Spanish Universities shaping to European Higher Education Area (EHEA) by means new teaching methodologies. A case Study.

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Abstract: - This paper describes briefly the transformation of the obligatory subject Introduction to Statistics (IS), in the first year of degree in the Faculty of Business Administration and Management (Administración y Dirección de Empresas FADE) at the Universidad Politécnica of Valencia (UPV) during the academic course 2009-2010. That course which a pilot European Credit Transfer System (ETCS) credit program was initiated, previous to its obligatory implantation in 2010, in the context of the European Higher Education Area (EHEA). The purpose of this research is to provide an overview of changes on the didactic model of this subject regarding previous academic years. Our work describes the new methodologies followed by teaching staff, the main problems troubled and the solutions adopted to solve them. Finally, a questionnaire was developed to evaluate the students' perceptions about new active methodologies and teamwork that let us to know how these aspects influence in the development of competences and abilities, especially the interpersonal and systemic ones. In spite of the need for a larger study, the results draw that students have been fitted well to the new active methodologies and cooperative work.

Key-Words: - European Higher Education Area, Educational Innovation, ECTS credits, pilot project, student opinion, analysis of questionnaires

1 Introduction

For several years the Universidad Politécnica of Valencia has committed itself to teaching innovation, with global initiatives, such as the Proyecto Europa. However, teaching innovation must include those methodologies which increase the power of the students' personal work, and favor the learning of attitudes and abilities, by appraising, evaluating and reflecting the results which are obtained.

The process of Convergence to the European Higher Education Area (EHEA) will constitute a reform of the Spanish university educational system, having the objective of increasing the quality of teaching, the learning of attitudes and abilities, favoring continuous evaluation and encouraging student mobility among countries in the European Union. In this context, Spanish universities are developing several measures, or studies to raise proposals for the reform of the Spanish didactic model.

Given that the transition to the European framework is a gradual one, the Faculty of Administration and Business Management has established the first proceedings to be able to evaluate the new didactic strategies. To this end, it decided to establish first a pilot group of active methodologies and ETCS credits, in the course 2009-2010, previous to its obligatory implantation in 2010, when the European Higher Education Area (EHEA) starts.

The objectives of this pilot program are twofold. On the one hand, implementing new teaching methodologies or active learning and then analyze its viability in the new degree. On the other hand, it is intended that students acquire a more active role in their own learning, becoming a major player in the teaching-learning process. The pilot program is, among other things, an initiative to improve educational processes and experiences, allowing to assess the cost of implementing innovative education programs: requirements, changes, efforts and, most in particular, the response of students.

The results which are presented in this article are the first part of a larger teaching innovation project developed throughout the 2009-11 courses, with the support of the Faculty of Administration and Business Management of the UPV. The general objective of the study is to carry out an educational experience where it is shown the transformation of the subject Introduction to Statistics (IS), in first year

of the degree course, to adapt to adapt to EHEA and promote initiatives of improvement in the quality of the teaching. The study will finish in 2010-2011, with the implantation of the degree course.

The work is structured in the following manner. In the first place, the context or framework of the educational innovation is analysed regarding the current initiatives at the moment in Spanish universities. A description of the subject under study is provided together with the problems found using traditional teaching and the new active methodologies presented for the future. Then, the method used in the present research is described: description of the sample; description of the instruments used, the procedures of analysis to use in the collection and treatment of data. Next, the results obtained from a sample group of students registered in the subject are presented. Finally, the most relevant conclusions are summarized and some possible contextualizations extracted from the research carried out, for the teaching-learning process.

2 Conceptual framework

The Convergence process to EHEA is a reform of current Spanish university system, with several objectives: to develop a structure of equivalent qualifications with the recognition of qualifications at European level; to increase the quality of teaching and learning skills and abilities of students; encouraging mobility of the university community between European countries, and, finally to develop a greater prominence for students and institutions.

This reform is materializing in diverse legislative initiatives establishing the legal framework for the transition process, in accordance with the Bologna Declaration signed by ministers of education from different countries in Europe, in 1999. It is also materializing, through the university centres with previous experiments in the process.

In Spain, the law: Real Decreto 1125/2003, 5 December 2003, laying down the European Credit system and the Evaluation system in the official university degrees [1], fixes in article 3 and 4 the concept of ECTS credits and their assignment. A European ETCS credit is the unit of measure of the academic level academic representing the amount of work the student meet to achieve the objectives of the program and to lead to the students to obtain university degrees with official character. This unit of measurement integrates the theoretical and practical teaching and other academic activities, including study time and work that the student must perform to achieve the educational objectives of each one of the subjects of each program.

Various sources have propounded the advantages offered by considering a teamwork-based methodology with university students [2-6]. On the one hand, it enables students to experiment and acquire the skills that they will need in their future jobs.

Some of these skills are: interpersonal communication, teamwork, group problem-solving, leadership, negotiation and time management.

The Ministry Of Education and Science in the document *La integración del sistema universitario español en el espacio europeo de enseñanza superior* (The integration of the Spanish university system in the European higher education area), indicates the highly commendable character of pilot implantation experiments with European credits. In this context, Palau Oliver et al. [7] comment that in recent years, in the majority of European universities, experiments with the implantation of the Bologna model[8; 9] have been carried out, known as “pilot ECTS experiments”, which imply the implementation of new teaching methodologies with subjects in present-day curriculums to evaluate the strengths and the weaknesses of said innovations in future degree courses. There is a great deal of investigations about this theme, for example, Zamora et al. [10].

Nevertheless, university lecturers perceive certain deficiencies and the lack of information about the true advantages and disadvantages of this type of methodologies, especially when comparing them with the traditional methodologies, based on classes mostly lectures [11; 12].

In this context, the implantation of a pilot program in the subject IS supposes several modifications of teaching activities that the teaching staff has been performing in recent years: on the one hand establishing new teaching methodologies, based on the active participation of the student as opposed to the exclusivity of the lecture or magistral classes; on the other hand establishing new evaluation methods, being based especially on the effort realized by students during all course and competencies and abilities that they have acquired once the subject is over.

2.1 Description of the subject under study

Introduction to Statistics (IS) of the Faculty of Business Administration and Management (FADE) of the UPV is a compulsory subject in the first year of the degree course which has a total of 6 credits. There are four groups, two in Spanish (one in the morning and one in the afternoon), one in Valencian and one in English, with a number of registered students that

ranges between 90 (morning groups) and 30 (English group).

The principal studied content will now be outlined. The contents are divided into 7 topics. The first one is an introduction to Descriptive Statistics, in which the whole course is outlined. Topics 2 and 3 form the first main part of the subject and are dedicated to the explication of descriptive statistics. Topic 4 is dedicated exclusively to the calculation of probabilities. Topic 5 deals with the probability of distribution and its application to discrete and continuous variables. Topics 6 and 7 describe the variability behaviour of principal discrete and continuous distributions respectively.

It is intended that the student be able to identify the usefulness of Statistics as an instrument for the analysis of data previous to decision making, as well as learning to carry out descriptive analysis using graphics and measures of synthesis such as those of position, dispersion, form and concentration; estimating the statistical dependence between two or more variables (qualitative or quantitative) through cross tabulation, correlation and regression analysis, controlling basic concepts relative to random variables and probability, and identifying the probability distributions of random phenomena in the real economic world. Finally, students should learn to work and solve cases and problems in an autonomous way with personal initiative using basic software for statistical analysis.

Likewise, it is considered that this material has a fundamental cross-course component in the delivery of other material, given that one of principal competences is that the student should acquire the ability to present and resolve problems.

Until of the program Pilot, the subject was based entirely on passive learning where the lecturer shape the content for the students completely and provide that information to them usually in a lecturer manner. This information is usually given, in logic structured lineal manner, with examples, solving problems on the blackboard, proposing tests and problems for homework and correcting the tasks given for homework. The student takes notes, memorizes the content, and feeds it back to the teacher for the test [13; 14]. Students only take and accept the information and the knowledge provided by the lecturer. The magistral class was completed with four laboratory practicals where students solve a real case through statistical software. The evaluation of the course is conducted by a single final exam which added the result of practices with a weight of 10% of the final mark.

This process used until now produced several problems: overcrowding in lecture theatres; the mentality of the students, who play a totally passive role in the classroom at the expense of the teacher's explanations, total lack of interest and motivation for the subject; very few students manifest real interest for the subject, due principally to the fact that they see the subject as unachievable, therefore requiring a different method of evaluation, of a more continuous manner, so that the students see that the effort made is proportional to the ease of passing; students did not need to make a prolonged study of the subject, and only made an effort before the final exam, which fell in the period corresponding to the rest of the exams; practicals were carried out without any motivation on the part of the students, who only attended because it was obligatory, given that they were not up-to-date with the theoretical side; as the course advanced, the number of attending students diminished, since the students had not understood the concepts of the previous topics; and finally, the number of students that did not take the exam in June was high.

2.2 Adapt of the subject IS to ETCS system

For the present academic year 2009-2010, a new teaching program was designed to harmonize the teaching quality and student competences to the European level [15], defining the methodologies of teaching-learning, directed to the student understanding the content in a continuous and progressive form, so that excessive preparation time is not required before the final evaluation, and students consider themselves more active in their own learning process incorporating innovative experiences such as cooperative and autonomous learning, based as much on team work, as in the realization of practical cases and problems [16; 17]. The results obtained using the new active methodologies and systems of evaluation will be appraised comparatively with those obtained with the traditional methodologies. Changes need to be made continuously in the teaching methodologies to avoid their failure.

As a starting point for this investigation, a Learning Contract was drawn up to define the new learning activities and evaluations in the subject. The students who signed it were named the “Pilot Group”. The contract, in addition to being a very positive tool favoring the students' autonomy, is also a tool that clarifies the proposed strategies for the subject and outlines the students' role in the delivery of the course. Therefore, the students had the possibility of signing the contract (resorting to the new teaching and evaluation methodologies), or not to sign it (sticking to traditional methods).

The teaching-learning methodologies to be used in IS at the present course are detailed below, comprising practice activities and evaluation activities. Both aspects are described at the same time that new active methodologies because, practices activities help students to acquire new knowledge by providing feedback, pointing out the most important information, and to prepare them for a final evaluation. The second aspect, evaluation of the subject, is continuous but must be a final experience that lets the students know whether they have mastered the objectives or no, in accordance with with some authors [18;19].

2.2.1 Participative lecture

At the beginning of each topic the lecturer provides an extensive organized explanation of the topic following a logical sequence using visual aids, and going into the material that has to be learnt. The class structure consists of three parts (introduction, body and conclusions) which are equivalent to "tell them what you are going to explain, explain it, and remind them what you have explained". The final stage, is resolving exercises, problems and practical cases in the classroom.

2.2.2. Cooperative learning

The methodology of cooperative learning has been introduced into the subject through the use of formal groups in the class, in which the students work together to reach shared objectives. Each student has two responsibilities: to maximize his learning, and that of his companions in the group. Following the participative lecture, each formal work group is given the topic divided in three parts (groups of 6, with 3 pairs). Each pair studies the material presented and presents it to the group in order to share ideas and material. Each group prepares and submits a report to the teacher. Likewise, the teacher presents a series of problems to each group at the end of the topic to be solved in the class and submitted to the teacher for correction.

2.2.3 Seminars

The students in this subject have 4 seminars of three hours each, in which the students carry out the group exercises. Said exercises are presented to the base groups formed on the day of the seminar. Later, each base group is presented with the solutions and exercises to be cross corrected between the different groups. These are submitted to the teacher later the same day for revision. In this way, the student receives feedback about his studying, so that each student group knows what was wrong with each problem and therefore the aspects that must be improved. In turn, the cross correction of the problems between groups, makes them assume a level of responsibility.

2.2.4 Laboratory practicals

In the laboratory, in addition to supporting the items explained in the class, each student works individually with specific software, so that they can develop procedures, abilities and attitudes. Practice evaluation is carried out 15 minutes before finish it, meanwhile a computerized questionnaire that lecturer has developed in the platform called PoliformaT, that is the official web site of UPV for posting information. Marks of each practice are sent to students immediately, showing questions good and bas answered, so the feedback is continuous.

2.2.5 Evaluation system

The system of evaluation of this subject, is continuous, that is, it is carried out from the beginning of the course, considering theoretical and practical aspects as recommend Morales [20]. The evaluation of the subject includes the four previously explained activities, cooperative work (40%), individual practical laboratory sessions (10%), the seminar group task (20%) and the final exam (30%).

3 Methodology

3.1 Sample

The group under study in the present work was made up of students registered in the principal subject Introduction Statistics of the FADE at the UPV in the 2009/2010 course, in two of four possible groups. Of the 143 students that make up both groups (66 in the first and 77 in the second) 19.6% were repeating the course, forming 27.3% of the first group and 13% of the second.

The response to the contract learning was 63.6% in the first group and 87% in the second. The learning contract required a minimal attendance of 80%, the continuous evaluation system permitting no more than three absences. The subject was imparted over twelve weeks with two classes (3¼ hours) every week. During this period, 14.3% of the students in the first group and 6% in the second broke the contract. This percentage is higher in the first group tan in te second, probably due to the greater number of repeating students in this group, as can be seen in Fig. 1.

Initially, the possibility of handing out the questionnaire to a randomly selected group of

students was envisaged. However, in the end the failure to attend the classes of those that had not formed part of the pilot program, and teaching experience, resulted in only handing out the questionnaire to those students who had decided to sign the contract and were present in the class when the questionnaire was handed out.

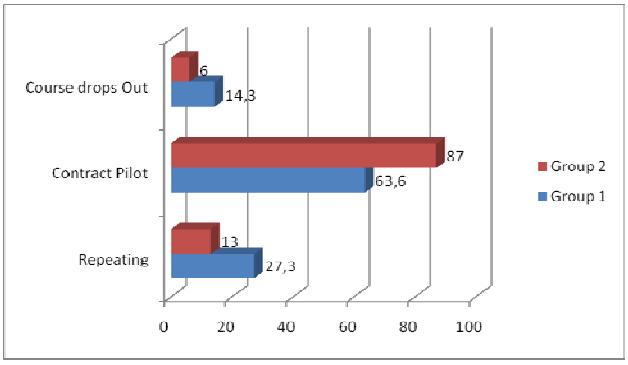


Fig.1. Percentages of students in the pilot programme, repeating students and drop outs in each group.

3.2 Instrument

For the evaluation of the experiment the students were asked to respond to a series of questions about distinct aspects related to the new active methodologies and the group tasks, voluntarily, and in an individual and anonymous form.

The questionnaire used in this experiment was designed starting from a series of instruments dedicated to gather information from students relative to different dimensions of quality of their experience in degree courses, in Astin's works [21-24] and most of all, [25], Ewell [26], Pascarella and Terenzini [27; 28], Hughes and Pace [29], Kuh [30] and McInnies et al. [31], being works that emphasize the importance for learning of factors such as student implication, the relations between the students, between students and teachers, the informal learning activities, etc.

We also used a questionnaire collected as a case example in Maiques [32], technical advisory of the Institute of Education Sciences (ICE) at the UPV. Nevertheless, structure and formulation of the said

Table 1. Questionnaire used in the experiment

Evaluation of new teaching methodologies
1. As a general impression I have felt satisfied in this work group.....
2. I feel satisfied regarding the work, the efficacy of the group, the results obtained..
3. I have been listening, paying attention to the ideas of the others.....
4. We have not agreed from the beginning on the objective, about what we had to do..
5. We have had not enough order, finding a method of work that helps us make good use of our time
6. We lacked someone to direct, we needed to name a coordinator or a secretary.....
7. One or more than one person has monopolized too much work and has hardly let the others intervene .....
8. One or more than one person has been very quiet, hardly taking part.....
9. We have deviated a great deal from the initial objective; we have talked or done other things.....
10. Does it increase motivation?
11. Does it increase the self-confidence of the students in their own capability?
12. Does it increase enjoyment of the subject of study, the perceived use, etc.?
13. Have you learnt something new that you did not expect you were going to learn?
14. Have you got to know some of your companions better?
15. My interest in the subject has increased.
16. I have learnt and understood the contents of this course
17. With his form of presenting the subject, the teacher manages to maintain the class's attention
18. The teacher's explanations, despite being fast, were clear
19. He has encouraged the students to share their knowledge and ideas with other companions
Evaluation of group work in general
1. They have contributed to us feeling more integrated in the class
2. They have improved my ability to interact with the others
3. They have improved my ability to understand the concepts of the subject
4. They have improved my ability in the solution of problems
5. This subject's workload has been normal, compared with others
6. The rhythm of the classes has been normal
7. On average the work outside the class took from 0 to 2 hours
Identify 5 positive and 5 negative aspects about the new teaching methodologies in IS

questionnaire was designed fundamentally to appraise how the students evaluate the new active methodologies set up in this course. To this end, it attempts to provide information on those relevant aspects, considered fundamental in the analysis of the strong and weak points of the planning and development of teaching in the subject, previous to the implantation of the degree course.

The questionnaire consists of two parts, plus an additional one which asks the student to identify five positive and five negative features, in order to, above all, detect the weaknesses and strong points, to guide the teachers to make the necessary decisions:

• The "Questionnaire on the new active methodology" which is designed to gather global information on the adjustment and coherence of the new proposed teaching techniques compared to traditional teaching. Said questionnaire is graded as: YES, NO and Do not know, do not wish to answer.

• The "Work Group Questionnaire", which considers the students views on the quality of work carried out by the base groups. It is a fundamental questionnaire, given that the new teaching methodologies attempt to encourage teamwork. This questionnaire is grade by means of a 4 point Likert scale: Agree strongly (4), Agree (3), Do not agree (2) and Disagree strongly (1).

The questionnaire is included in table 1.

4 Results

After examining the 77 questionnaires for this subject, the results obtained are summarized below.

Table 2. Percentage of answers in Active Methodologies

Item	Yes	No	DK/DWA
1	85.6	6.5	7.8
2	77.9	9.1	11.7
3	90.9	1.3	7.8
4	20.8	66.2	13
5	16.9	74	9.1
6	10.4	80.9	9.1
7	5.2	88.3	6.5
8	14.3	70.1	14.3
9	3.9	88.3	7.8
10	51	23.4	15.6
11	53.2	16.9	29.9
12	56.4	20.8	20.8
13	54.1	22.1	23.4
14	72.4	19.7	7.9
15	54.5	19.5	26
16	74	2.6	23.4
17	67.1	6.6	26.3
18	85.5	3.9	10.5
19	76.6	7.8	15.6

It can be seen that an important percentage of students: value teamwork positively, the need to be up-to-date with the work and the possibility of interacting and getting to know the rest of their companions better. Aspects appraised negatively are: the large volume of work outside the class, the speed of the theoretic explanations and that not all the members of a team collaborate equally in the elaboration of exercises and differences of opinion can occur.

It can be seen that the great majority of students positively appraise group work, its efficacy, and the results obtained. They also confirm paying attention to the ideas of the rest of the group.

They affirm that on the whole they did not have problems agreeing on the objective at the beginning, about that they really had to do, that they did not lack order or structures to decide on a method of work that helped them to make good use of time; neither did they need somebody to direct them.

The majority think that nobody in the group monopolized the work too much nor hardly let the others contribute, nor that anybody had been too quiet, hardly contributing and they did not deviate very much from the initial objective.

The evaluation of whether there are increases in motivation for the subject, the self-confidence of the students in their own capability and the enjoyment of the subject, the perceived usefulness and whether they have learnt something new they did not expect they were going to learn, are valued affirmatively with values of about 50% and does not know, does not wish to answer, about 20-30%.

The evaluations of whether they got to know some of their companions better, if interest for the material increased, and if they had learnt and understood the contents of the course, were positive at around 70%. Finally, the evaluations of the teacher were quite positive.

Table 3. Percentage of answers in Group Work

Item	Agree strongly	Agree	Do not agree	Disagree strongly
1	12.7	51.9	29.7	5.7
2	10.8	55.7	31.1	2.4
3	17.6	44.2	32.8	6.8
4	18.9	41.9	35.1	2.7
5	16.2	39.2	36.5	8.1
6	12.1	50	33.8	4.1
7	18.9	33.8	36.3	11.0

With respect to the questionnaire about group work, the majority answered Agree or Do not agree, and not at the extremes of the scale. The majority of those who said Agree, approximately 50%, agreed

that the new teaching methodologies had contributed to them feeling more integrated in the class, had improved their ability to interact with the others, had improved their ability to understand the concepts of the subject, had improved their ability to solve problems and considered that the rhythm of the classes had been normal.

On the other hand, they were fairly evenly divided about whether the workload was excessive and whether they had to work between 0 and 2 hours outside the class.

The list of positive and negative aspects is shown below in tables 4 and 5.

Table 4. Positive aspects highlighted by the students

Teamwork
The final examination counts less
The classroom are more didactic and amenable
The need to be up-to-date with work
Integration and better adaption
Fast and easy learning
Ability to interact and to get to know the classmates better.
Improvement in the solution of problems and doubts.
Coordination between classmates.
Timetables.
Tutorials.
Easier to pass.
More active classes with high level of participation.
Having previous knowledge before the exam.
Greater motivation.
The group work favours help between classmates.
Tasks distributed among classmates.
Increases confidence.
Increases enjoyment of the subject.
Permits sharing and contrasting ideas, seeing other points of view.
Better understanding of the subject.
Practical activities in class.
Less hours of individual work.
Study time better organized.
Learning to produce a report.
Greater attention to the explanations.
Using different methods to learn.
Obligatory assistance
Obligation to work outside the class.

Table 5. Negative aspects highlighted by the students

Requires a greater effort
Large volume of work outside the class.
Rapidity in the theoretical explanations.
Not everybody collaborates equally in the exercises and discrepancies can occur.
Not all of the concepts are understood.
Not enough examples given.
A lot of material in a very short time.
Too many seminars
Difficulty to come to an agreement
If the person who has the work is not present the work can not be handed in.
Motivation decreases.
Little intervention.
Little interest in the subject.
Assigned groups; the classmates are not known.
Many things that can lose one points.
Obligatory class attendance.
Low percentage in the final exam.
Writing reports for all the topics.
Little time for group work.
A lot of responsibility regarding classmates.
The note obtained depends, in part, on your companions in the group.
Companions do not understand.
Companions meet without warning.

In the following figures the percentage of students who agree with each of the aspects is shown.

Fig.2. Percentages of students' evaluations of the principal positive aspects

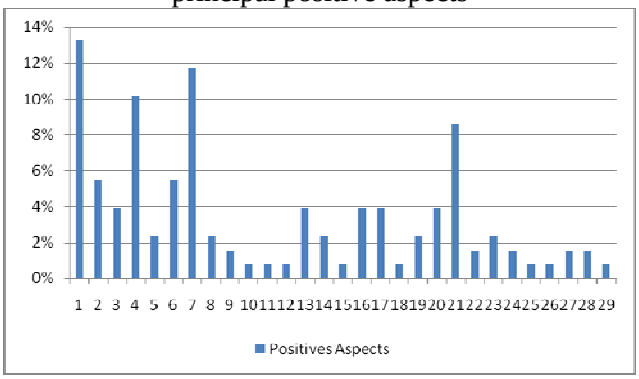
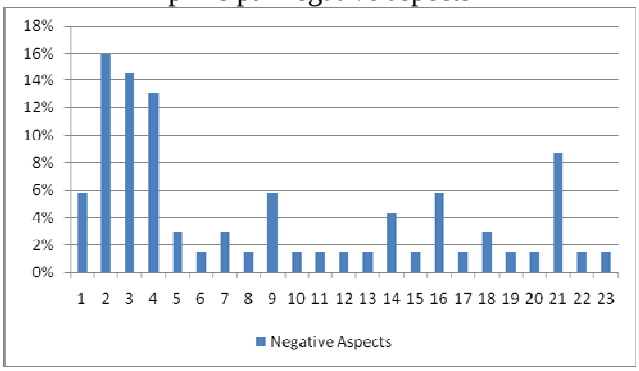


Fig.3. Percentages of students' evaluations of the principal negative aspects



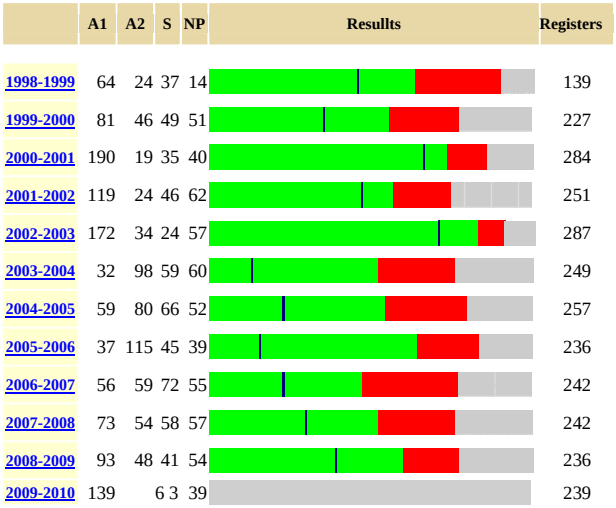
It can be seen that an important percentage of students positively evaluate teamwork, the need to be up-to-date with the work and the ability to interact and get to know the classmates better. The negatively evaluated aspects are the great quantity of work outside the class, the rapidity in the theoretical explanations and that not all members of a team collaborate equally in the exercises and discrepancies can happen.

Finally, the rate of registrations in the subject from the academic course 1998-1999, the pass marks in the first exam (A1), the pass marks in the retake (A2),

fails (S) and not taken (NP) is shown in Fig. 4. At the of date of writing the results of the present academic course are still to be evaluated, comparing the rate of pass marks and students taking the exam for each examined system, for those who signed the pilot contract and those that decided on the traditional system.

Nowadays, we can only advance the results of exam of June. Of a total of 239 students enrolled, 139 passed the exam (A1), representing a 57.32%, suspended (S) 63, which corresponds to 26% and not submitted to examination (NP) 39, it is to say, a 16%. Compared with other academic courses and considered the number of registered each year, we can see that only the percentage of A1 was higher in the courses 2000-2001 and 2002-2003, with a 67% and 60%, respectively. Regarding the rate of not submitted, it is only better in course 2000-2001, with a value of 14%. It is worth in whatever other course, with a value around 20%. This may be due to the fact that in that academic year, IS introduced an innovative educational project (IEP) to establish improvements in the teaching-learning system. However, because it was the first subject of FADE that introduced it, and considering the effort involved for lecturers and students, the following year it did not follow, keeping only some of its proposals.

Fig.4. Percentages of passes, fails and exams not taken for the academic courses 1998-2009



To finish, we developed an Exploratory Factor Analysis (EFA) to verify if our questionnaire could identify the main dimensions for it which was designed. We used Principal Component Analysis (PCA) to select the factors that seek a linear combination of variables such that the maximum variance is extracted from the variables. It then removes this variance and seeks a second linear combination which explains the maximum proportion of the remaining variance, and so on. In order to determine the number of factors to be extracted, eigenvalues greater than 1 were used.

We used Varimax rotation to redistribute the variance between the obtained factors so that the pattern of the factors was simpler and more significant.

In the case of active methodologies section, the measure of sample adequacy of Kaiser-Meyer-Olkin had a value of 0.519, indicating the suitability of using this analysis. Seven major components were obtained that explained a 69.95% of the variance, although only the first five 5 explain a 55.17%.

All variables were highly inter-correlated and the communalities or estimates of the variance shared between the variables were high (both before and after extraction) which implied that all the variables were well represented in the space of the factors.

To identify the most relevant items in each factor (loading), we evaluated the statistical power according to the size of the sample [33]. In order to achieve a minimum level of confidence of about 75-80%, with a significance level of 0.05, a factor loading of over 0.7, although these values changed according to the number of variables to be analysed. These loadings were in fact the standardised regression coefficients in the regression equation. The results appear in table 6 and 7.

As shown in Table 6, which represents the matrix of rotated components, the first factor is related to items 5, 6, 7, 8 and 9 (Integration and better adaptation, Fast and easy learning, Ability to interact and to get to know the classmates better, Improvement in the solution of problems and doubts, Coordination between classmates) and we can call it “involvement and motivation of the group”. The second was related with items 10, 11 and 12 (Timetables, Tutorials and Easier to pass) and we can call it “Quality and type of activities and learning experiences”. The third is mainly related to items 1, 2, 3 (As a general impression I have felt satisfied in this work group, I feel satisfied regarding the work, the efficacy of the group, the results obtained and I have been listening, paying attention to the ideas of the others) and may call it “Enthusiasm for learning”. The fourth dimension is related to items 13 and 14 (Have you learnt something new that you did not expect you were going to learn? and Have you got to know some of your companions better?) , and may call it “Interaction with the group”. Finally, the fifth relates to items 16 and 17 (I have learnt and understood the contents of this course and with his form of presenting the subject, the teacher manages to maintain the class’s attention), and may call it “Personal Attitude”.

Table 6. Structured Matrix

	Factor				
Item	1	2	3	4	5
1	.073	-.057	.772	.150	.158
2	.123	.294	.584	.156	-.250
3	.292	.024	.816	-.034	-2.525E-5
4	.463	-.053	-.197	.179	.147
5	.679	-.069	.129	.136	.227
6	.648	-.051	.334	.086	.113
7	.858	.130	.119	.058	-.007
8	.789	-.142	.043	.090	-.156
9	.726	.264	.076	-.299	.055
10	.001	.803	-.152	.099	-.063
11	.079	.673	.229	.321	-.017
12	.022	.739	.099	-.043	.008
13	-.021	.282	-.020	.742	.214
14	.088	.002	.197	.826	-.116
15	.029	.430	-.042	.147	.263
16	.184	-.192	-.026	-.012	.637
17	-.026	.078	.046	.049	.818
18	.152	.075	-.224	.104	.137
19	.016	.332	.224	-.014	.098

In the case of working group section, the measure of sample adequacy of Kaiser-Meyer-Olkin had a value of 0.811, indicating the suitability of using this analysis. We obtained two principal components explained a 59.11% of the variance.

As shown in Table 7, which represents the rotated component matrix, the first factor is related to items 1, 2, 3 and 4 (They have contributed to us feeling more integrated in the class, They have improved my ability to interact with the others , they have improved my ability to understand the concepts of the subject and they have improved my ability in the solution of problems), and we can call it “Interaction with the group”, and the second factor was mainly related with items 5, 6 and 7 (This subject’s workload has been normal, compared with others, the rhythm of the classes has been normal and on average the work outside the class took from 0 to 2 hours), and may call it “Workload and difficulty”.

Item	Factor	
	1	2
1	.785	.181
2	.796	.142
3	.846	.034
4	.711	.341
5	.031	.821
6	.247	.633
7	.132	.596

Table 7. Structured Matrix

5 Conclusion

In this research, we evaluated the process of adaptation of students from IS to a new teaching approach, in order to analyze their adaptation to new active methodologies, previous to its obligatory implantation in 2010.

Although this communication do not collected all the desired results, since students have not been evaluated, all indications suggest that students have been fitted well to the new active methodologies and cooperative work. The aspect worst rated has been overworked, but we must think that this is first-year students face a new teaching program.

Finally, we verify that the items selected for our reduced questionnaire (with the aim that students do not have to do a great effort complete it), extract the main dimensions, according to the questionnaires referenced in this paper, which had a great deal influenced to develop learning factors such as involvement, relationships among students or between students and teachers or learning activities.

In summary, the findings of this study confirm the fact that students value as positive the experience of working with active methodologies and it seems that they will adapt well to new educational plans raised by the EHEA

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