

Chapter 33

Inclusion: construction and adaptation of chemistry laboratory materials for a student with cerebral palsy

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ABSTRACT

The objective of the work was to build and/or adapt laboratory materials, to be used in the experimental classes of General Chemistry I, for a student who presented cerebral palsy. The methodology consisted in the observation of the commitment of the student and later the elaboration of specific material for the student to be able to execute the experimental class. The results were quite significant, with the student inserted in the class and executing all the proposed tasks. It was concluded that even with all the commitment that the student presented, there was the insertion of the student in the experimental subject and consequently to the class, to the course and also to the world.

Keywords: Inclusion, Cerebral Palsy, Laboratory, Chemistry.

1 INTRODUCTION

The thought of this work was of an inclusive education, which is conceived by the diffusion of values of justice, social equality, solidarity, and democratic insertion in the environment, as described in the Salamanca Declaration (UNESCO, 1994).

Strømstad (2003) addresses in his work that alternative paths for differentiated students is something inevitable, being necessary to learn from them and the school is the best place to do this learning.

The unfolding of an inclusive education requires changes of the different educational agents (teachers, monitors and laboratory technicians), changing the curriculum, also from the teaching-learning process, in this work, the laboratory must be modified, whether physical adaptations, such as chairs, benches and others, such as materials that the student will use, this causes resistance and even a certain fear on the part of teachers, laboratory technicians and monitors (FULLAN, 2001), but learning to deal with differences and accept the modifications, is a fundamental act of the teacher and also of all, to promote, in fact, inclusion.

2 METHODOLOGY

The methodology was developed through observation, reflection and development of construction or adaptation of subjects so that the student could perform laboratory classes, with the aim of real inclusion of the student with specific needs.

This student presented cerebral palsy with involvement in the hands, from the first period of the biology undergraduate course, of the Federal Institute of Rio de Janeiro, Maracanã campus, in the discipline of General Chemistry I.

The adaptations and/or construction of materials were:

- I. To measure volumes, pipettes, beakers, beaded and sticks, plastic, were used, thus replacing all glassworks;
- II. For the weighings, a spatula adapter was made (Figure 1), so that the student could handle it (the student did not present the tweezer movement).
- III. For heating, several adaptations were made:
 - an iron holder for the Bunsen nozzle (Figure 2); to light it, a lighter adapter was purchased (Figure 3);
 - a lever has been constructed to adapt the gas outlet tap (Figure 4),
 - in a steel tweezers, two adaptations were made: an iron lock, so that the student would not break the heated glass beaker and with a plastic tube, a handle was made so that the student could hold the tweezers without the need to use the movement of the fingers (Figure 5);
 - an extension of wood was placed in a wooden tweezers to be fitted to the spatula adapter (Figure 6).

Figure 1 - Spatula adapter.



Source: Authors

Figure 2 - Iron holder for Bunsen nozzle.



Source: Authors

Figure 3 - Lighter adapter



Source: Authors

Figure 4 - Lever to be adapted to the gas outlet tap, so that the student had autonomy in relation to the opening and closing of the gas.



Source: Authors

Figure 5 – Steel clamp with two adaptations: iron lock (not to break the bequer) and plastic tube to make the handle malleable.



Source: Authors

Figure 6 - Wooden tweezers with an extension to make it more comfortable and safe for the student.



Source: Authors

3 RESULTS

The discipline of General Chemistry I is the first contact of the student with the experimental part of the undergraduate course of Biology, which at the Federal Institute of Rio de Janeiro (IFRJ) presents a large workload in the experimental part, therefore, for the student be actually inserted in the course, it is necessary a domain, even if it is small, in the use and handling of existing materials in the laboratory.

The result of the work was that the student actively participated in all experimental classes of General Chemistry I, piping with plastic pipettes, weighing with adapter in the spatula, heating safely, so as not to cause danger to the student and or the other participants in the class (Figure 7).

Through these adaptations and/or construction of materials the student performed all laboratory classes, thus having the real possibility of continuing his course executing the practices of laboratories existing in the other disciplines of his graduation.

It can be observed that the students of the class in which this student belonged welcomed him in a very significant way, trying to help the student and giving "tips" to the teacher and monitoring her in the most adequate way to perform a certain work, it can be said that everyone, the student with paralysis, the other students, teachers and monitors learned from this work.

Figure 7 – Student in laboratory class on warm-up techniques of the discipline of General Chemistry I



Source: Authors

4 CONCLUSION

It is concluded that even with all the commitment that the student with cerebral palsy presented, it was possible to make the inclusion of this student to the class, to the discipline, to the course, to the knowledge, and consequently to the world, with the teacher reflecting, analyzing and constructing materials that best fit the student.

It is necessary that the other professors of the other disciplines of this undergraduate course give continuity to the work, which does not end, each discipline presents a specificity having the need to occur other adaptations or constructions of materials, this work was only the basis.

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