

# INTERDISCIPLINARY PRACTICES IN NATURAL SCIENCES TEACHING: AN INTEGRATION OF BIOLOGY AND PHYSICS CONTENT

Ruan das Flores de Azevedo<sup>a</sup> and Mayara Moretti Vieira Palmieri<sup>b</sup>

Presenting Author: Mayara Moretti Vieira Palmieri ([mayara.palmieri@usp.br](mailto:mayara.palmieri@usp.br))

<sup>a</sup>Colégio Estadual Sérvulo Mello, Secretaria Estadual de Educação do Rio de Janeiro, 2880-000, Brazil

<sup>b</sup>Universidade de São Paulo, Programa Interunidades de Pós-graduação em Ensino de Ciências, 05508-090, Brazil

**KEYWORDS:** Physics teaching, Science teaching, Scientific literacy

We understand that research with a focus on emancipatory teaching, which highlights freedom and autonomy of thinking, placing the student as an active subject within the learning process, are of great relevance when it comes to the restructuring of Physics and Science curriculums and teaching. Unfortunately, this has been suffering in Brazil due to the new education guidelines (BNCC, in Portuguese). In order to meet the expectations of the contemporary education and prepare students for the future, the development of scientific literacy has been considered a goal of science teaching. It aims to give students intellectual autonomy through the development of conceptual knowledge, understandings about aspects of nature of science and the factors that influence its practice and perception of the existence of relationships between science, technology, society and environment (Fourez, 1994, Sasseron & Carvalho, 2008). However, one of the obstacles in science teaching is the fragmentation of scientific contents and the lack of relationship between what is taught and what is lived.

The high school state school Sérvulo Mello is located in Silva Jardim, Rio de Janeiro. The city stands out for the conservation of the Atlantic Forest and its biodiversity. Given our goal is to work on scientific contents in an integrated way, a plan of educational actions was prepared with high school students of the teacher training course. Firstly, a field trip to view the golden lion tamarin in nature, where individuals are monitored through telemetry equipment. These devices are attached to their neck and emit radio waves at certain frequencies possible to be captured by mobile antennas. This monitoring is carried out by the Mico-Leão-Dourado Association, a Non-Government Organisation that acts with the mission to preserve and raise the golden lion tamarin's population. The strategy used to locate individuals of the species was fundamental for approaching wave concepts. Secondly, realization of the Science Fair. The students carried out their presentations for the Science Fair based on the experiences they had during the field trip. The students proposed a differentiated intervention, an alternative to the traditional experiments of this school practice. As a result, the group set up a sensory room at school with elements from the Atlantic Forest covering the floor with dry leaves to simulate the forest soil; plants scattered throughout the space; they also brought the smell and sound of the forest. The visitors were invited to take off their shoes and blindfolded before entering the room. As protagonists, the students managed to bring physics to this work, explaining sound as a mechanical wave that needs a material means of propagation, such as the air that conducts all the sound produced by the forest. Also, they explained how some equipment which capture radio waves are used to protect the golden lion tamarin's population. In addition, they presented light as a fundamental factor for the perception of the diversity of colors that nature presents.

This project enabled an interaction between school Natural Sciences contents. During the activities, the class stopped being the recipient of ready-made content. They became active subjects, who began to question, research, and propose socio-environmental responsibility actions for the local community through the integration of Physics and Biology contents.

## REFERENCES

- Fourez, G. (1994). *Alphabétisation Scientifique et Technique: Essai sur les finalités de l'enseignement des sciences*. Bruxelles: DeBoeck-Wesmael.
- Sasseron, L. H. & Carvalho, A. M. P. DE. (2008). Almejando a Alfabetização Científica ao Ensino Fundamental: a proposição e a procura de indicadores do processo. *Investigações em Ensino de Ciências*. 13(3), 333-352.

Proceedings of the IUPAP International Conference on Physics Education, ICPE 2022 5-9 December 2022, page 72, ISBN: 978-1-74210-532-1.