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Innovation Pedagogical Technologies Used in School Technology Education

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Abstract---*The essence of the formation of creative abilities of students through the repetition (strengthening) of practical work done in school technology education using innovative pedagogical technologies is highlighted. The effectiveness of the teacher's work in the educational process largely depends on the activity of students. To do this, the teacher must look for innovations, show examples of initiative and creativity. The methods proposed above serve to improve technology science lessons, teach students to perform practical work independently and creatively, and form and develop relevant work skills.*

Keywords---*education, innovative, pedagogical technology, student, training lesson.*

Introduction

It is known that educating young people, educating them, educating them as worthy personnel for the future has always been one of the top priorities of any state. In our country, too, such work is constantly in the spotlight of the leaders of our state - we can say the same truth. The Action Strategy on the five priority areas of development of the Republic of Uzbekistan, adopted on the direct initiative and under the leadership of President Sh.M. Mirziyoyev, has launched a new stage of development in the republic. The practical results of this process are reflected in all spheres of our lives today, and most importantly, in the consciousness, aspirations, and actions of our people. Particular attention is paid to the improvement of the education system, which is one of the priorities of the fourth strategy of action - the development of the social sphere ([Decree of the President, 2017](#)). The issues of upbringing a harmoniously developed generation and leading a healthy lifestyle of young people are considered topical issues in the meetings and speeches of the head of our state during his visit to each region. As the President said: "If we do not bring up our children properly if we do not pay attention to their behavior every day, every minute if we do not teach them science if we do not find a decent job, we will lose this deposit." ([Mirziyoev, 2017](#)).

Method

One of the important indicators of increasing the effectiveness of the lesson is the use of various innovative teaching methods, interactive methods in the classroom. One of the factors that increase the effectiveness of technology education is the use of integrated technologies. The point is that in technology science classes, technical technology, different teaching methods, information in other disciplines, and appropriate and effective use of concepts. In addition, technology lessons can be divided into 4 types, such as introductory lessons, new knowledge, and skills development lessons, repetition and reinforcement lessons, test lessons, and the selection of appropriate interactive methods gives good results. One of the important aspects of teaching technology is to teach students to do practical work independently and creatively in the classroom ([Azizxo'jaeva, 2003](#); [Delgado et al., 2019](#)).

Results and Discussion

Repetition (reinforcement) lessons are held to ensure that students acquire a certain amount of knowledge more broadly and deeply. The accuracy of the knowledge learned in the subjects depends in many respects on the

organization of repetition lessons. In such lessons, previously learned knowledge, rules, and definitions are repeated. Repetition of the studied educational material is carried out based on collecting and analyzing the facts on the subject, their comparison, sufficient practice on the subject. The knowledge gained is re-imagined through practice, the application of the acquired knowledge to different learning conditions. Accordingly, this type, of course, is a form of recalling previously learned knowledge and applying it to different learning situations. In repetition classes, on the one hand, there is a process of building skills within the framework of learning materials learned through exercises and various other means, and on the other hand, there is a process of concretization and expansion of knowledge. Repetition can take the following forms:

- Repetition of knowledge learned at the beginning of the academic year;
- Repetition after studying and consolidating a certain training material;
- Repetition of new learning materials learned in the classroom;
- To repeat the knowledge learned in previous lessons;
- Repetition, which is organized after passing a certain part of the subject;
- Final review at the end of the academic year.

Repetition (reinforcement) lessons can use a combination of technologies based on the conference, role-playing, cheerful and clever debate, business game (auction), and other similar methods. The following are recommendations for their use ([Shomirzayev, 2021](#); [Aryani & Rahayuni, 2016](#)).

Conference lesson

It is known that by the current curriculum in grades V-VII in the department of wood and wood processing technology are taught the production, types, structure, use, properties of wood materials, and the manufacture of various carpentry products. It is possible to organize a conference lesson to expand and expand the knowledge gained on related topics. During the lesson, students are monitored pedagogically and psychologically. Students are divided into three groups based on their interests and abilities, and Group 1: local historians; Group 2: carpenters; Group 3: called entrepreneurs. Before the conference lesson, the teacher instructs the groups on what resources to use and how to think. In doing so, the teacher encourages students to use extracurricular resources: literature, radio broadcasts, television and press materials, as well as local evidence. Based on this, students prepare and collect colorful materials ([Saidaxmedov, 2003](#); [Blau et al., 2020](#)).

The conference lesson plan

The purpose of the lesson:

- to strengthen, generalize, expand and teach students to apply their knowledge of woodworking;
- to teach students to love nature, appreciate human labor, thrift, entrepreneurship, and entrepreneurship;
- to develop students' interest in professions related to local lore, carpentry, and sales.

The following equipment will be prepared for the lesson:

- a geographical map of the world;
- a set of wood samples;
- an exhibition of wood species;
- various carpentry products;
- lathes, carpentry measuring, and working tools;
- sales rack and carpentry products placed on it;
- information on masters, sellers, and samples of their work;
- indicators of the profit brought to the account of the school.

The conference will be held in the following order

Leader: Hello, dear students! Today, we begin our conference on woodworking. The conference is attended by young local historians, carpenters, and entrepreneurs. First, we give the floor to young local historians. Please

- Local historian.
It is known that wood is an important building material. It is taken from the trees. And trees are in nature where we live grow. There are so many types. Poplar, willow, elm, spruce, maple, etc. From fruit trees grow trees such as apple, quince, apricot, cherry, walnut.
- Local historians.
Depending on the structure of the leaves of trees are of two types: 1) pine deciduous; 2) broad-leaved (deciduous). Broad-leaved trees grow mainly in European forests, such as spruce; broad-leaved trees include white birch, oak, poplar, elm, willow, etc. (these tree species are shown on a geographical map of the world).
- Local historians.
The leaves of the tree turn into hay in the fall and fall to the ground. Often we try to burn such leaves carelessly. It is the smoke from the burning leaves that pollutes the environment. Harmful gases increase in the atmosphere we breathe, which is harmful to human health. To prevent this damage, the leaves should be collected as mulch for domestic plants in our house or buried in special pits. Only then will we be able to contribute to the protection of nature and help new tree seedlings grow.

Beginner: Now it's the turn of the young carpenters. Please!

- Craftsman.
Carpentry is one of the most ancient professions. People have been engaged in woodworking since ancient times. People began to make for themselves a variety of labor and hunting weapons from wood, as well as other items necessary for their vital needs. Whichever field we take, carpentry works are available. That is why this profession is so proud.
- Craftsman.
Wood materials are the main raw material in our activities. Materials in the form of planks and beams are made by cutting down trees in nature and passing them through various saws. Trees are mainly cut transversely and longitudinally. When cutting, various defects such as twigs, cracks, tree trunks are taken into account. Wood materials have 2 different properties: 1. Physical properties - color, luster, density, electrical and thermal conductivity, odor, etc. 2. Mechanical properties: strength, softness, hardness, flexibility, absorbency, elasticity, and h.
- Craftsman.
In the process of making the cradle performs woodworking:
 - Immerse the cradle flange in water and bend it.
 - Prepare the bottom boards.
 - Preparation of the handle to be installed between the flanges TSD-120 shown on the woodworking lathe.
 - The attachment of the cradle parts is demonstrated. (To carry out the above work, the carpenters will have ready and semi-finished parts and a finished crib in front of them).

Beginner: Here we are the young geographers and carpenters above. We got acquainted with their thoughts and works. Now it's the turn of young entrepreneurs. They tell about their experiences, the secrets of the market. Please!

- Entrepreneur
Nowadays, entrepreneurial activity is entering every sphere. Our entrepreneurial profession is becoming as popular as the carpentry profession. From the earliest days of man's conscious life, he has been dealing with issues related to trade and commodity exchange, economics, and in this regard, he is facing various problems and trying to overcome them. What is entrepreneurship? Entrepreneurship is the organization of production, that is, the ability to produce a product, to sell it, to spend the money after the sale. An entrepreneur is a person who uses all the necessary factors of production and trade to create wealth. It's a lot of creativity in a much broader definition of people engaged in the field. The requirements for entrepreneurs are much broader than the requirements for other people who create material wealth. For example, let's say you are a carpenter. You can be a master farang to make boxes, cribs, windows, and other accessories. But if you start a business, in addition to the production of these items, you will have to deal with sales, marketing, management, accounting, financing, human resources. Where does entrepreneurship start? In modern conditions, all types of entrepreneurship are flourishing. The privatization of many enterprises is having a positive effect. Instead of large state-owned enterprises, small, agile, private enterprises that can quickly adapt to any conditions are proliferating.

- Entrepreneur
We determine how much raw material is used to make carpentry products, the cost of them, the calculation of profits. We set prices for items based on cost. Of course, pricing is based on market research, supply and demand. For example, to make a cradle, we can use wood materials from local willow and poplar trees, which are listed by local historians. We have to use wood materials very sparingly. Our way of dealing with the economy is to earn money in return for honest work and to use it wisely and economically where it is needed. Waste is the opposite of economy and thrift, and it is a waste of money and goods for inappropriate, useless, and charitable work. It is not for nothing that it is said, "If you stopped wasting, then you caught the foot of the state."
- Entrepreneur.
Stands in front of a sales desk and talks about the sales profession. It takes a lot of honesty and integrity to do business. In trade, the seller must have such universal qualities as the sweetness of speech, politeness, now responsiveness, warmth, eloquence.

Moderator: Here we are, dear participants of the conference, acquainted with the views and experiences of the above professionals. We learned what to look for when working with wood, how to use them sparingly. The above three professions are also very interrelated. We have witnessed that a local historian cannot run his business without a carpenter, a carpenter-entrepreneur. In this way, the ideas expressed in the lesson are summarized. The inextricable link between professions is illustrated by the example of their activities. The following pedagogical tasks can be solved in the process of organizing and conducting a conference-type lesson on technology science:

- Strengthening students' theoretical and practical knowledge of technology.
- To teach to think about the peculiarities of professions
- by directing them to make the right choice of different professions.
- Integrated interdisciplinary relations.
- Training to achieve high efficiency by working productively.
- Ecological, economic education.
- To teach the skills of thinking, reasoning, reasoning.
- Develop the ability to use additional literature.
- The fact that the possibilities of learning in students are infinite, their own convince them of their abilities.

Students take an active part in the conference lesson process. As a result of the exchange of ideas between the three groups of students who participated in the above lesson process, their interest in the profession will increase. In the conference lesson, students enter the image and status of their favorite professionals and demonstrate alertness, agility, responsiveness, resilience, business acumen, and business acumen. Such lessons can also be the first steps a student takes to do small-scale research. Such conference classes give positive results even if they are held in other classes (Shomirzayev, 2019; Burden et al., 2019).

Role staging

It is known that metals are the most widely used materials in life and industry. Therefore, it is advisable to provide students with more information about metals and metal alloys, their physical and mechanical properties, areas of application. It is better if the work is not limited to the teacher's oral presentation, but is done in a more interesting and lively way. For example, this work can be organized in a role-playing way. We will think about this below. This can be done in the following steps:

- Organizational work. First of all, several students are given the types of metals and metal alloys one by one, and they are told, "You will study this type of metal, enter into its image and interpret it." The venue will then be equipped. Samples of metals and their products, various exhibitions about metals are prepared. The order of the outputs is determined by the representation of different metals.
- The main part. One student comes out in the form of a yellow-robed, luminous-looking ore-mine and directs the scene (exercise, scene). On the other side of the stage, a student in the form of an ore approaches the students in the form of various metals standing in a semicircle on one side of the stage. Then he says to the audience - the students: "Hello, my dears!" Do you know anyone who wears and wears these clothes in different colors? What about me? No! - You say? Then let me introduce myself first. I am Ruda, that is, Mine. I live between underground and rock, my age is, uh-ho, a thousand, a million years. I was brought here by

relentless miners. They told me they could put me in a mill and get a lot of useful metals. Eh, let's just say I've been trying to figure it out. They blew up the mountains, loaded me into cars with the help of excavators, and brought me here. So the adventure of these things is long. These are the children and grandchildren you see. With your permission, I will now give them their turn. Let them introduce themselves too.

Then it's dark Cast iron The word begins: - I am a metal that is widely used in industry - Cast iron. You see my color, I'm darker. I am made of iron and carbon alloys. The amount of carbon in me is 2-4 percent. In addition, my body contains substances such as silicon, manganese, phosphorus, sulfur. I am a hard and heavy metal. But I have one drawback. I can't stand the "joke", I'm too fragile. That's why I make things that don't hit me hard. Various heating stoves, basics of countertops, and so on are made by me, as I have already said, don't joke about hitting such items with a hammer, otherwise, I will get angry and scatter.

After that Steel "Hey brother, Choyan, have you forgotten me?" After all, we are from the same family, the dynasty of ferrous metals! (turns to the audience). That is why our composition and character are close. I have up to 2 percent carbon in it. I am very hard like cast iron, but I am not brittle, I bend, I bend, but I do not break immediately (moving). So I can work on hammering and cutting methods. We steel, as our Madan ancestor said, look different. For example, I have friends who have soft, hard, sharp, stainless properties. We make cans, wires, pipes, nails, various tools, cutters, and so on (shows some items from the table). I can brag too. Because we have a lot of good features. For example, our heat resistance is strong, we conduct heat and electricity well, we do not dissolve in acid, and some of us do not even rust. Our ancestor will be iron ore. It is collected and melted in kilns, passed through special molds, and formed into various types of rolled products (shown on the plate). This work is done by miners and degreasers ([Shomirzayev, 2020](#); [Farberman, 2000](#)).

Ruda: You have met a family of ferrous metals. Our second family consists of non-ferrous metals. Now we turn to non-ferrous metals, please! Aluminum: - My name is Aluminum, I am a member of the family of non-ferrous metals. I am white, but due to oxidation in the air, a darker color also covers my face. I'm not that tough. Due to my low density, I can make a lot of things just by pressing and stamping. In particular, I play a key role in the manufacture of electrical wires. In order not to break, they make electric wires by twisting a few fibers, they even surround us with steel fibers. This is also a tribute to us! For the lightness of my weight, I am also used in engineering, shipbuilding, aircraft construction. By adding a little tin and so on to my composition, they make pots, teapots, sandpits, and even internal combustion engines ([Graham, 2011](#); [Butler-Henderson & Crawford, 2020](#)).

Copper-red copper appears on the scene. Mis: "Hey, comrade, you've been praising yourself so much!" I'll make the electricity for you! The tops of electric cars make turtles from me. I have more weight and density than you. That's why I'm also making a lot of rubbed stuff. In ancient times, masters made sandbags and logs from me. Now, comrade, I also have one big flaw. Your optical face is visible in the air, and I can see my crimson face. You can't even eat hot pilaf on a plate made of me, alas! Because my poison will come out!

Bronze:- Don't worry too much, Mis aka. Here we are to help you ring - bronze and brass are always with you. Your little brother brass's technical services are also invaluable. It ensures smooth, smooth movement of friction surfaces. And they make all sorts of badges out of me and brag about wearing them on their chests! White, shiny colored tin blends into the speech. Tin: - Now, dear friends and relatives! I stay pure, real. I am fast dissolving. This is why I use it as a soldering iron in various radio circuits. Here I am bending well (the reader moves the arm, leg, and waist joints). Pay attention to my joints, they squeak when I bend. Only real tin cans make that sound. This is the case with tin that is not mixed with foreign rocks. Don't get me wrong in choosing me, especially don't confuse lead. Because we have a lot in common with lead (lead scratches the throat). Now, brothers! Let's unravel another mystery. If a little is added from me to aluminum, duralumin is added, and when copper is added, a dye-speaking bronze is formed. So, my value, my place is not limited!

The spirit of the conversation is mixed. Spirit: - I also belong to the family of non-ferrous metals. My color is blue-white. The fracture is in the form of shiny white crystals. I don't rust. That's why the surface of steel cans covers me as a means of protection. From me, tin-makers also make household items such as buckets, tubs, speakers, elbows. Ore: - Dear students of science! Here you are introduced to several metals. There are so many types it's hard to say. Huh, do you see those who are that ball? (Shows a circle at one end of the stage. In the center of the circle are students in white and yellow shiny clothes. They are surrounded by students in darker clothes). Inside the circle are rare, precious metals - silver, gold, and platinum. We put guards around because they were so expensive. Otherwise, they may be kidnapped though. It's a joke, of course. This must be understood symbolically ([Koçoğlu, 2009](#); [Archambault & Barnett, 2010](#)).

Now frankly, the profession is also a great science. If you want to make something from these metals, that is, from metal materials, or if you want to use items made from them, you need to know their specific character, that is,

their properties, and act accordingly. Otherwise, your business will not work. You've been introduced to some of these features above. Now I will remind you once again of the basic properties of metals:

- Feature: Hardness. These metals are relative to other solid's resistance.
- Features: Flexibility and elasticity. This is a property of metals to maintain their state after exposure to external forces.
- Features: Plasticity and brittleness. These are the properties of metals that change shape under the influence of external forces, i.e., breakage, cracking, disintegration, crushing, elongation.
- Features: Electrical and thermal conductivity. Therefore, metal objects or rods (e.g., pipes, fittings, etc.) should not be touched on electrical wires, nor should they be cut in the oven. In general, metals have many properties. They are usually called physical, chemical, and mechanical properties. This is the end of today's meeting - our introductory session. Goodbye, dear ones, see you in the workshops! Such role-plays in technology science classes

There is an opportunity to convey this topic to students in a lively, effective, and thorough way. It is also independent of the pupil's or student's performance, and the ability to express one's thoughts freely and comprehensively develops (Ertmer & Ottenbreit-Leftwich, 2013).

Training lesson

The training lesson can be organized as follows to give students an understanding of mechanisms in technology science classes. The teacher begins the lesson with a brainstorming session: "What is the detail?" Students' answers are written on the board and underlined, and general rules are developed: "Integral parts of machines and mechanisms that are not divided into other components are called details."

The teacher then divides the participants into three small groups, the first group "What is a bullet?", The second group "What is a shaft?", And the third group "What is a spindle?". asks them to think for two minutes about the answers to the questions and tell one person from each group. After the students have responded, the teacher provides detailed information about the bullet, shaft, and spindle using a lathe and drawings. Games are held in between to keep students from getting tired and to increase their activity and interest. The teacher throws the ball to the students and asks the meaning of something, and the student has to throw the ball back with an immediate answer. For example, "What is a typical part?", "What is a special part?", "What is a spindle?" and h. At the end of the game, "What is the mechanism?" he asks and picks up the ball left unanswered and starts the next session. The teacher asks the students, "What do you mean by a mechanism?" The answers are written on the board and a generalized description is developed: "Mechanical devices consisting of leading and guiding links and transmitting motion are called mechanisms." Then the second part of the lesson begins. The teacher divides the participants into two groups and asks, "What do you mean by a car?" And "What are the parts of a car?" asks them to find answers to questions such as (Shomirzayev & Karimov, 2020).

When the groups are ready, the answers are discussed and the teacher corrects the mistakes made by the students, makes additions, and concludes the lesson. Students who actively participated during the lesson will be evaluated at the end of the lesson. The group with the most correct answers to the questions is the winner. During the lesson, we will use a special symbol to identify the winning team. Specially prepared marks were given to the groups and are the marks collected at the end of the lesson, based on which points are given. It is also important to note here that when students work in small groups, the teacher should guide them and help them correct their mistakes (Shomirzaev, 2020; Weller et al., 2005).

Auction lesson

One of the most convenient ways to increase the effectiveness of technology education is an auction lesson. One of the lessons in the auction lesson series is to organize and conduct a staged lesson on the use of trade in the market. The students selected for this course are divided into 3-4 groups and assigned tasks and responsibilities related to each of these groups, i.e., management, deputy, and supervisor are appointed. Under the leadership of these "responsible people", the groups try to fill their stalls, advertise their products, and sell them. For example, the first group may be embroiderers, the second group may be seamstresses, and the third group may be carpenters.

Various items are placed on the shelves. In this case, the students of the embroidery group presented their embroidery, handkerchiefs, doppi, and products decorated with various patterns; sewing group students make a variety of soft toys, dresses, and skirts for dolls, tablecloths, and towels; carpenter students can sell toys of various

shapes, household items: decorative vases, pencils, chopping boards, and jugs. To sell their products, they must first advertise their products and invite a buyer. When advertising, students can use a variety of posters and product samples (Avidov-Ungar & Forkosh-Baruch, 2018). Groups can also visit or issue promotional papers if needed. Not only students but also teachers can be directly involved in purchasing products. Assessing students' performance takes into account how many products they have produced, their ability to advertise and sell products, as well as students' interactions with customers. It is possible to organize another such method of sales among high school students. That is, in which sellers wrap the purchased product or add sugar to those who buy more, they can also add things like chewing gum, balls. In lessons like the above, students have the opportunity to develop initial skills in market relations by introducing them to market activities (Shomirzaev, 2019; Conole et al., 2008).

Conclusion

In short, the effectiveness of the teacher's work in the educational process largely depends on the activity of students. To do this, the teacher must look for innovations, show examples of initiative and creativity. The methods proposed above serve to improve technology science lessons, teach students to perform practical work independently and creatively, and form and develop relevant work skills.

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