

DOI <https://doi.org/10.30525/978-9934-26-146-6-26>

**DESIGN THINKING TECHNOLOGY
AS A TOOL FOR PREPARING FUTURE PRIMARY SCHOOL
TEACHERS FOR INNOVATION**

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Intensive development of technologies, significant growth of information, globalization and integrative processes in the world have led to the formation of a new digital landscape, which educates the current generation of students. The constant and stable interaction of students with digital devices has influenced the approaches to the organization of the educational process, in particular, how students of general secondary education perceive, analyze and use information. This encourages the education system to reorient the content and approaches to learning, taking into account the challenges and needs that, in turn, must find their place in the transformation of each level of Ukrainian education, including higher education.

Accordingly, there are new requests and requirements for the professional profile of primary school teachers. The Concept of Implementation of the State Policy in the Sphere of Reforming General Secondary Education «New Ukrainian School» states: «... It is worth talking about the new role of the teacher – not as the only mentor and source of knowledge, but as a coach, facilitator, tutor, moderator in the individual educational trajectory of the child» [2, p. 16]. To implement these functions, it is important not only to own and reproduce existing innovations in the educational environment, but teachers need to foster ability to independently create innovative products that would contribute to the effective solution of modern educational problems. Hence, such need appears already at the stage of training future teachers, in particular, primary school teachers, to form their readiness to carry out such

activities that would be the basis for independent innovative search in further professional activities. Various pedagogical technologies, in particular, «design-thinking» technology, are used to prepare future primary school teachers for innovative activities.

O. Babakina, V. Bondar, L. Vashchenko, I. Gavrish, I. Dychkivska, O. Dubasenyuk, Y. Zavalevsky, G. Ponomareva, I. Repko, V. **consider the problems of preparation of future teachers for innovative activity in their scientific works.** Slastyonin, I. Kholkovska; **The use of design thinking tools in the preparation of specialists for innovation** was the subject of research by V. Boychenko, L. Varava, A. Danilov, Y. Kulinka, D. Lehey, O. Litkovets, and K. Schwartz. The analysis of the scientific literature showed contradictions between the emergence of educational processes that require future primary school teachers to make innovative decisions and their lack of willingness to solve problems that arise during innovative pedagogical activities; acquisition by students of theoretical knowledge of innovative pedagogical activities and fragmentary preparation of future primary school teachers for the practical implementation of such activities.

The purpose of the work is to characterize the technology «Design-thinking» as a tool for preparing future primary school teachers for innovative activities.

The meaning of the concept of «innovation» has changed according to the time period of world development. Initially, «innovation» was understood as the process of renewal of legal contracts, and accordingly the term «innovation» was identified with the meaning of the term «contract in a new edition». Around the 16th century, the concept of «innovation» took on a derogatory form, as it referred to the activities of people who sought to update, rewrite religious texts. With the advent of the industrial revolution, these terms returned to positive content and at the same time acquired scientific significance, associated with inventions, as governments at the time identified the creation of research laboratories as a priority and source of economic stability. Josef Alois Schumpeter, in his early works, considered the concept of «innovation» as a new combination of production factors, motivated by entrepreneurial spirit. Later in his work «Theory of Economic Development» J. Schumpeter noted that innovation is not spontaneous and described economic development as a process of structural change, significantly driven by innovation, which, in turn, is divided into five types [6, p. 66]. From the twentieth century the Western World began to apply the concept of «innovation» in education. Nowadays, scientists consider the concept of «innovative pedagogical activity» as a synergistic combination of two levels: reproductive, characterized by activities to reproduce and apply already developed algorithms for implementing educational innovations, and

productive, during which the teacher creates educational innovations according to students' needs in his school. V. Petechuk and T. Grabovska define such stages of innovation activity as the team's awareness of the need for changes and introduction of innovations; updating and searching for ideas; implementation of innovation design; management of the innovation implementation process; choice of strategy of management and preparation of subjects of innovative activity for work in new conditions; overcoming resistance and psychological discomfort; publication of the results of innovative pedagogical activities [5].

Before the technology of «design thinking» began to be used to increase the effectiveness of the results of innovation in various fields, scientists considered it solely as a means of the cognitive process of designers. The key principles of its use were first systematized in the 1950s by John Edward Arnold, a professor at Stanford University. He argued that design thinking is based on a synergistic combination of creativity and technology that focuses primarily on people's needs. Later, Herbert Alexander Simon considered the technology of «design thinking» as a special way of thinking that allows you to turn existing conditions into desirable ones. Modern scientists, in particular, V. Paleeva defines the technology of design thinking as «an innovative process of solving real problems of consumers» [4, p.43], and V. Ivanova defines the technology of design thinking as a tool that «helps to solve various problems, in particular regarding the creation of new products (services, types of work) or new business, improvement of existing ones» [1, p.94]. Thus, most scientists agree that «design thinking» is a technology that can be used to improve, accelerate and visualize innovative activities carried out not only by designers but also by teams in educational institutions of any type. Although this technology has been widely used by educators in various fields of education, scientists identify many problems with it in scientific terms. In particular, many foreign researchers point out the lack of a common conceptual understanding of the application of «design thinking» technology. However, this does not slow down the use of this technology during the innovation processes of educational institutions. For example, S. Panke noted that more than 60 higher education institutions in the United States use the technology of «design thinking» in the training of workshops, additional training, courses or training programs in the context of innovation; this technology is one of the key in K16 + curricula to promote the development of skills of the XXI century [7, p. 282].

There are many mechanisms for applying the technology of «design thinking», but they all rely on the stages classically defined by G. Simon [3, p. 112]:

– empathy (defined in a deep understanding of the emotional world of the user, for example, the learner, in order to better understand his needs; at this stage the main method is the method of observation);

– research (after observations, the information is analyzed: organized, identify significant components; the result of this stage may be patterns of behavior, portraits of students, and most importantly – outlined a key problem that manifests itself in a particular need that must be met);

– generation of ideas (the key at this stage is the use of the method of «brainstorming», which should result in the main ideas to meet the needs outlined in the previous stage);

– prototyping (at this stage a layout is created that will help to model, test and evaluate the proposed ideas);

– testing (at this stage, the possible steps of the user during the application of the prototype are simulated, which will identify and eliminate some of its shortcomings before the stage of its application in practice).

Conclusion. The application of «design-thinking» technology increases the efficiency of innovation processes in various fields, in particular, in the preparation of future primary school teachers for such activities, which allows in the future to creatively solve a set of problems in general secondary education. After analyzing the stages of innovative pedagogical activities and the stages of application of technology «design thinking», we can identify common elements in these two processes. Accordingly, with the help of the given technology at the stage of preparation of future primary school teachers for innovative activity it is possible to model such activity. The prospect of further research is to substantiate the pedagogical conditions for managing the preparation of future primary school teachers for innovative activities by means of design thinking.

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