

# *The Collaborative Learning in the Science Laboratory: A meaningful Didactic Strategy*

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## **Introduction**

In the new educational model of curricular transformation at UNAN-MANAGUA, it is suggested the development of activities which promotes a meaningful learning. To achieve a number of strategies that teachers can develop together with the students, so that the student is the actor of his own learning and the teacher only a facilitator.

As part of this Curricular Transformation in Regional Multidisciplinary Faculty of Carazo from 2012 it started implementing these teaching strategies that has allowed teachers to enter this new educational model.

Among these strategies is implementing collaborative learning in the course Introduction to Chemistry as support for a more significant development, this is done through laboratory practices guides for the activity.

## **Basis of Collaborative Learning**

The collaborative learning is done through the addition of two or more students in the solving of an assignment. For this, knowledge intermingles and reconfigures. The language (its four major macro skills) plays an important role, so the facilitator should come to intersperse explanations reorient the exchange of ideas and adjust the terminology system which is needed to internalize. Such strategies include various procedures such as small group discussions, debates in which it deliberates (argues) and expose controversies, simulations, demonstrations, etc. allowing conclusions. They provide recommendations to guide decision making. (According to a standard curriculum changes UNAN-MANAGUA 2012)

In education, collaborative learning has a special connotation due to its rightful mission in the formation and development of the personality from the achievement of a comprehensive general culture.

The teaching of science, such as Chemistry, has traditionally developed theoretically and practically, for its experimental nature. In this sense, the laboratory has always seemed to fulfill an essential function as a learning environment for the implementation of practical work, which especially helps develop generic skills such as:

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1. The development of critical and reflective thinking.
2. The inclusion of collaborative work.

Furthermore, it can be mentioned disciplinary competences directed to:

1. It considers science as an interdisciplinary and collaborative process.
2. It interprets and quantifies the chemical-physical-biological phenomena among others.

Robert Marzano (2005) assumes that learning is a product of the interaction of five types of thought, he calls; Dimensions of Learning. Based on these dimensions, instructional planning is based on the achievement of objectives through activities and evaluations based on performance.

The performance aims for the student to demonstrate what he can do and perform. The development of these skills has such diverse functions as the survival of the individual, insertion in an increasing competitive society and the acquisition of knowledge and skills that directs him to learn how to learn.

### **Development or Application of the Strategy**

At the beginning the course is developed by applying other strategies but theoretically, even exercises related to content, using chemical formulas and mathematical support to solve them; but everything is a little superficial in the sense that students really do not see it, but it is through practice in the science lab that students are allowed to consolidate knowledge, especially through learning by doing, not just manipulating materials, not following a recipe guide that permits the students apply what they already know theoretically and develop their creativity to resolve issues raised in the laboratory.

In the development of the laboratory activity the following objectives are intended to:

1. Motivate students in the laboratory work.
2. Involve students in the learning process.
3. Get the students to assume the basic concepts, through explanations carried out mostly by themselves.
4. Produce positive mutual links among the students, promoting the collaboration among each other
5. Learn how to do teamwork, delegating and assuming responsibilities.
6. Encourage quick decision making for unexpected situations, group previous analysis (without depending on the approval of the teacher).
7. Go to the laboratory with an investigative attitude not just “following a recipe”
8. Encourage the capacity of self-analysis and constant improvement, being critical (constructive criticism) with themselves and the team.

First of all, the laboratory is planned according to content. It allows them develop the activity. In one or two practice sessions before the guidance is provided, general guidance on some reagents literature are given as well as the structure and content of the report delivered after practice. ....

The group class is divided for two laboratory sessions because they are usually very numerous; then teams of 4 students or 3 are formed. This permits greater order and better development of the activity and the ease to address their difficulties. Generally, the lab activity is done very enthusiastically from the side of the students and they are very clear that if they do not work collaboratively, they will not complete the activity.

In the same process they discover the importance of collaborative work in the laboratory and the ease of learning the subject in establishing the direct link between theory and practice to learn by doing.

The guide contains the following sections:

1. Objectives to develop
2. Contents involved in the practice
3. General introduction of the content
4. Material and reagents that will be used
5. Processes to develop
6. Observations on the development of the process or results
7. Conclusions
8. Observations according to the inconvenient in the laboratory
9. Bibliography

The lab report is prepared based on the same structure except that the introduction varies according to the bibliography. In the procedure they describe what they did in the lab, whereas in the comments what it really resulted from it. The conclusions are oriented according to results and developed content.

## Conclusions

In short, a change in our teaching practice in the laboratory must involve efforts directed to face up new experiences in which it is warranted to adjust time, resources, teaching content and attitudes to give the laboratory the place that calls on science learning efforts.

The application of collaborative learning strategy and development of skills in the same from the part of teachers is a need to raise the quality of teaching-learning process.

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