

Measurement of sonorous intensity with the use of ICT: teaching ability for the adaptation of activity from the Spanish context to the Brazilian

Valéria S. DIAS, Jéssica M. e SOUZA

*Instituto de Física - Universidade de São Paulo, Rua do Matão
Travessa, n. 1371 - CEP 05508-090
Cidade Universitária - São Paulo - SP - Brasil*

Fernando L. de C. CARVALHO,

*Instituto de Ciência e Tecnologia, Universidade Estadual Paulista, Rodovia Presidente Dutra, Km
137,8 - Eugenio de Melo - 12247-004 - São José dos Campos – SP - Brasil*

Abstract. In this research we adapted an activity developed and validated in Spain, Design and implementation of modeling tasks with iPad's: a dual approach [1], for the Brazilian school context. For measures of sound intensity we kept using a tablet application and introduced the use of the decibel meter. With the analysis of the data produced by the students of Basic Education, we broadened the discussion of functions of two variables to the discussion about scientific knowledge. We also discuss the skills and competences mobilized by the teacher to conduct an activity using ICT and support the students' learning process.

1 Introduction

The use of ICT has been widely discussed in the context of Physics [2,3,4]. In Brazil the incorporation of ICT in the classroom still occurs slowly, we are still in the process of overcoming the simple computerization of teaching for real contributions in the teaching and learning process. This requires specific competencies and skills of the teacher. There are several discussions on the use of ICT in the teaching and learning process [3, 4]. In any case, it is always faced with the various alternatives of electronic media use - cell phones, tablets, computers, etc. - and the need to insert an innovative embroidery, in which the teacher fulfills the role of mediator, exploiting these resources in teaching of physics, planning activities, guiding the collection of information, promoting the analysis and criticism of the collected information, guiding debate among students, raising explanatory hypotheses about the studied content, modifying existing material to better integrate contents, etc. This approach requires the teacher to have a specific set of competencies and abilities that allow the maximum use of technological resources in physics teaching.

2 Objectives

We performed a physics activity, based on the experience developed with students of secondary education in Spain, about the mapping of the sound intensity in a classroom, for the discussion of functions of two variables, having as main objective the use of validated activities in the context of education in which the use of electronic media is already a reality, and the analysis of teachers' needs in developing skills and competences. We adapted this activity to the Brazilian context in two ways: in the adequacy of the duration of the activity in the Physics classes, whose space for the teaching of this content is reduced from the curricular point of view and the introduction of a second instrument for the collection of data, in this case a decibel meter. In this way, we work with students from a Basic Education classroom, divided into groups, part of them using the decibel meter and another part using the tablet / cellular application. As in the activity carried out in Spain, students were instructed to construct the sound intensity curves. However, there was an expansion of the discussion about the differences

found with the use of the different instruments. Still in this work we raise the skills and abilities that the teacher needed to mobilize for the conduction of the activity and the difficulties encountered in this process.

3 Methodology

Audio and video recordings were made of the set of classes in which the activity was developed with students of Basic Education. The material transcribed for the analysis allowed to follow the conduction of the activity by the teacher, as well as the development carried out by the students in each group. We performed a comparative analysis of the results obtained by Spanish and Brazilian students with the objective of analyzing the impact of the adaptation of the activity with the reduction of time and the introduction of the decibelmeter. After the preliminary analysis of the results, we conducted interviews with the teacher aiming to broaden the understanding of the skills and competencies needed to conduct and adapt the said activity and to sustain the learning process of the students.

4 Conclusions

The comparative analysis of the results obtained by the students shows that there are no significant differences in the curves obtained by the Spanish and Brazilian students, or the introduction of the decibel meter has a low impact on the results. However, the introduction of this instrument allows a discussion of epistemological nature about the phenomenon and the measure. It was possible to identify the main difficulties encountered by the teacher to adapt the activity, to mediate its development in the classroom and to support the discussion of epistemological nature, pointing to a need to contribute in the training of Physics teachers to conduct similar activities.

References

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