v. 4, n. 11, 2024

International Journal of Human Sciences Research

DEMONSTRATION OF OSMOSIS AS AN INSTRUMENT IN THE TEACHING AND LEARNING PROCESS

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Keywords: Teacher training, Practical class, Introduction to Teaching.

Osmosis is a fundamental biological phenomenon that occurs when solvents, usually water, move through semipermeable membranes to balance solute concentrations. Understanding this process is essential for understanding cellular functions and biological systems as a whole. Osmosis occurs due to the difference in solute concentrations between two solutions separated by a semipermeable membrane. Water moves from the hypotonic (less concentrated) medium to the hypertonic (more concentrated) medium until an equilibrium is reached. This process is vital for biological processes such as the absorption of nutrients by cells and the regulation of osmotic pressure. (ARAUJO; NASCIMENTO; BEZERRA; ALVES; 2014).

The process of osmosis occurs through the action of the walls of biological cells, which act as semi-permeable membranes that allow the passage of water, small molecules and hydrated ions, however, they block the passage of enzymes and proteins that were synthesized within the cell. cell. The phenomenon can be demonstrated in the laboratory by separating a solution and pure solvent with a semipermeable membrane, a membrane that only allows certain types of molecules or ions to pass through (Atkins & Jones, 2012).

An experimental class must engage students not only in practical, manual work, but mainly intellectual work. It is not enough for the student to manipulate glassware and reagents, he must, first of all, manipulate ideas (problems, data, theories, hypotheses, arguments).

In other words, what is expected is that the expression "student participation", so often used to justify the use of experimental activities in chemistry classes and other didactic activities, begins to acquire the meaning of "active intellectual participation of students" (Souza et al. 2013, p.13).

We present, through this, a report on the experience as students at the Escola Estadual de Tempo Integral (CETI) Professor Manuel Vicente Ferreira Lima in the municipality of Coari-AM

We began the activities by following the classes taught by the supervising teacher, when we were able to observe his teaching methods in high school classes, specifically in the 1st year and 2nd year.

The observation experience was very enriching, as participation in the program gave us the opportunity to get to know what a teacher's day-to-day routine is like with their students and, through this, acquire knowledge and also observe the difficulties of students and how the teacher assumes this task of preparing their classes in such a way that they come to understand the subjects and minimize the students' difficulties.

A practice that the Pibidians did with the students and the teacher was about osmosis. The professor addressed the subject in a theoretical class with the students, and we, Pibidians, demonstrated in practice and explained some of the processes, accompanied by the professor. The substances used to react with the potato and red onion were NaCl (table salt) and C12H22O11 (sugar).

The first part was a presentation to Pibidianos students and then a brief explanation of the subject. Soon after, the first practice was carried out to demonstrate osmosis. Potatoes were used, a ready-made model was already on the bench, serving to explain the process, while the materials to do it in practice were nearby. The students were asked for a volunteer to come to the bench and prepare the experiment. Afterwards, practice was carried out demonstrating osmosis in red onion. The different phases of osmosis in red onion were observed under three

microscopes, followed by an explanation of each phase.

As an activity at the end of the class, the students made a drawing, both of the result of the potato, in the first practice, and of the phases of the red onion, describing in each drawing its parts and what happened. During the experiment, the students were able to observe that the water migrated from the less concentrated solutions to the more concentrated ones, demonstrating the osmotic flow. The volume changes in the solutions were consistent with what was expected by osmosis theory. This class strengthened both our understanding of the phenomenon and its biological importance and the students' understanding. Furthermore, we were able to discuss how this process is related to the absorption of water by plant cells and how differences in osmotic pressure can affect organisms in different contexts.

In addition to the experiences in the classroom and in the biology laboratory accompanied by the teacher, we were able to learn a lot from the teacher, about how to teach, how to react to certain student expressions, such as when the student talks a lot or is messy in the classroom.

In the laboratory it is necessary to have a firm stance, as teenagers sometimes just want to make a mess, so all safety measures in a laboratory need to be explained at the beginning and always remembered. The practical osmosis class was an enriching experience, as we were able to have teacher-student contact in a laboratory. During the class, some students wanted to touch the materials, however, they were warned not to do so and we were reminded of the biology laboratory's safety rules. During the practices we explain a theoretical part of the subject and then demonstrate it in practice, therefore, in addition to passing on the content to students about osmosis, we can demonstrate to them how it happens in practice.

This activity that was carried out with the students was important, as the subject that seemed complex, through this practice, became easier to understand, as observing the process helps in understanding the subject. In addition to providing practical experience in a laboratory, it is important to experience as future teachers, passing on lessons to the next generation who, soon, will know which path to follow in their future area of work and may even, who knows, inspire them. them to follow the same profession, that of a teacher.

The class, in addition to bringing knowledge to students and making them question the subject, is a great way to let them discover what they want to be when they finish high school.

In our training, as teachers, in addition to the experiences in the laboratory, classes in the classroom also brought us enrichment. Observing the teacher's methodology, we were able to learn how to teach and how to position ourselves in the classroom when students ask questions about more personal issues, about religion, for example, or about the teacher's life and his personal opinions. On the other hand, we must also learn how to position ourselves when the student is messy or talks a lot and disrupts the class.

We learned how to teach in a simple and efficient way, detailing everything on the class board and explaining afterwards and, at the end, answering students' questions. The activities carried out by Pibidianos students provided the opportunity for the first contacts with the classes, where we spoke directly with them and applied some very simple activities.

Thus, the teaching initiation program is something that provides diverse classroom experiences for students who, in the future, will become teachers. Despite being classes following the teacher in the classroom or in the laboratory, it is the first contact with

a group of students, where we realize the challenges and pleasures of teaching. The practices in the biology laboratory also allowed the development of teamwork skills, careful observation and critical analysis of results.

The combination of theory and practice has contributed significantly to a more complete and in-depth understanding of osmosis and its effects on living systems. As Pibidian students, we recognize the relevance of these activities in our training as future educators, enabling us to transmit knowledge in a more engaging and effective way. The opportunity to participate in PIBID and take this laboratory class was a valuable privilege that will certainly shape our approach to education and teaching.

THANKS

To the Coordination for the Improvement of Higher Education Personnel - CAPES for granting the Teaching Initiation Scholarship.

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