Abstract

This article discusses the issues of increasing the professional readiness of future chemistry teachers on the basis of projective activities. One of the indicators of a teacher’s readiness for classes is the preparation of didactic materials. At the same time, the use of digital technologies opens up great prospects for the educational process. A methodology for creating educational products in the process of projective activity is proposed.

Keywords: Projective Activity, Methodology, Educational Product, Professional Training, Information Technology, Chemistry

1. Introduction

To date, the most important goal of modern higher education, including chemical and pedagogical education, is to increase the level of general and professional training of the student, his intellectual potential, which requires the formation and development of the student as a professionally competent, culturally developed, creative person, having a system of scientific knowledge about the world and man, ready for continuous self-education, able in the future to take an active and professional part in solving urgent problems of our time in order to work successfully in constantly changing socio-economic conditions. For the development of promising and mobile higher pedagogical education in Uzbekistan, in addition to improving its quality, accessibility for young people, as well as creative and creative potential, it is necessary to interest students in the use of digital didactic learning tools, in particular digital educational resources. The use of computer technologies and multimedia equipment in training should not mean the replacement or cancellation of the traditional chemical experiment, excursions to production, to nature. Improving the methodology of teaching chemistry does not mean denying the years of experience in teaching chemistry and educating students in chemistry classes and extracurricular work. The story and explanation of the teacher in chemistry classes remain a very valuable acquisition and do not lose their importance in the context of the introduction of more "modern" active teaching methods.

2. Literature Review

From the point of view of modern teachers, the process of creating an educational and educational environment is a process of pedagogical design. In the 50s of the XX century, design went beyond technical projects, covered different spheres of human life; the design of the social aspect arose. V.V. Davydov wrote: "In order to correctly assess the modern meaning of this method (project method), it should be borne in mind that in recent centuries the role of scientific research in the study of reality has been absolutized and design (as well as design, programming, planning close to it) has been pushed back in this function. A characteristic feature of design is not the study of what already exists, but the creation of new products and at the same time the knowledge of what may arise” [1; p. 106-107].

According to the research of I.A. Kolesnikova, the modern understanding of the term "project" has an interpretation that is quite correlated with the educational context:

- preliminary, tentative text of a document (e.g. draft law, draft program);
- some action, a set of events united by one program or having a common organizational form of targeted activity (for example, an educational project, a publishing project, a television project);
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- a completed cycle of productive individual or joint activities (individual student, project group, student team, educational organization, corporation) [2, c. 25].

V.V. Bespalko noted that the term "design" is practically not applied to pedagogical phenomena [1; p. 107]. Instead, teachers prefer to talk about "creation," "development," "planning," etc. [3; p.28-29]. E.S. Zaire-Beck interprets "pedagogical design" as one of the areas of research pedagogical activity, which provides a solution to the problems existing in the practice of education in specific conditions. Design involves the construction of a complex of pedagogical ideas and the development on the basis of a systematic approach of the desired transformations and programs for their implementation into specific educational systems" [4; p.25]. In the research of P.F. Alekseeva [5], E.F. Bekhtenova revealed that design as a process has a normative and creative character [6].

The term "projective" is first found in the works of I.A. Kolesnikova as a derivative of the concept of "projection", which means the transfer of the image of the object into real practice [7; p.32]. Within the framework of design, we can talk about the ability of human consciousness to transfer (project) the image (properties, characteristics) of an object existing as a thought form into real practice. Projectivity acts in this case as a personal property that can be actualized with the help of certain methods or procedures (projective consciousness, projective technique, projective test) [2; p. 28].

Based on these definitions, projective activity is defined as a process in which the consciousness of a future chemistry teacher transfers the image and characteristics of an object (individual educational product) existing in its thought form into real pedagogical practice, which can be actualized through certain methods and information technologies.

3. Materials And Methods

In the education system, the possibilities of project activities are used to change the content of subject education, develop the personal qualities of students, improve pragmatic skills and deepen the knowledge and abilities received. At the same time, teachers in practice do not have time to restructure their projective activities in accordance with modern requirements, that is, with methods of working with information resources, so project activities are used periodically, complementing the educational process [8; p. 60]. In the structure of projective competence of future chemistry teachers, in addition to knowledge and skills, it is advisable to include professionally significant personality qualities, the formation and manifestation of which can be ensured in the conditions of digitalization of the university. At the same time, the use of digital technologies in project activities opens up huge prospects for the development of educational pedagogical methods, interactive educational activities, knowledge exchange and creative, creative training of future teachers [9].

In order to improve the effectiveness of chemistry training, it is necessary to use visual aids and rely on the visual perception of the educational material. In turn, the visual learning tools prepared by the teacher, didactic materials should be interesting, exciting and informative, contribute to the development of chemical knowledge of students [10-12]. The possibilities of projective activity in the creation of educational products by future chemistry teachers allow to take into account not only didactic requirements for teaching chemistry, but also the correct goal-setting of product development, competent work with information on chemistry, creative, original approach to presenting the results of their project work.

The stages of project activities to create educational products include:

- Problem (the problem should be relevant, important, interesting for students);
- Design (targeted activities that include steps leading to effective solutions);
- Search for information (students are looking for information in various sources);
- Product (planned result, form of presentation of the project product);
- Presentation (stage of presentation and protection of the project).

Projective activity of students - joint educational and cognitive, creative activity of students, having a common goal, agreed methods, methods of activity aimed at achieving a common result of activity. The prerequisites for the implementation of project activities for the creation of individual educational products are the following (see Fig. 1):
In projective activities, not only the results are significant, but also the organization of the process itself. Work on the project includes a reasoned plan, methods and means of solving problems [13; p.553]. Based on the complex structure and durability of the projective activity, the future chemistry teacher should be professionally and psychologically ready for its implementation [14; p.97-98].

However, the successful organization of projective activities provides for certain skills, namely: to maintain statistics, analyze and correct data, to know problem-research, search and partial-search methods, as well as such quality as creativity. The implementation of project activities should be carried out on a continuous, systematic, integrative basis of the components of the educational environment in the process of independent and extracurricular activities and be aimed at the interest of students in their pedagogical work and the success of the formation of projective skills.

3. Results and Discussion

In the course of the research work, we revealed that it is necessary to use practice-oriented and participatory approaches in the formation of practical experience in creating their own individual educational products in the process of project activities. At the same time, the teacher takes into account not only the student's involvement in the project, but also the vision of each student as a unique personality that creates an individual educational product to which standard assessment approaches are not applicable. When evaluating the created individual educational products, the following criteria were taken into account: formulation of the goal and objectives of the project, work with information, design of work, communication, originality, subject knowledge of chemistry and information and communication technologies [15].

In the context of our study, preparation for project activities was carried out on the basis of the electronic educational platform "Preparation for projective activities and criteria evaluation of projects" developed by us, based on the study of the subject "Methods of teaching chemistry". The thematic volume of the platform corresponds to the mandatory minimum content of the subject "Methods of Teaching Chemistry", within the framework of which the research work was carried out. The platform contains material on the basics of projective activities, information about interactive methods and software tools that can be used to prepare individual educational products for students. Convenient navigation system, the necessary links to additional sources of information, a menu that does not clutter the screen - all this makes working with the platform interesting and tireless. The platform opens to two users - a teacher and a student. On the part of the teacher, there are additional functions for adding a task, criterion evaluation of student projects, appointment of conferences. The launch of the platform begins with the "Menu" screensaver, in the center of which there is a screen, on the left - there are buttons that reflect the content of the training platform.

This platform makes it possible to:
- flexible planning of the individual educational route of each student when performing project tasks;
- the use of various formats of information presentation in the preparation of individual educational products;

Available online at: https://jazindia.com
- use of classroom and extracurricular communications of teachers and students in the process of project activities;
- constant access of students to information and educational and methodological support of the course;
- management of students' independent work;
- evaluation of prepared individual educational products of students.

In the process of project activities, students developed the following educational products - timelines, glogsters, video scrabbles, web quests, interactive presentations, tests, etc.

Let's look at them. Timelines ("time lines") are used to show how certain events have developed. This is usually a long strip on which important dates are marked in chronological order. Timelines structure voluminous information and make it visually bright and memorable. When teaching chemistry, they can be used in teaching such topics as the history of the development of chemical science and the contribution of scientists of Uzbekistan, the history of the creation of a periodic system of chemical elements or, for example, when studying the discovery of laws and others. Special attention should be paid to the preparation of a variety of glogsters (training posters) in the process of project activities. The main function of the interactive poster is to provide a high level of visibility, and the information is not presented immediately, but is disclosed in accordance with the actions of the user, allowing you to understand the topic [16]. Also one of the individual educational resources is scribbling. The use of scribbling in the study of chemistry causes. Students' interest in the subject, increases cognitive activity, encourages creative activity. Scribbling involves both hearing, vision and imagination of students, which contributes to memorization. Therefore, students are involved in the learning process faster and more actively. Skribs act on both logic and emotions of students, so the information is "passed through itself" and is easy to remember. Quickly and for a long time. The main function of the scrub is to "effectively" submit information on chemistry, making it attractive, to help to better remember and assimilate it, involving two analyzers in data processing at once - vision and hearing [17].

The peculiarity of the use of the Web quest in teaching chemistry is that some or all of the information for independent or group work of students with it is located on various websites, to which students go using the hyperlinks indicated in the task sheet. The use of web quests in chemistry classes allows you to interest students in the subject, teach them to independently "extract" knowledge, evaluate critical information, highlight the main thing. This will provide "the ability to learn", to improve orientation skills in the information space, that is, to form universal learning actions [18,19]. Students to prepare an individual educational product in the form of a web quest, not only collect and systematize information received not from the teacher, but from the Internet, but also direct their activities to the creation of didactic material on the task [20; p.52-53].

4. Conclusion

Students can use the developed educational products in the process of pedagogical practice, and in the future in their professional activities. They clearly show students the practical value of the knowledge they have acquired. Using the capabilities of a personal computer contributes to self-development, the formation of information and communication skills not only among students, but also for future chemistry teachers.

Thus, in order to form professional competencies corresponding to the specifics of training chemistry teachers, acquire practical professional skills of projective activity of the future chemistry teacher, develop his creative abilities and initiative in the preparation of individual educational products, it is necessary to ensure the formation of a holistic system of theoretical ideas about the prerequisites for the emergence and development, essential characteristics and features of the organization of projective activities in the context of the development of educational technologies.

It follows that the organization of projective activities of students to develop individual educational products based on information technology tools contributes not only to the mastery of relevant knowledge in the field of information and communication technologies, research activities, but also increases the level of their educational and methodological literacy, ability and readiness to organize an effective educational process.

References:


18. Shomurotova Sh. X., Jo'rayeva B. A. Kimyoni o'qitishda o'yinli texnologiyalardan foydalanish. "WOMEN IN STEM" Xalqaro forum imliy ishlar to'plami, Toshkent, 2023-yil, 10-14-fevral, b.-595-596.