam
Total			
Not passed	57.1%	38.1%	9.5%
Passed	42.9%	61.9%	90.5%
Group 0			
Not passed	43.8%	34.4%	3.1%
Passed	56.3%	65.6%	96.9%
Group 1			
Not passed	71.0%	41.9%	16.1%
Passed	29.0%	58.1%	83.9%

For the quantitative analysis, as an initial measure of student academic achievement prior to the class, we used the average GPA of their undergraduate in IR. During their first two years, students could only take core mandatory classes, which makes the average measure homogenous for the whole sample. Based on these data, we performed an ANOVA test to detect any difference between groups 0 and 1, in terms of the average GPA. The results did not show any statistically significant difference prior to our experiment (ANOVA f= 0.38; p= 0.847), which means that the sample was homogenous in terms of academic achievement. In other words, before the experiment, there was no relevant, statistically significant difference between the two groups.

First, we analyzed the results of the preliminary survey to detect any relation between these previous results and the two groups—control and treatment—immediately before the experiment. Then, we analyzed the scores obtained in the final survey administered at the end of the class after having implemented the two different methodologies, traditional and flipped, in the groups 0 and 1 respectively. This was complemented with a study about the differences. Considering that the preliminary and the final surveys were the same, to measure the evolution in the achievement of each student, we analyzed the differences between the results of the two surveys. Finally, we analyzed the scores of the section on "Latin American Politics" in the exam. Table 6 summarizes the data of the applied tests.

As can be observed, there are no statistically significant differences between the data collected from group 0 and data collected from group 1. This can indicate that the methodology used in class does not influence in any significant way the academic results of students, either in the surveys or in the exam.

Table 6. Summary of test results

Null Hypothesis	Test	Sig.	Summary
The distribution of the preliminary survey is the same between the categories group 0 and group 1	U Test of Mann-Whitney for independent samples	88.00*	Accept H_o
The distribution of the exam is the same between the categories group 0 and group 1		768.00*	

ANOVA Final Survey					
	Sum of Squares	gl	Root Mean Square	F	Sig.
Between Groups	0.000	1	0.000	0.000	0.99
Within Groups	100.29	61	1.64		
TOTAL	100.29	62			
ANOVA Differences between preliminary and final surveys					
	Sum of Squares	gl	Root Mean Square	F	Sig.
Between groups	2.65	1	2.65	1.78	0.19
Within groups	90.64	61	1.48		
TOTAL	93.30	62			

Finally, the series of quantitative data, which provides the information about the scores of the final survey and the scores of the "Latin American Politics" block in the exam, were transformed into qualitative series called Pass and Not-Passed. The main goal of teaching is student learning. The way we operationalized learning was through objective tests. Along these lines, in a range between 0 and 10, scores equal or greater than 5 represent the standard needed to pass the class, while scores lower than 5 indicate that the student did not pass and had to either repeat the class or perform additional curricular activities. We consider such cases as ones in which the student did not achieve minimally sufficient knowledge. Results equal to or higher than 5 signify the exam was passed, and the student achieved the minimum knowledge.

After having generated these series of data, we created a contingency table. The goal was to see if the academic result could be associated with the use of the more traditional or flipped methodology in the block of Latin American Politics. Through a chi-square test (see table 7), we find that in both the final survey and the exam, passing or not-passing did not depend on either the group type or the methodology used.

Table 7. Pearson Chi Square Test

	Value	df	Sig. Asymptotic (bilateral)
Final survey	.382[a]	1	0.537
Exam	3.090[b]	1	0.079

[a] 0 boxes expected a recount inferior to 5. Minimum recount expected is 11.81.
[b] 2 boxes expected a recount inferior to 5. Minimum recount expected is 2.95.

These data indicate that question $Q_{1.1}$ should be answered negatively: the acquired knowledge of students who used FC methodology is not significantly higher, from a statistical point-of-view, than the knowledge of the students who did not use it. Similarly, in relation to question $Q_{1.2,}$ the academic results of students who used FC methodology are not significantly higher than the results of students who did not use it. In sum, the answer to Q_1 should be positive : the performance of those who were exposed to FC improved, but the same happened with those in the more traditional class.

Analysis of the Results of the Qualitative Study

For this part of the study, we used NVivo software to analyze the data generated in the focus groups through a process of codification, composed of two main cycles (Bryman 2012: 568; Miles et al. 2017: chapter 4). In this first, we used a variety of initial coding techniques, in particular "descriptive," "In Vivo," and "process" coding (Saldaña 2012: 87-99), with the goal of assigning codes through which to classify the units of analysis. In the second cycle, we first refined the codification by using a "holistic" technique in order to sort the codes generated in the first phase into initial thematic areas (Saldaña 2012: 142-4). Subsequently, through the "focused" coding technique (Charmaz 2006: 57; Bryman 2012: 569; Saldaña 2012: 212-17), we identified the most "frequent or significant codes" of each thematic area in order to develop "the most salient categories in the data corpus" (Saldaña 2012: 213) and find patterns in the data.

Group 0: Control

The most relevant issues discussed with students related to their teaching methodologies preferences and possible impacts on their learning processes and personal development. The group manifested a clear preference for a teaching methodology capable of combining a traditional class based on frontal lecturing with an "interactive and participatory class" in which the professor relies on several active learning techniques, such as video lectures, problem-based debates, and teamwork exercises. Students expressed a clear consensus on this

point, which student I[7] concisely summarized this way: "To alternate different activities allows you to disconnect a little bit, but not completely, so that, at the same time, you focus more on the class. I think this way everything is a lot better combined."[8] Student R specifically focused on the potential benefits of alternating professors' explanations with other types of content, such as videos: "The best way to learn is when, at some point, they [professors] completely change the rhythm of the class and put on a video. Watching the video makes you understand what they were explaining." Along these lines, students appreciated a class composed of two hours of frontal lectures and two hours of active learning techniques per week. This had positive effects in terms of what happened both inside and outside the class. Inside, students perceived the class as more motivating, which facilitated the capacity to maintain attention and improved the desire to attend.

> "We get very much involved in the class and you look forward to going to class. This makes you remember much better what we are doing in class. It makes you eager for the class, otherwise you are more likely to leave it" (M).

Outside the class, students perceived some positive effects in their academic outcomes, in the sense that, with this type of class, it was easier to hold back information, which could improve their capacity to respond to exam questions more effectively.

> "What the professor taught during the exercises was very useful to me. In the exam there was a multiple-choice question that I knew thanks to that exercise that we did in class" (N).

Nevertheless, where students perceived the main advantages of this type of class was in their personal development. Students saw the combination of traditional and active learning techniques as a crucial way to improve their personal and human competences. A strong consensus existed about the fact that, through this methodology, students felt more capable of empathizing with the human and social experience of Latin American societies and their actors. Student E expressed this feeling by using the expression "humanizing history." One of the perceived advantages of a technique that made large use of documentaries, class debates, and small research assignments was that students became more capable to relate what they studied with the real-life experience of Latin American societies.

> "This is in a way how you humanize the history that they are teaching. For example, if I watch a video of a person giving a speech, maybe in a year from now I will forget his name. However, if I happen to see his

[7] Students appear in the article with the initial of their first name.

[8] Focus groups were conducted in Spanish. We translated their content into English by making sure that the original meaning was maintained in the English version.

> face again, I can identify him with what we were doing in class with the video at that time. So, this helps me to put him in context. To put it simply, to see faces or situations helps me contextualize what we say in class" (E).

This capacity to relate concepts with real situations was perceived as a stimulus to deepen the knowledge of the region, not only to pass an exam but also for the development of several skills that students viewed as important for their personal and professional life. For example, student M referred to the capacity to reduce the influence of national biases in the study of Latin America:

> "Coming from Spain, we often have some prejudices about Latin America, we have like a preconceived image in our mind. Frequently, while watching current videos about it, sort of, it is like saying to us 'look,' which is different from what you were thinking about what is going on in that country" (M).

Student E followed similar lines by focusing more specifically on the professional skills that she felt she acquired thanks to this methodology: "This methodology helped me develop myself professionally, to know how to speak and debate, to know what I am talking about" (E).

Finally, the debate revolved around the specific techniques that made the class more active in terms of learning, such as teamwork activities and students' presentations in class. In general, students perceived the potential utility of these activities. For example, they saw teamwork as a great stimulus to collaborate with their classmates, while they referred to presentations as an instrument to facilitate learning. Even though they dedicated only a few comments to these issues, which reduced the possibility of identifying clear tendencies in the data, what emerged was the perception that for these activities to be effective, the role of the lecturer is crucial. For example, students suggested that presentations be based on clear rules established in advance by the professor; otherwise they risked being boring and unhelpful. In this sense, they saw the professor as a fundamental facilitator and provider of the "rules of the game." Were professors not to play this central role in managing the class activities, students argued that they would feel more comfortable with the traditional lecturing format.

> "Personally, in the debate between these two ideas, I prefer to listen to the professor because normally, presentations that we see in class…like, students learn everything by memory, they deliver it and you just listen, right? Most of the times, I confess, I just switch off" (P).

> "Many times, I too disconnect because they [classmates] just beat around the bush, but, in fact, they are not really saying anything useful that can contribute. For this reason, many times I prefer the professor's explanations" (M).

In sum, the results of the first focus group showed that students greatly appreciated a combination of different teaching methodologies, which they directly related to an improvement of their achievement, understood as acquired knowledge and personal skills. Moreover, while they expressed satisfaction with different types of class activities, especially group exercises and, with some reservations, individual presentations, they also maintained that the role of the professor is crucial for the successful performance of these activities in the class and, in general, for their learning processes.

Group 1: Flipped Classroom treatment

The second focus group analyzed students' perceptions about the FC, which we applied to one block of their Latin American politics class. None of the participants had had any previous experience with this methodology. This aspect emerged in all the main commentaries, with students frequently observing that they all felt very rooted in the traditional teaching format, which is what they mostly had experienced since primary school. By traditional method, they meant the traditional lecturing format in which the professor lectures, and students take notes.

> "I think the main problem is that we have been using the same method since we were kids in primary school, so to change the teaching format abruptly might be a bit of a shock, so I would do it more gradually" (C).

In this context, students did not clearly argue either in favor or against the flipped format. Rather, they preferred to identify both the advantages and disadvantages of this technique. Among the disadvantages of this format, students agreed that the novelty initially created a sensation of a learning "burden," viz., a difficulty in understanding the sense and goal of this new methodology.

> "I think at the beginning we all felt a bit overwhelmed because it was like, as they said, everything was so new" (L).

In this sense, some students did not perceive a relation between the flipped format and their results in the exams, which they saw as independent of the type of technique used in class. This was the perception of some students especially for exams that required answering open questions in the form of short essay.

> "You can watch a video and, obviously, you remember the information. However, for the exam and for passing the exam, you don't rely on a textbook, or something that can indicate what is going to be asked in the exam. A video says many things, but you are not really able to understand how they can test you on that, or how it is going to be in the exam" (J).

> "Maybe it does not contribute the same way in order to get a grade because the student, when he arrives at the exam, except when it is mul-

> tiple choice and everything is very clear, maybe he does not know how to develop it because it is not simply a text that you could learn and develop" (A).

Other students observed that, although they did not see a direct impact on the exam grades, they did use the videos of the flipped format to review the main aspects of the syllabus before the exam.

> "I think in the end we tended to remember the video because we re-watched it. For example, I re-watched it the day before the exam because it helped me to review everything" (L).

> "I used it when I was reviewing" (C).

In general, students did not express a clear consensus on whether the format could improve their grades or simply function as a support for exam preparation. For this reason, the focus group did not elucidate whether the flipped classroom could improve students' performances on exams, either for multiple-choice or essay formats.

Nevertheless, students also observed several advantages with the flipped format. For example, they perceived the potential of an innovation that relies on videos that they could potentially rewatch in any place and at any time.

> "You can watch it in any free time or in ten minutes…which is better than downloading the slides [from the Moodle account], starting to read maybe 48 transparencies. So, I think this is very helpful" (C).

Finally, when asked about the possibility of implementing the FC on a larger scale (i.e., in other classes and for longer periods), students offered prudent advice about what they felt was essential. Because of the sensation of a learning burden, noted above, students suggested introducing this technique gradually and with attention to the peculiar characteristics of each class. Students perceived some classes would be more apt for this technique, although a clear consensus on this point did not materialize, with some students considering it better for social sciences and others for the natural sciences. For example, the following units-of-analysis reveal a disagreement between students A and J on the one hand, and student C on the other hand.

> "In those subjects, like history or other humanistic, social subjects, I think it helps you understand more than memorize and this can improve your knowledge" (A).

> "I think it can be good, but I don't think it can be extended to other types of classes" (J).

> "I think that if you are able to make a good video about a difficult concept, in those types of classes, such as statistics of models, where you

> have concepts that many people do not understand, it would be a great improvement." (C)

A clearer consensus emerged about the necessity of integrating the FC with other teaching methodologies. Students did not appreciate a class in which the flipped format was the only one used. Rather, they preferred a class in which this format was integrated both with other active learning techniques and some elements of the traditional teaching format. However, the most interesting aspect was that all students associated the success or failure of any of these methodologies—traditional, active, and mixed—with the professor's ability to stimulate their motivation.

> "Motivation has to do with each of us and that there will always be students who do not go to class, as A says, or that look for clothing in the internet…there will always be students like this. So, it is very important that the professor be able to motivate, to transmit" (C).

> "I think the most important for me is the professor. Through his material and presentation, he can manage to hook the student so that the student can understand it and not only to get a good grade in the exam, but also to internalize it and keep that knowledge so that he can use it in his professional or daily life" (A).

In sum, the results of the second focus group showed that the implementation of the FC initially created a sensation of surprise and, in some cases, even burden. However, students also recognized the FC's utility, especially for reviewing class contents before an exam. Nevertheless, consistently with group 0, students related the effectiveness of any teaching innovation to the talent and skills of the professor.

IV. DISCUSSION

The mixed-method approach allowed us to identify some tendencies that can contribute to the debate about the use of the FC in PS. First, the analysis of the focus groups supports the findings of some previous studies that PS students have, in general, a positive perception of active learning techniques (Omelicheva and Avdeyeva 2008; Baranowski and Weir 2011). In both groups, we retrieved a consensus about the fact that, when they are well planned and implemented, these techniques can stimulate their desire to learn and enrich their personal experience. In general, students felt that active learning has the potential to improve not only their academic skills but also their future personal and professional competencies. As with those studies that have found a positive impact of the FC on students' motivation (Touchton 2015), the participants in our focus groups referred to this issue especially in terms of their desire to attend class and expand their knowledge (in this case, about Latin American politics and society). The results of the quantitative study go in a

similar direction, in the sense that active learning methodologies seemed to improve student performance. For example, in our study, the use of FC was instrumental in equalizing the slightly different levels of knowledge detected in the preliminary survey. Nevertheless, we observed a similar improvement in the group that did not receive the FC. This suggests that the methodology type is not the main determinant of student performance, which is consistent with the conclusions of other studies (Elen and Clarebout 2001; Powner and Allendoerfer 2008; Jenkins 2015).

Second, students did not find only positive effects in these techniques. Perhaps because of the FC's disruptive effects on the traditional teaching format to which students are more accustomed, students suggested implementing the technique cautiously. Their perception was that, before restructuring teaching formats, academic authorities should consider the differences that may exist among different disciplines and among the teaching styles of their professors. This echoes Daniel Lambach et al.'s study of applying FC in an IR course, which concluded that the FC can be effective but needs to take into account "its compatibility with the course content…learning objectives, and the skills and teaching philosophy of the instructor" (2017: 564).

Moreover, both in the case of the group that received a more traditional class and in the case of the group that received only the flipped class, students expressed a clear consensus about the fact that these techniques cannot be a substitute for traditional teaching (Jenkins 2015). In both cases, students expressed that the main variable that could distinguish a good from a bad class was still the professor, understood both as a transmitter of knowledge and as a motivating coach. Future studies should try to assess whether perceptions like this are motivated by the fact that most education is still organized around the figure of the professor or that it is sometimes difficult to observe the positive impact of a relatively new technique. Nevertheless, what our focus groups told us is that the students did not regard the professor as a mere "guide on the side" but as a central figure. Students assigned to the professor most of the responsibility for how effective or ineffective active learning techniques were implemented, and, more generally, for their learning process. This is consistent with the results of the quantitative study, in the sense that student performance in terms of acquired knowledge was similar among both groups. This could mean that a key determinant of student performance is not the methodology but, rather, the teaching skills of the professor. As explained before, in our study, the same teacher taught both groups.

This finding partially challenges previous studies that found mostly positive results with implementations of the FC (Baepler et al. 2014; Zhang et al. 2016; Santikarn and Wichadee 2018).It is more consistent with studies that express more caution (Yen et al. 2018). Far from arguing that students did not appreciate active learning techniques, such as the FC, our data show students prefer "having mixed class sessions" over "having all flipped-class sessions" (Jenkins 2015: 610). The students that we were able to interview did not dismiss the

importance of either the traditional lecturing format or active learning techniques. What they expected was a balance between the two, which is to say, "some instructor-led lessons and some designed around student questions" (2015: 610). We are aware that this finding needs to be reinforced by more data, especially because, as explained above, the literature is not clear about what type of research design conduces to the most adequate comparisons. Effective comparisons need to identify specific causal factors that can isolate and explain the effects of active learning methodologies compared to other types of methodologies.

As Jensen et al. observe, comparing overly/very distinct teaching formats can entail significant enough differences in variables and conditions that it can be difficult to identify the effects of each methodology (2015). Scholars should be aware of the risk posed by confounding factors. Understanding which research designs can best identify relevant causal factors and thereby support reliable conclusions should be one of the goals of future research in the field. The very fact of flipping a classroom, even in studies that find adequate control variables, can generate very/overly different effects, mostly because students that are used to traditional teaching methods are likely to perceive the FC as an overly disruptive innovation. By comparing a pure FC with a partially traditional, partially active learning class, our study aims to find a potential middle ground between different choices of research design.

A final caveat has to do with the use of the data obtained through the focus groups. Scholars should be careful at taking students' feedback at face value because students are not always the best judges of how well they are learning. For example, Louis Deslauriers et al. find that students who are exposed to active learning tend to learn more than students who are not. However, the former can have the perception that they learn less, as a consequence of the "increased cognitive effort required during active learning" (2019: 19251). While our focus groups did not exhibit a clear tendency in terms of students' perceptions of whether they learned more with or without the FC, we agree with the recommendations contained in Deslauriers' study, which maintain that no active learning technique can succeed without a teacher's commitment to explaining their importance. This seems to accord with one of the findings of our focus groups, which is that the professor and his/her capacity to generate a positive learning environment are still fundamental elements of any effective teaching model.

V. CONCLUSIONS AND LIMITATIONS

Since most applications of the FC have, so far, been concentrated within a few disciplines, such as engineering, education, and languages, we believe that our study can be a valuable contribution to understanding its impact on academic performance and students' perceptions in the area of PS, in which the FC has

so far found a quite limited impact. The use of a mixed-method approach allows us to explore two different but related issues, which would be difficult to study if we were to have used an exclusively/purely qualitative or quantitative research design. Furthermore, the strategy that we used to collect quantitative data in three stages—the preliminary survey, final survey, and exam—can provide a robust understanding of the efficacy of the teaching-learning process.

Our study has some limitations. The experiment was based on only one block of one university class in a single semester. This limits the possibility of generalizing our conclusions to other teaching settings. We are aware that it is necessary to repeat the experiment with larger samples of students over entire courses (Creswell 2013: 202; Sampieri 2014: 455). In such a scenario, more sophisticated statistical techniques could be applied. Something similar could be said about the focus groups, which had a limited number of participants. Further research will permit better "triangulation" among different types of data (Sampieri 2014: 457), which, in turn, should improve the clarity and precision of our findings by "widening or deepening understanding" (Ritchie and Lewis 2003: 275) of the use of inverted teaching and other active learning techniques. More data on perceptions are needed to understand what specific aspects of active learning students prefer.

Our results are preliminary. As the students in our sample were accustomed to classes that combine traditional lecture and active learning techniques, we are aware that full acceptance of the flipped classroom may take time. For this reason, we hope/intend to conduct new measurements in relation to this specific group of students. This paper is part of a longitudinal research project whose goal is to detect and adjust the effects of flipped classroom techniques in the medium term.

Nevertheless, we believe that, as an exploratory study, our analysis provides useful insights about the academic performance and perceptions of students concerning the FC. It represents a starting point upon which to carry out more research about the implementation of active learning techniques in PS. So far, most studies in PS have compared qualitative classes taught with both traditional and active methodologies. One of the few exceptions is Touchton's study (2015), which has analyzed the impact of the FC on a quantitative, advanced statistics class. There are too few studies to conclude whether the FC, which is based on the possibility of re-watching videos, is more apt for quantitative subjects, in which students need to learn techniques that can be challenging, or for qualitative subjects, which require more study of the historical context of concepts and facts. However, it could be useful to compare the effects of the FC on both qualitative and quantitative PS classes, with the goal of understanding whether there is something inherent to PS's different methodologies that can make the FC more or less effective.

We are aware that implementing the FC can be disruptive, especially because most PS faculties still tend to structure their classes in a traditional way. This

is something that also emerged in our focus groups, where students told us that the main challenge would be to implement innovations not just for their own sake, but to facilitate the learning process". For this reason, we have so far implemented the FC only in one module of one class. We will continue implementing it cautiously as we think that reflecting on the effectiveness of various techniques should be one of the long-term goals of any study of active learning.

Studies of active learning have concluded that these techniques tend to have the most recognizable impact on high-order knowledge acquisition, including, for example, on soft skills such as critical thinking, analysis, and comparison (Lambach et al. 2017). An important venue for future research is to generate more data to test the impact of this conclusion. The goal is not only to understand whether the FC improves high- or low-order knowledge acquisition, but also to identify which aspects of the FC may be more useful than others. Finally, it is necessary to expand the research design in order to test the reliability of one rarely tested assumption in the FC literature: i.e., that knowledge acquired through flipped teaching lasts longer than knowledge acquired through traditional methods. This can be done by conducting the post-test later in the study and comparing how students retain and process information through time.

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