

Metasubject competences of University students as a reflection of psychological and pedagogical innovations in higher school

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Abstract—The article is devoted to the problem of formation of metasubject competences of University students in the context of pedagogical innovations. The authors believe that in the modern educational system metasubject approach is the most relevant and promising. The formation of professional competence of University students is a process that is based on the primary competencies inherent in secondary school. Organization of educational cognitive activity of students, based on the modular rating system of training provides increased success and leads to the stimulation of educational activities of students, the development of basic competencies. The effectiveness of the formation of professional competence of students is achieved through the implementation of the model of training in the creation of psychological, pedagogical and organizational and methodological conditions. This article touches upon the problems of quality training of students, identified effective forms and methods, justified the need for the use of pedagogical innovations implemented in the training of new educational programs (maynorah and electives).

An attempt is made to substantiate and prove the need for the use of pedagogical innovations in new educational programs based on a practice-oriented approach and aimed at the end result of pedagogical creativity, which is a universal, competitive specialist.

Keywords—*meta-methods, meta-skills, meta-subject competences, innovative technologies, new educational programs (minor, elective)*

I. INTRODUCTION

Starting to study a specific area of knowledge related to the in-depth study of problems in the field of innovative development of the industry, it is necessary, first of all, to determine the set of the most commonly used terms, their essence and content, which are key in modern higher education and the Economics of Education.

Certainly, in this context, our study will use a few fundamental concepts of the theory and methodology of innovative development. This, in turn, will require substantial adaptation of the essentially solved problems in the work. At the same time, the functional adaptation of the concepts used in the study and their definitions to the purpose, objectives and object of study is of importance for us.

In conditions of modern educational space is an urgent problem of quality of professional training of students of pedagogical higher education institutions, formation of interdisciplinary competencies, abilities to apply pedagogical knowledge and skills into practice in

the context of the new educational system, using the full potential of innovative transdisciplinary and multidisciplinary programs (minors, and elective courses), effective forms and methods of professional training of students of pedagogical universities.

It is impossible to ensure high quality of education at the University without the use of innovative educational approaches and appropriate pedagogical technologies. One of the educational innovations of recent years (2012-2017) was the introduction of a metasubject approach to the system of profile training in higher education, aimed at forming a holistic worldview of specialists through the development of their professional metacompetencies based on the practice-oriented orientation of the educational process and interdisciplinary integration.

The requirements for the training of a professionally competent specialist are declared in the state documents; the Federal program for the reform of higher professional education until 2010; the Federal target program for the development of education for the period 2006-2010; the Declaration of accession to the Bologna process.

The practical orientation of the educational process assumes as fundamental - the study of traditional Russian education disciplines of the natural science cycle in combination with applied disciplines. The reformed education system should play a key role in the preservation of fundamental science and the development of applied Sciences necessary for the sustainable development of Russian society. The specificity of the modern University allows training demanded in innovative production specialist - can work in a team of enterprising person with continuously increasing potential, having a high intelligence and flexible system thinking, professional courage, ready to solve complex problems. In the system of professional training of specialists in the University it is necessary to create psychological, pedagogical, organizational and methodological conditions for the formation of professional competence.

For students of modern University disciplines of natural science cycle, laying the foundations of General cultural, General professional, scientific and research competencies are of particular importance. However, in the process of teaching natural science disciplines there is a contradiction between the need to create a model of professional competence and ineffective ways of organizing the educational process at the University, which do not allow to solve this problem productively. The relevance of the search for new theoretical and methodological foundations of continuous formation of professional competencies in higher education is confirmed by the analysis of psychological and pedagogical literature.

II. MATERIALS AND METHODS

The methodological basis of the Research was the ideas of philosophers, psychologists and educators about the social nature of learning and education

human conditions and factors of personality development; the fundamental works of domestic and foreign scholars on issues of professional education: B. G. Ananiev, K. A. Abulkhanova - Slavskaya, B. C. Avanesov, E. I. Androsyuk, N. And. Aksenova, S. Y. Batyshev, V. P. Bepalko, A. A. Volumes P. E. Bocharova, O. V. Velkova, A. A. Verbitsky, V. K. Vilkonis, V. M. Gareev, P. Y. Galperin, A. D. Gladun, N. With. Gorelysheva, D. P. Gorsky, V. F. Efimenko, V. M. Zhurakovsky, M. Zinovkina, Ia Winter, M. K. Kabardov, E. A. Klimov, V. I. Kovalev, N. In. Kuzmin, A. A. Krutetskiy, C. B. Lednev, A. N. Leontiev, B. F. Lomov, V. Ya Laudis, V. I. Mikheev, I. O. Martyniuk, A. K. Markova, G. V. Nikitina, A. M. Novikov, K. K. Platonov, A. A. Rean, Z. A. Reshetova, S. L. Rubinstein, V. A. Slastenin, N. F. Talyzina, Yu. G. Tatur, B. M. Teplov, X. Hekhauzen, Yu Zigarelli, P. A. Shaver, V. D. Shadrikov, P. Juceviciene, V. A. Yakunin, J. Russell, S. N. Postlethwai. The organization and methods of research were determined by its goals and objectives, the need to simultaneously solve theoretical and practical problems. Theoretical research methods were used: analysis of philosophical, methodological, psychological and pedagogical literature, work programs, curricula, scientific periodicals and dissertations. Practical methods included: pedagogical experiment, observation, survey, ranking, questioning, testing. Statistical methods were used to process the results: factor analysis, student t-test method. The validity of the proposed provisions and the reliability of the results and conclusions are provided by the rigor of the conceptual apparatus of the study, a clear definition of the subject area and objectives of the study, theoretical analysis of the problem, the use of a set of diagnostic methods of pedagogical research, the application of the results in practice at the University, as well as representative samples of persons involved in the study.

III. DISCUSSION

Many researchers consider professional competence as a complex characteristic of a person, which is a set of professional knowledge, skills, qualifications (E. F. Zeer, I. A. Zimnyaya, A.V. Khutorskoy, S.I. Tarasova), other authors (V. D. Simonenko, N. V. Radionova, V. V. Vvedensky) - as a kind of General ability. The condition for the formation of professional competence of the future specialist, according to V. A. Slastenin, is a system that is based on value-oriented educational activities. "Values in learning are the drivers of professional growth and develop in three directions: 1) goals, motives and professional ideals; 2) knowledge, skills and methods of activity; 3) the quality of the individual." According to V. Ya. Lyaudis, "an Important condition determining the success of the process of formation of professional competence of future specialists of the University is the joint productive activity of the teacher with students and students with each other." In our research, we relied on the ideas of the holistic concept "the shifting epicenter of all human existence to the pole of culture" of such philosophers as M. M. Bakhtin [1], V. S. Bibler [2], Bondarenko T. N., Latkin A. P. [3], M. K.

Mamardashvili [4], and Golosov, S. V., Fedorenko L. P. [5], Penzin S. N. [6], etc., examining practice-oriented (activity-based) approach as appropriate to modern conditions of transition from ideology to culture in education. The question of the possibility of integration of education into culture was noted by "Georgian Socrates", M. K. Mamardashvili: "education should be filled with cultural, that is, human meanings" [4]. A great contribution to the development of the cultural concept of personality-oriented education was made by the famous teacher-researcher E. V. Bondarevskaya [7], the head of the well-known scientific school in the country, the priority of which is the education of a citizen, a person of culture and morality.

However, all authors associate professional competence with readiness for concrete activity on the basis of deep theoretical knowledge, practical skills in a certain field, and also existence of certain qualities of the person necessary for the solution of professional problems and tasks which arise in the course of activity. When studying the disciplines of the natural science cycle, the student receives theoretical knowledge of the basic laws of nature, gets acquainted with the experimental work, master the skills to solve practical problems, which leads to the readiness to perform a specific professional activity, which means that they master professional competencies.

The reform of the education system is dictated by the need to improve the quality of education at all levels of training, which is expressed in the current version of the Federal state educational standards (GEF), and in article 2 of the Federal Law "On education in the Russian Federation", which States: "Education — the uniform purposeful process of education and training which is socially significant good and carried out in interests of the person, a family, society and the state, and also set of the acquired knowledge, abilities, skills, valuable installations, experience of activity and competence of certain volume and complexity for the purpose of intellectual, spiritual and moral, creative, physical and (or) professional development of the person, satisfaction of its educational needs and interests" [8].

Reforms of the educational system in various countries of the world, including in Russia, are United by the concept of modernization, i.e. the scheme of setting problems and solving them with the help of certain means and methods. The nature of education, its orientation, goals and content are changing. The anthropocentric approach aims at the formation of an independent creative personality, orients it to the development of individuality, creative initiative and independence, competitiveness and mobility of specialists.

The state educational standard defines competence in the educational process as the ability to apply knowledge, skills and personal qualities for successful activity in a certain area. The internal structure of professional competencies is the core, which consists of knowledge and primary professional skills that are formed within the educational process. In the system of

vocational education, a certain level of readiness for the formation of competencies can be achieved, which includes knowledge, skills, personal qualities, motivation. Researchers N. O. Verbitskaya and D. Th. Kotova offer competency model as the core and shell composed of different elements. "Core competencies are professional motives, personal qualities, attitudes, values. On their basis, a shell of knowledge, skills is formed, continuously replenished by motivation, the need for professional self-development, professional interest." The problem of metasubject competences formation was considered in the works of A. V. Khutorskoy [9] and others, having proved and confirmed the effectiveness of this approach.

Russian scientists have considered the basic concepts of interdisciplinary approach: "metasubject" - mental activity, a universal activity that is "intransitive", at the same time is at the heart of these objects and the root connection with them; metapragmatic is an academic discipline, the content of which is grouped around several Perevoznikov. It should be noted that the modern information space is overflowing with the description of techniques and technologies aimed at improving the efficiency of the educational process.

The innovative processes taking place in the modern educational sphere include pedagogical technologies, modular, problematic, contextual training, new educational programs (mainly, electives), methods (case-study, business/role/didactic games, mini-lectures, discussions, creative meetings, colloquiums, seminars, brainstorming (synectics), research projects, art technologies, the practice of creating a variety of art objects, infographics, forums, webinars, virtual classes, etc.

The learning process can be represented as a consistent, gradual increase in the level of formed professional competencies, or readiness for professional activity. Depending on the level of assimilation of educational information by students and consolidation of their practical skills were formed qualitative and quantitative criteria for assessing the formation of competencies; - the first level involves the performance of tasks for which a passive knowledge of concepts, definitions, laws, formulas; - the second level requires the ability to solve simple ("typical") tasks on the basis of acquired knowledge; - the third level provides skills to solve non-standard problems. Quantitative criteria for evaluating the effectiveness of training for each qualitative indicator were: academic performance, the coefficient of completeness of learning, the level of formation of skills, the level of motivation for learning.

IV. RESULTS

On the day of checking the initial level of formation of basic knowledge, skills and abilities, students were offered a test, which included questions of theoretical and practical nature. On twenty questions offered in the test the correct answers, could give 50% of respondents. 10% of students were able to find physical quantities graphically, to determine the type of

dependence. Knowledge of units and physical terms could show 30% of students. Analysis of the diagnostic results at the entrance of the experiment showed that students do not have enough knowledge to solve non-standard issues, find it difficult to apply the knowledge in practice, do not have the skills to use reference books, do not know how to evaluate and analyze the results. Analysis of the results revealed the need for construction, the process of training aimed at the formation of a professionally competent specialist.

The young scientist considers the educational process in the context of world and national culture, anticipates the humanization of the content, the use of humanistic technologies of training and education, as well as the creation of an educational environment at the University that forms a person capable of creative self-realization in the modern socio-cultural situation. One of the main principles in education, creating an atmosphere of cooperation and co-creation, is the principle of creativity.

The experimental group was offered T. Ehlers test, the purpose of which was to assess the level of motivation to achieve success. During the pedagogical experiment, the number of students with a high level of motivation to achieve success in learning has doubled, moderately high - 1.8 times. The number of students with an average level of motivation decreased by 1.4 times, with a low level - by 1.8 times. The increase in the number of students with a high level of motivation was due to increased interest in the future profession and the desire for self-development.

Freedom of choice of disciplines will improve the competitiveness of University graduates. In addition, the case of bachelor's education in the framework of the Project 5-100 includes concepts (individualization, self-determination, education vs training, knowledge, skills, competencies, free program), formats: (educational pipe vs individual trajectory, credit-modular system), educational program (major, minor, nuclear program, electives / electives).

Taking into account the current trends, teachers face the task of designing new educational programs aimed at the formation of metasubject competencies. It becomes obvious that under the new educational paradigm, the regional educational model should have a metasubject (integrative) basis and be understood as the main socio-cultural platform for the development of the region, which reflects the anthropocentric idea.

Transdisciplinarity means that the original disciplines are by no means abolished or transformed into some kind of "centaurs" with the loss of the level of the original disciplines. On the contrary, the disciplines here are enriched by mutual knowledge, methods that teachers and researchers have acquired in their fields. That is, the logic of the prefix "Trans" means that some individual disciplines make a breakthrough beyond their discipline. Therefore, they do not lose their subject, but rather expand it, deepening humanitarian research. In the training of students-teachers, in our opinion, it is necessary to take into account that humanitarian knowledge involves not

only the transfer of knowledge and competencies, but also the reproduction of knowledge, their expansion, as well as the impact on the formation of personality.

However, a meta-pedagogy encompasses more than just secondary school, higher professional level this process is much more passive, which leads to the ambivalence problem of the quality of education in General. Consider what you need to understand the meta-results. By metasubject results we mean the ways of students' activity: cognitive, communicative, creative with the inclusion of planning, control and correction.

We developed a new educational product, Maynor "Signs and symbols of intercultural communication", in order to combine separate disciplines that allow to expand knowledge in various fields (foreign language, fine arts), and its content is directed to the formation of metasubject competencies of students, contributing to the implementation of creative, practical, professional, communicative tasks. In the development of the Mainor, it was necessary to justify the relationship of symbolic means for encoding social information.

The idea of creating a minor arose on the basis of our ideas that in society there is a symbiosis of synergetic sign systems, but none of them, taken separately, can not act as a generator of meanings. Meaning enriches the language of abstract visual thinking and emotional perception, which sanctions necessary for the formation of a universal specialist.

Methodological and theoretical basis of the minor "Signs and symbols of intercultural communication" are such disciplines as semiotics, cognitive linguistics, cultural linguistics, linguistics, linguistics etc. The Most important thing for us was semiotics and its concepts: the Word-sign. Language – sign. Ornament – sign. Color – sign. Form - sign. Language is a form of communication. The semiotics of culture is understood as a set of symbolic means by which social information is encoded. Maynor is designed for 2nd year students of all areas of the humanitarian cycle: "Journalism", "History", "Philology", "Sociology", "Pedagogical education", "Economics", "Law", this course will also be useful for natural science, physics and mathematics and other full-time education.

Thus, in the educational system, the integrating potential of modern pedagogy is enhanced, before that, in our opinion, it is not fully reflected both in pedagogical theory and in pedagogical practice, because pedagogy is multidimensional and multifaceted and is able to integrate various knowledge both in theoretical reflections and in practical educational activities.

V.CONCLUSION

The key result of the project 5-100 should be the emergence in Russia by 2020 of modern universities-leaders with an effective management structure and international academic reputation, able to set trends in the development of world higher education. The case of bachelor education in the framework of the Project 5-100 includes concepts (individualization, self-

determination, education vs training, knowledge, skills, competencies, free program), formats: (educational pipe vs individual trajectory, credit-modular system), educational program (major, minor, nuclear program, electives / electives).

Under the new educational system, the educational model should have a metasubject (integrative) basis and be understood as the main socio-cultural platform for the development of the region, which reflects the anthropocentric idea. In the course of optimization of educational process interdisciplinary pedagogy comes to the fore. Such criteria as independence and ability to navigate in a large amount of information become important in learning.

Metasubject content of education implies other activities, different from the traditional, enabling to develop meta-subject competencies necessary for successful personal growth, presented in the metaknowledge, meteomedia and Metastasio.

When forming metasubject knowledge of University students, it is necessary to take into account the characteristic features of meta-activity, for example, to attach special importance to the research factor, which, in turn, involves not only the identification of problems, but also the formulation of a hypothesis.

At the moment, multidisciplinary specialists with a set of different competencies are in demand. Unlike the old one, the new educational model allows to take this into account, offering a choice of different elective courses.

In this regard, the following conclusions were made:

– the modern world with the trends of rapid development in the field of education needs skills of self-development and processing of reliable information. This requires competencies that are expressed as metaknowledge, meteomedia, Metastasio and interrelate with others that ultimately allows to expand the range of vocational training of the teacher;

– professional training of students of pedagogical University on the basis of metasubject technologies is directly connected with work on formation of their Outlook and introduction of new effective methods of work, such as case-study, brainstorming (synectics), research projects, art technologies, practice of creation of a various number of subjects of art, infographics, forums, webinars, virtual classes, etc., and also development of the transdisciplinary educational programs (minors) influencing process of formation of metasubject competences, universal ways of activity (meta-methods) in various fields of knowledge. Undoubtedly, the metasubject approach is aimed at the disclosure of creative abilities, opens up new prospects, imposes new requirements for the training of teaching staff.

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