

PEDAGOGICAL POTENTIAL OF COMPETENCE TASKS AS A MEANS OF DEVELOPING CRITICAL THINKING OF FUTURE ECONOMISTS

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Purpose. The purpose of the article is to present the means of training future economists for analytical professional activity, which contributes to the development of critical thinking of specialists in economic specialties.

Results. The article is devoted to one of the urgent problems of training future bachelors in economics: developing critical thinking in the professional training of economists. We prove that competency-based tasks of economic content are an essential means of developing the critical thinking of future economics specialists. The main competence tasks with economic content include problems with labor productivity, cost, elasticity, rent, interest, compound interest, profitability, market equilibrium, profit, income taxes, credit, optimal decision-making, etc. The competence tasks bind economic concepts with their quantitative and qualitative characteristics and connections. These tasks reflect real economic situations, and solving them contributes to the familiarisation of students with economic concepts and cause-and-effect relationships between them (at the level of representation, assimilation, or consolidation), mathematical models in the economy, development of skills to build and research mathematical models of economic situations, apply mathematical methods and regularities in specific production processes.

Scientific novelty. The theory and practice of training economists, which uses competence tasks of economic content as a leading means of developing their critical thinking, has gained further development. The results of the survey of teachers and students confirmed the feasibility of the proposed approach to the use of competence tasks with economic content for the development of critical thinking of future economists.

Practical value. Solving competence tasks contributes to developing students' critical thinking, as it illustrates the process of applying knowledge, skills, and abilities to solving any problems that arise in practice (formalisation, solving a problem within a built model, interpretation). It is advisable to offer such tasks in studying specialised economic disciplines and the first courses in studying "Higher Mathematics".

Key words: critical thinking, future economists, competence tasks, economic content, professional training.

Introduction. Never before has the problem of the quality of education in Ukraine had such an important ideological, social, and economic significance as in the current conditions of the state's development. This determines the setting of the main task in today's conditions – to ensure the necessary level of professional competence of specialists capable of effective professional activity, who possess the modern technologies of their specialty, and the ability to use the acquired knowledge and skills

in the process of solving rapidly changing professional tasks.

A graduated bachelor of economics must perform analytical activities of a research nature. Modern production needs economists who can independently formulate a goal, set tasks and plan the stages of its implementation, make non-standard and creative decisions (Omelyanenko et al., 2020). Professional training is designed to consistently form specialists' economic thinking, a conscious attitude to the chosen profession in the conditions of integration processes, to equip specialists with theoretical knowledge and practical skills regarding the peculiarities of professional activity, the formation of the need for economic analysis, vision of the future, to learn to master the basics of scientific organization of work, etc.

The modern labor market's need for highly qualified analysts actualizes the need to study the problem of training bachelors in economic specialties and, in particular, the development of critical thinking in the professional training of economists.

Review of literature. Concepts, principles, and regularities of the functioning of critical thinking were studied by such scientists as J. Braus & D. Wood (1993), A. Crawford (2006), B. Moore (2009), R. Paul (1990), F. Rogow (2014), A. Fisher (2011), D. Halpern (1996) and others. In Ukraine, V. Kremen et al. (2016), S. Terno (2016) and others emphasize the need to develop critical thinking in pupils and students. Scientists note that the use of information technologies in educational activities ensures the development of critical thinking. The basis of her theory is the construction of an informational and pedagogical environment, where tasks of a searching, analytical nature, proposing and testing hypotheses, and creating special situations for finding and correcting errors prevail (Keller, 2004). At the same time, scientists have actualized the problem of mathematical anxiety associated with the fear of not solving the problem (Sarfo et al., 2022). International studies of modern psychologists and pedagogues have shown that only about 25 % of schoolchildren and students possess critical thinking skills and even fewer – critical thinking techniques (Choi et al., 2022). In the Western education system since the 80s of the XX century a pedagogical movement for developing critical thinking in schoolchildren and students. Its essence is that all academic disciplines must be rebuilt in the spirit of reflection, students must master the skills of a critical attitude to the proposed arguments and methods of activity. Critical thinking turned out to be a completely technological methodology applicable to various spheres of human intellectual activity.

In Ukraine, the problems of forming and developing critical thinking among young people using information and digital technologies began to be analysed in different contexts. The scientists study the problem of developing critical thinking in STEM education (Semenikhina et al., 2022), by using cloud technology (Yurchenko et al., 2023), gamification (Rudenko et al., 2022), and truth needs to develop media literacy (Scheibe & Rogou, 2014) and info-media literacy (Yachmenyk et al., 2023). Various aspects of the professional training of future economists are highlighted in the publications of Ukrainian scientists, in particular in the following contexts: economic and mathematical training of future economic specialists in the context of education

for sustainable development (Kovalchuk et al., 2024); the role of universities in the formation and development of talents (Howaniec et al., 2022); formation of communicative competence (Kucher et al., 2019); youth attitude to entrepreneurship (Wasilczuk, & Karyy, 2022); the impact of entrepreneurship education and cultural context on entrepreneurial intentions (Mykolenko et al., 2023). Despite the recognition by scientists and practitioners of the need for the formation and development of student's critical thinking through information and digital technologies, this problem is extremely rarely investigated in Ukrainian pedagogy.

The professional competence of future specialists in the field of economics and entrepreneurship is a complex multifactorial personality formation, which includes a system of scientific economic objective knowledge and specialist skills (methods of economic analysis and statistics, financial management, accounting, and legislation), the ability to adapt them to professional activity (management, marketing, financial analysis, audit, accounting), value orientations, motives of activity, integrated indicators of culture (language, style, communication, attitude to oneself and one's professional activity, to related fields of knowledge), as well as the presence of a stable readiness for professional growth.

The most important tasks in the formation of critical thinking are the acquisition of analytical knowledge, the ability to process information using various analytical methods, and the development of logical thinking. Underestimating the role of critical thinking as a component of professionalism in the work of an economic specialist often leads to the formation of an insufficient information base, the use of a limited arsenal of methods for transforming this information, and the unreasonableness of project decisions. This, in turn, becomes the basis for non-rhythmic work of the organization, loss of working time, inefficient use of material and financial resources, and, as a result, failure to achieve the organization's strategic goals.

Based on the analysis of the mentioned studies, the approaches proposed in them, and our work experience, we have determined the means that contribute to developing critical thinking in future bachelors of economic specialties.

Materials and methods. The purpose of the article – to present the means of training future economists for analytical professional activity, which contributes to developing the critical thinking of specialists in economic specialties.

We used several theoretical and empirical methods: analysis for generalization of scientific-pedagogical studies' results for proving competency-based tasks of economic content are an essential means of developing the critical thinking of future economics specialists; modeling for detecting some impotent aspects in the development of critical thinking of specialists in economic; observation for detecting the type of competency-based tasks of economic content and survey for determination educational progress.

Results and discussion. It can be argued that the development of critical thinking in economists should be understood as a purposeful process of personality development associated with all procedures for processing, searching, and analysing information of

various content and origin, which, in turn, is an object and a subject in the social system.

Critical thinking is interpreted as a combination of analytical and synthetic movement of thought, to derive knowledge and form actions, not limited to reliable conclusions (deduction), but also taking into account plausible conclusions (induction and analogy). Such activity is represented not only by mental operations but involves the creation of a holistic description of phenomena using different types of language (different means, even symbols), a combination of sensory and rational cognition, i.e., intuition, emotions, and intellect (abstract thinking) of an individual (Andrusiak et al., 2020).

The concept of “critical thinking of a future specialist in economic direction” is considered by us as a component of professional competence, which is an integrative dynamic, constantly enriched characteristic of a student-economist, and determines his ability to perform professional analytical tasks in the professional field in the future. At the same time, emphasis is placed on: knowledge of the theory of the organization of the analytical process; the ability to choose, justify, and apply appropriate analytical methods; development of logical thinking, and creative approach to this area of professional activity and gaining experience in it.

Critical thinking of modern economists presupposes the presence of such personal qualities as analytical thinking, the ability to work with large amounts of information, attentiveness, memory, intuition, observation, responsibility, creativity, attention to detail, a broad perspective, the ability to see things through, etc. (Liessmann, 2008).

Therefore, the task of training a qualified economist who uses the methods of mathematical modeling in everyday practice becomes extremely urgent and, to some extent should be (Morawski, 2005; Radvan, 2010):

- a) an economist – to use economic theory to analyse empirical data;
- b) a mathematician – to formulate an economic theory using the means of mathematical language, making it suitable for building formalized schemes and checking their correctness (adequacy with empirical data);
- c) a specialist in economic statistics – to master the processes of forming an information database and to be able to compare measured macro- and microeconomic empirical indicators by economic theory;
- d) a specialist in mathematical statistics – to use quantitative methods for the analysis of empirical data;
- e) a specialist in modern IT technologies – to use computer equipment and the necessary software products, without which system analysis is unthinkable today.

According to the competency-based approach, education should be aimed at teaching students:

- 1) analyse practical situations, and apply knowledge to explain them;
- 2) solve problems, and recognize problems that can be solved by mathematical methods. To be able to solve a task (problem) both based on known knowledge using a mathematical apparatus and when the amount of necessary material is insufficient, using assessment methods, at a qualitative level or the level of common sense;
- 3) skills of effective search for theoretical information and understanding of their

mathematical and economic content; reformulation of the problem from one symbolic system to another; the ability to critically evaluate the obtained results and use them to make practical decisions (World Economic Forum, 2020; World Economic Forum, n.d.).

Therefore, an important means of developing the critical thinking of future specialists in economics is competence tasks of economic content. These tasks reflect real economic situations, and solving them contributes to the familiarization of students with economic concepts and cause-and-effect relationships between them (at the level of representation, assimilation, or consolidation), mathematical models in the economy, development of skills to build and research mathematical models of economic situations, apply mathematical methods and regularities in specific production processes.

Competence tasks of economic content are a powerful means of developing an economic style of thinking, economic education, and developing economic literacy. Along with this, solving such problems contributes to the development of students' analytical competence, as it makes it possible to illustrate the process of applying knowledge, skills, and abilities to solving any problems that arise in practice (formalization, solving a problem within a built model, interpretation).

The system of competence tasks is effective if it meets the following methodological requirements:

1) compliance of solving methods and techniques with educational programs, and current textbooks on the course of higher mathematics for students of economic specialties;

2) display of real production situations and correspondence of numerical data to production processes and life situations;

3) the conceptual apparatus of the task conditions and its terminology should be known and understandable to the student;

4) compliance with symbols, designations, and statistical data used in scientific literature;

5) tasks and their solutions should illustrate the practical significance of the acquired knowledge.

Competence tasks of economic content are considered as tasks consisting of economic subject matter, conditions, and requirements. The problem specifies certain economic concepts with their quantitative and qualitative characteristics and their connections. The main competency-based tasks with economic content include tasks on labor productivity, cost, elasticity, rent, interest, compound interest, profitability, market equilibrium, profit, income taxes, credit, making an optimal decision, etc.

It is advisable to offer such problems not only in studying specialized economic disciplines but also in the first courses in studying mathematical disciplines of the "Higher Mathematics" course. An example of a competence problem of economic content can be the following.

Problem. Every month, the worker deposits 100 hryvnias into his savings account with a profit of 0.5 % for each month. Calculate the value of his savings immediately

after making contributions.

The solution. To find the value of the savings account immediately after making the n contribution, you should count $(n - 1)$ the month of the first contribution. After $(n - 1)$ months, the first deposit of 100 hryvnias will grow to $100 \cdot (1.005)^{n-1}$, the second contribution will grow to $100 \cdot (1.005)^{n-2}$, etc. Thus, the total value of the accumulation account will be the sum:

$$S = 100 \cdot (1.005)^{n-1} + 100 \cdot (1.005)^{n-2} + \dots + 100 \cdot (1.005) + 100.$$

Again, the sum of the geometric progression with the first term of 100 was obtained (we consider it in the reverse order), and the denominator $q = 1.005$. Therefore, it will have the appearance:

$$S = \frac{b_1(q^n - 1)}{q - 1} = \frac{100[(1.005)^n - 1]}{1.005 - 1} = 20000[(1.005)^n - 1].$$

Also, such forms of organizing the educational activities of students of economic specialties during the study of professional disciplines, in which it is appropriate to apply competence tasks for the development of critical thinking of students of economic specialties, proved their effectiveness during the formative stage of the pedagogical experiment.

1. Seminars are an educational event, the main task of which is the acquisition of knowledge by the participants. Experts transfer their knowledge in the group and during the subsequent discussion, this knowledge should be deepened and assimilated by the listeners. Conditional training during the workshop is divided into two stages: listening and exchanging opinions with experts and other participants. Students are expected to have basic knowledge and be ready for an active discussion. At the seminar, “included” forms of learning are rarely used, which involve the active activity of the participants themselves.

2. Workshops are intensive educational events, in the process of which participants learn primarily through their active work. The necessary theoretical “interjections” are usually short and play a minor role. The focus is on independent learning of the participants and intensive group interaction. Emphasis is placed on obtaining dynamic knowledge. Participants can determine the purpose of training themselves. They share responsibility for their own educational process with the teacher.

3. Laboratories are training aimed at participants studying their own behavior, which they independently analyse and change, if necessary.

4. Conferences – an event where the analysis of current problems and the search for ways to solve them takes place; presentation of new technologies, strategies, goals, or products; strengthening cooperation of different groups; increasing the motivation of participants. “Inclusive” forms of education are also rarely used. Sometimes small groups of conference participants are created to increase the degree of personal contribution of each participant, but individual participants do not influence the overall course of the conference. They adhere to a certain program of actions with reports, speeches, working materials, and presentations.

5. A symposium is an event where experts present their own points of view on various issues to a large audience. After the presentation, participants ask the speaker questions if possible. The presenter introduces the experts, makes an introduction to the reports, and regulates contact between the experts and the audience. The exchange of opinions between the experts themselves is rare.

6. A forum is an event where experts present different points of view and who are often opposite on a certain issue. Disputes between them do not always happen, rarely. After they have all expressed their thoughts, the audience can ask questions.

7. Open discussion – during the discussion, experts usually do not just express their opinions but also invite participants to discuss them, refer to each other, and make an attempt to clarify the problem with joint efforts. They must necessarily contradict each other, but instead try to transcend their conflicting positions and reach a new level of understanding. Participants are allowed to ask questions and comment.

To achieve success in the process of planning relevant classes, it is advisable to:

- use those forms of education that stimulate independent thinking and it is desirable to experiment; it is important to use learning situations in a group space – performing exercises in pairs, “threes” or “quartets”, learning in working groups; “open meetings” are effective when participants organize their own work and determine its topics and forms;

- to give priority to research training (experiments should not be limited to posing logical and scientific questions, they can also touch on social, economic, or psychological topics);

- predict logical and mathematical tasks, using them for entertainment, to teach a pragmatic approach to simple calculations to those participants who are afraid to make mistakes in various life situations (this explains a certain helplessness in economic discussions, exchanging opinions on political issues, in planning one’s own budget and the budget of the educational institution);

- use graphic tools (diagrams, sketches), pay attention to the features of the program, emphasizing the use of key phrases, for example: “I consider it appropriate to list the five components of the topic ...” or “Let’s pay attention to the seven steps of working with information ...” (such approach facilitates the work in class, stimulates the development of systemic analytical thinking).

To confirm the feasibility of this approach, we surveyed teachers (12 people) and students (59 people). The questions are presented in Table 1.

Table 1

Questions in the questionnaire

No	Question	Answers options
1	Which disciplines, in your opinion, have the most significant impact on developing critical thinking?	1) mathematical
		2) socio-economic
		3) humanitarian
		4) others
2	What teaching tools do teachers use to develop the critical thinking of economists?	1) tasks, cases
		2) digital tools

No	Question	Answers options
		3) analytical reports
		4) SWOT analysis
		5) others
3	Is it appropriate to use competency-based tasks for the development of critical thinking?	1) yes
		2) no
		3) not always
4	Should competency-based tasks be used in the future?	1) yes
		2) no
		3) can't answer

Source: built by the author.

The survey results are presented in diagrams (Figure 1, a–d).

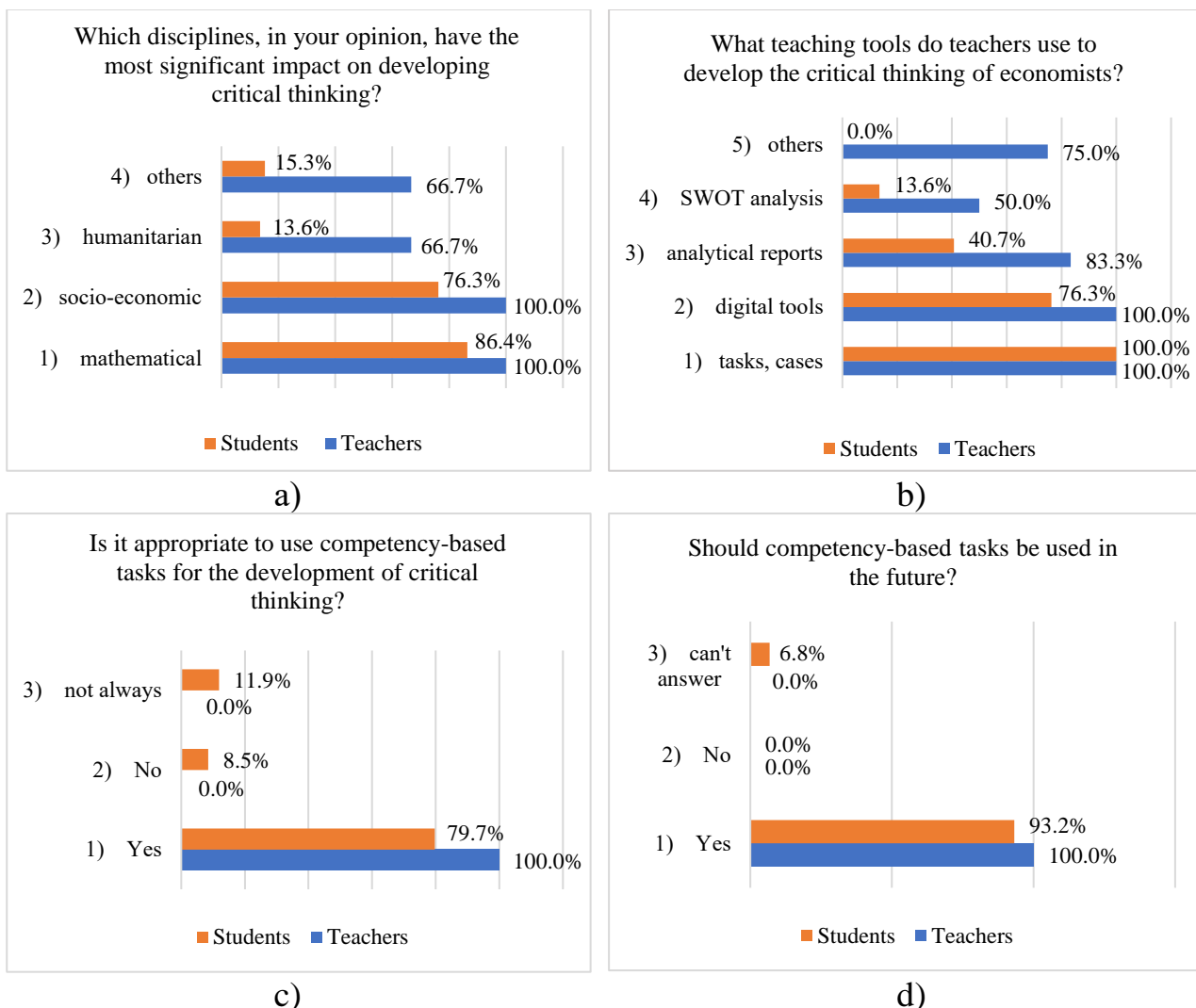


Figure 1. Distribution of respondents' answers

Source: built by the author.

The analysis of the answers shows that almost all respondents (teachers and students) consider the study of mathematical disciplines essential for developing critical thinking (100.0 % and 86.4 %, respectively). At the same time, among the means of developing critical thinking, all respondents mentioned tasks and practical

cases. This confirms our approach of using competency-based tasks with economic content to develop economists' critical thinking. Respondents overwhelmingly (100.0 % teachers and 93.0 % students) agreed with using such tasks to build young people's critical thinking in their professional training.

Conclusions. The education of students in economic specialties involves the formation of critical thinking, which is manifested in the ability to apply models and methods of mathematics in professional economic activity, the ability to develop and use economic thinking to solve daily problems, the ability to structure data (situation), distinguish relations, create a model of the situation, analyse and transform it, interpret the obtained results. Our research proved the effectiveness of using competence tasks of economic content to develop future economists' critical thinking. The study reveals that the most effective forms of developing critical thinking among future bachelors of economic specialties enhance mental abilities, logical intelligence, and verbal skills. These forms, which include communication with the teacher and the group, utilization of content potential for creative expression, and fostering self-education, self-improvement, and self-development, facilitate a shift from traditional to dynamic education in the continuous education system and self-education.

The study deals with the training of economists in the realities of Ukrainian higher education institutions. The results of the survey of teachers and students confirmed the feasibility of the proposed approach to the use of competence tasks with economic content for the development of critical thinking of future economists. The approaches highlighted are inherent in Ukrainian educational practice but can be extended to other academic institutions.

Further work on developing the outlined problem is advisable to construct methodic support for developing critical thinking in students of economic specialties.

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