

Poster presentation

MATHEMATICS IN HIGH SCHOOL AND RENEWABLE ENERGY SOURCES

P. A. M. do Nascimento, M. A. Raposo de Barros Brito, M. L. S. Albuquerque
Federal University of Pará, Bragança Campus, Professional Master in Mathematics
Leandro Ribeiro Street, Aldeia, Bragança, PA, 68600-000 Brazil

The projects that link environmental issues and school education comprise excellent tools to improve the social situation and the quality of human life, in the perspective of sustainable development. However, the teaching of mathematics currently goes against this perspective and has shown worrying results that reveal the marks of work without meaning for the student, showing the need to methodologically reinvent teaching for a better understanding of mathematical knowledge and contextualization of the student in environmental matters. Based on this assumption, this work has the general objective of using concepts and contents of Mathematics in High School in order to insert students in the context of energy sustainability and as specific objectives to evaluate the students' conception on the energy theme, to use mathematical contents so that the students create a critical perception about their residential energy consumption and, execute a project of Mathematics and Environmental Education that develops methodological activities for High School exploring the use of renewable energies. This research was carried out at the Domingas da Costa Sousa State Elementary and High School, located in the rural area of the municipality of Bragança, state of Pará. As a scientific methodology, Action Research was chosen because of its participatory nature. The didactic sequence of this research was composed of eight activities distributed in 27 classes lasting 45 minutes. The students of the 3rd year were able to form concepts about energy and the environment, as well as work them within the concepts of mathematics such as, linear equations, average, percentage. In addition to analyzing their energy consumption, students were able to apply their knowledge in the analysis of photovoltaic systems, calculate power, probability, cost and dominated their interpretation. All students with a tariff classified as low income (16 students) found that the value of 1 kWh is equal to R\$ 0.2294 for consumption up to 30 kWh. The value of R \$ 0.3932 was identified by 14 of these students for consumption between 30 and 70 kWh. In the context of mathematics and entrepreneurship, students were able to design a photovoltaic system project and present them to the teacher. The students demonstrated to have absorbed the learning in the construction and presentation of models that represented the different sources of energy, their benefits and harms. The teaching methodology applied to high school students obtained great acceptance and involvement from them in relation to the proposal. Interdisciplinarity and contextualization made learning more meaningful, participatory, and attractive.

Keywords: Mathematical Education. Environmental education. Renewable energy.