APPLICATION OF THE PROJECT METHOD IN TECHNOLOGY CLASSES IN SECONDARY SCHOOLS

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Abstract. *The article discusses the theoretical issues of applying the method of projects in the classroom on technology, it gives recommendations on the application.*

Keywords: *technological education, training workshop, technological operation, project method.*

INTRODUCTION

A whole block has been introduced into the exemplary programs of the educational field "Technology" - the module "Creative project activity", which provides for the organization and management of students' project activities (project method).

“The project method is based on the idea that is the essence of the concept of “project”, its pragmatic focus on the result that can be obtained by solving one or another practically or theoretically significant problem” [1].

The project method is always focused on the independent activity of students - individual, pair, group, which students perform for a certain period of time. This method is organically combined with group methods. The project method always involves solving a problem.

The project method of teaching assumes that the design is not carried out under the tutelage of the teacher, but together with him, is not based on pedagogical dictate, but on the pedagogy of cooperation, when the teacher turns into a consultant, an experienced leader of students' creative activities.

MATERIALS AND METHODOLOGY OF THE RESEARCH

The project activity of students consists of three stages: organizational and preparatory, technological and final (N.N. Nikitina) [2].

At the first stage, students conduct mini-marketing research, select and justify the project, analyze upcoming activities, determine the optimal design option, select material, plan the technological process, and develop design and technological documentation.

At the second stage, students perform technological operations provided for by the technological process, with self-control of their activities and compliance with technological and labor discipline, labor culture.

At the final stage, the control and testing of the product is carried out, if necessary, the design and technological documentation is adjusted, an explanatory note is drawn up with an economic justification and environmental assessment of the project, and the project is defended.

All “project activities of students require strict consideration of their age, range of interests. This is important both when choosing a project topic and when organizing work on its implementation” [3].

RESULTS OF THE STUDY

Primary schoolchildren are characterized by the desire to reproduce the objects that aroused interest, imitation, the expectation of personal success, so students must mainly carry out design and technological projects.

High school students are characterized by a desire to test their abilities, an anticipation of creativity. For that reason, like students who are studying in 8^{th}-9^{th} grades, they should mainly carry out art-design projects design-economic projects.

Replacing part of the training "pseudo-applied" exercises in the lessons of technology for processing various materials with exercises necessary for the high-quality implementation of the project (manufacturing of a particular product), significantly increases the motivation of students to the work.

Table 1

Outcomes of the student designing process

Designing Process	Students learn (learning outcomes)
1	2
1.Research of the need and a brief formulation of the problem	1.1. Identify human needs that can be met through the design and manufacture of a product 1.2. Briefly formulate the problem
2. Research and analysis of the possibility of manufacturing a product, including an assessment of the required knowledge, skills and abilities. Search for information about the professions required for the production of a particular product	2.1. Select and use the necessary information for your project 2.2. Know the list of professions required for the manufacture of specific products
3. Determining the list of criteria that the product must meet	3.1. Be able to determine the list of criteria that the product being developed must meet
1	2
4. Develop your ideas and search for possible solutions. Evaluation of ideas, selection of the most successful for further development. Studying how this product is manufactured in industry	4.1. Evaluate ideas taking into account the availability of time, equipment, materials, the level of knowledge, skills and abilities that are necessary to implement of the chosen idea 4.2. Prepare the selected offer to the level of product manufacturing
5. Planning for the manufacture of the product (acquiring the necessary skills): manufacturing the product	5.1. Record and use the detailed manufacturing sequence of the product: make changes as needed 5.2. Perform exercises to acquire the skills of making high-quality products
6. Economic evaluation of the manufactured product	6.1. Determine the cost of manufacturing the product (excluding the cost of labor costs)

7. In-use product testing	7.1. Test the product in practice
8. Evaluation of the product in accordance with the developed criteria	8.1. Assess the quality of the product (including its impact on the environment, society, culture, economy, etc.) 8.2. Suggest ways to improve the product
9. Evaluation of their activities in the process of design, manufacture and testing of the product	9.1. Evaluate the quality of your design, manufacture and testing of a product 9.2. Determine the difficulties encountered in the design and manufacture of the product 9.3. Develop an advertisement for your product
Designing Process	Students learn (learning outcomes)
1	2
1.Research of the need and a brief formulation of the problem	1.1. Identify human needs that can be met through the design and manufacture of a product 1.2. Briefly formulate the problem
2. Research and analysis of the possibility of manufacturing the product, including an assessment of the required knowledge, skills and abilities. Search for information about the professions required for the production of a particular product	2.1. Select and use the necessary information for your project 2.2. Know the list of professions required for the manufacture of specific products
3. Determining the list of criteria that the product must meet	3.1. Be able to determine the list of criteria that the product being developed must meet
1	2
4. Development of ideas and search for possible solutions. Evaluation of ideas, selection of the most successful for further development. Studying how this product is manufactured in industry	4.1. Evaluate ideas taking into account the availability of time, equipment, materials, the level of knowledge, skills and abilities necessary to implement the chosen idea 4.2. Working with the selected offer to the level of product manufacturing
5. Planning for the manufacture of the product (acquiring the necessary skills): manufacturing the product	5.1. Record and use the detailed manufacturing sequence of the product: make changes as needed 5.2. Perform exercises to acquire the skills of making high-quality products
6. Economic evaluation of the manufactured product	6.1. Determine the cost of manufacturing a product (excluding the cost of labor costs)
7. Product testing during use	7.1. Test the product in practice

8. Evaluation of the product in accordance with the developed criteria	8.1. Assess the quality of the product (including its impact on the environment, society, culture, economy, etc.) 8.2. Suggest ways to improve the product
9. Evaluation of their activities in the process of design, manufacture and testing of the product	9.1. Evaluate the quality of your design, manufacture and testing of a product 9.2. Determine the difficulties encountered in the design and manufacture of the product 9.3. Develop an advertisement for your product

The degree of activity of students and teachers at different stages is different. In the educational project, students must work independently, and the degree of this independence does not depend on their age, but on the formation of skills and abilities of project activities.

The role of the teacher is great at the first and last stages. And the fate of the project as a whole depends on how the teacher fulfills his role at the first stage - immersion in the project. Here there is a threat to reduce the work on the project to the formulation and implementation of tasks for independent work of students. At the last stage, the role of the teacher is great, since the students are not able to generalize everything that they have learned or studied, to stretch the bridge to the next topic, to come, perhaps, to unexpected conclusions that the teacher can make with his rich worldly experience, scientific outlook, analytical thinking.

DISCUSSION

A project in technology lessons is “a set of technical documents containing calculations, drawings, mock-ups intended for the construction, manufacture or reconstruction of structures, installations, machines, devices”.

The essence of the educational project is the implementation of some object of labor (available or feasible for the student) and the development of the documentation necessary for its implementation.

When choosing a project task, it is necessary to take into account its practical value. These can be products for personal use, for family members, for home and etc. Tasks should not be difficult, they should take into account the personal interests and abilities of each individual student or group of students, the material and technical capabilities of the school.

The completed project is accompanied by an explanatory note, which sets out the content of the project assignment and the results of the work done. It is drawn up in the form of sketches with explanatory text. It is advisable to discuss each project with a group of students and give it an appropriate assessment. At the same time, attention is paid to the feasibility and quality of the work done, its literacy and efficiency.

In order to assist schoolchildren while working with projects, it is recommended to make a “Creative Projects” stand in the classroom for labor training. In fact, the student will be able to independently find the information necessary at any stage of the project development.

CONCLUSIONS

Having studied the theoretical foundations of using the project method in technology lessons, we have made the following conclusions:

The method of projects is based on the development of cognitive skills of students, the ability to independently construct their knowledge and navigation to the information space, the development of critical thinking. The project method comes from the field of didactics, private methods, if it is used within a particular subject. Method is a didactic category.

This is a set of techniques, operations for mastering a certain area of practical or theoretical knowledge, a particular activity. This is the way of cognition, a way of organizing the process of cognition. Didactic teachers and educators turned to this method to solve their didactic tasks. The project method is based on the idea that is the essence of the concept of "project", its pragmatic focus on the result that is obtained when solving one or another practically or theoretically significant problem.

This result can be seen, comprehended, applied in real practice. The project method is always focused on the independent activity of students - individual, pair, group, which students perform for a certain period of time.

This method is organically combined with a group (cooperative learning) approach to learning. The project method always involves solving a problem. On the one hand, the solution to the problem involves the use of a combination of various methods and teaching aids, and on the other hand, the need to integrate knowledge and skills from various fields of science, engineering, technology, and creative fields.

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