Abstract

The Physics degree of the University of Granada (Spain) currently involves about 120 lecturers and 450 students. In the past, in addition to academic education, we have tried to carry out a parallel task of mentoring and orientation that, on one hand, improves students’ results, and on the other increases the degree of satisfaction of the different groups with the Physics studies. So far this effort has been done by some lecturers on a voluntary basis. Although the response has always been very positive, we have realized the need to create a more solid structure in order to accomplish the aforementioned tasks and to add others responding to the needs raised by the renewal of accreditation of this degree. This is why the innovation project entitled “Tutoring and academic/professional orientation for students of the Physics degree at the University of Granada” has been proposed and recently approved for the period 2016-2018. By means of this innovation project we aim for the reorganization of the different actions that were taken in recent years, both in contents and timing, and also the training of our lecturers in order to perform these tasks more efficiently and successfully. Likewise, we intend to incorporate new actions whose need has been detected both from our own experience and through the assessment of the different groups and its subsequent analysis, including the external evaluation of the degree.

Keywords: Innovation, orientation, tutoring.

1 INTRODUCTION

Physics studies at the University of Granada (UGR) have a great tradition. Starting in 1973, these studies are therefore very consolidated around departments and groups of lecturers with great specialization. In the academic year 2015-2016, 125 lecturers were involved in these studies, 54% have more than 15 years of teaching experience, 78% are Full Professor and a 74% have two or more six-year research periods. The total number of students enrolled in the academic year 2015-2016 was 404, being one of the most demanded degrees in the UGR.

With the change from bachelor to degree we have carried out a follow-up work that has allowed us to detect both the strengths and weaknesses of these studies. During the past year, the degree underwent the process of renewal of accreditation, during which a collection of data and evidences was carried out and subsequently analysed by a large group of lecturers and students of Physics. The evaluation reports have allowed us to have an overview of its performance, over which we have discussed the existing problems. Subsequently we underwent an external evaluation, completing and reinforcing this global analysis, which has led us to propose a teaching innovation project, which includes several of the suggested improvement actions.

From the beginning of the Physics studies in Granada there have been many activities organized, but in the last courses they have increased considerably, many of them strengthened by the Quality,
Innovation and Prospective Unit of the UGR. We have participated in training activities for lecturers, in particular, in a program of training and practices of lecturers by branches of knowledge, both as trainers and participants. We have also attended numerous courses, conferences and meetings of teaching staff. In addition, we have proposed numerous teaching innovation projects related to the different areas of Physics: the use of new methodologies, tools available to students, etc., which favour learning as well as motivation for both lecturers and students. Over the last few years we have published results related to these projects (e.g. [1], [2], [3], [4], [5], [6], [7], [8], [9], [10], [11], [12], [13], [14]). From the degree of Physics Committee, in charge of the academic organization of these studies, there have also been training workshops, information on different topics of interest for the student, as well as workshops on career opportunities. It has also collaborated with activities organized by different groups of teachers and students of the Degree.

In the evaluation period we have detected some deficiencies or weaknesses that need an improvement action:

- The participation in exchange programs has decreased compared to that in the bachelor degree.
- A dropout rate higher than expected, especially considering that most of the students that access the Degree in Physics do it as a first choice, and that their average grade in high school is quite high.
- Scarce participation of administrative and service staff in the satisfaction surveys of the degree.
- Poor relationship of the degree with the professional world.

This evaluation allowed us to have a more complete and general view of these issues. We have seen the desirability of giving more visibility to actions that we had been doing for years, and on the other hand to do some that allow us to improve the detected weaknesses.

In such a way, a group of lecturers with great experience in teaching and innovation, representing the main areas of Physics, some students from the different courses of the Physics degree, and several members of the administration and services staff of the Science Faculty at UGR, have been involved in a project, initially planned for two academic courses. The project is entitled “Tutoring and academic/professional orientation for students of the Physics degree at the University of Granada”. The will and intention is to involve all stakeholders from the different groups concerned, being the aim of this smaller group nothing more than organizational.

2 OBJECTIVES

Our objective is to guide academically and professionally the students of the degree in Physics of the University of Granada. To this end, we consider as necessary to improve the training and orientation actions carried out in the degree in Physics, as well as to incorporate new actions to facilitate the student orientation, which we can group in the following sections: (i) to establish an efficient tutoring system, (ii) academic orientation, and (iii) professional orientation.

3 METHODOLOGY

We distribute the actions addressed by this project through two academic courses, and in personal and professional orientation according to the subjects. For each of the actions to be carried out, the general methodology is a first step of lecturer training (whenever necessary), a second organizational stage and a third stage of implementation and analysis of results. To achieve the academic and professional orientation of the students we will carry out the following tasks:

3.1 To establish an efficient system of tutoring

- Lecturer training on university tutoring: learning the relevant aspects of tutoring, which aspects should be addressed, and with consideration for students with special needs.
- To implement a tutorial action plan: we have established a procedure to assign a tutor to students who require it. We have a previous experience because some lecturers participated in a Tutorial Action Plan of the degree in Physics (2009-2013) ([6], [7]). We offer the assignment of a tutor lecturer to the incoming students, and they can continue with this tutor throughout the academic period. We are also launching a mentoring service, as some students prefer to
discuss some topics with fellows from higher years. Although the offer is made at the beginning, they can request it when they desire or get an interest in it.

- Follow-up of the degree students: to verify the evolution of success and dropout rates. As previously mentioned, the dropout rate is one of the issues that concerns us the most. Tracking these data allows us to study the possible causes and to establish prevention mechanisms for necessary cases, which is one of our priority objectives. In particular, we study the situation of students who do not perform the qualification tests and those obtaining usually poor outcomes.

3.2 Academic orientation

- Round tables about optional subjects that can be chosen in the different courses: in our curriculum, students can choose optional subjects from the second course on, which allows them to focus on their own field of interest.
- Information sessions on research activities carried out in the different departments, which can be used as an orientation for the proposals of bachelor thesis and to facilitate the request for scholarships (initiation to research or predoctoral studies).
- Workshops on preparation and exhibition of bachelor thesis: how to use bibliographical tools, text editors most used in science, etc.
- A talk about exchange programs: information on different national and international programs, opportunities, to know previous experiences from colleagues, the necessary administrative management. Having all this information from the first year can encourage students to participate in the Erasmus and SICUE programs.
- Orientation related to the management: enrollment process, choice of groups, deadlines and university regulations.

3.3 Professional orientation

In a situation where it is not easy to find a job, it is essential to have the right tools to do an efficient search. On the other hand, establishing relationships with companies, where students can practice while they are still studying the degree, can improve the employability, as well as make more complete training. In this line, the actions to be performed are:

- Workshops on job searching tools: how to prepare a summary, interviewing, job search strategies.
- Informative talks about the different masters and doctoral programs offered by the UGR related to Physics: they are oriented for the students of the last course of degree. They are informed about educational programs but also about the scholarships, the application deadlines, professional orientation of each master, etc.
- Sessions on professional options in the field of physics: we organize talks or round tables with professionals in physics working in different fields (research, teaching, public and private organizations, business start-up, etc.), which provide to the students a view of how many different possibilities have and the great versatility of a physicist to make a job.
- To establish agreements with businesses or public institutions where students can do external internships, which can be recognized as optative credits. These agreements are not only convenient for training at the students' stage, but can also result in better employability.
- Compilation of relevant information about masters and doctoral programs of Physics in other universities, both national and international: many students are waiting to make use of exchange programs to finish the degree, so they demand information of this type.

4 RESULTS

Surveys are annually carried out on the degree of satisfaction of the different groups (lecturers, students and administrative and service staff) with the indicators of the Internal Quality Assurance System. Although so far we are only doing some of the actions mentioned in this paper, the results are acceptable and make us optimistic. In the last course (last for which we have these data) the degree of satisfaction in the case of the students of the degree in Physics are above the average of both the Faculty of Sciences (in which these studies are taught) and of the UGR, and in all sections are higher.
than 3 (over 5). Better results are obtained in the case of lecturers, with the degree of satisfaction for some of the sections above 4 (over 5).

An added result of this project is the realization of a web page where all the relevant information for students of the degree is collected.

5 CONCLUSIONS

Although the project just started, we can see that the implementation of the activities that we are carrying out makes the different members of the groups contribute with their experience and become more involved in improving the studies. For students, being aware of how important is their input on day-to-day makes them more involved, and that confidence is also transmitted when it comes to participation in class and tutoring. In an objective way, the rates of performance and success have been rising, reaching their highest value so far in 2015-2016 (Figure 1).

![Figure 1. Rates of performance and success in the degree of Physics (in percentage) over different academic years.](image)

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REFERENCES


