

# **ON THE FUNCTION OF ELECTIVE COURSES IN CHEMISTRY IN THE SYSTEM OF PROFILE TRAINING**

**Y. Arshansky**

*Doctor of pedagogical sciences, professor of Chemistry  
Vitebsk State University named after P.M. Masherov*

Profile training as the complete system (in a broad sense) includes two interconnected subsystems: pre-profile preparation and directly profile training in senior classes at school. The integral part both pre-profile preparation and profile training are so-called elective courses, however their functions within the framework of the designated subsystems are essentially different. Therefore it is necessary to define the place, the purposes and features of the content of pre-profile and profile (we shall name them so) elective courses in chemistry. In this connection, we shall reveal the essence of the concept «an elective course» (from latin electus – chosen) concerning other educational courses of school [2].

There are three types of educational courses: normative, optional and elective. The normative courses are obligatory courses (that's what they are usually called). Each student should attend these courses and report for his/her progress during the study process. Usually the invariant part of the curriculum plans consists of such educational courses it is, for them that the state educational standards are created and their assimilation is a necessary condition of continuation of education.

The optional courses are intended for construction of the individual educational program of the student. The set of such courses is offered to the students and they can choose one or offered optional from them. But the choice is not a must for all. As a rule, there is no final reporting in such courses.

Elective courses (or courses of choice) as well as optional courses can be chosen from the offered set according to the interests and requirements of students. But as soon as the course is chosen, it becomes similar to normative: with a duty to attend and to report.

It is obvious, that elective courses have a lot of similar features with optional courses. They have some similarity to educational modules. The content of the modular programs includes the obligatory and the additional parts. Also, the additional parts are modules. Thus, the modules represent fragments of the program, which differ in the content. The choice of this or that module is carried out by the teacher, taking into account the specificity of the region, where the school is situated. That's where the difference between the module and elective course, chosen by the students lies. Besides the content of elective course carries precisely expressed profile orientation.

In order to make an educational program from the modular program one the teacher should connect an obligatory part of the program and the chosen modules in a logical sequence. On the contrary, the elective course should not be necessarily coordinated with the basic course of chemistry, though such coordination, in our opinion, will be useful. The similarity of modules and elective courses is in the fact that they represent the additional parts of the content of educational material for studying, of which the definite time is allotted. Elective courses differ from «circle» classes (a kind of out-of-class work) by representing the wholly completed educational courses.

For the substantiation of features and functions of the chemical content of elective courses it is necessary to have clear understanding of the basic purposes of pre-profile preparation and profile training of the students.

Pre-profile preparation is a system of pedagogical, psychological, informational and organizational activity, which promotes self-determination of the student according to the chosen studying profile in senior classes of school and wide sphere of the subsequent professional activity.

Elective courses are the central part of pre-profile preparation system. Pre-profile courses of interest are propaedeutic in relation to the appropriate courses of the basic (profile) educational subjects at the senior step of training in classes of various profiles. The role of such courses consists in helping students of the basic school to make a choice of further profile of education.

While classifying pre-profile elective chemistry courses it is possible to distinguish three basic groups: common-oriented, subject-oriented and inter-subject. Let us consider their features.

Common-oriented elective courses inform the student of various profiles of training at senior school, to get the student acquainted with the world of trades and to help him to choose a profile of training according to the individual features and professional intentions.

Subject-oriented elective courses are directed on realization of pre-profile preparation in the certain educational subject, for example in chemistry. Teachers aspire to attract the students to the further study of chemistry in a profile class by creating such courses. These courses necessarily contain an entertaining material, which implies making effective chemical experiments etc. As a result the student chooses an appropriate profile for continuation of the chemical education. However, later on, having met a huge amount of theoretical educational material in chemistry, one usually gets disappointed with the chosen profile of training.

Another feature of developed subject-oriented elective courses is the aspiration to the deepening of knowledge of the students in chemistry. Such elective courses assume profound studying of separate themes or sections of basic school chemistry course, going beyond the limits of the school program. As a result, pre-profile elective course will fulfill not its own functions, but the functions

of profile elective course (see below).

Inter-subject elective courses in the system of pre-profile preparation direct students not only to the study of a certain educational subject at a profile level, but also uncover the specificity of studying the subject in interrelation with other profile subjects of the chosen profile. In our opinion, it is necessary to refer to such elective courses as profile-oriented, as namely they fully realize the idea of pre-profile preparation. The example, of such elective is the course «Chemical gates to the world of natural sciences» that we have developed.

The profile training in the senior classes is to provide the students with the opportunity of construction of individual educational trajectories in view of their own individual features, interests and inclinations, to create continuity between general and vocational training, to prepare the school graduates for development of the vocational training programs more effectively.

Profile elective courses are to carry out the following functions: 1) deepening of study of profile educational subjects (separate topics, sections) of high level and also several separate educational subjects of base level; 2) propaedeutics of subject study concerning the sphere of future professional activity; 3) satisfaction of learning interests and educational inquiries of the students, not connected with the training profile. In this way profile elective courses should be directed to intensification of profile specialization and further deepening of profile educational subjects study.

In classifying profile elective courses in chemistry it is possible to distinguish with three basic groups [1]:

I. Subject courses, the purpose of which is deepening and widening of students knowledge in chemistry. They are also divided into several groups:

1) courses directed to deepening of the basic chemistry course study, both thematically, and temporary coordinated. In this case all the sections of the course deepen more or less equally.

2) courses, where the separate sections of the basic course of chemistry are thoroughly. Here are several examples of such courses from chemistry «Structure of substance», «Oxydizing - restoration processes», «Chemistry of metals», «Electronic and spatial structure of organic substances» etc. So, in profile elective courses of this group certain topic, chosen by the student is studied more deeply.

3) courses where the separate sections of the basic course of chemistry which are (not included into the obligatory program of the subject) are profoundly studied. Examples of such courses can be «Introduction to chemical kinetics and thermodynamics», «Mechanisms of chemical reactions in organic chemistry» etc.

4) applied courses of interest, the purpose of which acquaintance of the students with the major ways and methods of applying knowledge in practice, developing student's interest in chemical science and production. Examples of

such courses are: «Chemistry and scientific technological progress», «Chemistry and environmental problems», «Modern chemical technologies» etc.

5) courses devoted to study of the methods of research, used in chemistry. Examples of such courses: «Research practicum in chemistry», «Introduction to chemical synthesis», «Bases of the chemical analysis», «Methods of physical and chemical researches», «Computer modeling of chemical processes», «Methodology of chemical inventions» etc.

6) courses devoted to the history of subject. For example «History of chemistry in persons».

7) courses devoted to methods of chemical problems solving. For example, «Quantitative calculations in chemistry».

II. Inter-subject courses of interest, the purpose of which integration of the chemical content with the content of profile disciplines. Examples of such courses for classes of biological and chemical profile can be «Bases of biochemistry», "Investigation methods of researches in natural sciences» etc. courses «Chemistry in hands of the artist», «Chemistry in the literature and poetry» etc. can be offered to students of humanitarian classes.

III. Courses not connected with school subjects included in the high school curriculum. These are the courses devoted to psychological, social, culturelogical, art history problems. Examples of such courses are: «Introduction to modern social problems», «Geography of human prospects», «At the crossroads of two cultures» etc.

IV. Professionally - directed courses of interest. Their purpose is to prepare students for the conscious choice of profession. Such courses strengthen specialization of profile. For example, pedagogical and biology-chemical classes can take the elective course «Introduction to a technique of chemistry training» which we have developed. This course implements propaedeutics of methodical preparation of students in chemistry, encouraging students to get the professional of a chemistry teacher.

In that way, we have tried to reveal and to prove distinctive features of pre- profile and profile elective courses in chemistry.

#### References

1. Аршанский Е.Я. Непрерывная химико-методическая подготовка обучающихся в системе «профильный класс – педвуз – профильный класс»: Монография. – М.: Прометей, 2005. – 256с.
2. Аршанский Е.Я. Обучение химии в разнопрофильных классах: Учебное пособие. – М.: Центрхимпресс, 2004. – 128с. – «Химия в школе – абитуриенту, учителю. Библиотека журнала».

#### Summary

В статье раскрываются виды и функции элективных курсов в системе профильного обучения и предпрофильной подготовки школьников по химии.