ЕКОНОМІКО-СОЦІАЛЬНІ ВІДНОСИНИ В ГАЛУЗІ ФІЗИЧНОЇ КУЛЬТУРИ ТА СФЕРІ ОБСЛУГОВУВАННЯ

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FEATURES OF TEACHING STEM TECHNOLOGY TO SECONDARY SCHOOL

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The current pace of digitalization, the widespread digitalization of the education system and a change in its paradigm lead to changes in the approaches to learning themselves. Rapid trends in education the active development of digital technologies actualizes integrated approaches to learning [1].

The STEM approach is a broad tool that includes a complex of actions, approaches, practices and methods aimed at making both society and the individual ready for the future. The use of the STEM approach in the educational process leads to the fact that students take thoughtful risks, participate in experimental learning and creative activities, and solve life-oriented situations.

The STEM approach is based on research as the leading type of educational activity based on problems, questions, processes. A STEM project necessarily requires the inclusion of a target, role-based task. Students are subjects as independent authors, initiators, leaders, and team members. The form of Organization of learning includes project and practical STEM components, the combination of which is more effective than classroom learning [2].

As a result of the use of the STEM approach in education, it is assumed that the orientation of students in the world of professions will improve. According to the statistical data of countries with developed STEM education, in the near future the world will have a sharp shortage of IT specialists, programmers, engineers, specialists of high-tech industries, integrated specialties (bio-, nanotechnology) will appear in the board. Today's students work in the future in professions that do not exist now, use technologies that have not yet been developed, and STEM provides an opportunity to choose a future profession [3].

One of the principles of the STEM approach is Project Learning. This method itself is not new, but here it plays a decisive role, since it allows the implementation of natural relationships between subjects.

Special attention should be paid to the features of creating STEM stems. The simplest, basic level of introducing the STEM approach to the educational process is an individual lesson. Here the efforts of teachers aimed at finding methods and approaches to the implementation of the project are concentrated. A number of important principles for analyzing the accumulated experience in this direction, developing and preparing STEM lessons are as follows: the applied nature of the approach to the problems of the real world; learning by solving the problems of activating critical thinking; combining elements.

Based on the principles, the characteristic criteria for building STEM classes are determined: 1) consideration of «real» problems that allow you to turn to different branches of science and different sources of information search in order to choose the optimal method (books, internet sources, research or experimental self-experience); 2) presentation of problems which solutions have their «own way» and many correct answers; 3) inclusion of game and competitive elements in the problem-solving process; 4) compilation of «available», creation of projects with a limited budget, calculation of the cost of projects that contribute to the development of image, economy, budget planning, management skills; 5) implementation of the principle of independence in experimental, design, design activities; 6) promotion of teamwork skills, teamwork, cooperation skills; 7) evaluation of the results of work before the group.

STEM learning is based on solving problems related to real life and everyday life. The problem is the starting point from which the entire project is formed. Work on solving the problem should motivate students to independently search for information. A specific goal arises from the problem, problems and methods of activity are determined, a plan is drawn up, materials and equipment are selected. At this stage, the teacher acts as an active «observer» of the work process on the project, focusing on solving the problem from various positions (science, technology, mathematics). An effective tool is the use of Route sheets, which contributes to the algorithmization of the process of searching for the necessary theoretical and practical information. In the foreground apply their knowledge in practice [4].

Students implement innovative ideas of mechanisms, techniques, programs in their practical projects. In grades I–IV, the main type of design activity is the solution of specific engineering tasks using the necessary tools and materials, instructions. In grades V–VIII, projects become more complex, a scientific approach is used, aimed at the formation of UNT analysis, argumentation skills.

In grades IX–XI-practical project research activities that form the ability to structural analysis and creativity. The service focuses on engineering design from demand (challenge or problem) and then Product Creation with analysis and presentation of results.

Stages other than the practice-oriented problem situation can be arranged in an arbitrary order.

In addition, STEAM projects can be used as lesson elements, homework options, the basis for extracurricular activities. At the same time, students develop the ability to identify the problem, formulate the problem, analyze the data and results obtained. In project activities, children play the active role of discoverers, gradually moving from the acquisition of ready-made tasks and the search for good knowledge. The specific goal of the design and research work is the development of universal skills necessary for solving professional and life tasks. Here the facts are not memorized, but taught to learn, becoming the basis for life success.

Thus, the STEM-approach to the educational process increases the motivation of students, helps to understand what knowledge, skills, acquired in an educational institution are needed in solving practical problems, for successful study in a higher educational institution, for career growth.

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