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PREFACE

Dear Distinguished Delegates and Guests,

On behalf of the Local Organizing Committee I am pleased to welcome our distinguished delegates and guests to the **INTCESS 2019- 6th International Conference on Education and Social Sciences** held during 4-6 February 2019 in Dubai.

INTCESS 2019 is organized and sponsored by *International Organization Center of Academic Research (OCERINT)*.

The conference provides the ideal opportunity to bring together professors, researchers and postgraduate students of diverse disciplines, discuss new issues, and discover the most recent development, research and trends in education and social sciences.

The main goal of this event is to provide international scientific forum for exchange of new ideas in a number of multidisciplinary fields of education, social sciences and the humanities for in-depth interaction through discussions with colleagues from around the world. Core areas of education and social sciences, and multi-disciplinary and inter-disciplinary areas, will be covered during the conference.

The conference program is extremely rich, featuring high-impact presentations. The program has been structured to favor interactions among attendees coming from many diverse horizons, scientifically, geographically, from academia.

INTCESS 2019 has welcomed delegates from nearly 40 different countries. This multicultural experience gives us the opportunity to meet new partners and learn from each other in an international and friendly atmosphere.

INTCESS 2019 more than just a place to present papers; it is a place to meet and welcome new people and colleagues. It is a place to interact and discuss new ideas and new innovations. In short, it is a place to build not only a community of scholars but a community of friends.

This proceeding records the fully refereed papers presented at the conference. The main conference themes and sessions are Education, Social Sciences and Humanities.

The conference has solicited and gathered academic research submissions related to all aspects of the main conference themes.

I would like to thank the organization staff, program chairs, and the members of the program committee for their work.

Additionally, I invite you to discover and enjoy the world's 21st century city of Dubai. Do not miss the opportunity to walk around and visit its impressive architecture, modern buildings of this lovely city.

Thank you very much for participating in INTCESS 2019 and for contributing to this inspiring international forum.

I hope you enjoy your time with us!

With my warmest regards,

Prof. Dr. Ferit Uslu

Chair of INTCESS 2019

Organizing Committee

February 4, 2019

Dubai

RESULTS OF INCORPORATION OF PROJECT-BASED LEARNING AND COOPERATIVE LEARNING INTO LABORATORY PRACTICES

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Abstract

Classical laboratory practices in the mechanical engineering degree have been modified in order to be adapted to new emerging trends in education. This experience is based on the implementation of project-based learning and the combination of these with cooperative learning. The inclusion of these methodologies in laboratory practices has been progressively developed with the aim of analyzing behavior and opinion, as well as the results obtained by the students. Thanks to the results obtained, it has been possible to analyze in depth the suitability and incorporation in the classrooms of a greater number of transversal competences, directly improving the quality of learning in the classrooms and, consequently, training better professionals.

During the educational process, students obtain different roles and responsibilities, generating direct feedback between them with the course of each practice and generating a positive work environment where each one of them is a fundamental part of the final objective. Initially, the students have their usual role, but as the practices progress, they acquire more knowledge and responsibility, developing work-groups among them and giving feedback to the projects of each block. With this method, all together generate a positive push in the career of their learning always supported by the lecturer as the main guide.

Project-based learning allows students to consider which are the main problems that could be taken into account during the different processes involving practices. This system enable them to participate very directly in a learning process, generating much greater feedback between their peers and the teacher and moving them away from their role as listeners. This experience provides information applicable to the teaching and learning processes developed in any university degree.

Student satisfaction and results have been evaluated in relation to the new method, obtaining good results and an improvement in academic performance and student motivation.

Keywords: project-based learning, student motivation, laboratory practices.

1 INTRODUCTION

From the early days, the human being has been able to stand out above other species thanks to the ability to think and reason. Although we have these skills innate, it is necessary to develop them at a higher level, in order to continue growing and acquire new knowledge and different ways of seeing things.

University studies are a means for students to obtain directly a technical knowledge that allows them to go to the real life to work with the best possible preparation. In addition, for this time, it is intended that this step by the university serve to improve also the skills of leadership, teamwork and different skills that are very useful in real life.

Until recently, master classes were the most common way of imparting knowledge in universities. However, the implementation of teaching away from old techniques allows us to directly improve not only the students' ability to think, but also their aptitudes and the increase in the retention of concepts. For this reason, it is intended to use project-based learning and cooperative learning as a new learning methods in practice to maximize the knowledge of the student. As Montañés indicates (Montañés Muñoz, Balart, Sánchez Nacher, Quiles Carrillo, & Fombuena, 2017) "It is essential to replace the classical teaching systems with new educational practices in which the students are not merely a receiver of the information and data presented by the teaching staff, but an active agent that intervenes in their own teaching-learning process".

This study has focused on optimization through new methodologies in laboratory practices. This is because the laboratory practices of the subjects give students the possibility of understanding how knowledge is built within a scientific community. On the other hand, it is possible to determinate the scientists work, and how they recognize disagreements, what values move science, how science relates to society, to culture, industry, etc.(López Rua & Tamayo Alzate, 2012).

Several authors consider that knowledge is immersed and linked to the situation in which learning occurs (Applefield, Huber, & Moallem, 2000). This generates a starting point to develop and implement methodologies that favor knowledge directly in the student's learning.

From a more dynamic approach, the proposal of teaching through projects has as main axis to promote the development of learning through the elaboration of projects that respond to a real problem. This allows students to favor the connection between knowledge and application contexts, while at the same time encouraging reflection on the processes developed in the development of the solution(Cenich & Santos, 2005).

With the implementation of cooperative learning, it allows the teacher to reach several important goals at the same time. It increases the performance of all students, and also helps to establish positive relationships between students. Finally, it provides the experiences they need to achieve a healthy social, psychological and cognitive development, generating a complete learning(Johnson, Johnson, & Holubec, 1999).

Currently it is necessary to replace the classical teaching systems in order to obtain students with the capacity of obtaining knowledge, skills and aptitudes before different problems, having their own critical thinking and skills to work in a group. All this is of vital importance to train good professionals who know how to function adequately in the company or positions of high responsibility. From this point of view of education, the application of methodologies such as project-based learning and cooperative learning can be a great advantage for students.

From this new trend, it is intended to obtain students with a greater understanding of what happens in the laboratory practices, giving them a critical knowledge and with sufficient skill to be able to perform work positions from a practical point of view. For this reason, the incorporation of this type of methodologies in engineering studies is a great starting point for the improvement of one of the most important parts of this type of knowledge: Laboratory practices.

2 PRIMARY AIM

The main objective of the use of project-based learning and cooperative learning in laboratory practices is to offer students a new teaching method. In this way, we are working on a new, much deeper background where students are allowed to solve in a coordinated manner the different problems and activities that arise during the course of the subject.

With the incorporation of these new methodologies, students are able to acquire certain responsibilities, both group and individual to work together towards a common goal. All this always supervised by the teacher who will be the guide in the different levels of learning with the objective that the students develop their own

learning.

The combination of these two methodologies allows directly evaluating the student both individually and collectively. This allows analyzing in a simpler way what problems students have when working and how to solve them.

Thanks to the incorporation of projects and cooperative learning, students are able to understand and analyze in greater depth the objective of each laboratory practice, obtaining a much more applied knowledge and favoring the transversal competences that are evaluated in the Universitat Politècnica de València (UPV)(UPV, 2017). As has been mentioned, within the Universitat Politècnica de València (UPV) there is a project with the aim of orienting teaching practices to a higher education based on competences, in which 13 transversal competences have been established. Some of the transversal competences that are worked with this type of methodology are:

- Design and project.
- Teamwork and leadership.
- Permanent learning.
- Specific instruments.
- Planning and time management.
- Application and critical thinking.

The current dynamics of laboratory practices have been changed with the main objective that students improve certain skills such as teamwork, leadership, collaboration and improvement of results analysis. All this for the student to work and improve the skills directly trying to meet the objectives of the UPV and also serve as a real model when working in a company.

From the beginning of the classes, the teacher is in charge of explaining the operation and the details of all the trials and machineries. As the practices progress, students will gain greater ability to independently perform the practices to finally perform the projects indicated by the teacher, both individually and collectively.

3 METHODOLOGY

The methodology used for the incorporation project-based learning and cooperative learning in the practices of the subject has been based on the application of different concepts that have great relevance when putting the system into operation.

On the one hand, the teacher must establish what actions and essays will be developed throughout the course. From these data, the student is responsible for attending and collecting data in order to work independently when they should proceed to carry out projects. On the other hand, we must take into account the cooperative learning. In this section, students, based on the teacher's instructions, must be able to work and collaborate as a group. With this type of group work, students must coordinate among themselves in an autonomous way to perform different tasks and offer the group different skills and ways of working.

Both methodologies are very close to each other, since from the most practical point of view, any realization of a project takes into account the good interaction between the members. The combination of these methodologies allows the student to see in a real way how they work in the real world, being able to detect failures and improvements individually but which have an impact on the final result or work group.

The important thing about the implementation of these methods is that the students participate and collaborate with each other in order to create a dynamic environment. Once they begin to work together and perform the tasks of the project, the teacher, not having to worry about exposing the theoretical content, can attend in a more personal way to each of the students and receive comments on how they progress in learning the contents of the subject. Likewise, due to the great burden of students who currently suffer some subjects, with this type of methodology can be offered a more direct treatment to students.

4 RESULTS

To evaluate the suitability of the technique, two separate analyzes have been performed. On the one hand, the average grade of the last years in the subject has been analyzed and, on the other hand, the students have been asked directly about this technique.

In general, the results obtained have been very positive. During the development of the practices, there has been a noticeable increase in the interest and motivation of the students. In addition, the surveys conducted and the analysis of academic results has undergone a marked improvement over previous years.

In relation to the academic results, Fig. 1 shows the final average grade of the laboratory practices. In the 2015/2016 and 2016/2017 courses, without the incorporation of this type of methodologies, the average score did not exceed 7.9. On the contrary, the inclusion of the project-based learning and cooperative learning is an improvement in more than 1 point the final average grade.

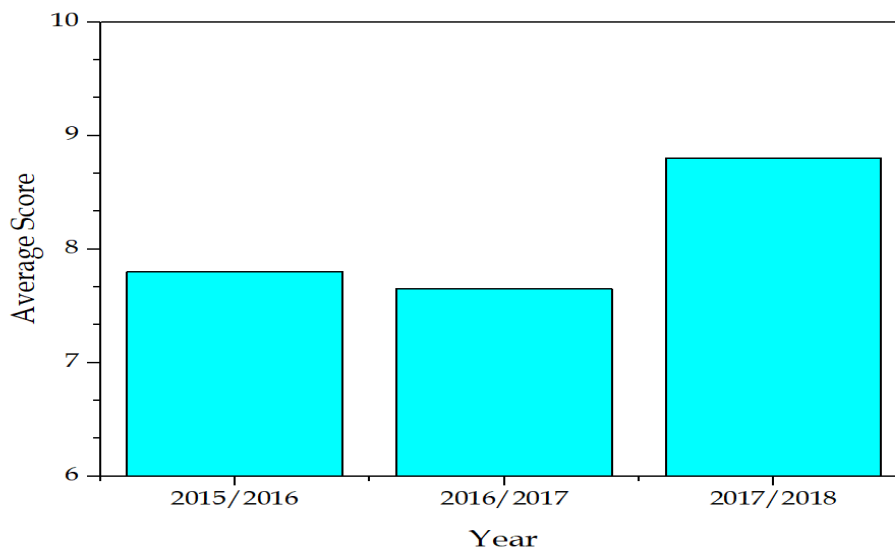


Fig. 1. Average grade of the practices of the subject

From the academic point of view, the final grade of the students who have worked during the course with this type of methodologies has been clearly improved. In addition, from the point of view of the teacher, this type of methodology has meant a very positive improvement in the final knowledge of the students. In order to evaluate also the real satisfaction of the student, at the end of the subject a small general survey was made to the students about the implementation and final evaluations of this type of technique. The results appear in Table 1. A total of 32 students participated in the survey and the following questions were asked:

- Question 1: Have you maintained interest in the subject with this group dynamics more than in a conventional practice?
- Question 2: Would you like to have more lab practices with this method?
- Question 3: Do you see yourself capable of applying what you have learned in class in a company?
- Question 4: Have you felt comfortable working in a group?
- Question 5: From 1 to 10, what grade do you give to the practices of the subject?

Table 1. Final data of the survey

	YES	NO
Question 1	91%	9%
Question 2	89%	11%
Question 3	95%	10%
Question 4	89%	11%
Question 5	Average score 9.1	

From an objective point of view, the results obtained from the survey show an increase in interest and the acquisition of various skills. The students have left happy at the end of the course. The assessment obtained by the subject has been very positive, with an average of 9.1.

The improvement in the acquisition of knowledge and skills of students can be reflected in the continuation of the subject in the following year, where it will be possible to analyze in greater depth the retention of concepts and procedures explained the previous year in a much more fluid way that before the introduction of cooperative learning and project-based learning.

5 CONCLUSIONS

The results obtained after incorporating new methodologies such as project-based learning and cooperative learning in the practices of the subject, have been very promising values. These results show not only a significant improvement from the academic point of view, but a marked improvement in the attitude and acceptance of students to the implementation of more active and innovative teaching methods.

It has been shown that in current education, and in particular in laboratory practices, the implementation of techniques that make students an active part of the learning process significantly enhances both academic results and student satisfaction. In the era in which we live, any student can obtain information in a very simple way, that is why within the classroom should promote creativity, teamwork and techniques that favor the way of working of students.

The use of new methodologies, allows directly to significantly improve numerous skills and attitudes that with old methodologies was impossible to obtain and qualify. The transversal competences get in a very simple way to work and significantly increase the interest of the student. It should be noted that the interest in teamwork and cooperation in current times is being taken into account, not only in academic areas, but also in the professional field.

The application project-based learning and cooperative learning in this type of classes, seems to be a good starting point to improve not only the knowledge acquired, but also the skills and abilities of the student when going to the labor market.

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