



## **Awakening the scientific vocation in schoolchildren through project-based learning in a rural environment.**

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Science, and in particular the scientific method, is the basis of knowledge, being applicable for most situations of life needing a decision-making not based on speculations or superstitions. In many occasions, the access of general population to scientific knowledge is poor and difficult, and the presence of scientist in the society is of great importance, especially in rural areas. This communication presents the results of a project that has tried to bring science to the most proactive population sector to receive it, schoolchildren from 9 to 17 years old. The main objective was to awaken the scientific vocation in students of primary and secondary education levels. On these basis, the present communication describes the work carried out with these 169 “young researchers”, students of Primary and Secondary educations in the educative centres of Almadén (Ciudad Real province, Central Spain), under the supervision of junior to senior researchers from the Almadén School of Mines, Universidad de Castilla-La Mancha, Spain. The pedagogic method was a project-based learning, centred in scientific works about mercury and its environmental cycle in the locality of Almadén. Four different projects were designed, two of them with a lower degree of difficulty for primary school students (mercury atmospheric dispersion and mercury biomonitoring) and two more complex to secondary level (mercury transfer from soil to plant and mercury presence in the diet). The work of the students spread for 4 months, including sampling, sample treatment, analysis, discussion of main findings and presentation of results in a local scientific congress. The understanding of the topic of work seems to be more difficult in the early stages of the project, but at final stages, 85% of students showed an acceptable degree of comprehension of the topic. The preferred stage of work was the analytical part in the laboratory (56% of students), with minor acceptance for sampling (26%) and presentation of results (18%). The best time management was two hours of work in small groups (not more than 8 students), and with changes in activities to limit time devoted to the same activity. The dynamics of working with groups of more than 8 students or in 3-hour time segments showed worst results, especially with younger students from primary educational level. Another important factor in the success of the activity was the implication in the work of the school-teacher, an important reference to correct the attitude of the more rebellious students. The safety aspects in the laboratory work must to be independent of the collaboration of the students, because some students do not follow the instructions or do not have the capacity to follow them due to disabilities like attention deficit/hyperactivity disorder.

In conclusion, the experience influenced in 50% of students to define their choice for science based studies, and communicated to school-children that all people can be a scientist (89% of students have this opinion) without genre differences.

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