

Production literacy future technology teachers

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Abstract. *The problem of professional self-determination of students after graduating from a general secondary education institution in Ukraine is characterized. The essence of the inefficiency of the polytechnic approach and the generally accepted content of technical and technological literacy of future technology teachers regarding professional self-determination is revealed. The concept of "workplace" is proposed as the smallest element of schoolchildren's production literacy. It is proposed to form production literacy on the basis of educational material on the organization of the production process in the factory shop and the use of a predominantly figurative component of technical thinking.*

Keywords: *professional self-determination of high school students, technology teacher, production organization, workplace, factory shop, shop plan.*

Self-determination of graduates of secondary education institutions regarding future work in production is an old and still unresolved problem. The last century with its industrialization and urbanization actually passed in Ukraine under the banner of unprestigious work at the factory and factory for the youth of that time. The introduction of a labor polytechnic secondary school practically did not fulfill a career guidance function. The fact is that the cell of polytechnicism was a technological operation as a separate action of the technological process of manufacturing finished products [7]. As a result, school graduates were aimed at forming in them craft skills limited by the narrow framework of technological operations for processing metals, wood and obtaining sewing products using a lock stitch. Later, the sporadic patronage of individual industrial enterprises over labor polytechnic secondary schools also did not contribute to the formation of graduates' conviction in the expediency of work in production. Soviet propaganda was also powerless, because the bulk of the youth of the second half of the 20th century already understood its manipulative function. Instead, social factors became decisive in terms of industrial self-determination, in particular, the migration of young people from villages to cities, which was accompanied by significant difficulties in their full and rapid integration into urban life and a relatively large number of students with low academic performance, mainly due to single-parent families, bad habits of parents and low material well-being of such

families, etc. In industrially developed countries, the issue of professional self-determination of secondary school graduates was solved mainly by continuously introducing innovations into production processes, due to which the working conditions of workers changed radically, and its content increasingly contained more mental operations, rather than purely physical actions as before. For example, in the logging industry, the mechanization of felling trees using chainsaws began in the first half of the 20th century, and in the second half of the 20th century, the mechanization of felling trees began, and from the mid-1970s, the use of multi-operation machines (forest harvesters and machine systems) - harvesters and forwarders - began. In Ukraine, until now, only chainsaws have been used to fell trees. Of course, the conditions and content of labor of workers at the plant and factory have changed even more radically due to the automation and robotization of production processes.

In the USA, studies were conducted on the formation of technological literacy in schoolchildren, however, depending on the context, technological literacy was often replaced by technical literacy [1]. Later, such studies were also conducted in Ukraine, and in our country, the concepts of technological literacy and the concept of technical literacy of schoolchildren were clearly separated. The basis of technological literacy was the concept of technology, and the basis of technical literacy was either technical thinking or a generalized structural-functional concept of a machine [2; 3; 6]. However, both technological literacy and technical literacy did not at all characterize the real conditions of the labor process in factory workshops for schoolchildren and actually served as a diagnostic tool for the inclination of high school students to understand the future activities of an engineer. Students could not self-determine what they did not see and did not understand, because they lacked literacy in the organization of production processes.

As a basis for selecting the content of educational material during the formation of production literacy of future technology teachers, we offer the concept of "workplace" and the structure of technical thinking. To characterize the workplace, neither engineering literacy of schoolchildren nor technological literacy is required. With this approach, it is necessary to have a relatively small in content and structure array of educational material on the basics of organizing the production process. It is known that the structure of technical thinking is mainly as follows: technical knowledge; technical images; technical skills and the ability to read drawings [2; 4; 5]. To form the production literacy of future teachers, the skills to read drawings of the plan of a factory shop and determine methods of organizing production and types of production based on it are necessary. The production literacy of future technology teachers formed on the basis of knowledge about the organization of production and the ability to read factory shop plans will be used in their professional activities. Then

a high school student with the formed foundations of production literacy will have an idea of the working conditions of workers in the factory shop. During a tour of the factory shop, he will be able to understand with minimal external assistance what is happening there. Thus, the ability of a high school student to understand and evaluate working conditions at workplaces, as well as to obtain a general idea of the production process in the shop, will be the basis for making a decision about professional self-determination after graduating from a general secondary education institution.

Further research will be related to determining the criteria and indicators of industrial literacy of future technology teachers and developing a model for the formation of industrial literacy in the process of professional training of future technology teachers.

References

1. Barak, M., Ginzburg, T., & Erduran, S. (2024). Nature of Engineering. *Science & Education*, 33, 679–697. <https://doi.org/10.1007/s11191-022-00402-7> [in English]
2. Ivanchuk A. V., Marushchak O. V., Krasyl'nykova I. V. (2025). Tekhnichne myslennia maibutnikh uchyteliv tekhnolohii [Technical thinking of future technology teachers]. *Naukovi zapysky. Seriya: Pedahohichni nauky*, (217), 137–141. <https://doi.org/10.36550/2415-7988-2025-1-217-137-141> [in Ukrainian]
3. Ivanchuk, A., Zuziak, T., Marushchak, O., Matviichuk, A., & Solovei, V. (2021). Training pre-service technology teachers to develop schoolchildren's technical literacy. *Problems of Education in the 21st Century*, 79(4), 554–567. <https://doi.org/10.33225/pec/21.79.554> [in English]
4. Kurok, V. P. (2015). Inzhenerna pidhotovka uchyteliv trudovoho navchannia u VNZ: realii ta perspektyvy [Engineering training of labor training teachers in universities: realities and prospects]. *Pedahohichni dyskurs*. (18). 114–118. URL: <https://ojs.kgpa.km.ua/index.php/peddiscourse/article/view/265> [in Ukrainian].
5. Nehovskyi, I. V. (2010). Formuvannia zahalnotekhnichnykh znan u protsesi profesiinoi pidhotovky maibutnikh uchyteliv tekhnolohii [Formation of general technical knowledge in the process of professional training of future technology teachers] (Dys. kand. ped. nauk, Natsionalnyi universytet bioresursiv i pryrodokorystuvannia Ukrainy). Kyiv [in Ukrainian].
6. Pleasants, J., Krutka, D. G., & Nichols, T. P. (2023). What relationships do we want with technology? Toward technoskepticism in schools. *Harvard Educational Review*, 93(4), 486–515. <https://doi.org/10.17763/1943-5045-93.4.486> [in English]
7. Yurzhenko, V. V. (2018). Osnovy tekhniky, tekhnolohii ta ekonomiky vyrobnytstva [Fundamentals of engineering, technology and economics of production]. Vydavnytstvo Dombrovskyi Ya. M. [in Ukrainian].