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The articulation between the STS Approach and Environmental Education for the contextualization of Acoustics in Physics Teaching

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Environmental degradation is an increasingly present concern throughout society, and it is a reality that needs to be changed and surpassed. This implies an urgency shift in Basic Education in order to educate critical citizens whom will seek to maintain the best social-environmental conditions for human existence on their communities and on the planet as a whole. Noise pollution presents itself in an invisible, dangerous and permanent way, with effects which have a prolonged effect. High sound pressure levels are closely related to multiple negative effects on public health and to risk factors for various diseases. In school environment, acoustic discomfort does not only affect human health, but also affect the quality of verbal communication and student performance, interfering with concentration, writing, speech development, learning and reading comprehension. An adequate acoustic environment contributes decisively to an improvement in the process of teaching and learning, and enhances the interpersonal relationships involved in the educational process. In this sense, it is important to introduce subjects of Acoustics such as environmental noise into the contents of Science and Physics transmitted to high school students as well. In order to place science and technology in concepts linked to the social and environmental context that surrounds the students, preparing them for a balanced and responsible life in society, we seek to combine the STS Approach with Environmental Education, intending to develop didactic sequences that combine the strongly interdisciplinary content of Acoustics with an environmental awareness that goes beyond a mere conservationist reductionism. The Brazilian Common National Base Curriculum (BNCC) emphasizes the importance in Science Teaching of discussing the role of scientific and technological knowledge in environmental issues, in order to minimize human impacts and improve living conditions at the local, regional and global levels. In addition to the mandatory curricular knowledge, STS Education assumes a scientific and technological education based on social construction, culturally and socially contextualized. It deals with science, technology and its teaching as a way to influence the daily lives of students, developing skills such as the ability to analyze problematic situations while seeking possible solutions in a grounded and responsible manner. In their future lives, students may face the need to make decisions related to environmental practices, such as respecting sound levels that are comfortable for living in society as urban noise is a matter of global scope. Cities were designed and built for cars, based on a limited and wrong understanding of Nature as a separate entity, in function of human needs, which led societies to isolated positions, disconnected from the environment that surrounded them. Moreover, those social contradictions caused by the disorderly development of large cities are directly related to the aggravation of environmental problems and the failure to promote social welfare. In order to understand and transform the current reality, it is required the comprehension of science, technology, society and environment within a full context, as these dimensions are intrinsically complementary. Thus, the articulation between the fields of the STS Movement and Environmental Education can be an important strategy to overcome the supposed contradiction in the discourses on environmental conservation and scientific-technological development, especially those that undermine human formation in its entirety and that are linked to mere utilitarian projects.

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