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ADVANCED OXIDATIVE PROCESSES AS AN EDUCATIONAL TOOL IN THE CONNECTION BETWEEN UNIVERSITIES AND PUBLIC SCHOOLS: AN EXPERIENCE OF SCIENTIFIC DISSEMINATION AND PEDAGOGICAL TRANSFORMATION (Poster)

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Partnerships between universities and primary schools have been growing over the years. This interaction is necessary to disseminate research developed at universities and research centers to encourage more students to pursue careers as scientists. Through these partnerships, university professors and primary school teachers can reflect on teaching and learning practices in the classroom. In this context, continuing education groups for teachers, known as professional development groups (Gorozidis and Papaioannou, 2014), can be formed. In these spaces, teachers can plan activities that will be applied in the classroom, develop their teaching materials, and write narratives about the different ways of teaching and learning.

The objective of this paper is to present how a school discipline focusing on the concepts of electrochemistry developed through a partnership between a chemistry teacher, undergraduate students, a graduate student, and a university professor contributes to bringing universities and public schools closer together. To carry out this experience, action research was used, which seeks to combine research with practice (Ketele and Roegiers, 1993). It means that action research is applied to projects in which professionals seek transformations in their own practices (Brown and Dowling, 2001). Collectively, it was decided that one of the activities developed by the group would be the planning of an elective discipline. Elective disciplines are offered in public schools in the State of São Paulo, Brazil, and last for one semester and are designed by teachers, so that students feel interested in participating, based on their life projects.

The course was called “I, the Scientist” and was designed with the main objective of introducing students to the scientific method and highlighting the relevance of the role of scientists in contemporary society. This course was implemented with basic education students, aged between 12 and 14, from a public school located in the interior of the state of São Paulo, Brazil. The central theme of the course was “Water”, and throughout the course, students explored fundamental concepts of electrochemistry, chemical transformations, substances and mixtures, contextualized in everyday life and with an environmental approach. The choice to work with a greater focus on electrochemistry was based on the difficulty that students have in relating aspects of everyday life with the chemical species involved in electrochemical phenomena (Jong; Treagust, 2002). In this context, to overcome this difficulty, a practical approach was incorporated based on scientific research conducted by the Electrochemical and Environmental Processes Group of the Chemistry Institute of São Carlos of the University of São Paulo (IQSC/USP). This group investigates the contamination of aquatic and terrestrial resources by substances such as dyes, pharmaceuticals and pesticides, and proposes the use of electrochemical processes, such as Advanced Oxidative Processes (AOP), as potential solutions for the treatment of these contaminated matrices.

One of the core activities developed was an inquiry experience (Cuevas et al., 2005), including the students to performe a demonstration experiment using the POA technique used by the research group to degrade industrial dyes present in water samples (Figure 1). This activity allowed students to concretely observe the application of scientific concepts to real environmental solutions.

In addition, students watched a science dissemination video produced by the research group and participated in an interactive discussion with a graduate student, who shared experiences and clarified questions about the research being developed. The activities carried out in the course were jointly designed by the members of the professional development group, seeking to strengthen the partnership between public school teachers and the university, in addition to bringing public school students closer to what is being developed within universities by research groups, presenting possible solutions to real environmental problems faced by the population.

Figure 1. Students performing POA experiment.

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