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РОЗВИТОК КРИТИЧНОГО МИСЛЕННЯ МАЙБУТНІХ ФАХІВЦІВ З ЕКОНОМІКИ В УМОВАХ ЦИФРОВІЗАЦІЇ

Анотація. У статті подано теоретичне узагальнення та практичне обґрунтування моделі розвитку критичного мислення майбутніх фахівців з економіки в умовах цифровізації. Розвиток критичного мислення майбутніх фахівців з економіки в умовах цифровізації тлумачимо як процес удосконалення їхніх індивідуальних характеристик мислення, який базується на сприйманні аналітичної діяльності як базової для професійної економічної діяльності і реалізується через вплив на мотивацію здійснювати аналітичну діяльність, розвиток знань з математики та фахових дисциплін, розвиток умінь виконувати аналітичну діяльність та здатність здійснювати рефлексію щодо неї. Розроблено модель розвитку критичного мислення майбутніх економістів. Показано, що модель базується на використанні комплексу загально-дидактичних принципів (систематичності, зв'язку теорії з практикою, індивідуалізації, активності, систематичного розвитку основних видів мислення, наочності) і специфічних принципів (системності, студентоцентризму, використання компетентнісних задач, динамічності, моделювання професійної діяльності). На основі кількісного статистичного (критерію однорідності χ^2 Пірсона) та якісного аналізу результатів виявлено, що реалізація моделі розвитку критичного мислення майбутніх фахівців з економіки призвела до суттєвих статистично значущих змін у рівнях її сформованості у студентів експериментальної групи.

Ключові слова: критичне мислення; фахівці з економіки; професійна підготовка; розвиток; освітній процес; модель.

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DEVELOPMENT OF CRITICAL THINKING OF FUTURE SPECIALISTS IN ECONOMICS IN THE CONTEXT OF DIGITALIZATION

Abstract. The article presents a theoretical generalization and practical substantiation of the model for the development of critical thinking of future specialists in economics in the context of digitalization. The development of critical thinking of future specialists in economics in the context of digitalization is interpreted as a process of improving their characteristics of thinking, which is based on the perception of analytical activity as basic for professional economic activity and is implemented through the influence on the motivation to carry out analytical activities, development of knowledge in mathematics and professional disciplines, development of skills to perform analytical activities and the ability to reflect on them. The author creates the theoretical model of development critical thinking for future specialists in economics. It is shown that the model is based on the use of a set of general didactic principles (systematic, connection of theory with practice, individualization, activity, systematic development of basic types of thinking, visibility) and specific principles (systematic, student-centered, use of competence tasks, dynamism, modeling of professional activity). Based on the quantitative statistical (Pearson χ^2 homogeneity test) and qualitative analysis of the results, it was found that the implementation of the model for the development of critical thinking of future specialists in economics led to significant statistically significant changes in the levels of its formation among students of the experimental group.

Keywords: critical thinking; specialists in economics; professional training; development; educational process; model.

Formulation of the problem. Today, the economy of Ukraine needs specialists who can work actively, and interestedly, with high professional skills and an innovative approach. It is important to form a new scientific economic thinking in the future specialist of the economic sector, the desire to analyze the results of their own and collective work.

Today, information technology (IT) occupies a rather important place in the life of modern society. They have become part of a large number of products and services, enable the exchange of information over long distances, and are widely used in business, while changing the process of production, promotion, and sale of various tangible and intangible goods, more rational use of production resources, allowing them to be engaged in different countries and automate the process of managing it as a whole. In turn, the use of IT in the economy and business with their full dedication requires specialists who have competencies both in the field of economics and in the field of information systems and technologies.

Objective changes in policy, digitalization in the socio-economic sphere, and meeting the needs of the state's economic system in highly professional and competitive specialists, by current international standards,

determine the need for the formation and development of professionally important skills and abilities, the development of professional economic competence, in particular critical thinking.

The analysis of actual research. The problems of modernization of professional training of future specialists in the economic sector are reflected in the scientific works of domestic and foreign scientists. In their works, the researchers consider the psychological and pedagogical principles, models of professional training of specialists in the economic sector in Ukraine (M. Artyushina, O. Dubaseniuk, L. Kapchenko, N. Kosheleva); features of professional training of economists in the context of multiculturalism (S. Sysoeva, N. Yaksa, M. Yakovitska), issues of professional training economists (I. Drach, I. Zaitseva, H. Kovalchuk, S. Kubitsky, O. Kuklin, O. Mykhailov, T. Poyasok), formation of professional competence of economic specialists (N. Balovsyak, O. Goncharova, V. Lokshyn, O. Olefir, I. Poleshchuk, O. Romanovskiy). The need for the formation and development of system thinking in modern specialists based on the development of analytical knowledge, skills, and abilities is substantiated in the scientific works of domestic and foreign philosophers, sociologists and futurologists: V. Andrushchenko, M. Vashchekin, R. Grant, W. Deming, K. Korsak, V. Kremen, P. McLaren, O. Malyuta, Y. Moskvich, E. Toffler, P. Freire.

The reflection of views on critical thinking in pedagogical theory and practice is represented in the research of such researchers of critical thinking at the present stage as J.S. Wilson, A. Braus, D. Wood, A. Crawford, J.S. Smith, McInster, S. Matthews, B. Moore, R. Paul, F. Rogow, W. Saul, A. Fisher, D. Halpern, S. Scheibe, I. Gorokhova, V. Makarenko, O. Pometun, I. Sushchenko, S. Terno, O. Tumantsova, O. Tyaglo and others. Summarizing their views on the problem of the development of critical thinking, its meaning, functions, and characteristic features, it should be emphasized that the thinking of a modern specialist in economics should meet the requirements of the time, that is, work in conditions of information overload, at the same time relying on true values, avoiding stereotypes, influencing the environment and the world, history, and science should be the main part of the cognitive process.

The social significance of the problem of developing critical thinking of specialists in economics in the context of the ultra-rapid penetration of digital technologies into the economic sphere led to the choice of the research topic.

The article's goal is to reveal the impact of digital technologies on the development of critical thinking of future specialists in economics in the context of their professional training.

Materials and methods. Analysis, synthesis, and systematization of scientific sources to identify the state of elaboration of the problem, abstraction, and generalization to study the practical experience of the development of critical thinking; terminological analysis to determine the essence and content of key definitions of the study; structural analysis to determine the components, criteria, indicators, and levels of critical thinking development; pedagogical design and modeling to describe the model of development of critical thinking of future specialists in economics in the context of digitalization; pedagogical experiment to experimentally test the effectiveness of the developed model for the development of critical thinking of future specialists in economics in the context of digitalization; statistical methods.

Results and discussion. Generalization and systematization of scientific sources made it possible to establish that the level of economic education of society is an important factor in the economic progress of the country, therefore, in the context of digitalization of the financial and economic sphere, the developed critical thinking of future specialists in economics in the conditions is of particular importance.

Theoretical analysis of the research positions of teachers and psychologists gives reason to believe that critical thinking is a combination of analytical and synthetic movement of thought, to deduce knowledge and form actions, not limiting itself only to reliable inferences (deduction), but also taking into account plausible conclusions (induction and analogy). S. Terno lists the characteristics of a critical thinker: to be honest with oneself, to reject dishonesty, to overcome confusion, to ask questions, to draw conclusions based on obvious facts, to trace the relationships between phenomena, and to be intellectually independent [13]. At the same time, researchers distinguish the following research skills used in critical thinking: observation, comparison, evaluation, determination, recognition, association, generalization, prediction, application, and search [13]. Modern researchers, in particular S. Terno, define the following characteristics of critical thinking: awareness, independence, reflexivity, purposefulness, validity, controllability, and self-organization.

Individual psychological characteristics of thinking, which are formed throughout life, determine the level of formation and lay the foundation for the further development of critical thinking of the future economist: logic; intelligence; speed of mental orientation; depth; breadth; flexibility; independence.

The development of critical thinking of future specialists in economics in the conditions of their professional training should be considered not only as an important factor in personal development but also as an important component of the professional competence of a specialist in the field under study and considered as a professionally significant integral personal characteristic that combines individual characteristics of thinking (logic, ingenuity, depth, breadth, flexibility, creativity) with the ability to analytical activity in the professional field [6; 7].

Based on structural analysis, generalization and systematization in the structure of the process of development of critical thinking of future specialists in economics in the conditions of their professional training, we distinguish motivational component (development of values, interests, motives for carrying out analytical activities, professionally significant qualities); cognitive component (development of analytical knowledge); activity component (development of analytical skills, results of activity); reflective component (development of introspection, self-education, self-improvement) [11].

Thus, the development of critical thinking of future specialists in economics in the conditions of their professional training is understood as a process of improving their characteristics of thinking (logic, ingenuity, depth, breadth, flexibility, creativity), which is based on the perception of analytical activity as basic for professional economic activity and is implemented through the influence on the motivation to carry out analytical activities, the development of knowledge in mathematics and professional disciplines, the development of skills to perform analytical activity and the ability to reflect on it [9].

Based on the analysis of scientific sources and the study of practical experience, the correlation of the social order of society, the requirements of the State Standard of Higher Education for the professional training of future specialists in economics, the norms and requirements for this profession, the principles and provisions of digitalization were determined, and the goals and objectives of the development of critical thinking of future specialists in economics in the conditions of their professional training were determined.

In the system of professional economic education, we define praxeology as an important methodological basis for substantiating the specifics of performing the correct and effective actions of the future economist. The implementation of the praxeological approach is based on a combination of the main categories of praxeology and the scientific provisions of the theory of thought to clarify the essence of the effective analytical professional activity of the economist. Therefore, individual psychological characteristics of thinking, which are formed throughout life, determine the level of formation and lay the foundation for the further development of critical thinking of future specialists in economics in the conditions of their professional training.

Based on the methods of systematization, generalization, design, and structuring, it is substantiated that the methodological accents of the development of critical thinking of future specialists in economics in the conditions of their professional training are to motivate analytical activities as a way of professional development; expedient choice of forms and methods that ensure the implementation of analytical activities; introduction of educational and methodological support adequate to the content of analytical activities; mastering analytical tools by future specialists in economics.

The developed model of development of critical thinking of future specialists in economics in the conditions of their professional training provides for the improvement of educational and methodological support of professional training at each stage through the use of forms (game technologies, trainings, interactive forms of classes (problem lecture, lecture-visualization, lecture-conversation, lecture with errors, problem seminars, independent work), binary classes), methods (methods of interactive learning (aquarium, decision tree, brainstorming, etc.), the method of projects, the method of cases, the method of synectics, methods of activating cognitive motives, active methods (creating a situation of success, basket, incident, nominal groups, business simulation, senkan)) and means (competency tasks, videos, films, Internet materials, situational interactive tasks) of training that ensure the development of critical thinking of future specialists in economics in the conditions of their professional training.

The most significant IT trends in the development of various sectors of the economy and business are artificial intelligence, voice and visual search for goods, chatbots, big data, self-driving machines and devices, augmented analytics, digital twins, biometric data, 5G technology, intelligent edge technologies, immersive technologies, intelligent space, digital ethics and privacy, quantum computing, blockchain. That's why we used these technologies primarily in our model development of critical thinking of future specialists in economics in the conditions of their professional training, creating Smart Space. An intelligent space refers to a physical or digital environment in which people and systems interact within more open, interconnected, coordinated, and intelligent ecosystems. By combining people, processes, services, and things into an intelligent space, immersive, interactive, and automated interaction between members of the target group of people, or industry scenarios, is ensured. Smart spaces are emerging most intensively in the form of smart cities, digital workplaces, smart homes, and connected enterprises [1].

Information technology creates opportunities for unlimited business expansion and allows you to optimize management processes as a whole. However, they must be used thoughtfully and carefully. A positive effect is only achieved if there is a clear understanding of how to develop their application to support the successful implementation of the business strategy. Otherwise, this expensive and difficult-to-use tool will not bring benefits to business, and investments in information technology will be ineffective [1].

The main commercial areas of application of artificial intelligence technologies are computer-aided translation, business intelligence, pattern recognition, expert systems, text recognition, information acquisition, understanding and analysis of natural language texts, image analysis, intelligent information

security systems, speech recognition, and robotics. The development of the use of AI leads to the adaptation of technologies in the classic sectors of the economy: defense industry (combat robots; cyber wars), energy (loss reduction, prevention of energy theft; optimization of pricing depending on the time of day and dynamic tariffication; automatic selection of the most profitable supplier; detailed consumption statistics; automated customer service; optimization of energy consumption taking into account the habits and behavior of the client), banking activities (automation of field managers' activities; currency control; processing of payment documents; chatbots; processing requests from executive bodies; credit risks; opening a current account), transport (unmanned cars), logistics (virtual assistant with speech recognition function; robot cars), trade (customer recognition; bots that know how to trade), production (reducing the number of errors, reducing the delivery time of raw materials; forecasting the volume of provision support and maintenance services; pricing management; improving the planning of vehicle fleet routes, demand for fleet resources; improving the quality of training of service engineers), etc.

Based on the results of the analysis of approaches to the construction of the criterion basis of the study for diagnosing the levels of development of critical thinking of future specialists in economics in the conditions of their professional training, four criteria and indicators have been developed, respectively: value (analytical thinking), knowledge (depth and breadth of thinking), operational (logical thinking, ingenuity, flexibility), personal (independence of thinking, creativity of thinking). Based on diagnostics at the ascertaining stage of the experiment, diagnostic tools were developed and the levels of development of critical thinking of future specialists in economics were specified: critical (unsatisfactory), stereotyped, and productive.

The pedagogical experiment was carried out during 2019-2023. In the first stage (2019 – 2020), a theoretical analysis of the problem under study was carried out, the theoretical foundations of the study, the object, subject, purpose, and objectives of the study were determined, and a research program was developed. In the second stage (2020 – 2021), a model for the development of critical thinking of future specialists in economics was theoretically substantiated and developed, a conclusive experiment was carried out, the course of which, based on certain criteria and their indicators, the levels of development of critical thinking of future specialists in economics were determined. In the third stage (2021 – 2023), a formative pedagogical experiment was carried out, the purpose of which was to test the effectiveness of the model for the development of critical thinking of future specialists in economics, experimental data were processed and compared to find out the dynamics of levels development of critical thinking of future specialists in economics. We arbitrarily divided future economics specialists who were involved in the experiment into two groups: one group of students was identified as an experimental EG – 161 people (they studied according to the developed model), and the second – as a control CG – 163 people (they studied according to the traditional most common method).

Based on the quantitative statistical (Pearson χ^2 homogeneity test) and qualitative analysis of the results, it was found that the implementation of the model for the development of critical thinking of future specialists in economics led to significant statistically significant changes in the levels of its formation among students of the experimental group (Table 1).

The students of the experimental group showed an increase in the indicator "Analytical thinking" at the productive (by 7.21%) and template (3.3%) levels. It was recorded that the number of students with a productive level of development of a critical at the formative stage of the experiment in EG increased by 17.12%, with a template level – by 3.87 % due to a decrease in the number of students with a critical level by 20.99%. According to the indicators of the operational criterion "Logical thinking", "Ingenuity" and "Flexibility of thinking", we also have that the number of EG students with a productive level of critical thinking development increased by 25.41%, 22.66%, and 20.64%, respectively. An increase in the personal criterion "Independence of thinking" was also registered: the number of students with a productive level of critical thinking development in EG increased by 21.61%, and in the indicator "Creativity of thinking" by 11.18%.

A significant number of studies by modern foreign teachers and psychologists are devoted to the problem of the development of critical thinking. Our research is consistent with the most significant ones.

The book by C. Crawford et al. [3] is intended as a guide for upper secondary school. It emphasizes the importance of training in the methods of mental work, considers goal setting as the most important condition for success, features of teaching and processing lectures, reading and studying books, keeping notes and notes, using the library, performing written works, discussions, debates, reports, essays, laboratory work, accounting, thinking, research work.

In 2001, the Cambridge University Press published A. Fisher's book "Critical Thinking An Introduction" [4], which discusses what critical thinking is and how to improve it, determining the causes and conclusions: the language of reasoning, clarification and interpretation of expressions and ideas, evaluation of sources, etc.

The book " Environmental Education in the Schools – Creating a Program that Works!" by J.A. Braus and D. Wood is devoted to various aspects of the development and implementation of environmental education: environmental problems in your society, the realities of the school system, the importance of intellectual and moral development of students, improving the goals and objectives of the school curriculum,

innovative teaching strategies (creative and critical thinking), activities that can be adapted according to one's own needs, suggestions for means of supporting programming ideas, development of formal and informal methods for assessment own success [2].

Table 1.

Comparative Results of the Levels of Development of Critical Thinking of Future Specialists in Economics

Level	Ascertaining stage		Formative stage		Dynamics	
	KG	ED	KG	ED	KG	ED
<i>Analytical thinking</i>						
Critical	46%	48%	47%	22%	-1%	-24%
Placeholder	30%	29%	28%	32%	1%	3%
Productive	24%	23%	23%	46%	1%	21%
<i>Depth and breadth of thinking</i>						
Critical	31%	29%	31%	8%	1%	-20%
Placeholder	46%	48%	44%	56%	-2%	3%
Productive	23%	23%	25%	36%	2%	17%
<i>Logical thinking</i>						
Critical	33%	32%	28%	5%	-2%	-28%
Placeholder	48%	47%	46%	49%	-2%	3%
Productive	19%	21%	26%	46%	4%	25%
<i>Intelligence</i>						
Critical	31%	30%	28%	3%	-2%	-26%
Placeholder	48%	48%	46%	53%	-1%	3%
Productive	21%	22%	26%	44%	2%	22%
<i>Flexibility of thinking</i>						
Critical	40%	39%	39%	16%	-1%	-22%
Placeholder	43%	44%	43%	46%	-1%	2%
Productive	17%	17%	18%	38%	2%	20%
<i>Independent thinking</i>						
Critical	53%	43%	46%	11%	-6%	-31%
Placeholder	34%	44%	41%	54%	5%	10%
Productive	13%	13%	13%	35%	2%	21%
<i>Creative thinking</i>						
Critical	49%	49%	37%	29%	-12%	-19%
Placeholder	31%	32%	38%	39%	8%	8%
Productive	20%	19%	25%	32%	3%	11%

In scientific circles, D. Halpern's book "The Psychology of Critical Thinking" [5] is considered one of the most authoritative publications on critical thinking. The author examines the features of thinking, memory, the relationship between thinking and language, logical reasoning, analysis of argumentation, thinking as a hypothesis test, probability, and uncertainty, decision-making, development of problem-solving skills, and creative thinking from the point of view of critical thinking.

Attention is drawn to the book by S. Scheibe and F. Rogow "Media Literacy. Critical Thinking in the Multimedia World" [12]. The authors define the components of critical thinking: curiosity, desire to explore, constant analysis of information, "basic skeptical attitude", appreciation of quality argumentation, flexibility, and impartiality.

The ninth edition of the book "Critical Thinking" by B. Moore and R. Parker presents the basics of critical thinking, types of reasoning, pure thinking, critical thinking and understandable writing, reliability, persuasion through rhetoric, categorical and truly functional logic, three types of inductive arguments, explanation of reasons, moral, legal and aesthetic reasoning [8].

In 1990, R. Paul presented the book "Critical Thinking: What You Need to Know to Survive in a Fast-Paced World" [10], which emphasizes that critical thinking should be at the center of educational reform. The movement of critical thinking from a historical perspective, on the way to a critical society, critical thinking as the foundation for the formation of a free society, etc., dialogical and dialectical thinking, the Socratic question, critical thinking in science, etc., why critical thinking can be applied to all disciplines and fields, Bloom's Taxonomy, critical and cultural literacy, philosophy and cognitive psychology, etc., are considered.

As can be seen from the analysis of scientific textbooks, and distance courses on the concept of critical thinking at the present stage in foreign pedagogical practice, this concept has a rich history and practice, which is actively implemented in the education system of all levels. A significant number of books, and teaching aids are devoted to the development of critical thinking of college students and school students.

Conclusions. The paper presents the author's model for the development of critical thinking of future specialists in economics in the context of digitalization. It is shown that the model of development of critical thinking of future bachelors in economics is based on the use of a set of general didactic principles (systematic, connection of theory with practice, individualization, activity, systematic development of basic types of thinking, visibility) and specific principles (systematic, student-centered, use of competence tasks, dynamism, modeling of professional activity). The results of the experimental verification of the effectiveness of the model for the development of critical thinking of future specialists in economics in the context of digitalization at the level of significance of 0.05 confirmed its effectiveness: based on the Pearson criterion, significant positive shifts between the levels of development of critical thinking of future specialists in economics in the context of digitalization of the control and experimental groups were confirmed.

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