

Las Tareas docentes integradoras. Una vía para la formación integral de los docentes en formación ***Integrative teaching tasks. A way for the integral formation of trainee teacher***

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Resumen

El presente trabajo forma parte del proyecto ramal “vías para elevar la calidad del aprendizaje”, como parte del perfeccionamiento del proceso formativo de los estudiantes. El mismo tiene como objetivo socializar una metodología basada en las relaciones interdisciplinarias, se ilustra un modelo de tareas docentes integradoras, para contribuir a la formación del docente del 2do año de la Licenciatura en Educación, Especialidad Construcción, se determinaron cada uno de los componentes de las tareas a partir de su relación con el eje integrador, el problema profesional que proporcionaron los modos de actuación y la formación de saberes integrados.

Palabras clave: Tareas integradoras; Calidad del aprendizaje; Formación del docente; Procesos formativos

Abstract

This work is part of the program "ways to improve the quality of learning", as part of the improvement of the students' training process. It aims to socialize a methodology based on interdisciplinary relations, a model of integrative teaching tasks is illustrated, to contribute to the training of teachers in the 2nd year of the Bachelor's Degree in Education, Specialty Construction, each of the components of the tasks were determined based on their relationship with the integrating axis, the professional problem that provided the modes of action and the formation of integrated knowledge.

Keywords: Integrating tasks; Quality of learning; Teacher training; Formative processes

Introduction

Cuban society has considered the important need to enrich the integral formation of man, whose preparation places him at the height of the development of today's world, allowing him to become aware of himself and to raise his responsibility, laboriosity and un conditionality as critical and transforming social beings to act opportunely and consequently, orienting himself in the successive and frequent changes that occur in the world in which they live and for which they need to have a global vision of reality in all its complexity.

In one of the reports issued by the Central Institute of Pedagogical Sciences (ICCP) (1998, p. 3), which supports the need to carry out curriculum activities in an integrated manner, as one of the conditions for efficient and true learning, it is stated:

Learning is global, because it is not isolated from other mental and physical processes, hence the activities have an integrative character, this responds to the psychological criterion that the mind is syncretic and the perception of the individual is global. (p.62)

Nowadays, the establishment of rigid frontiers among disciplines, besides fragmenting knowledge at school into disconnected and meaningless parts within the whole, is also decontextualizing the contents of the curriculum. If the school continues to operate in this way, it could alienate students, breaking their relationship with the world, wasting their ability to create, to venture, to seek the direction of the unknown by their own means, and constitute a real brake on their education.

In this sense, it is appropriate to consider the need to radically change the conception of an authoritarian and passive pedagogy of the traditional polytechnic school for higher education, thus increasing communication, interaction and projecting itself by these flexible and integrative curricula that challenge what the new society demands: to create men capable of solving problems that arise in the concrete conditions of production and teaching, responding to our socialist socioeconomic structure.

Development

The need to achieve a more active role of the student in the learning process, forces the abandonment of traditional methods of instruction, in favor of integrative Didactics. The conception of concrete tasks responds to the need for interdisciplinary teacher training as one of the most important premises for the changes that contemporary education needs, so that the supremacy of knowledge fragmented by

disciplines is replaced by a mode of knowledge capable of apprehending the objects in their contexts, complexity and set, teaching for this the necessary methods and procedures that allow establishing these relationships and reciprocal influences.

The integration of disciplines implied a much closer and deeper relationship among subjects of the educational system around an integrating objective. Such an approach leads to a conception of a much more flexible, gradual and continuous methodology in the curricula.

The teaching activities proposed are conceived in an interdisciplinary process, whose purpose is the formation of integrated knowledge in students through the establishment of interdisciplinary relationships, which are structured around an integrating axis and all the components of the didactic system.

The success of the integrative teaching task with interdisciplinary character is fundamentally based on the essential research of which are the integrating axes and which practical solutions to offer to achieve a growth of the personality and develop their creative capacities according to the diversity of problems; propitiating that the students learn the relations of science, technology and society, and act consequently with the practice; opening a general integral culture to them.

It is through interdisciplinarity that integration takes place. It responds to how to operate in practice, which allows, with the action of teachers and students, the integration of learning processes and knowledge, thus allowing their mobilization and application in real life situations.

Conception of integrative teaching tasks

This was conceived in a systematic way, in its conformation underlies the orientation, execution and control, as elementary steps that are related to each other; they are:

- Orientation: guides, texts and other materials were specified, the procedures to be used, curricular strategies to be dealt with, the necessary contents to be interrelated, thus the motivational preparation of the teachers in training were explained.
- Execution: the planned actions were developed to achieve the proposed goals, including the necessary human and material resources; these were elaborated in teams and independently.
- Control: the development or execution of the designed integrative teaching task was evaluated, the results obtained were evaluated and reoriented if necessary.

The methodological performance of the teachers is materialized in the development of these tasks, for which it was instrumented through procedures and methods, which were structured according to the material means and the cognitive-instrumental repertoire available (procedures, methods, actions, means).

In the projection of the integrative teaching tasks, the program of the subject Construction Materials, corresponding to the Bachelor's Degree in Education, was taken as a reference. In this case, its theory was studied, the curricular design and its components, the link with the rest of the subjects and the research-labor practice thus, as well as the professional problem it solves, were evaluated.

The interrelation with the study of the discipline of Chemistry, makes possible the knowledge of the properties and characteristics of the substances that compose each one of the materials and products of construction, for which without its important laboratory results, the analysis of the influences of high temperatures during the elaboration of these products, thus the study of the effects of acids, salts, oxides and the impact caused by the aggressiveness in the environment, the advances in this branch would be impossible.

The selected subject is introduced in the 2nd year of the investigated career, it presents characteristics of a globalized design, as its contents are projected with an integral approach, since it provides a valuable opportunity for the socialization of the achievements reached in the solution of teaching and practical problems, through a greater mastery of the characteristics, properties and chemical composition of the different construction materials and products, with a view to favoring a better selection of the products to be used in the execution of works and a greater preservation of the environment and human health.

An integrating axis was chosen whose design allowed us to work on interdisciplinary relations in the career (2nd year), this year has additional needs from the point of view of the teaching-learning process in comparison with the other years, a body of knowledge and skills is incorporated that conforms a specific way of professional performance. At the same time, a singular scientific-technical language is accessed, which allowed it to grant professional performance a privileged place in the initial teacher training.

The integrating axis (professional problem) constitutes the pivot through which the process of interdisciplinary articulation takes place; it is the meeting and convergence point where the interrelation between the different components of the system flows.

In the integrating axis is found the unity of the interdisciplinary teaching-learning process, since it allows the inclusion of topics related to aspects of social interest of today's importance.

Characteristics of integrative teaching tasks

The integrating tasks respond to the professional problems of the Bachelor of Education in Construction Specialty, they focus on the direction of the educational process in the institutional way of the initial formation and in particular, in the different forms of organization of this process. They also cover the preparation of the professional for the direction of methodological and scientific-methodological teaching work and scientific research in the subsystem, thus entering into the different fields of action of the future graduate and in fundamental functions of the teacher's performance; among its characteristics are:

- They are performed through actions that are deployed in the frameworks of professional performance, in their relationship with academic activity.
- They are based on interdisciplinarity and on the relationships established between the integrating axis with the components of the didactic system, the functions and the mode of professional performance in the context of subject-object-professional role relationships.
- They have an integrating axis of interdisciplinary nature and systemic character.
- Its integrating axis is a professional problem.
- They involve the students themselves in the detection, characterization, substantiation and solution of problems, which occur in the object of the profession, making use of the problem-solving teaching method.
- They channel the construction of knowledge and instrumentations, which allow the use of methods, procedures and means characteristic of the professional of the student's future work context.
- They encourage cooperation among students in the performance of the task, thus encouraging discussion and diverse points of view.
- They provide students with the information they need during the solution process, performing a supportive task, aimed more at asking questions and fostering in students the habit of questioning, rather than providing answers to their questions.
- They have been designed fundamentally for the integration of knowledge of the disciplines Project, Construction and Conservation of Buildings with an integrative approach.

- They presuppose the integration of knowledge based on the solidity of previous knowledge and the students' leading professional role, conditioned by the subject-object-professional role relationship.
- They are guided by the logic outlined by the principle of systematicity, following the knowledge spiral through the transfer of knowledge to new problematic situations.

Its essence is not the final evaluation of students, although it does not exclude it, but teaching students to learn to relate and interweave contents when facing problems of their profession and to produce integrated knowledge.

Examples of integrative teaching tasks

A system of integrative teaching tasks is proposed through the contents of the subject Construction Materials, the Discipline of Chemistry and Methodology of Educational Research, focusing on the areas for the formation of the personality: affective and socio-moral, intellectual and cognitive, aesthetic, development of skills and abilities.

Subject: Construction Materials.

Professional problem of the career

Social need to train graduates in Construction Education, to contribute to the economic and social development of the country from its labor incursion in the Technical and Professional Education with a prosperous and sustainable vision.

Professional problem of the subject

The need to contribute to the formation of a Construction Education professional with advanced knowledge in new technologies on construction materials and products, capable of applying it in practical life and in the solution of professional problems in Technical and Professional Education.

Educational Objective

To direct the educational teaching process based on the knowledge of construction materials and products in order to solve pedagogical and technical problems that appear in the professional model, taking into account the advances of new technologies and the preservation of the environment.

Spheres of action: relationship polytechnic school-community-company-political and mass organizations.

Materials for the elaboration of mortars and hydraulic concretes.**System of knowledge**

Aggregates. Obtaining. Chemical composition. Classification. Natural stones. Characteristics. Classification by size. Properties. Protection measures and environment. Sampling. Tests. Natural sands. Characteristics. Classification. Sea sand (limitations). Tests. Hydraulic cements. Obtaining. Chemical composition. Characteristics. Classification. Uses.

Integrative teaching tasks

1- Construction materials are composed of different chemical substances that determine their properties in this aspect.

- Make a summary, where you express the importance that you give to the study of the chemical composition of construction materials during their production process. Discuss it in your group taking a construction product as a reference.
- Research in the historical center of your city, 5 of the construction materials used in the colonial period. Mention the architectural styles identified in the area. With the help of specialists in the field, characterize them. Provide examples of these architectural styles with photos, plates, magazines and others.
- What are the chemical properties that stand out in the materials and products that make up these works that still remain today?

2- In the area near the Mariel factory, Havana province, a polytechnic will be built using the improved traditional system, where sea sand extracted from the bay of the site will be used. The foundation will be of 20 MPa (200Kg/cm²).

a) Mention three laboratory tests that you would make to the sands to guarantee their adequate use.

b) Make a study in the model of the professional of your career and establish an analysis of the proposed exercise, from the reading say what transformations you want to achieve in the teacher in training. Which subjects are related to this exercise? Ask your teacher for help.

3- The presence of white spots on concrete walls and ceilings is called efflorescence.

a) Elaborate another definition of efflorescence from the theoretical references studied by different authors and the use of specialized dictionaries, analyze each of the definitions and assume your position on the matter (opinions, judgments, criticisms, etc.).

b) Present concrete situations where this phenomenon is manifested?

c) List ideas about the ways in which you as a future teacher can indicate to your students the solution for its elimination. Evaluate by applying indicators in correspondence with the possible answers.

4-Lime and gypsum have been used since ancient times in the elaboration of several elements and products for engineering and architectural construction.

a) Locate, using computer and communication techniques, their uses, characteristics and properties. Relate them in a synoptic table.

b) Write the nomenclature of gypsum and lime. Explain why gypsum is an ecological material.

5-A warehouse manager received several bags of calcium sulfate semi hydrate to be used in the finishing of the buildings (painting, puttying, and patching). List the measures to be taken so that it is well protected from the environment.

a) State which didactic principles are manifested in this task. Justify why these principles are important to prepare your classes. Analyze it with your classmates taking into account what other texts say about it.

6-An earthwork was built in a maritime zone in the north of Ciego de Avila province. In a place close to it, there is a deposit of gypsum rocks which is forbidden to be used for the construction of the embankment.

a) Explain with concrete reasons why this prohibition is due. Conduct an interview with your teachers regarding the problem you are facing and collect the results in an electronic tabulator.

7- In a lime scale (lime quarry) two tons of calcium oxide or quicklime are obtained, which is widely used to save cement.

a) What measures would you use for its transfer?

b) Study carefully the content of the topic Materials for the elaboration of Mortars and Hydraulic Concretes. Draw up a list of important concepts. Order it hierarchically.

c) Relate Martí's phrases and concepts, referred to the topic and its link with the care and protection of the constructions and the environment. Discuss your ideas in group sessions.

d) After having read this topic, review the planning of a class related to it and given by you or by another teacher and point out positive and negative aspects and suggestions that you can offer to this planning. Write a report and draw conclusions together with your classmates.

- Interdisciplinary links

Values: Laboriousness, Responsibility, Aesthetics, Solidarity.

Determination of problems of global and local interest: For example, environmental and health education.

Mother tongue: It is a fundamental way for the appropriation of knowledge, requiring the correct use of terms and definitions, both written and oral.

Methods: Independent work, joint elaboration, problémica teaching, emphasizing the latter (research methods, problémica teaching method), the use of new information technologies.

Practical activity: visit to hydraulic, civil and road works, observation of videos on new construction technologies, stripped of any disciplinary approach.

Skills: The integrative teaching tasks derived from the relationship integrating axis and methods; ensure the actions to be executed by students who understand the professional's mode of action. Example: Identify, diagnose, support model actions to solve professional problems, to direct the teaching-educational process afterwards.

Media: texts, study guides, specialized construction magazines (OBRAS) and videos on new construction technologies.

The object of study of each science: Those that are reflected in the teaching-learning process.

The main concepts: These serve as a guiding thread in the treatment of new content. Examples: substances, chemical reaction, oxidation, chemical and physical properties, nature-society relationship, particles.

General methodological indications for the solution of the proposed integrative teaching tasks

- Analyze in each class which professional results should be promoted, prioritizing responsibility, hard work, aesthetics and humanism.

- Select the objectives of the Construction Materials subject derived from the professional's model and the selection and sequencing of the contents.
- Self-preparation of the personnel and the previous clear orientation of the teacher to the student, to face the interdisciplinary relations that contribute to form a competent professional and to a better solution of the integrating teaching task.
- To plan the necessary actions to raise the quality of the integrative process in function of stimulating abstraction, exploration, with its concrete thought, of the phenomena and processes of study, without the need to use the material object to refer to it.
- To elaborate tasks with coherent interrelation and increasing levels of complexity, for the gradual development of the students' abilities.
- Select the skills of the disciplines and subjects and model of the professional that contribute to the integrative discipline Project, Construction and Conservation of Buildings.
- The activities must be motivating, objective, with real, significant data and that pose problematic situations that facilitate independent research and group exchange.
- Master the chemical nomenclature of the substances that compose the materials and products of construction and the possible applications and damages that can be caused by inadequate use and established percentages.
- Guidance from the individual and group diagnosis of the different bibliographies, which facilitate the search and quick solution of each integrative teaching task and the differentiation of integrative teaching tasks.

Conclusions

The integrative teaching tasks conceived in this work, based on their relationship with the integrating axis and the professional problem; provide ways of action for the Construction education professional, based on the formation of integrated knowledge.

It favors interdisciplinary relations in the initial training of the teacher of this specialty, due to the organizational characteristics and the previous work carried out by the career, which ensures cooperation and exchange relations.

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