THE IMPORTANCE OF USING MODERN ACHIEVEMENTS OF TECHNIQUES AND TECHNOLOGIES IN THE EDUCATIONAL PROCESS

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Annotation. The socio-economic and technological changes brought about by modern technology necessitate reflection in both the professional and general school education fields. With the advancement of science and technology as well as the emergence of new technologies, the content of technological education is updated. The processes of modernization of the content and technologies of education are especially acute in the subject area of technology, which is the basis for the formation of a technological culture of school graduates and their successful completion of further professional training. The demand for technological education is currently high. In a world that is constantly changing, it is possible to find the best paths for social development because of this.

The article's goal- is to argue for the necessity of changing the subject matter and method of technological education in light of the emergence of a new technological order in society, a shift in the nature of work, and the development of fundamental production technologies.

Techniques and methodology. The idea that evolving technological structures and distinct organizational cultures determine the patterns of multidirectional cardinal changes in society as a whole and in a person's life served as the methodological foundation for the study. The author's methods for working included an analysis of the state of the technological education system at the time, formulation and conceptualization of the issue of modernizing technological education for schoolchildren, an expert survey, and generalization.

Results and novel scientific findings. It is proven that updating the subject matter and delivery methods of technological education is essential and inevitable because it affects how well students will prepare for their careers in the future in light of the shifting demands of the labour market. It also ensures that the nation's economy will remain competitive on a global scale as a result of the socioeconomic and technological development of the world. In response to a shift in technological structures (industrial revolutions), patterns of changes in technological preparation are described. The core of technological training's subject matter and delivery methods that address contemporary issues are made clear. There are suggested actions for putting this training into practice.

Relevance in practise. Researchers who study the technological education of students as well as writers and concept developers can use the materials from this article to update the subject's educational technologies and content.

Key words: technological education, basic technology, organizational culture types, change in technological structures, and technological education methods.

Introduction

The world's social production has dramatically increased at the start of the 21st century, and new, advanced, science-intensive, resource-saving, and energy-efficient technologies have been developed. Human talent, creativity, and initiative are the most crucial resources for economic and social development in an economy that is actively growing its innovation sector-an economy built on the application of new knowledge. The importance of labor education as the transmission of knowledge from one generation to the next is waning.

In general education schools, a large portion of the knowledge students learn becomes outdated before it is applied. In education, the emergence of creative aptitudes, the development of abilities to learn, comprehend, and develop new things, come to the fore.

As of now, the subject area "Technology" serves as the primary mechanism for integrating entrepreneurial and humanitarian knowledge into the process of subject-practical and project-technical activities. It also reveals the ways in which these knowledges can be applied in a variety of human endeavours and offers a pragmatic orientation to general education [1, 2].

Economic and socio-political processes are significantly impacted by the technological development of society. The fundamental technologies and means of production change when a new technological formation emerges. At this point, we're discussing the high-tech economy's outpacing growth, the shift to "unmanned" production, the redistribution of human resources from the industrial sector to the design sector, and the design of new materials and products with the accompanying "erosion" of professions and professional fields of activity.

In the course of the development of the next technological education, the previous generations of machinery and equipment are pushed aside, the infrastructure of production undergoes a fundamental transformation, technological production schemes are updated, target orientation in innovative activity changes, and a new set of values emerges that govern the future growth of the economy and of production.

Today's schoolchildren must receive a technological education that satisfies the needs of the economy and production in order to develop a personality (Fig. 1) that is prepared to live and work in qualitatively new conditions. This requires more than just the ability to operate equipment and technologies that are constantly improving; it also necessitates the ability to handle a variety of new production tasks, including design, engineering, technological, managerial, and entrepreneurial tasks; it follows that this means that.

Fig.1. Technological theory, cycles, practical application.

The content of technological education in schools has not significantly changed in the meantime, despite the revision and implementation of several educational standards and programmes of general education; it is still carried out in accordance with the requirements and realities of the economy and production of previous technological modes.

In light of the significantly increased demands for the level of technological culture of the individual, which are based on concepts about advanced production technologies, the main challenge in the development of technological education for schoolchildren is to find its adequate content and means that meet the challenges of the new technological order. Technological mode: a group of related industries with a single, synchronously developing technical level. The uneven pace of scientific and technological advancement is predetermined by the alteration in the economic technological structures (Fig. 2).

Fig.2. Technological theory, cycles, practical application. Literature review

In the content of technological education of schoolchildren, based on the listed components, four areas were identified:

- technical work;
- maintenance work;
- agricultural labor;
- drawing.

The culture of the home, the family economy, the fundamentals of entrepreneurship, and the method of projects (design) were and still are frequently studied modules for the subject area "Technology" [5, 6].

The requirements of labour protection, the fundamentals of materials science, the fundamentals of mechanical engineering, the operational mastery of technology, the manufacture of labour objects, the implementation of complex projects, and the fundamentals of production in this industry have historically developed along with the logic of mastering the technology of processing a particular material.

The formation of practical skills was reflected in the constructure and technological, and later in the project and technological system of practical training, in which the emphasis was on solving designing, technological and project research problems in the process of manufacturing objects of labor.

Due to the lack of adequate logistics, the curricula's emphasis on an in-depth study of traditional types of materials, and the integration of educational material into the content of training and existing textbooks, updating the content of technological education by expanding

the types of processed materials, the range of technologies studied, and modern model equipment has recently been virtually impossible. The implementation of educational and creative projects that involve a comprehensive solution to the problem and the creation of a tangible product based on knowledge from various scientific fields was the only novel element of the content of technological education.

As a part of domestic general education, technological education enables the integration of students' productive experience in a variety of activities, primarily design and engineering, revealing creative resources, developing their technological culture, and developing personal qualities that enable them to successfully solve both conventional and non-conventional technological problems.

The development of a student's creative skills is a fundamental process that combines the potential of technological education, labour education, professional self-determination in technological education, and enables the student to become the subject of creative self-development in the technological field (Fig. 3) [7].

The critical years, when the next technological order is established, the means of production are changed, and new basic technologies are spread and mastered, affecting all sectors of the economy and the developing infrastructure, are characterised by:

- revision of the place of the subject area of labor training in the structure of general education;
- updating the subject content of training;
- increase in the number of hours allocated for the study of the subject area;
- updating the methodological and logistical support of the scientific process [8].

Fig.3. School of the future: how technologies affect the educational process.

These measures are linked to a reevaluation of the importance of specific sectors of the economy, a shift in priority areas for the development of production technologies, the emergence of new professions, and/or changes in the requirements for professional activity and training. Sections on microelectronics, energy processing, and promising energy areas are included in programmes for the subject "Technology" in foreign countries such as the United Kingdom, Germany, and Israel, among others.

The modern domestic school aims to develop studjnts' engineering thinking and technical abilities through the mastery of universal activities such as design, engineering, and research by schoolchildren.

At this point in society's development, when it is transitioning to a post-industrial way of life, there is a need to justify changes in the content and means of technological education.

Materials and methods

Our study's methodological foundation was the concept of changing technological patterns in society and the concept of changing types of organisational culture [9], which determine the nature of a person's labour activity, as well as the means and technologies he employs at various historical stages of society's development.

The analysis of the current state of the system of technological education of schoolchildren was used in the process of solving research problems; methods of setting and conceptualising the problem of modernization of this area of education; expert survey; generalisation of the data obtained on its basis; and, in general, the study results.

Research results

The development of a new modernization of the content and teaching technologies of the subject area "Technology" facilitated the actualization of the problem of finding the optimal content and means of technological education, reflecting the requirements of the new technological order [10].

- schoolchildren's low level of technological training, which is reflected in the effectiveness of their professional training in colleges and universities.

- presentation of new requirements from modern society and employers for individual literacy and competence;

- the subject "Technology" has a low status in school and society [11, 12].

The content of technological education should be viewed through the lens of the formation of an individual's work experience, which should be based on the integration of scientific knowledge of natural and human sciences, computer science, mathematics, and art through:

- mastery of universal activities (design, research, management);

- solving production and technological problems in specially equipped educational laboratories and workshops, real production conditions

The process of students mastering work experience lies in the plane of the formation of a design and technological culture, which in the historical context is a modern type of organisational culture, four types of societal organisational culture are substantiated:

1) traditional;

2) corporate craft;

3) professional (scientific);

4) design and technological [13, 14].

These cultures are directly related to labour and production processes at a specific point in the evolution of techniques, technology, scientific knowledge, and social relations.

Both the reflection in the content of the relevant subject area of the design-technological organisational culture and modern technologies, as well as the process of "passing" the student through all types of organisational culture, are important for the technological education of schoolchildren. They exist not only in traditional technologies used by people, but also in activities that allow the development of fine motor skills, coordination, applied skills in the use of manual and electrified tools, the formation of a work culture, and the personal qualities of students.

It is difficult to determine an exact and complete list of materials, the most common objects of engineering and technology, which should be included in the content of technological education in today's conditions of scientific, technological, and industrial development. On the one hand, the structure of the technological process can serve as a determinant, which students can consider and master by using any material processing technology or any complex technology as an example. The majority of schoolchildren, however, will be denied opportunities for professional orientation in various industries (areas) of production and mastery of various operations and technologies, including familiarity with the technical and technological base that has developed to date and the prospects for its improvement.

The educational content should be formed based on the need for students to master meta-subject competencies and to acquire the skills and abilities of the main types of activities associated with the implementation of design, research, and management. In this case, a rich and interactive technological environment that allows students to conduct research, design, experiment, and carry out various projects becomes a necessary condition for learning.

In global practise, there are seven major approaches to developing technological education content.

Its focus is on
1) craft skills;
2) production;
3) design;
4) high technologies;
5) improving scientific knowledge quality through technology;
6) key competencies; and
7) engineering concepts [15, 16].

Today's technological education content should allow for the non-linear use of textbook materials and the free design of educational (working) programmes based on the technologies, modules, and areas of technological education being studied.

The modernization of the content and technologies of teaching the subject area "Technology" identified five major areas of technological training for schoolchildren.

The following factors can influence the selection of technological education content:

- metatheoretical, ontological, theoretical, model-projective, and practical knowledge, as well as the laws of development of technical and technological sciences [17, 18];

- universal types of activity inherent in any type of professional activity:

- design, building, research, and management.

The following fundamental concepts were discovered while conducting experiments: materials, energy, information, techniques, technology, design, research, organisation and management, relationships, economics and ecology, past and future technology, innovative creativity and invention. These fundamental concepts allow curricula developers and authors of textbooks and educational kits on technology to freely design the content of educational material while applying different logic for presenting the content of technological education, for example, on the basis of "interlines," according to enlarged didactic units, by types of students' activities, by meta-subject and subject results of education, and so on.

The structure of tasks solved by students in the process of subject-practical and design-technological activities can reflect universal activities in the content of technological

education. We're talking about tasks like design, engineering, technology, research, management, and entrepreneurship [19, 20].

The means of technological education, which include information, material and technical assets, pedagogical and other assets, as well as a set of conditions for the effective implementation of technological education content, must also be updated - brought in line with the key outcomes of technological education, which are the formation of a design and technological culture among students.

The main requirements for the development and selection of technology education means are:

- adequacy to the goals and main directions of the content of technological education;

- compliance with the age characteristics of students, including anthropometric, physiological, sanitary and hygienic, psychological and pedagogical, etc.;

- providing opportunities for the implementation of project and research activities of students in technology lessons and in extracurricular activities;

- formation of skills in the field of planning, research, constructing, management, etc.;

- providing opportunities for organizing work with talented students; - holding competitions of scientific and technical creativity and invention;

- development of design and engineering thinking, entrepreneurial personality traits;

- focus on the development of the content of technological education in the field of application of modern materials and operation of equipment, the use of high and promising technologies, the organization of continuous practical training at the level of the formation of professional competencies.

From our perspective, the following actions are required to effectively implement technological education for schoolchildren:

- development of technological education in the system of general education, including a roadmap for introducing the concept into the activities of educational organizations;

- making appropriate changes to primary general, basic general and secondary general education, exemplary basic general education programs of primary general and basic general education;

- ensuring the development and testing of basic and optional programs for students in all academic subjects, modules and courses of technological training, including extracurricular activities programs and technological practice programs;

- ensuring the development, public and professional examination and testing of new technologies in all academic subjects, as well as the most popular variable modules of technological training, including the development of the main textbook, variable workbooks and teaching aids for teachers in all areas of technological training, with the involvement of digital and multimedia resources;

- development and implementation of continuing education programs reflecting the modern content of education for technology teachers and educators involved in the implementation of technological training for students;

- provision of material and technical equipment for technological education in all academic subjects and modules, taking regional specifics and areas of technological training into account;

- creation of regulatory and organisational conditions that provide a broader range of opportunities for social partnership of educational institutions with enterprises and organisations, including:

- attraction of productio

- monitoring the quality of technological education through the following indicators:

- implementation of variable content in the subject area "Technology";

- development and development of additional education programmes in the technical and technological direction;

- attracting schoolchildren to participate in competitive and olympiad movements, etc.

The means of technological education, as a set of necessary objects, requirements, and actions for putting the new content of technological education into practise, must correspond to the state of modern high-tech production - the environment in which a person performs real-world practical activities.

Discussion and conclusion

Changing the content and methods of technological education as society transitions to a new technological order is an ongoing and unavoidable process. It determines the quality of future professional training of students in accordance with changing labour market requirements, the latest achievements in the field of engineering and technology, and serves as a guarantee of the country's economic competitiveness on a global scale of socio-economic and technological development of world production.

The content and methods of technological training in a general education school identified and described by us as a result of the study are aimed at achieving the main goal - the formation of a design and technological culture among students. Regardless of the chosen field of professional activity, school graduates should be prepared to live and work in a high-tech environment, realise their personal potential, and gain work experience.

To incorporate new technological training content into educational standards and general education programmes, first develop criteria for selecting such content and describe the principles, procedures, and logic for constructing educational material based on fundamental concepts and the sequence of mastering universal activities by students. Second, the means of implementing technological training must be chosen and identified as the most effective. Third, guidelines for teachers on the use of modern methods and technologies in the classroom and extracurricular activities of students are required.

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