

INTERDISCIPLINARY CONNECTION IN FORMING STUDENTS' CREATIVE SKILLS

(In the Case of Technology Lessons)

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ANNOTATION

In this article, the current tasks before the technical science of general secondary schools and the psychological, pedagogical and technical-technological aspects of the educational process, the use of interdisciplinary links in the educational process and general secondary education are discussed. Many organizational, legal and scientific research works are being carried out on reforming the system, improving teaching technologies, forming modern knowledge and skills in students, using new teaching methods for this purpose. Through this, it is aimed to create a system of training a generation of competitive and high-potential personnel. This makes the formation of creativity-related skills in students one of the urgent tasks. That's why, on the basis of innovative tools, thoughts and opinions about the need to develop creative abilities in young people have been discussed.

Keywords. project, design, creative person, creativity, creative thinking, ability, creative abilities.

INTRODUCTION

The issue of creating a system for developing students' creative abilities is becoming urgent in the world. Education of a creative person based on the possibilities of STEAM sciences, which play an important role in the development of modern society in the world education experience - science, technology, engineering, design (art), and mathematics, is a priority. is defined as Also, UNESCO's report "The Future of Jobs" released in October 2020 stated that critical thinking and creativity will be among the top five skills in demand by 2025. . Therefore, improving the theoretical foundations of the development of creative abilities of students in the international educational space is considered as one of the important socio-pedagogical tasks.

In the world's developed scientific research institutes and international centers, a lot of scientific and research work is being carried out in order to reveal the hidden abilities of students, to improve the tools of influence aimed at developing the skills that are required today. The developed countries of the world are setting themselves the task of not only increasing production, but also transitioning to an innovative economy based on deep knowledge and scientific achievements. That is why the development of one's economy by creating innovative products, mastering and introducing advanced technologies into development is considered as the main factor of development. Such social changes increase the demand for educating students who are creative, critical thinkers, who can quickly solve problems and quickly adapt to situations from the modernized general secondary education system.

A lot of organizational, legal and scientific research on reforming the general secondary education system in Uzbekistan, improving teaching technologies, forming modern knowledge and skills in students, and using new teaching methods for this. work is being done. Through this, it is aimed to create a system of training a generation of competitive and high-potential personnel. This makes the formation of creativity-related skills

in students one of the urgent tasks. Therefore, there is a need to develop creative skills in young people based on innovative tools. After all, the demand for "development and implementation of local innovative technologies in such vital sectors as information communication technologies, chemistry and biotechnology, genetics, ecology and production of agricultural products, pharmacology, medical diagnostics" depends on creative abilities, ways of thinking and skills. is the basis for improving the system of training specialists [1].

LITERATURE ANALYSIS AND METHODS

Based on this, in general secondary schools of technology classes in the direction of "Technology and design" by means of design projects, the problems related to the formation of creative abilities of students are purposefully researched, which constitute its content and essence, and it is necessary to select and systematize the necessary forms, methods and tools of the field of education, which are compatible with the educational program, on a scientific basis.

Today, there is an increasing need to form creativity in students and, through this, to develop their creative skills in relation to work and professional activities. The place of technology classes in the educational content aimed at developing students' creativity skills is high. The design process in technology classes helps students to work independently, to think freely, to search creatively, and to increase efficiency. Determining the content of materials aimed at forming knowledge and skills related to design elements as part of educational materials that should be taught to students in general labor and general professional competencies, first of all, the labor activities of specialists and inventors in production enterprises. It implies the development of the skills of observation, design of the process of manifestation of creativity in them and its practical application. Also, based on the fact that the subjects of technology for students of grades 5-7 are chosen in a simple and understandable way, this problem design projects aimed at forming students' creativity skills were selected as a tool.

It is clear from the analysis of the DTS and curriculum of the subject "Technology" of general secondary education schools that the program aims to familiarize students with the basics of design (artistic construction), to continuously form knowledge and skills related to design. . In this program, students of the 5th grade "do practical exercises from design work. It is intended to acquire knowledge and skills related to the design of professional items and products, taking into account the aesthetic and economic aspects. And in the 6th grade, students were given educational assignments on "...in the process of constructing and modeling simple items, analyzing the artistic aesthetic characteristics of products related to the fields of folk crafts and carrying out exercises to solve design solutions", 7 and the students of the first grade "... design the products to be prepared and apply design methods to them. Completion of assignments on "creating projects for the performance of design tasks" is defined [2].

Currently, in the "Technology" classes of general secondary education, according to the content of the modernized State Education Standard, it is envisaged that students will acquire a number of knowledge, skills and qualifications related to the science of technology. According to it, students should have an outlook on the labor process, general labor knowledge, skills and qualifications, a general idea of professions, national economy, production and service sectors. to have knowledge about, to have basic artistic processing skills for various materials, to know national labor traditions and customs, to have skills to prepare a technological map of the product focused on solving.

It is known that it is appropriate to work on various indicators in solving the goals and tasks of the science of technology. According to this, if we first pay attention to the content of the purpose of technological education, the mental development of students is to teach them to be diligent and to frame human work, "to carry out pre-vocational training by preparing them for a conscious choice of profession, and the well-being of society and individual or It is envisaged that it consists in developing personal qualities and thinking that allow them

to join the labor activity" [3].

In this sense, the analysis of the relevant aspects of the necessary requirements for the level of preparation of students in technological education is one of the current problems of the field, which is waiting for its scientific-practical solution. Therefore, in the course of the "Technology" classes, it is one of the priority areas of this research to work based on the relevant bases for the study of technologies for the formation of general labor and general professional skills and qualifications. is one.

Some topics in technology have been changed for the 2021-2022 academic year and more emphasis has been placed on introducing and guiding students to modern careers and activities. For example, in the chapter "Composite materials" of the 5th grade, information is provided about the methods of using composite materials, the equipment used in processing. Also, the inclusion of a tutorial on how to make various three-dimensional objects from polymer clay (booklet-shaped keychain) and a 3D pen will be an important tool in forming their creativity. The new chapter entitled "Energy production and its use" will help the student to easily use the technical capabilities of various alternative energy generating equipment in his life activities. The chapter "Mechatronics-LEGO education" has been added to the technology textbook. This chapter includes the topics of making a simple rotating mechanism, making a carousel, increasing the speed of the carousel, basic algorithmic constructions, designing a robotic system, assembling an Otto robot, and a robot competition. The chapter "Basics of Socio-Economic Technology", which was newly included in the textbook, helps students to acquire economic knowledge and develop the necessary skills to apply them in everyday life. Tasks related to the TRIZ (theory of solving inventive problems) method were included in the textbook. In this, students learn to conduct research and research, apply algorithms and models to research education, and implement problem-oriented projects.

In technology classes, students' actions related to the completion of tasks, especially creative activities, including the development of creativity through design projects, play an important role in mastering the actions. The following factors require special attention:

The first factor is undoubtedly the compliance of education with normative requirements, that is, the content of any educational material must first of all be in accordance with the DTS of the field and the curriculum.

The second factor is complex, both as the main educational material and the material introduced as a component of the formation of general labor skills in students, in particular, as training sessions aimed at mastering materials related to design projects. it should not be too simple, i.e. content that does not arouse a sense of creativity. In the first case, it does not work due to a certain level of stress and low performance, and in the second case, there is no stimulation of creativity.

The third factor can be divided into two categories according to its structural components, that is, the educational materials provided taking into account the interests and natural inclinations of students, as well as their gender characteristics, are one of the important factors in the development of creativity. Coordinating work activities, increasing work productivity, and quickly and qualitatively performing the tasks will serve as a source of goods and signs.

RESULTS AND DISCUSSION

When organizing the process of teaching students in technology classes, it is necessary to determine the content of the situation and correctly direct it. Conditions are created for the student to study the educational materials specified in the DTS.

In order to acquire practical skills, the student needs to complete the mastering labor exercises and the initial tasks oriented to production. In order to implement this process, the methodological guide for students will be directed to methodological recommendations and educational goals. In this process, students have to do something independently. This process is important.

One of the conditions for managing the educational process is that the teacher should pay attention to the work being done. It is necessary to monitor the skills and qualifications of any of the students. In each case, the content of education consists of situations that are new to the student or have not been mastered by him. Previously mastered knowledge serves as a ground for further mastering.

"When dividing the educational content into parts, the teacher should first of all take into account the complexity of this skill, not in terms of execution, but in terms of mastering. Therefore, depending on the student's preparation, each part can cover the entire work process in one case, the sequence of work in another case, and the only known method in another case. In order for students to acquire new skills quickly and thoroughly, it is not appropriate to use real labor tasks in many cases. The newly studied task may seem very complicated to the student, although he has already mastered the operation that is part of it" [4].

In any case, if the student does not understand the action he is studying, if he does not know the essence of its content, the quality of the work will not be effective. The student should be able to understand and imagine the essence of the action he is doing. He needs to know whether the process is right or wrong.

The level of understanding of the task by students plays a decisive role in the performance of tasks with elements of creativity.

The teacher must be able to provide knowledge about the goal to be implemented. The student learns this process practically. In doing so, he observes with his own eyes the work done with production, learns to measure and determine. In all cases, it studies a specific production task.

The types of knowledge implemented in technology classes are different, for example, the tool of actions is used to implement it demonstratively. In the form of verbal action, the condition of the matter is expressed using words. It requires a certain effort to implement it. In technological education, the form is more of an intermediate state at the end. The solution is always tested by practice.

Practices show that clear images of the labor process also serve to speed up labor activity. It guarantees its actions and increases its success. Increases labor productivity. An important methodological task of the teacher is that the student is able to perform new actions correctly or distinguish the ways to achieve them.

At the stage of educational types, the cooperation between the teacher and the student changes in different ways. At first, learning is difficult and slow to get used to, and later it becomes faster as a skill is formed. The study of each process will be under continuous and systematic control. As skills are formed, work productivity increases.

Based on the principle of continuity, the design projects used in the formation of students' creativity are also changing, becoming more complicated, and creative approaches are improving.

The use of interdisciplinary connections in the educational process is of great importance. It is known that "any science arises under the influence of other sciences close to it and develops together with them. Therefore, it is important to use interdisciplinary connections and connections in the teaching and learning of subjects in schools, "the land of knowledge" and higher educational institutions. In the same way, connecting technology lessons to other subjects gives effective results and is considered one of the important factors of increasing the effectiveness of the lesson. Interdisciplinary connections in the science of technology can be divided into two types, and they can be conditionally called internal and external interdisciplinary connections. In the lessons of technology science, internal connection is understood as the interconnection and connection of topics in the subjects related to this field. And the external connection refers to the connection between the lessons of technology and other subjects" [5]. Therefore, the teaching of technological science in such a sequence is inextricably linked, they strengthen and complement each other. It is important to ensure cooperation between technology education and fine arts in developing students' creative abilities. "The role of pictures in technology lessons is extremely important, because before making any detail or item, a picture or sketch of it is drawn and shown to the students. Pupils copy and draw these pictures in their notebooks.

Students create an idea about that detail or item through these pictures. It can be seen that here the students develop various drawing skills. But it is known from experience that painting is not an easy task. Many students face difficulties in doing this work because they do not have enough knowledge and skills in drawing. Therefore, in technology classes, the teacher should give students an understanding of technical drawings, sketches, clear images, perspective, the sequence of work in drawing, as well as distinguishing colors, placing them in proportion, and so on.

Also, the formation of knowledge and skills related to drawing will be effective in this activity. "Technology lessons cannot be imagined without drawing. Drawing is also very necessary in technology classes. Because making any detail begins with reading its drawing, and in this process the student gets an idea about the parts of the future item. Therefore, the drawing and use of technological and instructional flashcards, which are one of the important exhibits in the Technology classes, also depends on how the drawings are used. So, students' practical activities and the quality of the prepared items depend to a large extent on their drawing knowledge and skills. However, drawing is taught from grade VII. Therefore, it is necessary for the teacher of Technology to give information about drawing, dimensions, arrow lines, sectioning, cutting, drawing tools and their use to students starting from the 5th grade." In this case, the work should be done taking into account the knowledge of the students in this field in the previous classes.

Mathematics education in school education has an incomparable role in the formation of students' creative abilities. Formation of students' mathematical knowledge and development of mathematical thinking also has a strong influence on their thinking and way of thinking. This way of thinking also develops their creativity. Therefore, it is effective to conduct mathematics education along with technology education in school education on an innovative basis. "In the lessons of technology education, students need the concepts of creating shapes such as right angles, perpendicular and parallel lines, right triangles and rectangles. In addition, in technology lessons, students learn about the axis of symmetry, symmetrical placement of shapes, circle, dividing it into parts, experimenting with ruler, ruler, protractor, protractor, circle. with the help of tools, they have to determine the angles, centers of arcs, other dimensions of straight and curved lines. In such cases, knowledge of geometry is necessary. Therefore, in the school geometry course, there are great opportunities to use drawing and measuring tools, to change surfaces. The task is to use them appropriately in technology classes." Also, knowledge of arithmetic is necessary to determine various dimensions of the given items, such as length, width, height, surface, volume, and to calculate how much material and time will be spent.

In the conditions of students' deeper penetration into technology education, they lack the knowledge and skills of Physics and Chemistry. Because in technology education, understanding the harmful effects of a substance, physical changes in the process of making something allows them not to put their health at risk. "It is necessary to know their physical properties before working with various materials in practical training on technology education. The property of a substance to maintain its chemical composition as a result of external influence is called its physical properties. Such properties include such properties as color, density, solubility, heat resistance, heat capacity, thermal and electrical conductivity, and magnetism. For example, when a metal is heated, its composition does not change when heat or electric current passes through it, when it is magnetically affected. The physical properties of metal are very useful in distinguishing them from each other and using them. For example, any metal has its own luster, which is called its color. Not all metals are the same color. For example, copper is red, tin is shiny white, zinc is gray, and steel is light blue. It can be noted here that metals change color when oxidized in air, and even the thinnest piece of metal does not transmit light. When a material is heated, it quickly transfers heat from itself is called its thermal conductivity. The faster the metal conducts heat, the faster and more evenly it heats up and cools down. Therefore, it is necessary to take into account the possibility of their dimensions changing due to heat during the manufacture and processing of

metal products. In general, it is possible to distinguish materials according to their physical properties, to choose alternatives, and to prepare details and parts of the product" [5].

In addition to these, it is necessary to make wide use of physical concepts such as types of movement, force, pressure, power, energy, work, and friction in making various items from materials with the help of basic tools or machines, adjusting tools, in technology lessons.

SUMMARY

Xulo'rnida o' texnologiyasini o'quvchilarda kreativlikni ta'minlash asosida ularda kasb tanlashda to'g'ridan-to'g'ri tanlovni amalga oshirishni qo'llash orqali ham rivojlantirishni maqsad qiladi. Misol uchun, «5-7-sinflarda asosan kasb xaqida ma'lumot beriladi. O'quvchilar bilan tanishish ishchi kasblar borligi bilan. Bu kasblarning o'quvchilarining ustaxonadagi faoliyati mazmunini tashkil etadi. Bu hol o'qitishning shu keyingi o'quvchilarni umumiy texnik tayyorlashga to'la mos keladi. 6-sinfda va ayniksa, 7-sinfda kasb to'g'risida ma'lumot berish bilan bir qatorda kasbiy tarbiyalash ishlari ham olib boriladi. Bunga sabab shuki, 7-sinfni bitirish arafasida o'quvchilar bo'lgusi mehnat tayyorlashning profili (yo'nalishi)ni tanlab olishlari zarur. Har bir profil ko'plab ijtimoiy ishchi kasblarni o'z ichiga oladi. Bular ustaxonadagi mashg'ulotlarning mazmuni bilan ishlayotgan aloqada bo'lgan kasblar bo'lishi (masalan, metall va yog'ochga, gazlamagaishlov yo'lda kasboid kasblar) yoki ular bilan hech qanday aloqador bo'lmaganlar bo'lishi mumkin»[6].

agar, maktablarning ishlayotganida shunday manzarani kuzatish mumkinki, o'qituvchilar bu masalani o'quvchilarning o'zlashtirishlariga qarab xal qilishga urinishadi, ya'ni a'lochi o'quvchilarga tanlash huquqiga ega bo'ladilar. 'lishadi.

Xulosa qilganda, umumiy o'rta ta'limda «texnologiya» ta'limi o'quvchilarda mehnatsevarlik bilan birgalikda ijodiy ko'rinishini rivojlantirishga ta'sir ko'rsatadi. Shu bois o'quvchilarda kreativlik ko'rinishini kuzatishda, mehnat muhitini his qilish, texnika va texnologiyaning yaratish jarayoni, undan jo'natish uchun doir bilimlarini muhim ishga tushirish.

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