ABOUT DESIGN METHODS IN EDUCATION

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Abstract

Project-based learning is a non-traditional learning model that seeks to better prepare students for solving real problems and problems, while at the same time teaching them what they need to know in the natural research process. Project training is used in systems of school, technical and higher education. The article discusses design activities in the process of school and university education. The features and positive aspects of the use of project-oriented training in the educational process are considered. Examples of projects for schools and universities on the example of various disciplines are given. The necessity of using projects and research in the learning process based on the results obtained is proved. The conclusions drawn from the results of the study make students and all interested people also think about environmental problems, which today should be of paramount importance.

Keywords: project activities, project-oriented training, self-education, research.

I. INTRODUCTION

The modern education system in Russia over the past two decades has been gradually changing the traditional model of education to alternative ones. It is being replaced by elite educational models focused on non-standard solutions; aimed at specific requirements and results, examples can serve as a competency-based approach; The project method is also being actively introduced. The task of education is to train and educate specialists of a new generation, the level of education of which allows to expand the traditional volume of competencies acquired at a university. Entrepreneurship is an important vector in the training of future specialists, therefore project-oriented training sets the task of gaining such knowledge and skills that would allow them to create their own projects in the future, from an idea to their implementation in the form of a knowledge-based business or production.

A project may take a different form of implementation, but it is always a creative activity. Participants in project teams should have certain knowledge and skills, the ability to work in a group, think outside the box, creatively.

Today, the modern generation of students is already ready to do this, because schooling in some cases involves the implementation of projects and the experience gained allows them to develop further. It should be noted that project-oriented programs allow you to perform work both individually and in groups, which opens up great opportunities for students, because not everyone can communicate and, on the other hand,

not everyone can complete the project alone. Therefore, project-oriented training can be called a flexible system that allows you to build training in accordance with the characteristics of the students and the prevailing circumstances.

The purpose of the study is to analyze design and research activities at different levels of education and its impact on personality development.

II. METHODOLOGY

The study of the project-oriented learning process is interdisciplinary in nature, as the project most often involves related scientific or subject areas requiring an integrated approach.

The reliability of the research results is ensured by the use of a set of methods adequate to the goals and objectives of the study; the logic of the experiment; analysis of specialized literature on a selected problem; analysis of facts; reasoned conclusions; application of the results and recommendations of the study in teaching practice.

III. DISCUSSION

Great experience in using the project approach in training is available in studies of foreign authors, among which we can distinguish M. Knoll, J. Bastian, J. K. Weiss, J. Dewey, V.Kh. Kilpatrick, E. Collings and many others [2. 8, 9, 10, 13]. Their works traces the origin and development of this direction in pedagogy. The basis of project-oriented learning is the project method, which makes it possible to maximize the effectiveness of educational and cognitive activity of students, with the formation of motivation for research, and as a result of general learning, the development of independence, creative initiative of schoolchildren and students is ensured.

The Russian scientists also note the crucial role in education, and the scientific and methodological works are devoted to this area (V.P. Bespalko, M.P. V.V. Guzeev, TB Zevina, I.A. Kolesnikova, A.B. Khutorskoy, I.D. Chechel, etc.) [3, 7, 11, 20].

Historical and theoretical analysis of the development of the ideas of project learning in foreign (J. Dewey, F. Carsen, G. Kershensteiner, V.Kh. Kilpatrick, M. Knoll, E. Collings, A. Reichwein, O. Haase, etc. [2. 8, 9, 10, 13]) and domestic pedagogy (AC Makarenko, S.T. Shatsky, V.N. Shulgin [15, 19]) allowed us to form an idea of the leading goal of project training, the specific logic and forms of organization of the educational process, the levels of interaction and types of relations between participants in project training, as equal subjects of project activity.

Modern domestic researchers V.V. Guzeev, M.V. Clarin, O.S. Kruglova, T.D. Novikova, N. Yu. Pakhomova, I.D. Chechel [7, 11, 16, 17] and others consider project training at a qualitatively new level: as a holistic teaching technology that helps students learn methodological knowledge, abilities, and skills as the basis for further self-education; as a means of developing the abilities of students, research skills, social skills, etc.

In [4], the trajectory of elite education through the creation of intra-university and then inter-university projects with a phased implementation of the proposed model is proposed; specific examples of projects for technical specialties are given.

In accordance with the views of modern scientists (VV Guzeev, VV Nikolina, N.Yu. Pakhomova, E.S. Polat, N.G. Chanilova, I.D. Chechel), differences in project training, which is special a didactic system focused on the formation of the student's qualities of the subject of project activity, and the "project method", which acts as an instrumental component of this system, educational technology related to the organization of independent activity of students aimed at solving significant problems and getting competitive retrieval result, product.

IV. RESULTS

In the higher education system, a large proportion of the time is devoted to independent work, as part of this type of activity, students are invited to prepare an essay, report, conduct research or study an additional topic. Also, in many universities, project-oriented training is actively used today, which involves independent implementation of projects with the support, but without the active guidance of a teacher. The project is aimed at solving a specific problem within the framework of its specialty, in the implementation of which there should be some know-how at the output. At the same time, students must themselves formulate goals and objectives, draw up a work plan and complete the project.

They must make their own decisions about the project, how they will work and what they should get as a

result. The project should be framed by a significant or urgent problem, which must be resolved and ultimately determine the future fate of the project - a patent, start-up or the ability to commercialize your ideas.

Project-based learning is a non-traditional learning model that seeks to better prepare students for solving real problems and problems, while at the same time teaching them what they need to know in order to succeed in school, college or university right now.

An important point in project-oriented learning is the ability to independently choose a topic for study, thereby the learning process becomes really interesting for students. Project training is used in systems of school, technical and higher education. School projects are more often of a research nature, allowing deeper study of disciplines.

One of the positive aspects of introducing project activities into training is interdisciplinarity. Often, to realize the idea of a project, knowledge from related fields of science is needed. The modern learning process is based on the teaching of discipline, as an independent subject, has its own program, its own competencies, etc. Perhaps some disciplines are connected and knowledge passes from one to another, but interdisciplinarity should have a different function.

The purpose of interdisciplinary training is to study the chosen topic or solve a problem as a significant whole, and to provide students with the opportunity to study the same problem from the point of view of different disciplines. An interdisciplinary approach allows pupils and students to see and discover the connections between disciplines, as well as the connections between things from real life. Interdisciplinarity prepares them for critical thinking and creative problem solving so that they can adapt to the ever-changing needs of society and develop the necessary skills.

As an example of using the principles of a project-based approach to teaching, we can cite a project with elements of the scientific approach «My native river». Almost every city has a river, the study of which can be devoted to several design works. The project can be built on the research work of students, data for which can be collected on campaigns, expeditions, and historical information can be collected in museums and archives of your city.

The aim of the implementation of such a project will be:

- Repetition and consolidation of basic information from geography, botany, biology, physics, chemistry and other disciplines;

- Disclosure of the relationship of the above disciplines in the real world;

- The use of pupils' observations during the river expedition;

- Introducing children to research;

- The use of the achievements of human civilization for research, namely: gadgets for photo and video recording, orientation, location, taking water, soil, plants to detect pollution and assess the environmental status.

The pedagogical tasks of such a project will make it possible to cultivate love for the native land, respect for nature, patriotism, and interest in research.

In general, projects related to the study of natural phenomena allow us to understand a lot. Since people began to live in permanent settlements, they have had to deal with the problems of providing clean water and the disposal of solid waste and wastewater. With the growth of cities and the emergence of various industries, people also had to worry about air quality and pollution of soil and water. Today, environmental pollution and nature protection issues are more relevant than ever. For the normal coexistence of people and nature, it is necessary to recognize the consequences of anthropogenic impact on the environment, moreover, at an early stage of human development, i.e. include in the upbringing and educational process starting from preschool institutions, further strengthen in the school curriculum and do not exclude in higher education in all specialties. It is necessary from a very young age to teach children to love nature and treat it with care

Carrying out experiments with natural phenomena from an early age, children build an understanding of nature, which allows them to engage in increasingly complex research and the accumulation of knowledge over time. In addition, at a time when there is no access to nature in the lives of children outside the school, the allocation of time and space for nature management as part of the school curriculum becomes more critical.

The most successful option to get close to nature and learn a lot about it is hiking that can be organized for children of different ages. The experience of the teachers [12] shows that the organization of trips for the purpose of scientific research allows you to get such a pedagogical effect that does not give a class lesson, not a single extracurricular event.

Then the students move on to design work, which forces them to perform a set of work, such as: collecting and organizing materials, setting goals, analyzing, formulating conclusions, etc.

The study of natural phenomena is not covered by a single discipline, most often research and projects are interdisciplinary in nature, at the intersection of sciences and therefore are carried out at inopportune times. Interdisciplinarity of project activities is a positive side of the educational process, as Firstly, it allows to arouse real interest in the subject, because I want to find out everything to the end, and secondly, links between the sciences are revealed and, possibly, can lead to new discoveries.

Skills, experience and emotions acquired in the process of cognition of nature will allow us to successfully carry out project activities in schools and universities in the future. The basis of the project activity is, on the one hand, the team, on the other - independence. Both that and another is acquired in campaigns. Awareness of the importance of the team and teamwork is necessary to obtain the expected result. Responsibility for the final result in different situations lies with all team members and this unites and allows us to show and develop such feelings and characteristics as: confidence in partners, sociability, overcoming problem situations, being needed by the team, etc.

Using project training, you can highlight the features and benefits:

- The manifestation of a real interest in learning, as it becomes alive for students and the acquisition of deeper knowledge in the field of research;

- The manifestation and development of creative and intellectual abilities, as well as independence, which is lacking in the modern generation. Deviation from the usual teaching methods aimed at memorizing the finished material in the direction of the search for new things should motivate schoolchildren and show all of his untapped personal resources;

- Collection, systematization and analysis of materials in order to obtain new ones. Not thoughtless copying of materials from the Internet, but selection from a large amount of information, a critical understanding of the collected data and the possibility of realizing an unresolved problem;

- The project can be carried out individually, in pairs or in groups. Group projects are especially interesting and significant in that at the present stage, schoolchildren and students practically do not perform joint work, the learning process is aimed at individual tasks, and simple communication through the active use of gadgets has gone into virtual space. A project carried out in a team will help the manifestation of such qualities as: communicativeness, joint definition of a problem, search for a solution to a problem and decision making;

- Most often the project is designed for a long period of research, which allows students to correctly plan the entire process themselves in order to successfully solve a problem or task.

- Interested persons from schools, other educational institutions or enterprises may be included in the project. Sometimes in the search for solutions the experience of others can help, a view from the side, the production experience of people whose professional activity is related to the topic of project research can be especially useful;

- Project activity is interdisciplinary in nature, since often the field of knowledge of one discipline is not enough and the integrated development and involvement of related disciplines is necessary;

- The study and use of technical means to present their design decisions, for example, the use of various gadgets, programs and multimedia tools for the presentation of your project;

- The possibility of commercializing the project. In market conditions, the main questions are: what can be done about this? Who will need it? How can this be sold?

Of course, school design work is unlikely to be of commercial interest, rather it is an opportunity for another level - a technical school or university, but school programs now also have a vector for entrepreneurship.

V. CONCLUSION

The advantages of the students ’project activities highlighted in the course of the study showed that its

participants receive multifaceted development, all cognitive functions of the brain are involved, and a natural cognitive process is underway.

An integrated approach to research using this example allowed us to obtain very valuable results containing conclusions from various disciplines: physics, geography, history, chemistry, biology. The conclusions made by the results of the study make students and all interested people also think about environmental problems, which today should be put at the forefront, because the scale of environmental pollution has reached critical values.

The goal of project training and research on the example of studying the river of the native land was achieved: students acquired research skills; used and applied knowledge from different disciplines; practical research results were obtained and conclusions were drawn on them; the effectiveness of collective activity in the research process is proved; A reserve has been obtained for further project activities at the next stages of education and professional activity.

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