

Pharmacy student's engagement, performance and perceptions in a pilot study of cooperative learning applied to "introduction to the galenic pharmacy" subject

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1. Introduction

Introduction to the Galenic Pharmacy (IFG) is a required subject of first-year (2nd semester) of Pharmacy Degree of the University of Barcelona (UB). This subject is very conceptual and descriptive and contains many terms with their corresponding definitions. It is considered the basis for the subjects of pharmaceutical technology that are studied in higher courses.

Due to the absenteeism observed in recent years, the teachers team decided to make a change of methodology in order to recover the classroom presence and encourage the acquisition of deep knowledge. In this way, an active method based on cooperative learning was introduced as innovation teaching during the 2019-20 academic year.

It is known that active learning with oral presentations improves student outcomes and skills [1][2][3].

Cooperative learning is a generic term for various small group interactive instructional procedures. Students work together on academic tasks in small groups to help themselves and their teammates learn together. In general, cooperative learning methods share the following five characteristics [2]:

- Student work together on common tasks or learning activities that are best handled through group work.

- Students work together in small groups containing two to five members.
- Students use cooperative, pro-social behavior to accomplish their common tasks or learning activities.
- Students are positively interdependent. Activities are structured so that students need each other to accomplish their common tasks or learning activities.
- Students are individually accountable or responsible for their work or learning.

This proposal represented a substantial change in the methodology used so far for IFG (lecture-based classes). It replaces a face-to-face modality combined with autonomous work with a modality that combines face-to-face classes with directed non-face team work and autonomous work [4].

2. Methodology

Taking into account the shortcomings mentioned above, in the academic year 2019-20 a voluntary pilot test was started with two of the six IFG theory groups, implementing an active method to encourage learning and improve various skills. It consisted of commissioning students of the pilot groups (133 students among 346 enrolled) to develop the two topics of the program on routes of administration and pharmaceutical forms, in

the form of various knowledge capsules, under the supervision of teachers.

Groups of 2 to 6 students were formed and teachers assigned them a subject (16 subjects were chosen). Individual work was also accepted.

Each work should contain the following four basic sections:

A. Definition and explanation of the administration route assigned.

B. Advantages and disadvantages of the administration route.

C. Indication of the pharmaceutical forms that can be administered by this administration route.

D. Explanation of the characteristics and properties of the pharmaceutical form assigned.

All the necessary information and the recommended bibliography to carry out the work was available on the UB Moodle platform. Additionally, a few days of tutoring were also established to resolve possible doubts.

Each group had to submit the work using computer tools as PowerPoint, Prezi, Video, etc. An exhibition of each one in the classroom was made in order to defend and explain the work done to the rest of the classmates. After the presentation, the teacher emphasized the strengths points and clarified or corrected the weak one's. Suggestive feedback was made so that, if necessary, students could modify the sections that required it.

References

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In order to properly evaluate each work, a rubric was created.

In each class the presence of the total number of students in the classroom was evaluated through attendance lists.

3. Results

In both pilot groups, a total of 14 works of the 16 proposed were developed, assuming 87.5 % participation.

Of the 28 works carried out, 54 % were presented in powerpoint format and 46 % in a multimedia format. 90 % of the submitted works contained more or less rigorously, the four required basic sections.

For the pilot groups, the absenteeism decreased greatly (there was a class presence of 90 % of the students enrolled) compared with the other groups (60 %).

The exam about these topics was the same for all groups and it allowed to assess the impact of the teaching method on student's learning.

The exam results for the morning pilot group was extraordinary. There was 100 % pass rate and the average grade for the group was 9.05, higher than the average for all groups (which was 8.83). The results of the afternoon group were good. There was a 93 % pass rate and the average grade for the group was 8.50, slightly lower than the average for all groups.