

*Scientific Bulletin of Chelm*

*Section of Pedagogy*

*No. 2/2017*

## THE COMPETENCE OF THE TEACHER AS A DIDACTIC CONDITION OF STUDENTS' EFFECTIVE INDEPENDENT WORK ORGANIZATION

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**ABSTRACT:** *On the basis of the analysis of psychological and pedagogical literature and empirical studies of the educational process in higher educational economic institution, the necessity of systematic teachers' training for the organization of independent work of students, while studying mathematical disciplines, has been defined in this article. Taking into account modern requirements of scientific and pedagogical activities, the definition of "didactic competence of the teacher of mathematical disciplines" has been proposed as an important condition of organization of independent student's work. The components of the didactic competence as a system unit have been characterized, namely motivational-value, cognitive, methodically-organizational and reflective components. To ensure a sufficient level of didactic competence of teachers of mathematical disciplines, it has been proposed to conduct trainings, consultations and interviews in accordance with the principles of coaching technology.*

**KEY WORDS:** *competence, didactic competence, independent work, the teacher of mathematical disciplines, students of economic specialties*

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## **Setting the problem**

The professional competence of the teacher as an organizer and leader of the active independent work of students, their counselor and assistant is becoming more and more important with the development of new educational paradigm, which is focused on independence, individuality, professionalism, and creative learning. Only professionally competent teacher can train qualified high school graduates who will have not only professional knowledge and skills, but also independent ways of working to obtain new knowledge and skills for further growth in their professional activities.

An important component of professional training of the modern economist is a mathematical component. The study of mathematics plays a special role in the formation of a certain level of mathematical culture, intellectual development, and in terms of the formation of the scientific worldview, the understanding of practical orientation of mathematical disciplines, the mastery of techniques of mathematical modelling and independent application of acquired knowledge to solve relevant tasks and case studies (Kudryavtsev, Kirilov, Burkovskaya, Zimina, 2002). However, most Economics students see little use of mathematics in solving real problems. Teachers of mathematical subjects that teach Economics should pay attention to this problem.

The solution to this pressing problem that has both theoretical and practical significance, is possible on condition of the implementation of appropriate training of the teachers. Due to examining the features of the process of organization of independent work of students of economic specialties while studying mathematical disciplines, we found that 43% of teachers experience difficulties in the organization of independent work during class learning (in particular 67% during lectures and 33% during practical classes), and 57% – in the formulation of tasks for after-classes individual work and its implementation. Therefore, there is a need for the investigation of the essence of didactic competence of teacher of higher educational institutions (particularly economic ones) as one of the didactic conditions of organization of independent work of students while studying mathematical disciplines.

**Analysis of the research into this problem.** The professionalism of the teacher is one of the main factors of the efficiency of the educational

system, which determines the quality of the implementation of the basic pedagogical functions. The problem of the professional competence of the teacher has been researched considerably in many studies, including the works of such scientists as I. Ziaziun, M. Yevtukh, N. Kichuk, L. Mishchuk, L. Stolyarenko, L. Khomych, N. Basova, V. Beshpal'ko, V. Zagvyazinsky, V. Kozakov, V. Kremen, O. Pehota, O. Savchenko, D. Chernilevskiy, V. Yakunin, I. Grishina, N. Kuzmina, A. Markova, T., Dobudko, A. Radchenko, and others.

The question of the formation of professional competence of the teacher of mathematical disciplines in the light of his pedagogical skill in pedagogical literature was studied by numerous educators, particularly by A. Buhra, S. Rakov, O. Mazniev, S. Skvortsova, V. Bevz, M. Burda, S. Goncharenko, O. Dubynchuk, V. Klochko, A. Kuzminskiy, N. Losieva, N. Tarasenkova, O. Chashechnikova and others.

The analysis of the work of these researchers shows that the formation of teacher's professional competence plays an important role in his pedagogical activity. The didactic competence is particularly important, as it involves fluency in his subject, understanding of teacher's role in training and educating students as well as possession of professional and pedagogical qualities. However, the competence of the teacher of mathematical disciplines as a didactic condition of effective organization of independent work of students of economic specialties requires to be researched since it remains slightly neglected by the scientists.

The **purpose** of the article is to justify the structure and content of the didactic competence of the teacher of mathematical disciplines as an important condition of organization of independent work of students of economic specialties.

**Statement regarding the basic material of the research and the justification of the results obtained.** The focus of educational system on learning, which was traditional and justified earlier, no longer meets the modern social demand, which is determined by the objective necessity of the society to have new individuals capable of independent, responsible, creative actions with intellectual personality with critical thinking, who live in a difficult, contradictory and full of problems modern society and is ready to professionally solve them (Drach, 2013; Iehorova, 2013). Today it is required to educate independent, proactive and responsible members of society, able to interact effectively

in the implementation of social, industrial and economic problems. The fulfillment of these tasks requires a significant improvement in the quality of professional training of future specialists. This circumstance determines one of the key tasks of higher education reform in Ukraine – the reorientation of the educational process from the traditional “knowledge” approach to the competence approach, which provides the transformation of educational logic of cognition from “knowledge” to “action” from “know” to “take action”. The solution to this problem is possible on condition of appropriate training of teachers, in the structure of pedagogical component defined as a key professional competence (Iehorova, 2013, p. 48-49).

The analysis of psychological and pedagogical literature (Grishina, 2002; Dobudko, 1999; Kuzmina, 1985; Markova, 1996; Radchenko, 2006) indicates significant attention of scientists to the study of the essence of teacher’s competence and its components (table 1).

Tab. 1 Teacher’s competence

<b>Author’s surname, source</b>	<b>Competence</b>	<b>Components</b>
I. Grishina (Grishina, 2002)	Complex multi-aspect personal formation, which includes functionally related components	<i>motivational</i> – a set of motives adequate to the goals and objectives of management; <i>cognitive</i> – knowledge necessary to manage; <i>operational</i> – a set of abilities and skills of practical solving of tasks; <i>personal</i> – a set of personal qualities important for the management; <i>reflective</i> – a set of abilities to anticipate, to evaluate, to "slow down" their own activities, choose the strategy of management.
N. Kuzmina (Kuzmina, 1985)	The knowledge and skills necessary for	– <i>special and professional</i> in the field of discipline that is taught;

Author's surname, source	Competence	Components
	professional activities	<ul style="list-style-type: none"> <li>– <i>methodical</i> in the ways of formation of knowledge, skills of students;</li> <li>– <i>socio-psychological</i> – in the processes of communication;</li> <li>– <i>differential-psychological</i> in the sphere of motives, abilities, orientation of students;</li> <li>– <i>auto-psychological</i> in the field of achievements and shortcomings of his own activities and personality.</li> </ul>
A. Markova (Markova, 1996)	A certain mental state that allows you to act independently and responsibly; the possession of skills and ability to perform certain functions	<p><i>special</i> – possession of own professional activities on a high level, the ability to design their further professional development;</p> <p><i>social</i> – possession of common (group, cooperative) professional activities, cooperation and adopted in a particular profession methods of professional communication; social responsibility for the results of their professional work;</p> <p><i>personal</i> – possession of techniques of personal self-expression and self-development, means of opposition to professional deformations of the personality;</p> <p><i>individual</i> – possession of techniques of self-realisation and development of individuality within a profession, readiness for professional growth, ability to individual self-preservation,</p>

Author's surname, source	Competence	Components
		disinclination to professional aging, the ability to organize their work efficiently, without overloading time and energy, to work without strain and without fatigue.
T. Dobud'ko (Dobudko, 1999)	The unity of theoretical and practical readiness to the pedagogical activity	<ul style="list-style-type: none"> <li>– <i>problem-practical</i> – adequate understanding of the situation, formulation and effective implementation of the objectives, goals, norms in a particular situation, the willingness to continuous education with the aim of achieving occupational mobility;</li> <li>– <i>informative</i> – adequate understanding of the situation in a more general context;</li> <li>– <i>value</i> – the ability to adequately estimate the situation, its meaning, goals, objectives and norms from the perspective of private and general important values.</li> </ul>
A. Radchenko (Radchenko, 2006)	The process and result of creative pedagogical activity, integrated indicator of personal and activity essence of a teacher caused by the realization	<ul style="list-style-type: none"> <li>– intellectual,</li> <li>– psychological,</li> <li>– managerial,</li> <li>– motivational,</li> <li>– communicative,</li> <li>– projective,</li> <li>– didactic,</li> <li>– methodical.</li> </ul>

<b>Author's surname, source</b>	<b>Competence</b>	<b>Components</b>
	of his humanistic orientation	

From the mentioned above approaches to the interpretation of the concept of “competence” and taking into account current qualification requirements for professional activity of the teacher of high school (Ielnykova, 2010), we consider it possible to define competence (from lat. *competentis* – able) of the teacher of mathematical disciplines in the context of organization of independent work of students. Didactic competence is a trait that is an integrative characteristic of the individual and it reflects the willingness of the teacher to ensure the process of active independent work. Based on the analysis of definitions of competence given in table 1 it can be asserted that its main components are: motivational-value, informative, methodically-organizational and reflective components. From the perspective of the goals of our scientific work focused on the research of peculiarities of organization of independent work in the process of studying of mathematical disciplines by students of economic specialties, we are about to characterize the essence of the defined components.

Motivational-value component includes: motives, goals, needs, values, it stimulates creative expression of the teacher’s personality in the profession; assumes the presence of interest in professional activity. The importance of this component is due to the fact that most Economics students do not benefit from the study of mathematics in solving real economic problems. And that is the reason for the low level of mathematical knowledge of students as well as their inability and unwillingness to work hard and independently with the learning material. This determines the presence of the teacher skills to engage and motivate the student for learning cognitive activities, particularly independent work; the ability to stimulate students’ creativity; the ability to clearly set goals and values. The teacher should provide a comfortable atmosphere of cooperation that will enable to efficiently organize independent work of students in the process of studying mathematical disciplines.

The informative component involves mastering of content (Buriak, 2001) of mathematical disciplines (“Higher mathematics”, “Theory of probability and

mathematical statistics” and “Optimization methods and models”) and awareness of the connections between them; ability to organize independent work of students in the specified disciplines with regard to their future professional activity; ability to solve real economic problems by mathematical methods; to be an example for them in pursuit of continuous self-education.

Methodically-organizational component of competence implies the ability to organize independent work of students and to carry out methodological support of this process. The teacher must be able to adapt the content of educational material of mathematical disciplines in accordance to the specifics of Economics. This gives opportunities to use mathematical tools and instructional techniques for concise description of examined objects; to provide possibilities for quantitative comparison and well-founded choice of content suggestions, logical hypotheses to identify implicitly existing factors that affect the dynamics of economic indicators. The teacher's skills include the ability to organize individual and group independent work of students on classroom (lecture and practical) training, and in extracurricular time; to organize independent work of students in accordance with the levels of autonomy in performing tasks (reproductive, partially-search, research), to carry out their pedagogical and methodological support and control over the process of these activities in various degrees and in different forms.

Reflective component determines the ability of the teacher to comprehend the process and the results of independent work of students, the definition of didactic means of their correction, improvement of the quality of knowledge and levels of readiness to work independently to achieve the highest result. The essential element of a teacher in this competence is indicated as the ability to organize not only reflection “teacher-student” but also “student-student” and self-reflection of the student in the process of studying mathematical disciplines in further study.

So, the didactic competence of the teacher of mathematical disciplines must have a sufficient level in relation to:

- the motivation and interest of students of Economics in the study of mathematical disciplines;
- the content of key concepts of mathematical disciplines that explains economic phenomena and teach students how to solve real problems;



- the organization of independent work of students of economic specialties in the ways that best contribute to the study of mathematics;
- the ways to diagnose levels of readiness of students to independent work while studying mathematical disciplines.

To ensure a sufficient level of didactic competence of teachers of mathematical disciplines we propose the training “Ways of increasing the efficiency of independent work of students”, individual consultations and interviews in accordance with the principles of coaching technology. We have chosen the coaching technology (it is a deliberately created partnership to help people self-actualize, to act effectively and to learn new things throughout life), and in particular training, because under such conditions there is an informal, relaxed communication, which gives the group options for the development and solutions to educational problems. The training involves informing the teachers about the changes that occur in the educational environment; obtaining professionally significant knowledge and skills by the participants; development of skills to organize independent work of students using optimal forms and types of work; development of skills in the implementation of self-reflection, self-improvement and positive motivation.

For example, here is a structure of one of the training courses, which can be represented in this way.

Aim: forming of knowledge and skills that promote conscious choice of forms and types of independent work of students of economic specialties while studying mathematical disciplines.

The procedure:

- I. Greeting and introduction of participants.
- II. Mini-lecture on the theme “Optimal forms and types of organization of independent work of students.”
- III. Exercise “Analysis of the economic situation”.
- IV. The activity “Select the type and form of independent work in accordance with the tasks”.
- V. Discussion of the results of the training and summarizing.

Questions for discussion:

- Which of the given information was unknown to you?

- Which examples of specific economic situations interested you most of all?
- Did you have any difficulties while doing exercises? If yes, which ones?
- What do you remember most?
- Have any of your expectations realized during the training?

Please, write a few sentences which will express your wishes for the training.

*Thank you for your attention and participation in the training!*

The main indicator of the impact of the proposed measures for the formation of didactic competence of a teacher in our view is the level of formation of cognitive component of readiness of students for independent work. The knowledge of mathematics and the ability to organize independent work of the teacher directly affect the level of assimilation of knowledge by students of economic specialties.

### **Conclusions**

The analysis of approaches to the interpretation of the concept of "competence" has given the opportunity to identify the didactic competence, to reveal its contents and structural components. Didactic competence of the teacher of mathematical disciplines is an integrative personality trait; component of his professional competence that is formed in the process of didactic training. Its structure includes motivational-value, informative, methodically-organizational and reflective components. Motivational-value component assumes the teacher's ability to interest and motivate the student for learning cognitive activities, in particular the independent work in the process of studying mathematical disciplines. An informative component determines teacher's use of professionally oriented tasks for independent work. Methodically-organizational component provides pedagogical and methodological support for adapting the content of teaching material of mathematical disciplines in accordance with the specifics of Economic specialties. Reflective component determines the ability of the teacher to arrange various types of control and self-control. Didactic competence of the teacher of mathematical disciplines is an integral component of his professional skills and is directed to teach students specializing in Economics to use mathematical knowledge as the basis of modern economic knowledge, and assimilate methods of obtaining this knowledge independently.

A more detailed research need to be done to define the features of influence of didactic competence of the teacher on the formation of motivational, procedural and reflexive components of readiness of students of economic specialties of higher education institutions to independent work while studying mathematical disciplines. We determine these questions the prospect of our further scientific research.

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