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DEVELOPMENT OF DIDACTIC HANDOUT MATERIALS BASED ON INNOVATIVE TECHNOLOGIES IN TEACHING THE SCIENCE OF TECHNOLOGY OF WORKING WITH METALS AND NON-METALS

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ABSTRACT

The article presents ideas about the development of didactic handouts based on innovative technologies in teaching the subject of metal and non-metal working technology, the stages of developing didactic handouts based on innovative technologies, its importance, and a bank of cases.

KEYWORDS: *Education, Teaching, Training, Didactic Handouts, Innovative Technologies, Case Bank, Practical Skills.*

The Strategy of Actions for the Further Development of the Republic of Uzbekistan pays great attention to further improving the continuing education system, increasing the availability of quality educational services, continuing the policy of training highly qualified personnel in line with the opportunities of the labor market, improving the quality and efficiency of education in higher educational institutions, and training highly qualified, creative and independent decision-makers, who can master techniques and technologies and quickly adapt to innovations.

Currently, the subject "Technology of processing metal and non-metal products" aims to provide students with knowledge, skills and qualifications in woodworking, manufacturing technology, planing, drilling, turning, milling, machining on machine tools, control, measuring and planning tools, hand tools, as well as thin-walled processing and high-quality product manufacturing technology. [2, 48b]

The use of innovative technologies in the modern educational process is considered one of the important factors in increasing the effectiveness of education, and didactic handouts play an important role, especially in teaching technical subjects. The development of didactic handouts serves to increase the effectiveness of the educational process. These materials are an important tool for consolidating students' knowledge, making the lesson process interactive and interesting, and expanding opportunities for independent learning. In teaching the subject of technology of working with metals and non-metals, it is possible to consolidate students' knowledge, improve their practical skills, and make the educational process interactive with the help of didactic materials based on innovative technologies.

1. The importance of didactic materials in teaching the subject of metal and non-metal working technology The subject of metal and non-metal working technology is considered important in various industries, and through this subject, students learn metals and their properties, processing methods, and technological processes. Innovative didactic materials provide the following advantages:
2. **Combining theoretical and practical knowledge -** reinforcing concepts through visual and interactive materials.
3. **Increasing student engagement** – making lessons interesting through didactic materials.
4. **Simplifying the learning process -** making complex technological processes simple and understandable.

Stages of developing didactic handouts based on innovative technologies. The following stages are carried out when creating innovative didactic materials:

1. **Student learning -** identifying which topics are in misunderstanding during the lesson.
2. **Material design –** developing visual, interactive, digital and print materials.
3. **Testing -** checking the effectiveness of the created didactic materials.
3. **Improvement and implementation -** updating materials and integrating them into the learning process based on feedback from students and teachers.

Innovative didactic materials used in teaching the science of metal and non-metal working technology

1. **Interactive electronic textbooks -** creating visual textbooks and animations in electronic form.
2. **3D modeling and simulations -** demonstrating metal and wood processing processes in a virtual environment.
3. **Virtual labs** – opportunities to interactively test metallurgical and processing processes.
4. **Video tutorials and online resources -** preparing lessons with animations and real-life examples explaining technological processes.
5. **Printed and interactive test materials –** creating didactic tests to test and reinforce student knowledge.

Advantages of using innovative Didactic Materials

• **Increasing students' interest in science -** making the learning process interesting through interactivity.

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• **Better understanding of technological processes -** connecting theory with real life using visual and practical materials.
• **Increasing the effectiveness of the learning process -** consolidating knowledge based on concrete information and examples.
• **The possibility of independent learning -** students can self-teach using didactic materials.

Didactic materials based on modern pedagogical approaches require the use of visualization, graphics, diagrams, tables, and interactive elements. They are also adaptable to different learning levels, ensuring an individual approach to each student.

When developing didactic handouts, their relevance to the curriculum, clarity and clarity of expression, and practical application should be taken into account. The use of digital technologies can make these materials more accessible and effective.[1,2, 34, 78b]
In general, the development of high-quality and effective didactic materials, while improving the educational process, increases students' interest in learning activities and helps develop their independent thinking skills.

The following didactic handouts were developed based on innovative technologies in teaching the subject of technology of working with metals and non-metals.Case Bank

Case 1: Woodworking
Situation: A furniture manufacturing workshop plans to create environmentally friendly and durable wood products for customers.
• **Questions**
1. What processing technologies should be used to improve the quality of wood products?
2. What types of wood should be used to obtain quality products?
3. How can wood be protected from moisture and harmful factors?

Case 2: Metal Cutting Process
Situation: A new method is planned to be introduced in the factory to increase production efficiency in the process of cutting metal sheets.
• **Questions**
1. What modern methods of metal cutting are available?
2. What are the differences between traditional and modern methods?
3. What criteria should be considered to select the most effective and economical method? [4, 58b]
These case assignments will help students consolidate their knowledge of analyzing practical situations and finding solutions.

Case 3: The process of Manufacturing Wooden Products
Situation: A furniture manufacturer plans to create environmentally friendly and durable wooden products for its customers.
• **Questions**
1. What processing technologies should be used to improve the quality of wooden products?
2. What types of wood should be used to obtain quality products?
3. How can wood be protected from moisture and harmful factors?

Case 4: Reducing waste in Wood Processing
Situation: A wood products manufacturing plant is looking for ways to reduce waste in the production process and use it more efficiently.
• **Questions**
1. What technologies can be used to reduce wood waste?
2. What new products can be produced from recycled wood?
3. What are the ways to increase the efficiency of the enterprise by recycling waste?

Conclusion The use of didactic materials developed on the basis of innovative technologies in teaching the subject of metal and non-metal working technology is of great importance in the modern education system. This not only helps to consolidate the theoretical knowledge of students, but also serves to develop their practical skills.

REFERENCES

1. *Olimov K.T. and others. Methods of teaching specialized subjects. Teaching manual. Tashkent, "Fan" - 2009. 172 p.*
2. *Rasulova Z.D., Sh.H.Kuliyeva, A.R. Jo'rayev "Methodology of teaching the science of technology". Textbook B.: Durdona Publishing House, 2021. - 384 p.*
3. *Olimov K.T., F.H.Gaffarov D.A. Sayfullayeva, A.Yu. Isakov, O.E. Azizov. Innovative educational technologies. Textbook. LESSON PRESS LLC Publishing House 2021. - 67 p.*
4. *Sayfullayeva D.A. Methods of teaching specialized subjects using innovative pedagogical technologies. Monograph. Bukhara Regional Printing House. 2020. -56 p*
5. *Mirboboyev V.A. "Technology of structural materials". - T.: "U'zbekiston", - 2004.*
6. *Usmonov K.V. "Fundamentals of metal cutting". - T.: "O'qituvati". - 2004.*
7. *Sayfullaeva D.A, Safarov A.A. Methodology of conducting and conducting practical training in specialized disciplines. "Pedagogical skills" scientific-theoretical and methodological journal. Bukhara. 2025. No. 2.114-p.*
8. *Sayfullaeva D.A, Safarov A.A. Practical training as a component of technological education. "Prospects of development of science and education" 2024.- 30 p.*