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DEVELOPMENT OF PROFESSIONAL COMPETENCE IN STUDENTS OF ECONOMICS

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Abstract

The article deals with training specialists in economics on the basis of a competence approach. Transition to the innovative economy, implementation of bachelor's programs requires development of skills and abilities to solve problems in the field of future professional activities by means of all academic disciplines. To solve these problems, we need appropriate pedagogical learning technologies, implementation of the principle of professional orientation. Mathematics as one of the main tools of economic research plays a special role. The traditional approach to teaching mathematics based on solving abstract theoretical tasks sometimes accompanied by illustration of physical applications does not allow students to develop relevant competences. The article discusses the system of economic tasks developed by the author. The tasks are solved by various methods of mathematics. The tasks are developed in accordance with the main sections of mathematics studied by first-year students of the economic department. The subject and orientation of tasks are close to their future professional activities. They reflect features of economic activities associated with the need to make a decision under uncertainty and lack of complete data. This makes it possible to discuss solution methods, evaluate results, create conditions for discussion. The results of the experiment speak for the importance of these tasks and efficiency of the teaching method. They are a powerful motivational factor of learning developing relevant competences in future economists.

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1. Introduction

Modern Russian society and the innovation economy require economists who have fundamental knowledge and are able to solve professional tasks of various levels using methods corresponding to the technological structure. This determines the content of modern economic education, reflected in the competence approach and formulated in federal state educational standards. Implementation of bachelor's programs requires changes in the training system. Teaching disciplines should be aimed at the formation of required competencies (general cultural, general professional, professional) and comply with the principle of professional orientation (Verbitsky, 2006). Skills and abilities to solve professional tasks should be developed within all the disciplines studied by future economists commencing on the first day of studies.

Mathematics plays a special role in training future economists. The language of mathematics has always been fruitful for statement and solution of economic problems. The mathematics methods contributed to successful development of economic theory. Basic economic statements are formulated as hypotheses and theorems; mathematical models are developed; optimal solutions and development trajectories are identified. On the other hand, economic development stimulated development of many branches of mathematics, for example, game theory. The Nobel laureate (1994) in economics, German mathematician Zeltou says: "... game theory is, first of all, an explanatory theory, as it gives specific guidance to follow. The manager who knows the game theory is more likely to win than the one who does not rely on this theory" (as cited in Kharshany & Zeltou, 2001, p. 61). This statement can be applied to all other branches of mathematics and become a basis for mathematical education of future economists. Modern information technologies reduce the time required for choosing optimal solutions of economic problems, free from routine calculations.

2. Problem Statement

Modern innovative economy requires specialists with practical knowledge, skills and abilities to solve professional tasks using various methods. The studies show that 80% of undergraduates begin to work immediately after graduation. The reduced period of studies in universities actualizes the issue of training of an economist commencing on the first day of studies by means of all the curriculum disciplines. Mathematics as one of the main tools of economic research plays a special role. The definition of economics as a science studying satisfaction of needs with limited resources is a mathematics task – the Lagrange problem. Mathematics, studied in the first year, takes a significant part of university hours. There is a need to change the approach to teaching mathematics in universities training economists (Zaichikova, 2013; Mikhaleva, 2016; Petrenko, 2007).

3. Research Questions

The main research questions are opportunities for implementing the principle of professional orientation in teaching mathematics to first-year students of economic specialties, and developing professional competencies by means of all the disciplines taught to the students.

4. Purpose of the Study

Implementation of the competence-based approach for developing an image of an economist makes it urgent to ensure professional orientation of all disciplines, regardless of their cyclic affiliation, starting from the first year and using innovative educational technologies. The aim of the article is to solve this problem on the example of mathematics. It is necessary to develop the material for forming an expert in economics by means of mathematics; to set economic tasks solved by mathematics methods; to systematize available and develop teaching technologies.

5. Research Methods

The methodological basis of the study is axiological and humanistic approaches, according to which a person is the highest value and a goal of the social development and educational process; the competence-based approach is the main direct result of economic education. The theoretical method is used for analyzing educational and training programs designed for economic specialties. A stating and formative experiment was used.

6. Findings

To form an image of an expert using mathematics tools, economic tasks corresponding to the main sections of mathematics (linear algebra, analytical geometry, differential calculus, integral calculus, functions of many variables, differential equations) were developed (Monaco, 2016).

The first section, linear algebra, presents a series of economic problems to be solved using matrix algebra methods. The inter-sectoral balance model (the Leontief model) is of special interest. On the one hand, this is a solution to a serious macroeconomic problem by filling abstract mathematical constructions with real economic content. On the other hand, students are beginning to apply mathematical knowledge to solve specific professional problems. They realize that the mathematics apparatus studied in the first year is the first step towards the Nobel Prize in economics.

The economic tasks solved by the methods of analytical geometry make it possible to implement the principle of visibility, justify the graphic economic material: the budget straight, demand and supply functions, types of equilibrium, break-even points, saturation points, etc. The tasks are a methodological aid for students studying the economic theory. They allow them to understand features of economic graphics.

Differential calculation is a qualitatively new level of development. The concepts of function and functional dependence allow it to model quantitative and qualitative relationships between different economic characteristics. Any economic area can be modulated by means of differential calculus. The supply and demand functions, profit, cost, revenue, aggregate consumption and savings functions are presented in various tasks. The ability to find extremums of functions allows for solving economic problems. The tasks are used to determine optimal final costs, maximum income, maximum revenue, marginal propensity to consumption and saving, optimal production volumes taking into account the tax policy of the state. The concept 'elasticity' helps understand subtleties of economic processes, determine the price policy aimed at maximizing profits.

The integral calculus section presents tasks that allow you to calculate various average economic characteristics: the amount of income, utility of consumption, labor productivity, costs, rental costs, etc.

The functions of variables make it possible to bring learning tasks as close as possible to multidimensional economic reality, assess the impact, significance and contribution of each factor, and evaluate their interrelationship for solving various economic problems.

Differential equations are used for tracking changes in economic characteristics (demand and supply, equilibrium prices, aggregate consumption, evaluation of investment flows).

In addition, a series of complex problems has been developed. To solve them, it is necessary to use knowledge of various branches of mathematics and economics. These problems are of interest, since this is a step-by-step solution of a large economic problem involving analysis, choice of solution methods, application of various mathematical methods, finding a solution, its evaluation and adjustment.

The developed tasks are related to the area of future professional activities of students. The tasks develop skills and abilities to fill abstract mathematical constructions with concrete economic content, find optimal solutions. The economic tasks do not have unambiguous solutions; they have to be solved under uncertainty and lack of data. To choose a right solution to the economic problem, it is not enough to rely on the experience of previous generations and "common sense". Extensive knowledge of mathematics, economics, and other branches of science is needed. Knowledge and skills to use modern technologies are crucial for solving economic tasks.

The tasks force students to consider different points of view, analyze, reason, create conditions for discussions in the student audience. They reflect specifics of activities of individual economic entities and the economic system as a whole; they allow students to form required competencies. They are a powerful motivational factor for learning. This approach allows students to develop logical thinking, ability to think outside the box, fruitfully use the mathematical apparatus to solve economic problems, to develop responsibility for solutions.

The tasks were tested during practical classes with first-year students of the North Ossetian State University named after K.L. Khetagurov and other universities of the Republic of North Ossetia-Alania. Ascertaining and educational experiments were conducted. At the ascertaining stage, the components of professional competence were diagnosed. The results of diagnostics for the control and experimental groups showed similarly low levels. For students of the experimental groups, the educational process was in agreement with the model for developing an expert in economics by means of mathematics. By comparing the initial and final results, we can conclude that in the experimental groups, the indicators of professional competence changed as follows: 22, 97% of students reached the high level of competence, 23.65% - the average level, and 46.62% remained at the low level. In the control groups, these generalized indicators are as follows: 8.78% of students reached the high level of competence, 5.41% - the average level, and 14.19% remained at the low level.

The results show the effectiveness of the method. The dynamics of changes in the achievement coefficient shows that the level of professional competence in the control groups developed steadily from bad to good results. In the experimental groups, high results were observed at the final stage. The educational experiment showed that there were qualitative changes in the level of professional competence.

Undoubtedly, the positive result of the research is the fact that students of the experimental groups began to develop economic tasks which can be solved by the methods of mathematics. Their mental activities were involved in assessment and description of activities of business entities using the methods of mathematics according to the scenario used during the classes. Some senior students decided to carry out research using mathematical methods. Some of these works received awards. Some of them took part in the program "Participant in the youth science and innovation competition".

7. Conclusion

Training students in solving problems is the first step in professional development of future economists. The tasks are a basis for further effective study of general educational and professional disciplines. Solution of the tasks, discussion of the various economic situations contribute to formation of constructive economic knowledge.

These tasks allow it to implement the principle of professional orientation of training and develop required competencies. They contribute to the motivational factor of learning, increase interest in economic activities, help carry out research in economics.

The results are in complete agreement with the studies carried out by A.A. Verbitsky, A.K. Markova, T.A. Matis and other authors in relation to students of different specialties (as cited in Knyazeva, 2009; Tatur, 2004).

References

- Kharshany, J., & Zelton, R. (2001). *The general theory of equilibrium in games*. St. Petersburg: School of Economics.
- Knyazeva, O. G. (2009). The problem of professional orientation of teaching mathematics in technical universities. *Bulletin of TSPU*, 9(87), 14.
- Mikhaleva, O. V. (2016). *Analysis of the effectiveness of mathematical modeling in the economy*. Retrieved from: <http://cyberleninka.ru>
- Monaco, T. P. (2016). *Mathematical analysis and differential equations in problems of economic content*. Ulyanovsk: Zebra.
- Petrenko, A. A. (2007). Competence approach in the educational process. *Modern problems of science and education*, 1, 62.
- Tatur, Yu. G. (2004). Competence in the structure of the model of quality specialist training. *Higher education today*, 3, 21.
- Verbitsky, A. A. (2006). Contextual learning in the competence approach. *Higher education in Russia*, 11, 39.
- Zaichikova, I. V. (2013). The use of active and interactive methods of teaching economics students to mathematical disciplines. *Modern problems of science and education (electronic scientific journal)*, 6.