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# SCIENTIFIC TRAINING OF HIGH SCHOOL STUDENTS. INTRODUCTION TO LABORATORY WORK

C. Vázquez\*, J. Pérez, J. Espinosa, C. Hernández, D. Mas, C. Illueca, J.J. Miret

Teaching Group in Optics and Vision Science<sup>1</sup>. Departamento de Óptica, Farmacología y Anatomía.

University of Alicante. (SPAIN)

\*email: [ferri@ua.es](mailto:ferri@ua.es) <sup>1</sup><http://web.ua.es/es/gite-docivis/>

## SUMMARY

In this work, we present the obtained results in a collaborative network composed by university professors belonging to the Teaching Group in Optics and Vision Sciences DOCIVIS from the University of Alicante, and high-school teachers. The aim of the network is to introduce and train high school students into laboratory practice. The actions carried out, can be summarized in: to search high schools and teachers interested in the proposal, joint planning of sessions, preparation of the laboratory kits, implementation of several physics experiments and, finally, a satisfaction survey both for teachers and students.

## OBJECTIVES

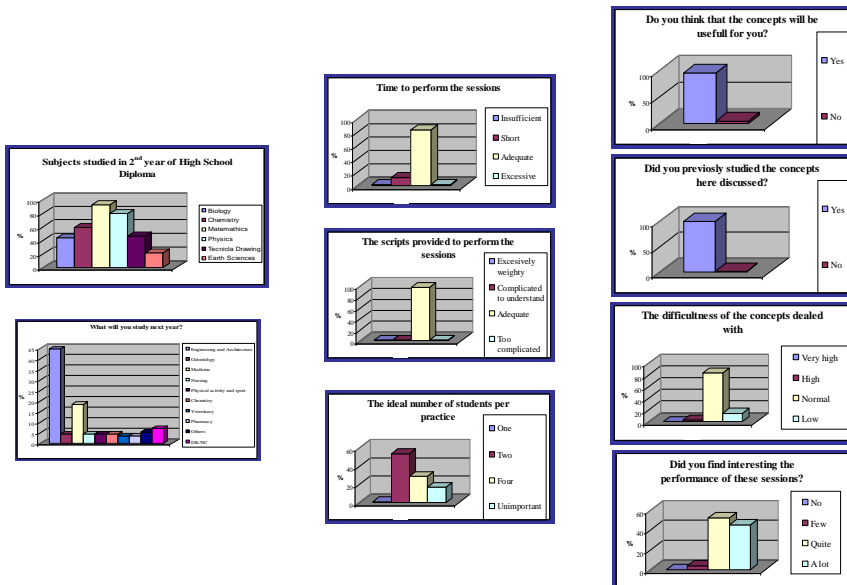
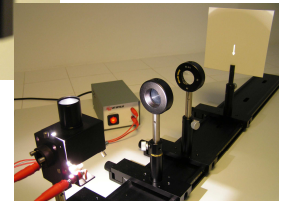
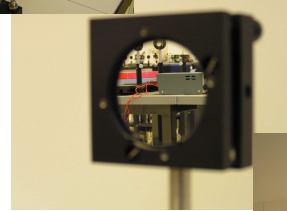
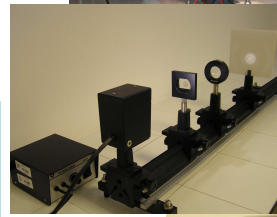
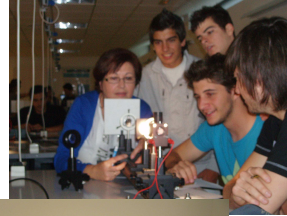
- To promote the relationship between the University of Alicante and secondary schools in the province.
- To promote interest in scientific subjects and encourage students towards scientific careers.
- To effectively collaborate in scientific and practical training of future students of the University of Alicante.

## METHODOLOGY

We propose to design, plan and offer students and teachers of secondary schools practical sessions in educational laboratories belonging to the Department of Optics, Pharmacology and Anatomy of the University of Alicante.

Although the above goals are very important, it must be noted that the planned activity must take into account whom it is addressed. In this case, the students of secondary school (and teachers) should find in it an immediate application. These sessions must be planned in such a way that they are directly related to the students current studies and to the content of future examinations. Moreover, the students may be able to use them to review and clarify theoretical concepts seen in class. In addition, teachers in each school will evaluate these activities.

There were three sessions of 3.5 h with a participation of 114 students. In two of them (first and third), all students (77) attended Physics in 2nd year high school. Experiences concerning Geometrical Optics and determination of light spectra were simultaneously conducted. To do this, groups were divided into two subgroups, each one performing a different session for about the first 90 minutes. There was a short break, and then exchanged subgroups. Within each subgroup the students were divided in teams of two and four students. Students received the scripts of the sessions in advance. The teachers deal with the concepts involved in their classes. In the second of the sessions (with 34 students attending), as there were students who were not studying Physics in the 2009-2010 academic year and they all attended the course of Chemistry, all agreed to deal only, but more deeply, subject of atomic spectra. We incorporated and reminded concepts related to atomic structure: There was a Power Point presentation of 1 h, then a break and continued with the realization of a practical session concerning atomic spectra.



## RESULTS

In order to assess the performed work and to identify the strengths and possible mechanisms to improve the procedure, we have obtained the opinion of the participating students and teachers using small surveys that were conducted immediately after the sessions.

One issue, which is the most satisfactory result, is that referred to the usefulness of the practical sessions. Almost all pupils indicate that the concepts studied in these sessions were of immediate and future utility, which was a key objective of our work: to assist in the preparation of future university students.

As a result, it was noted that 96.4% of students indicated that these sessions were very interesting, 95.5% of them believed that both discussed practice and concepts would be useful and 100% of students would like to continue conducting such sessions. All the teachers considered that the proposal was very satisfying and motivating, and they would like to continue this project in coming years.

## CONCLUSIONS

The authors think that the results obtained by this project during its short duration, are highly satisfactory to all parties involved. It is interesting that, in general, students receive satisfactorily Physics laboratory practices and consider the time spent helpful.

## Acknowledgements

This work has been supported by the project "Proyecto Redes de Investigación en Docencia Universitaria. Convocatoria 2009-2010. Universidad de Alicante"