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C-01. Extracurricular activities in study of chlorine and its compounds

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Let's not educate our children for today's world. This world will no longer exist when they are great and nothing allows us to know how their world will be. Then let's teach them to adapt.
Maria Montesoria -*The discovery of the child*

Education through extracurricular activities tries to establish correspondence between skills, talents, and stimulating creative behaviour in some areas. The extracurricular activities purpose is to involve pupils in various activities, to cultivate interest in certain cultural activities and to develop special skills. Extracurricular activities are complementary activities that contribute to the development of creativity and spontaneity, but also to the gaining of self-confidence. The theme of present research was based on two motivations. First, it can be highlighted the particular interest generated by the analysis of several studies that targeted extracurricular activities and the second is given by the opportunity to live in a city where one of the most important factory in the chemical industry, ChimComplex Borzeşti operates.

This paper aims to identify the interest level of secondary school students for chemistry and when extent extracurricular activities can be effective methods to attract students to this discipline. The pedagogical research was carried out during the two years, 2016-2018, at the 8[th] grade students from the Oituz Gymnasium School and the Gymnasium School no.1 Oituz. During the visit to ChimComplex Borzeşti, the students saw how chlorine was obtained by electrolysis of the sodium chloride solution using an ion-exchange membrane, but also the control panels through which the operating parameters of the plants are monitored. At Salina Targu Ocna the students visualized from where and how the raw material is extracted. This trip took place after teaching lesson about the Salt Learning Unit. The students were given a scientific test before and after this visit. By comparing the results obtained it was found that through this activity the pupils managed better the information presented at class.

During the third visit at the Beer Factory, students were able to see how to determine the amount of CO_2 in a beer, to visit the water treatment plant, the boiling, fermentation, filtration and bottling sections of the beer, as well as how to prepare plant sanitation solutions.
After analysis of the students' answers at applied questionnaires we can be drawn following conclusions:- choosing a future profession depends largely on what can practically students achieve; - students are interested by that extra-curricular activities which stimulate their knowledge in chemistry. Thus, out-of-school activities have a positive impact on student creativity and spontaneity. Also they will retain much better informations about chemistry and understand the concepts and process with that discipline operates.

Keywords: extracurricular resources, stimulation of creative behavior, statistics

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C-02. Laboratory experiment – an ace in chemistry teacher hand

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The laboratory experiment as an euristhic method for teaching-learning is necessary in the study of sciences in general and in the study of chemistry in particular. The adequate use and integration of this method in the chemistry lessons can lead to growing the efficiency of learning new notions and to a progress for the students. Integrated in the didactique activity, the experiment gives to the process of learning a more attractive character, brings variety, relaxes, brings seriosity and others. Working practically the students become more interested in the activity they develope, braver, becaming more aware of their capabilities.

From the wish to study the eficiency of the laboratory experiment in acquiring the properties of the composed substances such as acids, bases and salts by the 8[th] graders we did the followings stages:

It were registred, analysed and compared the results obtained by the students of two 8[th] grads classes from Valea Seaca Gymnasium School and Contesti School at chemistry and phisics disciplines during the 2016-2017 scholar year

- The students from the two classes did alternativelly experiments at three chapters taken into study: the students from Valea Seaca did the experiments to *Acids* and *Salts* chapters, and students from Contesti did experimental activities only to *Bases* chapter.
- It were applied tests at each chapter and the results were interpreted statistically;
- It were applied final evaluation tests at the end of each scholar year with marks on items;
- By the collaboration with the form teachers of the two classes it were applied questionaires regarding the schollar and professional orientation and if the knowledge about chemistry are necessity for the future wanted job.

Through this research we wanted to show that the laboratory experiment is „an ace in the hand" for the chemistry teachers and the use of this method will lead clearly to the scholar progress of the students.

Keywords: laboratory experiment, acid, base, salt, questionaire

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C-03. Education for exact sciences in the context of pre-university education

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The current status of the exact sciences (those in the Mathematics and Science curriculum) do the impression of a significant weight in the volume of school work allocated to the above-mentioned sciences. The mentioned assertion is not necessarily based on the number of hours for leasons in the framework plans, but on the intrinsic difficulty of these disciplines and on the very large differences between classes in the receptivity of those contents. If there is added the nature (the manner) in which discipline is valued at the classroom by teaching - learning act (which is not only the teacher responsibility), it can obtained the quite large picture of the dysfunctions that exist now day at the disciplines from curricular area Mathematics and Sciences. By present study authors intended to investigate how students from different profile classes of a National College answer to a specific competences: "The conclusions about the informations obtained from different documentation sources, graphs, schemes, experimental data that respond to the formulated hypotheses" and "Integration of mathematical relations in solving of problems" statements issued in accordance with the 9th Grade School Schedule. The mentioned didactic approach takes into account the particularity of the school in which the docimological tests have been applied. Therefore the standard of the formulated subjects is specific to a differentiated curriculum, which exceeding the standards specific to the common trunk. The results of present research intended to be useful to teachers who teach elements of inorganic chemistry, physical-chemistry and analytical chemistry.

Keywords: chemical equilibrium, constant equilibrium, objective and subjective items, statistical tests.

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C-04. Teacher style - condition of success in the school environment

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In this paper, the authors propose to discuss by the broad issues of factors that can condition human learning. These factors can be grouped into those that include reward and punishment, for which literature suggests a wide range of approaches of grading register of the two attributes that condition learning or factors describing the teacher's style. These being those who can predict success / failure in a learning activity based on what the teacher does in the teaching act. On the other hand, aspects of the relation between model (teacher) and observer (pupil) can be highlighted and, as a corollary, the effects of the above mentioned factors in connection with each other.

Human learning remains a difficult process at the quantitative level. Many assessments on the factors that influences the learning are at qualitative nature, or even speculations of the various authors. By restricting to a certain extent the area of learning, in limits in which school learning can be circumscribed, it can be identified instruments and techniques of measurement and interpretation of various influences.

Keywords: teaching style, school learning, reward, punishment

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C-05. Aspects of assessment at chemistry in gymnasium classes

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The evaluation refers both to the education system and, more broadly, to the whole social body to which education is an integral part. Among the landmarks that characterize the assessment under current conditions can be mentioned aspects regarding the overall assessment of education in relation to other activities within the society, the institutional evaluation in relation to certain standards, the evaluation of the teachers and the decision-makers of the educational system in relation to the imposed requirements of their status, but also with the requirements of educational policy, the assessment of students in terms of behavioral anticipated changes in the register of their interests, knowledge, attitudes and skills necessary for their access to higher education or post-graduate employment. Chemistry, as a nature science, is the provider of many approaches that integrate science into education, with predictable goals for a future professional pathway of students.

In the present didactic approach, the authors attempt to emphasize, for the 8[th] grade student, an association between the evaluation in the standard format (the evaluation provided by the teacher) and the inter-assessment of students during a lesson with a pronounced heuristic content, which can be considered as a way of mutual appreciation of student groups, based on students' knowledge of chemistry. Student activities can be a measure of the behaviors associated with various levels of complexity in the Bloom taxonomy.

Keywords: school assessment, statistics, Bloom taxonomy, interactive methods

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C-06. Interdisciplinary approach in structuring content of natural sciences studies. Innovative didactic projects

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Without a multidisciplinary scientific culture, including mathematics, physics, chemistry and biology, no research on a narrow specialty can be made. The multiplication of learning sources and cognitive accumulations in different areas of knowledge impose new strategies for sizing and structuring content. Their effectiveness is given not only by the way in which information is selected, but also by hierarchy, organization and articulation strategies in complexes as close as possible to the described reality and the educational objectives.

One of the contemporary requirements for content structuring is the promotion of interdisciplinarity. The principle of interdisciplinarity derives from the space of scientific research and in education field it can be perceived in two aspects: the conception of the contents in the interdisciplinary perspective and the design and organization of the didactic processes in an interdisciplinary vision.

Monodisciplinary teaching and learning have the advantage of accentuating the sequential and insular perception of reality. Up to a point the analytical approach is indispensable, but at some point it is necessary to link school disciplines through mergers between multiple conceptual or operational perspectives. An interdisciplinary structured school content is better suited to the reality and ensures a consistent and coherent perception of existential phenomenology.

The interdisciplinary approach can be successfully used by physics, chemistry and biology teachers in structuring content, creating teaching situations, activities and learning tools designed to lead to a unitary and coherent understanding of laws, phenomena and principles of reality.

The present paper presents two models of innovative interdisciplinary didactic projects for activities with students from „Nicolae Iorga" Gymnasium School of Iasi within the Methodical Circle no. 9 of the Chemistry Teachers of Iasi County and in the „Sciences" Methodical Commission that can be examples of good practice for the teachers interested in the interdisciplinary approach of knowledge.

Keywords: interdisciplinarity, sequential approach, natural sciences, strategy

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C-07. Interactive methods used in amino acids study

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The paper presents some of the interactive methods that have been applied for the study of amino-acids at the 11[th] grade of highschool. Amino acids - organic compounds with biological importance, are studied together with proteins, vitamins, enzymes, sugars, other classes of compounds of the Chemistry branch called Organic Chemistry and studied at highschool in X[th] and XI[th] grades, respectively, depending on profiles and specializations.

By using interactive methods, students have developed their originality and creativity, learned to work both individually and in teams to solve their workloads.

The paper attempts to emphasize that the use of interactive methods in the learning process is based on cooperation, competition, curiosity, practical skills, training and less emphasis on the reproduction or memorization of knowledge.

Interactive methods are many and diverse. Their application and use depends on several factors, including the teacher's mastery. Thus, materials from the paper can be used and applied in the classroom to deepen the amino acids study and not only.

Keywords: interactive method, amino acid, VENN diagram, creativity

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