FORMING THE TECHNOLOGICAL COMPETENCIES OF 8-9TH GRADE STUDENTS AND THE CHALLENGES FACED IN THIS PROCESS

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Abstract*. This article addresses the emergence of new meanings in the global education system through the discipline of technology, the process of organizing technology lessons within the general education system based on competency-oriented approaches, the requirements imposed on it, the challenges encountered in activities aimed at shaping students' technological competencies in technology classes, and their solutions.*

Keywords*: society, technology, competence, modern production, education system, effectiveness, profitability, motivation, transformational activity, industry, method, issue, quality, result.*

The beginning of the formation of a new technological society at the end of the 20th century marked the beginning where technological knowledge and skills started to play a distinct role. The emergence of a new educational direction "Technology" in the curricula of schools in many developed countries of the world brought forth new challenges not only for future engineers and technicians but also for future bankers, doctors, actors, and other specialists. However, the return of vocational education and career guidance to life, not through a mechanical repetition of forms and methods of the second half of the 20th century, but through the implementation of solutions based on competencies outlined in educational documents, indicates the necessity of moving towards a method that aligns with the requirements of modern times. The modern education system responds to this situation by seeking new strategies and effective solutions. Such a broad-based educational approach points to a new task in terms of quality — preparing individuals who are fit for the demands and opportunities of the modern era. In today's society, traditional knowledge, skills, and capabilities alone are not sufficient for human success and goal achievement. It requires not only professional knowledge, skills, and abilities, but also practical experience, social competence, self-education skills, and a range of other complex qualities brought together. Starting from elementary education and extending to higher education, various areas of educational system activity are aimed at shaping a "versatile" individual. Modernizing education has led competence-based approaches to be at the core of educational development nowadays in a positive way. In its turn, the educational direction "Technology" in the general education system sheds light on the complex of technological knowledge and skills, labor, citizenship, and patriotism characteristics inherent to the individual, necessary for shaping their technological competence, productivity, global outlook, and civility.

Analyzing the above, we can conclude that complexity arises when looking at the concepts of competency regarding "knowledge, skills, and abilities." Various issues, including complex real-life problems, find their expression in certain situations and demand the application of knowledge, experience, and even personal initiative. Today, schools worldwide are captivating students with interests in robotics, modeling, engineering, programming, 3D design, and other

innovations. Testing these interests in practice requires the acquisition and development of complex knowledge, skills, and competencies. In this regard, not only understanding and acquiring these but also conducting research and showing initiative are required. Throughout the research process, it became evident that there are limitations in shaping students' technological competencies in school activities. Particularly, rural school students lack sufficient content in labor education tailored to current requirements, accounting for individual characteristics and interests of students, and enhancing labor education with regional and national unique features. The overall organization tends to focus on shaping technological competencies among school students inadequately meeting modern demands. The inadequacy of the material-technical base of technological education and upbringing, as well as the lack of necessity for labor skills among students, are noticeable consequences of these shortcomings. Teaching the subject of Technology to students by instructing methods of work based on technology with natural, metal, and non-metal materials, aimed at enhancing technical creativity, abilities, and critical thinking, further strengthens vocational orientation. It focuses on fundamentals of craftsmanship, production, and innovation, electrical work, electronic basics, project development technology, imparting knowledge, skills, and attitudes related to vocational skills in daily life. Teaching this subject specifically directs attention to the development of students' technical creative abilities and innovative thinking. This process is the cornerstone of shaping technological competencies. Developing and enhancing such competencies requires a comprehensive methodological approach from the teacher. Experience shows that technological competency is not just an isolated competency but encompasses elements of other competencies. Often, in many cases, competencies formed within the field of "Technology" education were mentioned as competence shaped within technological education. Describing technological competence involves the effective utilization of knowledge, skills, and attitudes in the preparation of products (production) under clear conditions, considering technological practices, technical safety regulations, and labor protection requirements, demonstrating the ability to effectively use their knowledge, skills, and attitudes. When developing technological competencies in lower grades, particularly starting from 8th to 9th grade, it leads to the enhancement of identified technological competencies among students.

Generally, Technological Competence is the acquisition of knowledge, skills, and attitudes related to a specific profession, enabling individuals to use modern tools, equipment, and technologies effectively. In the process of developing technological competence, students study various tools, schematics, design and apply them in everyday life, perform practical tasks logically and consistently, assess their abilities correctly, organize their activities in a disciplined manner, and use available resources effectively in achieving solutions to problems. Graduates of general secondary schools specializing in Technology play a crucial role in the further development of all branches of the industry, being the "driving force" in the production of high-value competitive industrial products. Recruiting such personnel highlights the significant importance of scientific and methodological aspects of technology education. Competence-based lesson planning in the learning process indicates that teachers need to have high proficiency and adopt new methods and tools to develop additional or subject-specific competencies in students. In lessons aimed at developing technological competencies in grades 8-9, the educational process should be organized based on the following requirements: reflecting the latest advances in the subject matter; teaching topics in a simple and clear, easily understandable and accessible language, adhering fully to the rules of the Uzbek literary language; applying logical consistency and precision; having clear

statements of questions and assignments; using pedagogical technologies in teaching students to think, write, illustrate, draw diagrams, calculations, perform practical tasks, and conduct experiments; integrating texts and illustrations related to vocational orientation, expanding technical creativity and logical thinking through project development and modeling assignments. Additionally, the effectiveness, profitability, ergonomics, and high motivation elements of technological competence will gradually develop in students.

Conclusion

In the context outlined above, the methodology for identifying and developing the technological competencies of 8th-9th grade students has been refined based on the Active Learning and Lateral Thinking methodologies, tailored to the requirements of the DTC (Didactic Methodological Complex). General secondary schools have finalized the individual developmental training package by incorporating these methodologies into the teaching process, focusing on adapting lesson activities and individual learning trajectories to enhance technological competencies in 8th-9th grade students. The organizational structural model for developing technological competencies has been customized to differentiate lesson activities and trajectories to individualize student learning experiences. The levels of maturity of technological competencies in students (knowledge, practical-operational, innovative) and the components of identification (analysis, survey, assignment) and functions have been determined through integrated alignment. The practical importance of our explorations lies in the fact that the organizational structural model and algorithmic map for identifying and developing technological competencies in 8th-9th grade students in general secondary schools have been developed, along with the creation of a website for the "Technology" subject, integration with software and open educational resources, and their positive impact on the general performance indicator in educational institutions. In general, the readiness of each teacher to prepare the educational process with high quality and innovative methods and technologies for nurturing intellectually capable generations contributing to society is emphasized. In our technological era, nurturing a generation with profound knowledge of science and technology, equipped to use advanced techniques and technologies in production, becomes a relevant topic; therefore, the importance of the Technology subject is invaluable. At this point, it is essential for us to remember the prominent status and significance of the Technology subject, perceived as a secondary subject in the past, but recognized today as a leading field with high importance and relevance.

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