

# **SPECIFICITY OF METHODOLOGICAL TRAINING OF TEACHERS OF CHEMISTRY IN CLASSES OF DIFFERENT PROFILES**

**Yevgeniy Arshansky**

*Candidate of pedagogical sciences, assoc. professor of Department of Chemistry  
Vitebsk State University by P.M. Masherov*

Today, one of the most important goals of a modern school is the revealing and development of pupils' individual features. That is why, the problem of differentiated teaching remains actual, because it does have to contribute to uncover a pupil's personality, to develop his potentialities and inclinations.

In didactics there are two types of differentiation – internal (according to different levels) and external (according to different profiles). The internal differentiation means that pupils are divided within a class into groups and they are taught by different methods on different levels of complication. It is carried out by the differentiation of tasks, the choice of forms of pupils' activity and the use of different sorts of a teacher's help to a pupil. The external differentiation involves the unification of pupils in special groups (classes) according to their interests, inclinations and abilities. In modern schools this type of differentiation is realized by the creation of classes of different profiles.

The nomenclature of profiles is various, but it is possible to distinguish three most important of them – naturally-scientific, physico-mathematical and humanitarian. So, methodics of teaching chemistry aim to determine the specification of goals, content, forms and methods of teaching chemistry not only in naturally-scientific classes where this subject is profile, but in physico-mathematical and humanitarian classes where chemistry is not amongst the main subjects.

However, today every school needs a teacher of chemistry who is able to work efficiently in classes of different profiles and to organize teaching in the proper way in order to show pupils of classes of different profiles that chemistry is an important and useful science. It demands the perfection of professional and methodical training of teachers of chemistry.

Working in biological-chemical classes, a teacher should take into account that these pupils will continue their studies in naturally-scientific universities that is why they should learn more of the theory and get acquainted with the methods of the chemical science. In classes of the physico-mathematical profile a teacher should pay more attention to mathematical devices of chemistry as an exact science, show the ties between physical and chemical processes and explain physical methods used in chemistry[2]. In humanitarian classes a teacher should aim to make pupils understand that chemistry is a part of a world humane culture and it is important to show the humanitarian potential of chemistry and its necessity in men's life [1].

One of the means of training teachers for this kind of work is a special course «The system of work of a teacher of chemistry in classes of different profiles». This course is considered to be a part of methodical training of teachers of chemistry which is based on knowledge and skills acquired by students while learning methodics of teaching chemistry, psychologo-pedagogical sciences, chemical and biological subjects, physical and mathematical university courses, social humanitarian subjects.

The content of the course was selected according to the system of the following principles: continuity, systematization, integration, accumulation of knowledge, variation, mobility and complete orientation.

The principle of continuity means the realization of training students for work in classes of different profiles during their studies at university taking into account the succession of all the levels of this training.

The principle of systematization gives the possibility to realize the structurization of the content of training teachers of chemistry for work in classes of different profiles. This approach helps to establish structural-logical connections between separate cycles of subject matters in a pedagogical university and the special course.

The principle of integration reflects complexity and diversity of training a teacher of chemistry for work in classes of different profiles which is only possible on the basis of integration of sciences. This principle is realized through the realization of intersubject connections.

The principle of accumulation of knowledge is realized through the content of the special course which selectively includes and actualizes the psychologo-pedagogical, special and methodical knowledge needed for complex training of a teacher of chemistry for work in classes of different profiles.

The principle of variation supposes the use in the special course of such a content which may be frequently and differently worked through various forms and methods of training students.

The principle of mobility reflects the necessity of realization of such a methodical training of students for work in classes of different profiles which will quickly allow them to adapt to work in real conditions of a certain school.

The principle of complete orientation of training a teacher of chemistry for work in classes of different profiles represents a part of the special system and contributes to the formation of methodical competence of a teacher of chemistry on this problem.

The special course includes two mutually integrated blocks - psychologo-pedagogical and constructive - modeling.

The psychologo-pedagogical block aims to make students learn special features of educational-cognitive activity of pupils studying in classes of different profiles and methods of its diagnostics.

The constructive-modeling block provides with substantiation of the goals and main approaches to modeling the content of the course of chemistry for classes of different profiles, as well as with definition of the most acceptable forms and methods of teaching chemistry to every profile.

Various organizational forms of work with students are proposed in this special course. All of them can be divided into basic forms (lectures, seminars, practical course) and auxiliary ones (independent work, consultations).

The special course consists of three parts: a theoretical course (26 hours), a practical course (10 hours) and students' independent work (4 hours).

The theoretical part of the special course should provide future teachers of chemistry with knowledge about:

- 1) essence, purposes and tasks of teaching chemistry in classes of different profiles;
- 2) pupils' psycho-physiological features in classes of different profiles and approaches to the individualization of teaching chemistry on their basis;
- 3) specificity of the content of the course of chemistry in classes of naturally-scientific, physico-mathematical and humanitarian profiles;
- 4) the most acceptable forms, methods, methodical ways and means of teaching chemistry in classes of different profiles;
- 5) peculiarities of giving lessons of chemistry in classes of different profiles;
- 6) opportunities of the organization of a chemical experiment in classes of different profiles and requirements to it
- 7) elements and opportunities of a teacher's research work carried out in classes of different profiles.

The realization of the program of the practical course provides future teachers of chemistry with the following skills:

- 1) to determine pupils' psycho-physiological features, their cognitive interests by using different sorts of tests;
- 2) to carry out the selection of the content according to the themes of a school course of chemistry taking into account the specificity of a profile;
- 3) to select and use the most effective forms and methods of teaching chemistry and of the control of its results taking into account the features of pupils' cognitive processes of the given profile;
- 4) to carry out regular planning, to work out and give lessons of chemistry in classes of different profiles;
- 5) to make chemical problems according to the profile of a class and use them;
- 6) to select experiences for a chemical experiment, carry them out and comment on them according to the specificity of the profile of a class;
- 7) to carry out pedagogical research of the work in classes of different profiles.

The theoretical block includes three units of lectures on the following themes:

Unit 1. Psychologo-pedagogical bases of the organization of teaching chemistry in classes of different profiles. Themes of lectures:

- Introduction (2 hours).
- Psycho-physiological features of educational-cognitive activity of pupils in classes of different profiles and approaches to teaching chemistry on their basis (2 hours).

Unit 2. Didactic model of the content and methods of teaching chemistry in classes of different profiles. Themes of lectures:

- Methodical features of teaching chemistry in classes of the naturally-scientific profile (4 hours).
- Specificity of teaching chemistry in classes of the physico-mathematical profile (4 hours).
- Methodical approaches to teaching chemistry in classes of the humanitarian profile (4 hours).
- Peculiarities of methods of teaching chemistry in classes of different profiles: specificity of the use of chemical problems and chemical experiments (4 hours).
- Model of construction of a lesson of chemistry with a variant component and training teachers for it (2 hours).

Unit 3. Diagnostics of the efficiency of teaching chemistry in classes of different profiles taking into account pupils' psycho-physiological features. Themes of lectures:

- Definition of pupils' psycho-physiological features in classes of different profiles and their abilities to learning chemistry (2 hours).
- Efficiency of the use of the variant component of the course of chemistry in classes of different profiles (2 hours).

The practical course includes work on the following themes:

- Profile differentiation of teaching chemistry as a pedagogical problem (2 hours)
- Specificity of the use of chemical problems in classes of different profiles (4 hours).
- Peculiarities of the realization of chemical experiments in classes of different profiles (4 hours).
- Construction and modeling of lessons of chemistry for classes of different profiles (4 hours).

The special course assumes the realization of students' independent work at school. It includes the following themes:

- Revealing of special features of pupils' educational-cognitive processes and their interests in classes of different profiles.
- Studying of work experience of teachers of chemistry in classes of different profiles.

The special course is usually finished by the holding of a scientific - practical conference where students represent their individual tasks and results of their research work in front of the colleagues, teachers and professors of faculty of chemistry.

In Vitebsk State University by P.M.Masherov they have been training future teachers of chemistry for work in classes of different profiles on the basis of the given special course for four years yet. The received results prove the efficiency and expediency of its realization.

### **Literature**

1. Аршанский Е.Я. Методика обучения химии в классах гуманитарного профиля. – М.: Изд. центр Вентана-Граф., 2002. – 176с.
2. Аршанский Е.Я. Специфика обучения химии в физико-математических классах.// Химия в школе – 2002. - №6 – С.23-29.