

Motivate to Learn: other ways of learning Biology, Maths and other Sciences

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Abstract. The development of teaching and learning strategies that effectively assist in the understanding of scientific knowledge is an ongoing challenge. Doing experiments outside the classroom, one of the recommended approaches, presents some risks, because students can divert their attention from the pedagogical objective of activity [1]. However, experts agree in considering that learning outside the classroom can be used to facilitate Education. Providing students with learning activities in relevant situations beyond the walls of the classroom is vital for helping them to appreciate their experiences from a variety of different perspectives. Furthermore, experiences outside the classroom provide opportunities to practice skills of enquiry, values analysis and clarification, and problem solving in everyday situations, thus enhancing learning [2].

The Educational Resource Centre of Externato Infante D. Henrique in Ruíhe, Braga, Portugal has multipurpose facilities and a dynamic and committed teaching team, ready to embrace new challenges. This team decided to bring to school the project *Homo numericus*, a STOL-*Science Through Our Lives* initiative that includes an exhibition of eight attractive roll-ups and a set of hands-on activities. It has a WIP character and the main aim is translating into numbers many curious aspects of the human body and the human being, or even its relationship with the environment in a

truly multidisciplinary perspective in which Biology, Mathematics, Physics, Chemistry, Ecology, Sociology, Geography and many more Sciences are revealed [3].

The presentation of such initiative at school intended not only to achieve programmatic objectives of the syllabus of Natural Sciences for students from 6th to 9th grades but also to promote interdisciplinarity and interaction among science, culture and school, as well as to display students' curiosity for facts about their body and their environment. The strategy for assessment of the activity occurred in three stages. Firstly, students were invited to fill in a questionnaire on related themes suggested by the planned activities; secondly groups of 4-5 elements were formed to explore in an informal and interactive way, the exposed materials and resources. In addition, books, writing material and tapes were provided for measurements and mathematical calculations associated with the concept of the Vitruvian man. In third place, a survey was applied to all students to evaluate the learning progress after their participation in the activity.

A preliminary analysis of the results suggests that the initiative boosts the curiosity of students, especially in what concerns some particular details like the information about the brain, the amount of produced fluids and the size of the digestive tract. Students used different numerical representations and performed calculations to figure out if they had the "perfect"

Vitruvian body measurements. Students of the 9th grade were specially engaged within this task, powering the "vanity" in their perfect measurements. The aim of the present work is also to assess whether this activity, clearly exciting and motivating for students, also contributes to make school syllabus more relevant and meaningful for them and to promote the overall quality of their education.

Keywords. Hands-on, exhibitions, students, motivation, learning.

References

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