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Research Article

EFFECTIVE FACTORS AND PRINCIPLES OF TEACHING CHEMISTRY BASED ON INDIVIDUAL APPROACH

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ABSTRACT

In the teaching of chemistry based on an individual approach, the individual direction of the student should be developed as a sequence of separate didactic modules designed to achieve specific didactic goals. Effective factors and principles of teaching chemistry on the basis of an individual approach are highlighted in the article based on the analysis of scientific works.

Keywords

Scientific, efficiency, technological, instrumental, system, humanitarian, manual, tool, object.

Introduction

Today, there is a need to acquire knowledge of economics. law. innovative management, computer, ecological "literacy" in the teaching of chemistry, which ensures the success of training a competent specialist in the labor market. However, as many authors have pointed out, quality training of students in the field of chemistry has become complicated.

Teaching chemistry to students based on an individual approach is of independent importance during their future career. We associate the solution of the problem of teaching chemistry based on an individual approach with the selection and improvement of the necessary educational tools and their comprehensive use in the educational process. Well-known teachers methodologists and M.T.Akbarova,

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D.A.Shayzakova and others were involved in the development of educational tools, the creation of qualified and author's examples, and the creation of methodical manuals on their use in the educational process [2]. As a preliminary definition of educational tools, A.A. Grabetsky, L.S.Zaznobina, T.S.Nazarova include educational tools as "all material objects specially designed for the entire educational process or introduced by the teacher to have a greater pedagogical effect." [3].

Educational tools include textbooks, training manuals, models, banners, videos, multimedia, didactic handouts. Chemistry teaching aids are classified on different basis. In the works of A.A. Grabetsky [3], L.S. Zaznobina [4] and others, it is classified according to a number of signs. So, on the basis of the material carrier of information, printed, volumetric, natural, screen, etc. are distinguished. From the point of view of educational goals, they are divided into motivational, cognitive, generalizing, educational tools - as sources of creative work.

Based on the analysis of scientific works [7, 9, etc.], the following principles of teaching chemistry based on an individual approach can be indicated: the principle of scientificity, the principle of efficiency, the principle of technologicality, the principle of instrumentality, the principle of humanizing the methodical system. Let's look at these principles in detail.

1. The scientific principle implies the obligation to build a methodical system on the basis of existing (or specially developed) theoretical rules that

provide the working mechanisms of such a system. This principle defines teaching according to an individual approach and is reflected in the structural structure, organizational forms and educational methods. In the teaching of chemistry based on an individual approach with the help of electronic educational resources, the individual direction of the student should be developed as a sequence of separate didactic modules designed to achieve specific didactic goals.

Agreeing with the opinion of A.M.Lozinskaya, T.N.Shamalo [8], we define the didactic module as not only the integral autonomous content of educational information, but also all the components of the methodical system (goals, content, organizational forms and educational methods, educational tools, education control and evaluation of results) as a functional independent unit. The technological implementation of the modules is the electronic educational resources of the information-educational environment of the school, which are hierarchically considered as didactic modules of the lower level. Teaching according to the individual approach should be aimed at the implementation of personal important goals of the student indicated at each stage, which allows to regulate the optimal size of the educational content of the module (electronic educational resources) and the choice of educational methods. Therefore, an individual approach to each student should be determined by the goal, appropriate content, methods and tools of education, stimulation of the student's thinking self-organization. and the and

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of results according achievement to predetermined criteria.

- 2. The principle of effectiveness consists in the need to plan the features that ensure the superiority of this methodical system over other existing (currently or in the future) similar systems in the development of educational goals. This principle should be reflected in the student's achievement of in-depth knowledge of chemistry, in the formation of the student's readiness for further education, in the reduction of the student's financial costs for additional education, in the reduction of the teacher's labor costs for the regular work of checking the students' homework. The principle of efficiency, taking into account the development dynamics and changes in the state educational standard, the formation of an individual approach to the teaching of chemistry requires the student to acquire independent learning skills on the basis of electronic educational resources, the content of the subject corresponds to the modern stage of the development of the science, and network resources distributed in the informationeducational environment. Thus, the considered principle gives the student the opportunity to get high marks in the subject in the final state exam and to continue studying using information and communication technologies.
- 3. The principle of technologicalness indicates that the implementation of the methodical system should be easily transferred to the practice of other teachers, and the methodical system created for them should be designed taking into account the effectiveness of teaching with a

- contingent of students. According to this principle, at each stage of teaching chemistry based on an individual approach, the opportunity to use all components of the methodical system: goals, tasks, content, and methods should be formed to form an individual approach to the subject taught by the natural-scientific cycle teacher. E-learning resources, which will be the basis for the formation of an individual approach, can be selected by the teacher from the collections made in open modular systems, in accordance with the requirements of the controlmeasurement materials of the current school year and taking into account important personal goals.
- 4. The principle of instrumentality includes the use of ready-made or specially designed tools that ensure the effectiveness of the educational process. In accordance with the principle of instrumentality, the formation of an individual approach should include the use of ICT and education management system services in education. Therefore, the technologies and services used should have an independent content character that provides accessibility for a wide range of disciplines. Users' tools should be unified in order to ensure the unity of the technologies used for all users.
- 5. The humanitarian principle is to take into account the interests of students and teachers in the design, to ensure maximum comfort for their activities. E.F. Zeer [5] states that the student's personal potential is his real possibilities (knowledge, skills, abilities, physical and intellectual capabilities) and aspirations (the general direction of the person). The principle of

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humanitarianism allows to realize the personal potential of the student in teaching in the information-educational environment due to the possibility of adapting the electronic educational resources to the individual characteristics of the students. At the same time, the student moves from the object of the learning process to independently mastering the methods of working with educational information. In addition, it will be possible to create a comfortable psychological microclimate, because the student's mistakes are not presented for general review, but are discussed only with the student.

Within this study, taking into account the above principles, a methodology for teaching chemistry based on an individual approach was developed, content of education, forms, the goals. educational methods and tools included elements pedagogical technology [9], including diagnostics of the introduction of student knowledge in chemistry, final state certification includes control and evaluation of educational results according to the criteria defined in the control-measurement materials. Methodological and organizational requirements for teaching chemistry on the basis of an individual approach, the principles of building methodical systems are practice-oriented. control-evaluation staged, the information-educational stages environment on the basis of an individual approach, the goals, content, forms of educational organization, the formation and clarification of educational methods gives

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