

Educational innovation in large groups

Design of an experimental study implemented at the Polytechnic University of Madrid

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Abstract

The present paper shows the design of an experimental study conducted with large groups using educational innovation methodologies at the Polytechnic University of Madrid. Concretely, we have chosen the course titled "History and Politics of Sports" that belongs to the Physical Activity and Sport Science Degree. The selection of this course is because the syllabus is basically theoretical and there are four large groups of freshmen students who do not have previous experiences in a teaching-learning process based on educational innovation. It is hoped that the results of this research can be extrapolated to other courses with similar characteristics.

Keywords

educational innovation, large groups, study design, university

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Introduction

During the academic year 2009/2010 began the implementation of the Physical Activity and Sport Science Degree with the methodological implications of educational innovation that requires the adaptation to the European Higher Education Area. At the Faculty of Physical Activity and Sport Science there is a special interest in this process since the academic year 2004/2005 some teachers started to teach pilot courses implementing active methodologies with small groups showing a satisfactory success.

Since the launch of the new degree, these methodologies have begun to be applied to large groups¹ in various courses and it has been identified the need to evaluate the implementation and the effectiveness of them.

Therefore, during the academic year 2010/2011 has been chosen the compulsory course "History and Politics of Sports" -which is taught in the first year- to develop an experimental study designed to show how educational and innovative techniques are effective for knowledge acquisition and development of specific skills with university students. Additionally, the course chosen is mainly theoretical, which makes the results easier to extrapolate to other courses with similar characteristics not only in Physical Activity and Sport Science Degree but also in other specialties.

It should also be noticed that students are freshmen who were registered in this course during the first semester. This fact has a particular relevance because it allows to introduce the students from the beginning of their university education to a working method which will be developed throughout the degree.

Objectives

The objectives of this study are:

1. To improve the reception and orientation process of new students.
2. To improve mentoring assistance.
3. To adapt teaching materials for new courses.
4. To improve teaching-learning process through Information and Communications Technology (ICT) resources in large groups.

As regards to the specific objectives, they are:

1. To evaluate what techniques are more effective to promote learning and specific skills development of students.
2. To develop reliable assessment tools for evaluating the impact of the different techniques applied.
3. To introduce freshmen students in the active teaching-learning process that they will received throughout the degree.

4. To provide the teacher a basic manual with the most effective techniques for using educational innovation in large groups.

Sample

Participants in this study were students enrolled during the academic year 2010/2011 at the graduate course "History and Politics of Sports", a compulsory and predominantly theoretical course of 6 ECTS (European Credit Transfer System).

In total there are involved 343 students, of which 39 are repeating students from the previous year. Participants were randomly divided using their last names in four groups of around 70-80 students each.

The fact that the majority of the sample was freshmen students provided a privileged sample because they still have no experience in cooperative learning in the university and therefore it can be more clearly evaluated the impact of such methodologies in the teaching-learning process.

On the other hand, the professor who teaches the course has over 30 years of teaching experience and has extensive training in educational innovation. In fact, she has previously implemented similar experiences in small groups.

Finally, regarding ethical concerns, participants agreed to participate in the study by signing a consent form that was distributed in class during the first day.

Educational innovation techniques used in the study

As already mentioned, the course chosen for this study is mainly theoretical in nature, so it was decided to provide 60% of lectures and the other 40% using active methods of cooperative learning. Specifically, we will use the following techniques:

- *Puzzle/Jigsaw*: groups of 5 people. The syllabus is divided into 5 parts and given to each member of the group that has to do a comprehensive reading and become an "expert" of the content given. After that there, is a meeting of the experts of each subject who debate about the topic given. Subsequently, each expert returns to his/her original group and explains the content, so all the students are informed of the 5 contents of the syllabus (Sharan, 1980).
- *Forum*: is done with the whole class. It is necessary to establish a coordinator and a secretary. This technique complements a previous activity (in our case a film). During the forum different topics are presented and also the rules to participate in the forum (García Hoz, 1972).
- *Public interview*: groups of 5 people. The group works on the subject given to prepare different questions for an interview by a qualified person who comes as guest speaker to class. The day of the interview a leader of each team will become the interviewer and the rest of the class take notes of the answers (García Hoz, 1972).

- *Carousel*: in groups of 3 people. A topic is proposed and each group has to develop it with a presentation (in our case a poster). The work of each group is assessed by the teacher and the other class groups (Prieto Navarro et al. 2008).
- *Research group*: in groups of 5 people. The teacher introduces the topic and gives the students a specific literature about it. The groups has to prepare a class work providing the information prepared and specifying how they worked, the division of tasks, what sources have they used, where they found them, how they organized data, etc. (Prieto Navarro et al. 2008)

In addition, Table 1 shows the random distribution of the four large groups of class according to the following variables: attendance, use of ICT and group stability. The aim of this distribution is to facilitate further comparison of results and discussion.

Phases of the study

The study will be implemented in five phases:

A. Initial phase:

We will conduct an initial assessment to the students in order to verify their prior knowledge and skills, allowing us to create heterogeneous cooperative learning groups.

B. Course teaching:

The syllabus has seven topics, which will be evaluated at the end of each one. To achieve the objectives of this study, it will be used different techniques as has been exposed above. We are currently in this phase of the study.

C. Final activity:

A final activity will be conducted in the historical sport locations of Madrid, where each group will explain a work previously demanded by the teacher. In this activity, students will have to show the knowledge and the skill level gained during the course.

D. Final assessment:

At this stage it will be evaluated the knowledge and the specific skills acquired by the students throughout the semester. The instruments of assessment and the evaluation criteria are identical for all four groups of students.

Data collection of instruments

The data collection instruments used in this study are:

- Observations:
 - Video: each session of class is video recorded so students get used to the camera allowing the use of these recordings as non-participant observations. Later, there will be a viewing of the videotapes to establish the time of teacher and students participation, level of interaction, etc.
 - Field notes: during each session a researcher is present in class taking notes of what is happening without interfering in any moment in the development of the session in order to triangulate the data obtained from the videotapes.
- Interviews:
 - With the students: semi-structured interviews will be conducted with one member from each working group chosen randomly once they have completed the evaluation of the course. The purpose is to know their opinion about the different techniques used during the course. It is scheduled to conduct a total of 60 interviews.
 - With the teacher: at the end of each session, the researcher who has attended to class conducts a brief interview with the teacher as a "class diary" for their points of view about how was the session or if the objectives were reached as it were planned.
- Pre-post tests:
 - Test PAPI (Personality and Preference Inventory) is a validated test and single assessment, which evaluates the behavior and working style of each group members. The objective of this test, among other things, is to know if there is any change in the participants in relation to their workgroup.
 - Test of knowledge: in the first session were given a test with questions related to the course syllabus. These questions are planned to appear in the final exam of the course.
- Final exam: students will face a final exam for the course (with open-answer questions and test questions) that will determine whether there is any change in the level of knowledge acquired in the course.

Conclusion

Due to the preliminary stage of the study, we cannot show any results. However, after the first month of course we can say that the development of the study is satisfactory and the level of involvement of students is high. It is hope that once we analyze the data collected we can offer valuable and practical information that can be useful for university teaching.

Tables

Group 1	Group 2	Group 3	Group 4
Take attendance	Take attendance	Not take attendance	Not take attendance
Stable working groups	Change of group in each technique	Stable working groups	Change of group in each technique
Frequently use of ICT ²	Not frequently use of ICT	Not frequently use of ICT	Frequently use of ICT

Table 1. Characteristics of each large group

Notes

1. We refer to courses where enrollment is around 300 students, divided into groups of 70-80 people.
2. Principally we have used Moodle through the Virtual Platform of the University (www.upm.es/politecnica_virtual).

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Rodrigo Pardo has an European PhD in Physical Activity and Sport Sciences from the Polytechnic University of Madrid. His research field focuses primarily on the use of sport as a means of values transmission with youth and the use of active methodologies in education.

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