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USING PROJECT TECHNOLOGY IN CHEMISTRY LESSONS

Annotation. *In this article, the effectiveness of the use of project technology in chemistry lessons is given. When using project technology in chemistry lessons, students develop general educational skills - the ability to control and evaluate the process and result of activities, to reflect on the methods and conditions of actions. At each stage of work on the project, the formation of personal universal learning activities of students (independent and personal responsibility, readiness and ability for self-development, awareness of responsibility, etc.) takes place.*

Key words: *project, project activity, chemistry, technology, students.*

Анотація. *У статті наведено ефективність використання проєктної технології на уроках хімії. При використанні проєктної технології на уроках хімії в учнів формуються загальні навчальні вміння – вміння контролювати й оцінювати процес і результат діяльності, обмірковувати способи й умови дій. На кожному етапі роботи над проєктом відбувається формування особистісної загальні навчальної діяльності учнів (самостійної та особистої відповідальності, готовності та здатності до саморозвитку, усвідомлення відповідальності тощо).*

Ключові слова: *проєкт, проєктна діяльність, хімія, технологія, студенти.*

Introduction. The teaching of chemistry is an integral part of the general education system, and therefore, to a certain extent, it is subject to the main trends in the development of this system. Developing education by means of chemistry is

achieved by involving students in active cognitive and creative joint activities in solving one common problem. It is obvious that the achievement of this goal becomes possible if motives and conditions are created in which students can show cognitive activity and feel the desire to really use the acquired knowledge and formed speech skills and abilities. Project work has unique opportunities in this regard. The project is valuable because in the course of its implementation, schoolchildren learn to independently acquire knowledge, gain experience in cognitive and educational activities. If a student receives at school the research skills of orienting in the flow of information, learns to analyze it, generalize, compare facts, draw conclusions and conclusions, then, due to a higher educational level, it will be easier for him to adapt in later life to changing living conditions, choose the right future profession, will live and work creatively. The project method is promising. thanks to its pedagogical capabilities, students can learn to argue their position, oppose and respect the opinion of the interlocutor, find ways to solve various problems, work independently with educational literature, take a creative position [1].

The aim of the article is to reveal the effectiveness of using design technology in chemistry lessons.

Research results. When working on the project, all conditions are created for the involvement in educational activities of not one, but the majority, if not all, of students. Such work, which includes an explanation of the results and conclusions, clarifying the misunderstanding that has appeared unexpectedly for the student, activates the oral speech of students, as it requires them to quickly respond, i.e. direct connection of chemical knowledge with mental activity. Touching the direct experience of students increases their interest in participating in what is happening. Students have the opportunity to express their own ideas. They can take a fresh look at themselves and the realities of everyday life. All this, ultimately, is designed to contribute to the formation of an active citizenship of students and the maximum development of the individual abilities and talents of each.

When performing research work, the search for literature is one of the tasks assigned to the student himself. The role of the leader in this case is to teach to

navigate in the special literature. First, some information about literature must come from the teacher: this may be a link to a popular book, an Internet site, a magazine article, etc. Further, the student, using the links available in these sources, should find more detailed information on the topic of the work, make a short literature review and discuss the results of their search with the teacher.

Acquaintance with the literature at a sufficiently high level will inevitably lead to foreign scientific journals. It is not realistic to recommend the systematic reading of such journals, but in some cases students may be asked to translate individual articles. At the same time, it is useful to draw the attention of schoolchildren to the importance of English language proficiency for a chemical researcher.

In our time, the development of all spheres of human life, including science and culture, production requires that each teacher regularly acquaints students with the latest achievements of science and culture, equips them with modern knowledge, strengthens creative abilities so that the younger generation can go with the times and learn with enthusiasm . Obviously, the interest of students in learning and creativity makes them more active in the educational process, which leads to greater motivation, the manifestation of their talents and the achievement of success in the study of science [4, p. 17].

According to E.S. Polat: «The project method is one of the ways to achieve a didactic goal, which is carried out through a detailed study of a problem (technology) that needs to be solved in the form of a real, tangible practical result, designed in one way or another; this is a set of techniques, actions of students in their specific sequence to achieve the set task - solving a problem that is personally significant for students and designed in the form of a certain final product» [5].

When completing a project, students activate the development of creative thinking, a critical attitude to the information received, the need for self-education increases, the ability to analyze the information received, put forward hypotheses and assumptions, make decisions, and the initial research skills are formed. research and scientific activities.

In his work, the author [2] points out that in the process of the project implementation, students develop: interest in learning and independent search for new knowledge; ability to appreciate joint work; the ability to make a plan and allocate time according to the planned plan; the ability to draw up the results of the work performed and present them in a visual form; ability to communicate.

If we analyze project activities in chemistry, we can clearly point out the following results of applying this method:

- work on projects stimulates internal cognitive motivation and increases interest in chemistry;

- classes will be more lively, students will be looking forward to both the moment they start working on projects and the final stage - the presentation;

- a possible increase in the number of students in chemistry, as an elective subject, choosing an exam in chemistry for final certification;

- the applied nature of the project activity, the practical orientation of the selected studies attract and make projects personally significant for students;

- manifestation of interest and incentive not only in obtaining a positive assessment, but also in obtaining good results of the work done;

- the science of chemistry is a difficult science to understand for most students. The humanistic meaning of project-based learning is to develop the creative potential of students of various levels of development, capabilities and individual characteristics [3].

For example, when studying the topic «Water. Solutions» in grade 8, you can use the project technology method. At the project defense stage, students present the results of their work in various forms: an oral report, multimedia presentations, an abstract, a video project [6].

Project protection plan:

1. Introduction:

– literature analysis;

– formulation of the problem, its relevance;

- Hypotheses and their justification.

2. Main body:

research methodology;

– analysis of the obtained results.

3. Conclusions. Project evaluation results.

4. Discussion.

Conclusions. Thus, as practice shows, project activity really contributes to the formation of a new type of student who has a set of skills and abilities for independent constructive work, who knows how to purposefully work, who is ready for cooperation and interaction, and who has the experience of self-education.

Project activity is becoming an important factor in ensuring the continuity of basic and additional education.

Most importantly, participation in the project allows students to acquire a unique experience that is impossible with other forms of education.

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