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A horizontal banner image showing a close-up of a yellow, textured surface, possibly a honeycomb or a similar geometric pattern, against a blue sky with white clouds.

**CONFERENCE
PROCEEDINGS**

**SEVILLE (SPAIN)
12-14 NOVEMBER 2018**



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UNDERGRADUATE STUDENTS AS LABORATORY TEACHERS TO PROMOTE CREATIVE SCIENCE EDUCATION AT HIGH SCHOOLS

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Science and technology are the drivers for sustainable development in a country. Therefore, encouraging young people to study Science is one of the main challenges for the current education system. In the case of University education, a key aspect for success is to actively engage students in their own learning. Service-learning can be a valuable tool to achieve this aim, since this pedagogical approach extends the classroom learning environment into real-life situations by combining the acquisition of knowledge with community service. Here we describe the results of a service-learning experience run by the BIOMETAC group ("Active Methodologies for teaching Biology") at the Faculty of Biological and Environmental Sciences of the University of León (ULE, Spain).

The project team involved 18 Professors from different areas of expertise, together with 50 undergraduate students of Biology, Biotechnology or Environmental Sciences (third and fourth-year students). Volunteer undergraduate students were recruited to act as high school Science teachers, developing a laboratory practical program from various scientific disciplines (including a collection of educational videos). Thus, the project would serve a dual purpose: (a) to strengthen the student's professional and social skills in a meaningful situation, like playing a teacher role, and (b) to provide an alternative perspective on laboratory practical teaching at high schools, which could improve teenager's motivation and foster future scientific vocations.

The project was divided into three main phases. The first year undergraduate students worked in pairs to design and teach a laboratory practical session to high school students (14 participant schools). During the second year, the lab protocols were refined and used to elaborate a lab manual, which was supplemented with a series of educational videos. For each practice, the focus and content of the video was planned and skills on how to structure a shooting script were developed. Video recording was performed with professional support from the University and post-production is currently taking place (third year). All the resources will be available at the group web page.

Through the whole process, there was a continuous feedback between professors and students; in addition, surveys and reports were used to analyze the learning outcomes. One of the main results was that all participants agreed that the development of these experiences can effectively improve student's professional skills, such as critical thinking, team work and communication skills. Furthermore, both undergrads and professors believed that these projects definitely have a positive impact on the community and would encourage others to participate in service-learning experiences. As for the high schools, the results shown that the students received the lab practice with enthusiasm and that this kind of experiences can help to build the necessary connections between Universities and Schools. Despite of the benefits, some limitations were noted, mainly related to the fact that they are very time-consuming activities which are difficult to manage within the university academic calendars. Therefore, institutional support should be increased to reinforce student and teacher's efforts if we want to achieve educational excellence and to benefit society.

keywords: science education, service-learning, laboratory practical, biology, undergraduate students, professional skills, high schools, educational videos.