Methodology for Implementing Project-Based Learning in Developing Independent and Creative Thinking of Students

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Abstract: This article is devoted to studying the methodology of implementing project-based learning in developing independent and creative thinking of students. The article presents a step-by-step methodology for implementing project-based learning in educational institutions, a model of new relationships between teachers and students, assessment criteria, and practical application experiences. Research results show that project-based learning not only forms knowledge and skills in students but also develops problem-solving abilities, teamwork skills, communicative competencies, and critical thinking. This methodology is an important pedagogical tool in preparing students for future professional activities.

Keywords: project-based learning, independent thinking, creative thinking, innovative methodology, student activity, practical competencies, problem-based learning, pedagogical technology, cognitive development, critical thinking, teamwork, innovation in education, educational projects

Introduction. The 21st century places new demands on the education system. In the modern conditions of the rapidly developing world community, traditional educational methods do not allow to fully prepare students for life and future professional activities. Today, educational institutions are required to train not only knowledgeable, but also specialists who can think independently, approach creatively, solve problems and adapt to constant changes.

Project-Based Learning is one of the most effective methods of modern pedagogical technologies. This approach gives students the opportunity to connect theoretical knowledge with practical activities, to demonstrate their abilities in the process of solving real-life problems. Through project-based learning, students not only gain in-depth knowledge on a specific topic, but also develop the skills of conducting independent research, analyzing data, critical thinking and creating their own ideas.

The documents adopted on the reform of the education system in the Republic of Uzbekistan, in particular, the Law "On Education" and the "Concept for the Development of the Education System of the Republic of Uzbekistan until 2030", also emphasize the need to introduce modern pedagogical technologies.

Theoretical foundations of project-based education

The concept of project-based education originated at the beginning of the 20th century from the idea of "learning by doing" by the American scientist and educator John Dewey. Later, this approach was developed by William Kilpatrick, Jerome Bruner and other educators. In modern conditions, project-based education is considered one of the main components of the constructivist theory of education.

Project-based education is an educational process organized on the basis of students working independently or in teams for a long time to solve a specific problem, conducting research and creating their own products. In this process, the student is at the center of the educational process, and the teacher plays the role of a guide and consultant.

The main principles of project-based education are as follows:

• Student-centeredness - the educational process is built on the interests and needs of the student;
• Problem-orientedness - attention is paid to solving real-life problems;
• Activity and independence - students act as active participants and independent researchers;
• Collaboration - teamwork and collaborative problem-solving skills are developed;
• Result-orientedness - focus on creating a specific product.

The role of project-based education in developing independent and creative thinking in students

Independent thinking is the ability of a student to freely formulate his own thoughts, independently analyze information and draw conclusions. Creative thinking refers to the ability to create new ideas, find unconventional solutions and apply existing knowledge in new situations.

Project-based learning contributes to the development of these skills in the following ways:

1. Problem identification and solution process During the project work, students must first identify the problem and analyze it from various angles. This process requires critical and independent thinking. Students must study the available information, understand the essence of the problem, and independently search for ways to solve it.

2. Research skills and information search Project work requires students to conduct extensive research. They must collect information from various sources, compare it, assess its reliability, and select the necessary information. This process strengthens the skills of independent work and analytical thinking.

3. Search for creative solutions. Within the framework of the project, students are not limited to standard solutions. They can develop their own unique ideas, try different approaches and choose the most effective method. This stimulates creative thinking and develops students' innovative approaches.

4. Self-management and responsibility During the project, students plan their time, distribute tasks and monitor their own work. This develops self-management, organization and a sense of responsibility - important components of independence.

5. Evaluation and reflection During the project and after its completion, students should evaluate their work, analyze what was done well and what needs to be improved. This develops reflective thinking and encourages students to constantly work on themselves.

Methodology for implementing project-based learning

A systematic approach and a step-by-step methodology are necessary for the effective implementation of project-based learning in the educational process. The main stages of this process are as follows:

Stage 1: Preparation and Planning

At this stage, the teacher performs the following tasks:

• Analysis of the curriculum and subject content;
• Identification of project topics and objectives;
• Development of criteria for evaluating project results;
• Preparation of necessary resources and materials;
• Creation of a timetable and work plan.

The project topic should be interesting for students, of practical importance, and related to the curriculum. For example, topics such as "Development of a marketing strategy for a local enterprise" for students of the economic direction, and "Creation of a lesson plan using modern educational technologies" for students of the pedagogical direction can be chosen.

Stage 2: Introducing the project and creating motivation

The teacher introduces the students to the project and provides information about its purpose, importance, and expected results. At this stage, it is important to:

• Show the relevance of the project to real life;
• Arouse students' interest;
• Explain how the project results are useful for their future professional activities;
• Determine the students' attitude to the project through questions and answers.

Stage 3: Group organization and distribution of tasks

Working in groups is important in project-based learning. When organizing groups:
• Groups of 4-6 people are optimal;
• Group members should have different abilities and skills;
• Each student should have a clear role and responsibility in the group;
• It is necessary to distribute roles such as leader, researcher, designer, presenter within the group.

Stage 4: Working on the project

This is the longest and most important stage and includes the following activities:

Collecting and analyzing information

• Searching for information from various sources (books, the Internet, questionnaires, interviews);
• Systematizing and analyzing the collected information;
• Studying the problem in more depth.

Developing a project plan
• Setting clear goals and objectives;
• Creating a work plan and timeline;
• Determining the necessary resources;
• Designing a vision of the results.

Carrying out practical work
• Carrying out actions in accordance with the plan;
• Using various methods and tools;
• Finding a solution to the problem;
• Creating a project product.

The role of the teacher in this process:
• Providing advice and guidance;
• Providing assistance when necessary;
• Monitoring and evaluating student performance;
• Coordination between groups.

Stage 5: Project Presentation

The project presentation is an important stage where students demonstrate their work and report on their achievements. The presentation can take various forms:
• Oral presentation (presentation);
• Poster presentation;
• Video presentation;
• Website or application;
• Conference or seminar.

During the presentation, students:
• Explain the goals and objectives of the project;
• Show what methods were used;
• Present the results achieved;
• Share challenges and ways to overcome them;

• Make conclusions and recommendations.

Stage 6: Evaluation and reflection

Evaluation of project results is carried out at three levels:

Self-evaluation Each student analyzes his/her own work, what knowledge and skills he/she has acquired, what he/she has succeeded in, and what needs to be improved.

Group assessment Group members evaluate each other's contributions, cooperation, and teamwork.

Teacher assessment The teacher evaluates the project based on the following criteria:

• Quality and completeness of the project;
• Level of creativity;
• Effectiveness of presentation;
• Teamwork skills;
• Time management;
• Level of achievement of learning objectives.

During the reflection process, students:

• Analyze their own experiences;
• Understand what they have learned during the project process;
• Identify what needs to be changed in the future;
• Identify areas for professional development.

The role of the teacher in implementing project-based learning

The role of the teacher in project-based learning is significantly different from traditional learning. The teacher is no longer a transmitter of knowledge, but:

A facilitator - a person who facilitates the learning process and creates conditions for students to work independently;

Advisor - provides advice when students encounter difficulties, but does not give ready-made answers;

Motivator - interests students and builds their confidence;

Coordinator - coordinates the project process to move it in the right direction;

Evaluator - monitors and evaluates not only the final result, but also the entire process.

The teacher should have the following skills:

• Project planning and management;
• Use of various educational technologies;
• Individual approach to students;
• Understanding and managing group dynamics;
• Use of modern information technologies;
• Methods of motivating students.

Advantages and disadvantages of project-based education

Advantages:

1. For students:

• Independent thinking and creative approach develop;
• Practical skills are formed;
• Problem-solving skills increase;
• Teamwork skills develop;
• Motivation and learning activity increase;
• Self-management skills are formed;
• Communicative competencies are developed;

• Preparation for professional activity is strengthened.

2. For teachers:

• Opportunity to improve pedagogical skills;

• Establish new relationships with students;

• Professional development;

• Revitalization of the educational process.

3. For an educational institution:

• Increased quality of education;

• Compliance with modern educational standards;

• Increasing the competitiveness of graduates;

• Improving the reputation of the educational institution.Qiyinchiliklar:

Organizational difficulties:

• Time-consuming;

• Difficulties in working with large groups;

• Lack of necessary resources;

• Incompatibility with the traditional lesson schedule.

1. Methodological difficulties:

• Insufficient experience of teachers;

• Difficulty in developing assessment criteria;

• Incompatibility with all subjects;

• Balancing theoretical and practical components.

2. Psychological difficulties:

• Students' lack of familiarity;

• Teachers' resistance to change;

• Increased additional workload;

• Conflicts within the group.

Recommendations for the effective introduction of project-based education

1. Phased implementation. It is advisable not to introduce it to all subjects at once, but to conduct pilot projects first.

2. Teacher training. It is necessary to conduct special trainings and seminars on project-based education.

3. Creating the necessary conditions. Providing modern technical means, the Internet, library resources and other materials.

4. Developing cooperation. Establishing cooperation with other educational institutions, industrial enterprises increases the practical significance of projects.

5. Taking into account the needs of students. Project topics should be related to the interests of students and future professional activities.

6. A flexible approach. One should not be afraid to make changes during the project process if necessary.

7. Using information technologies. Using modern programs, platforms and social networks increases the effectiveness of the project.

8. Sharing experience. It is useful to hold regular meetings to exchange experiences between teachers.

In conclusion, it should be said that project-based education is one of the most promising areas of the modern education system. This methodology not only forms in-depth knowledge and practical skills in students, but also develops their independent and creative thinking skills. In the process of

working on the project, students acquire such important skills as problem identification, analysis and solution, search and processing of information, teamwork, planning their time and self-assessment.

The effective implementation of project-based education requires thorough preparation, a systematic approach and active participation of all participants in the educational process - teachers, students and administration. Despite the initial difficulties, this methodology will bear fruit in the long term and help to form students as competitive specialists who meet the requirements of the 21st century.

By widely introducing project-based education in the education system of Uzbekistan, we will not only increase the level of knowledge of students, but also make a significant contribution to their personal and professional development. This, in turn, will have a positive impact on the economic and social development of our country.

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