

Una mirada a los ejercicios y tareas docentes en la enseñanza de la Biología

A look to the exercises and educational tasks in the teaching of the biology

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Resumen

La praxis educativa demuestra que una de las causas del fracaso escolar, es la concepción y aplicación de ejercicios y tareas docentes tradicionales que fomentan el aprendizaje memorístico de algoritmos y procedimientos, sin una plena comprensión y aplicación de lo aprendido. En consecuencia se aporta un procedimiento para la elaboración, fundamentalmente de las tareas docentes, de manera tal, que permita su concepción, orientación, control y evaluación, en aras, de elevar la calidad de la clase. Los métodos aplicados permitieron concluir que la propuesta es pertinente para potenciar el aprendizaje en la práctica escolar.

Palabras clave: Praxis educativa; fracaso escolar; Aprendizaje memorístico; Tareas docentes

Abstract

Educational praxis shows that one of the causes of school failure is the conception and application of exercises and traditional teaching tasks that encourage the rote learning of algorithms and procedures, without a full understanding and application of what has been learned. Consequently, a procedure is provided for the elaboration, fundamentally of the teaching tasks, in such a way that allows its conception, orientation, control and evaluation, in order to raise the quality of the class. The methods applied allowed concluding that the proposal is relevant to enhance learning in school practice.

Keywords: Educational Praxis; school failure; Memory learning

Introduction

The current scientific and technical advances and their diverse applications in the human doing, pose to society and the contemporary school the need to attend in a differentiated way the learning process, with the aim of forming citizens capable not only of processing the large volume of current information, but also understand and act with knowledge of the essence of the causes, with personal involvement and responsibility, in solving the problems they present in everyday life.

That is why Basic Secondary Education today faces radical changes in its educational model, in the social historical context of the improvement of the Cuban socialist model, the strengthening of the battle of ideas, for the achievement of a comprehensive general culture as an expression of the third educational revolution in the country.

In this regard, as part of the III Improvement of the Cuban National Education System, from the school year (2018-2019) a new general curriculum was implemented, which aimed to overcome the deficiencies found in the II improvement, focusing on reducing the volume of information through the concentration of the essential, to adapt the contents to the peculiarities of assimilation and to the cognitive possibilities of the students, with the aim of achieving a better preparation for life.

An important aspect to realize these aspirations is the attention to the teaching-learning process, as this constitutes an ideal way to contribute to the formation of that ideal of man to which society aspires.

In this sense there are several ways to stimulate learning, problem teaching, participatory techniques, educational games, modeling, learning situations, exercises, teaching tasks, among others. The authors of this work give preference to the exercises and teaching tasks which allow the cognitive independence of the students and thereby learn to learn.

With the work "Exercises and teaching tasks in the teaching of Biology", a look is given to the objective and essential conception of the exercises and teaching tasks to achieve their structural and functional understanding by the teacher, and from that, suggest a procedure for the fundamental preparation of teaching tasks, in such a way that allows their conception, orientation, control and evaluation, in order to increase the quality of the class.

Development

When talking about didactic exercises, reference is made to the “repetition” of actions with the objective of forming and developing habits and abilities, which is achieved when the student is able to adequately reproduce each of the elements, of the actions that they are proposed and repeated correctly.

On the other hand, in the Methodological Orientations for the program of the eleventh grade Physics subject, 1988, it is understood as an exercise: *“to the repeated execution of certain actions or types of activities, which are intended for assimilation, based on a control conscious and corrective (...) the exercises perfect knowledge and are the fundamental means for the formation of habits and abilities ”.*

Likewise, García (2004), points out that the exercises constitute the system of simple tasks by their composition, which includes independent activities aimed at the assimilation of knowledge, the development of simple skills (...) are a way of using logical operations and independent practices to understand the content of the study material for the formation and consolidation of habits and abilities (...).

For his part, Bernardo Trimiño Quiala, defines exercise as “any planned teaching task, in which there must be: a question to be solved, a certain degree of motivation for it and where the immediate pathway, or the solution algorithm may be evident” (Trimiño, 2015, p. 53).

The importance of using exercises and problems in the teaching-learning of science is highlighted by numerous specialists. They are resources so important that they can hardly disappear from any curricular transformation.

Several authors classify the task of learning of an applicative nature, in exercise or problem, evidencing that it is relative, since, as they point out that distinction, it depends not only on its own characteristics, but on the cognitive-instrumental system that the person facing it possesses. "A task is merely repetitive (exercise) or novel (problem) based not only on its own characteristics but on the knowledge of the person who faces it" (Pozo and Gómez. 1999).

The essential difference that can be established between exercises and problems lies precisely in the fact that the former do not require updating the subject's cognitive-instrumental heritage that is involved in its solution, nor does it require a high level of directionality in acting. Its fundamental

objective is the systematization of the system of actions and operations necessary for the execution of a certain performance, and thus bring the instrumentation to the level of ability.

Vicente González Castro's criterion is supported in that the approach of exercises in the teaching-learning process should stimulate the processes of analysis, synthesis, generalization and other active operations of the student, which do not limit the student's action to reproduction.

This author agrees when he says: "We must end the type problems that the student must master and promote the definition of type operations, which take into account the potential of the student in the different stages of their development" (González, 1989) .

In this work, the actors assume the principles postulated by Skinner, B.F, quoted by Trimiño, B (2015) on learning:

- Principle of small steps: it states that learning is more effective when done through successive tasks.
- Principle of learning at your own pace. Recognizes that each student learns at their own pace, in accordance with the time they need to complete the assigned task.
- Principle of immediate feedback. Ensures that a student learns more when he checks his answers immediately.
- Principle of active response. State that the student learns more when he issues an answer.

For their part, teaching tasks play an active role in learning biological knowledge by concretizing the activities of students both internally and externally through different links in the process.

The teaching tasks have been treated in a wide and dispersed way by different pedagogues, from different latitudes and from different learning perspectives, so they have consequently been called teaching tasks, cognitive tasks, didactic tasks, typical tasks, intellectual tasks and tasks of learning, among others, according to the interests of each researcher and the specific context in which it takes place.

Authors such as Álvarez (1999) Rico (2002) Gutiérrez (2003) and others consider the teaching task as a basic and fundamental element in the teaching-learning process. They specify that the actions and operations that students must carry out inside and outside the class, ideas that we share and that we assume in the conception of the proposal are specified.

In relation to the definition of teaching task, Carlos Álvarez de Zayas states that it is a structural unit of the teaching-learning process and draws attention to the importance of such a structural unit by calling it the process cell.

In this sense, he points out that: "... the process cell is the teaching task, which cannot be divided as it loses its nature and essence." It also considers, "that it cannot be subdivided into subsystems of lower orders. In it you can recreate all the personal components of the teaching - learning process and the laws of teaching" (Álvarez, 1999, pp. 21 - 115).

For his part, Rodríguez says that the teaching task is "the cognitive activity that the student must solve, guided by the teacher or that he considers solving himself, according to his interests and motivations" (Rodríguez et al., 2012, p. 174).

The researchers Rico and Silvestre, define the teaching task as: "(...) that activity that is conceived to be carried out by the student in and outside the class, linked to the search and acquisition of knowledge and the development of skills" (Rico and Silvestre, 2002, p. 78).

They also highlight the need to reshape the teaching-learning process and require, among other elements, an essential change in the conception and formulation of the task. Gutiérrez (2003, p. 2), in the article "The pedagogical process as a management process", makes a very accurate synthesis of the essential features that typify the teaching task and which are taken into account for the conception of the tasks. He considers them the same:

- They constitute the basic cell of learning.
- They are the essential component of cognitive activity.
- They are carriers of the actions and operations that favor the instrumentation of the method and the use of the means with predetermined ends.
- They serve to cause the movement of the content and achieve the objective.
- They are done in a planned time.

Taking into account, the criteria of this author can be understood that the teaching task is an essential element in the teaching-learning process, because it summarizes the actions and operations that students must perform inside or outside the class according to the guidance and guidance of the teacher.

It must be planned, taking into account its role as a dynamic agent and stimulator of the role of students, from a deep knowledge of the particularities and potential of each of them, that is, to personalize the activity taking into account the diagnosis of each one.

Silvestre defines the teaching task as “the activities that are conceived to be carried out by the student in and outside the class, linked to the search and acquisition of knowledge and the development of skills” (Silvestre, 1999, p. 35).

The realization of the teaching tasks, therefore, presupposes that the student perfects his mode of action and elevates himself in the individual and in the group until he becomes the holder of universal knowledge because that is where the actions and operations to be carried out by the student and the guiding and controlling role of the teacher.

These can be reproductive and reflexive. The requirements must be specified according to their three fields of action: instruction, education and development.

Therefore, it should not lead to the performance of isolated, but systemic actions, hence, according to Silvestre, varied, sufficient and differentiated.

Varied: in the sense that there are activities with different levels of demand that lead to the application of knowledge in known and unfamiliar situations that promote the effort and intellectual work of the school, leading to higher stages of development.

Sufficient: so that the dosed activity itself includes the repetition of the same type of action in different theoretical or practical situations, the actions to be repeated will be those that promote the development of intellectual abilities, the appropriation of learning content, as well as the habit formation.

Differentiated: in a way that promotes activities that respond to the individual needs of schoolchildren, according to the different degrees of development and reached preparation. The authors consider that taking into account the characteristics of the teaching task, mentioned above can influence the instruction, development and education of the student, which could be linked to their motives and interests.

According to Trimiño (2015), the teaching task as a basic cell of learning in the classroom, must pay tribute to the fulfillment of the following requirements:

- a) The correspondence among the diagnosis, the group strategy and the individual plan.
 - b) Attention to diversity.
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- c) That is motivating enough to create the need for your solution.
 - d) To involve students specifically in the activity to generate their own procedures and methods of self-learning.
 - e) Preventive work from class.
 - f) The correspondence between the treatment of the content and the individualized responses.
 - g) The treatment of the content based on the interests and motivations of the group.
 - h) It takes into account criteria and doubts of students in particular to give general explanations.
 - i) The use of existing resources that support the teaching-learning process.
 - j) The demonstration of the usefulness of the class for its activity based on the needs of practical life.
 - k) The simulation of teaching situations from practice.
 - l) The stimulation of communicative competence.
 - m) The development of self-learning and self-assessment actions.
 - n) The orientation, execution and control of independent work.
 - o) Control and evaluate the process and the result of the work in the teaching task to achieve the objective specifying to what extent the real state approaches to the desired one.

Taking into account these requirements, we suggest the methodological procedures to develop teaching tasks whose objective is to promote the development of creative thinking, the formation of habits and skills as well as the interaction teacher - student, student - student, student-group, teacher-group and thus promote a developer process where developer learning is achieved.

The proposal is considered in this case as a functional variant that facilitates the work with the teaching tasks, teacher oriented logical steps to operate with it. In this case, the proposal made by Trimiño, B (2015), but contextualized to the purposes of this work, is assumed. Proposal of logical steps for the development of teaching tasks.

1. Consider the result of the individual and group diagnosis in terms of specifying trends and needs in the order of potentialities and deficiencies, both in the group and in the individual.

It is necessary to consider that the diagnosis allows us to specify the state in which it behaves in a segment of reality, the socially established ideal and therefore, the teaching task will allow to bring the diagnosed real state closer to the socially established ideal.

From the perspectives of this work, it means performing the exploration at a first moment that allows us to know the current state of the student, this reveals the domain of knowledge and biological skills.

2. Derive the objective of the class (fulfill the principle of the gradual derivation of the objectives

- Level objectives.
- Objectives of the degree.
- Objectives of the subject.
- Objectives of the unit.
- Class objectives: the teacher contextualizes it according to the individual and group diagnosis. The objectives are the starting point for the development of teaching tasks. These must be productive and formative.

3. Formulate the objective of the class in which it should be structured in a way that determines:

- The ability.
- Knowledge.
- Educational intentionality.

4. Determine the form of organization of the student-student relationship; teacher-student; student-group; teacher-group to develop the task: individual, by teams and in plenary or groups.

5. For the orientation of the teaching task:

Determine how to organize the guiding base for its realization, for which it is important to take into account questions such as the following:

- For what? • That?
- As? • When?
- Where? • With what?

6. For the control of the teaching task:

Determine how to control the process and the result of the work with the teaching task to assess the extent to which the real study approached the ideal by fulfilling the objective.

In this sense, the evaluation system that is planned must meet the proposed objectives. This stage allows to receive, classify and sort the information of the transformations that the students have had.

It is an important moment that begins with the individual and group assessment of the results process where achievements and difficulties are exposed.

1. Overall assessment of the results.

For the individual evaluation of the students, they can reflect on the following questions.

In what aspects are the greatest difficulties evident?

What is the best answer?

What is the note you propose?

Argue.

What concrete actions will you take to improve the results?

Then a general assessment of the group is made to detect the difficulties, highlight the achievements and then an individual and general qualification that can be quantitative or qualitative is argued.

2. Results obtained in the application of teaching tasks with a problem approach.

It will be valued from:

- Greater mastery of content.
- The development of creative and independent cognitive thinking of the student individually and in groups.
- The development of the general comprehensive culture.

Based on the previous methodological procedures, the authors of this work infer that:

- A teaching task constitutes a plan for student performance.
- The teaching task must be centered primarily on meaning. These include some type of void, be it information, opinion or reasoning, that students must complete with their own resources.
- Therefore, the tasks simply create a scientific framework, within whose limits the student can move freely.
- A teaching task involves real processes of use of knowledge and at the same time of communication.

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- The teaching task may require the use of any of the developed skills, sometimes several at once.

Conclusions

The exercises and teaching assignments can be applied in the current conditions of the middle school; they are valid for frontal work with students and for the performance of individual and team tasks. The teacher's use of them depends on the way he combines them to structure the teaching-learning situations.

Both ways promote reflective and meaningful learning in the teaching-learning process of Biology. They constitute an alternative to improve academic results and for students to learn to learn.

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