IMPROVEMENT RESEARCH COMPETENCE OF FUTURE STUDENTS IN HIGHER EDUCATIONAL INSTITUTION

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ABSTARCT

The present day specifies more requirements for a person's ability for selfimprovement and self-development, and professional and social mobility, to the level of intellectual development as these qualities determine human value as a personality and as an expert in modern society (Biktagirova & Valeeva, 2013). Therefore the system of higher education has to provide for the development of these qualities to ensure the university graduates' life-long self-improvement. This goal may be realized through the competency-based approach which the Federal law "About education in the Russian Federation" has defined as the major practical method of higher education modernization in regard to the increase of its quality and labor market requirements Many scientific works (e.g. Pidkasisty, Belyaev, & Khutorskoi, 2013) are devoted to the issues of theoretical substantiation of education modernization and students' training system improvement for professional activity in the context of present-day conditions.

Nowadays, scientists express various opinions in regard to competency-based approaches in education. At the same time, the analysis of sources allows us to draw a conclusion that there is no uniform, standard definition of the concept "competence", besides, there is a different interpretation of the terms "competence" and "competency". To differentiate the semantic meaning of these concepts we will consider Khutorskoi's point of view, who understands competence as "some aloof, beforehand set requirement to a learner's educational training, and competency as already accomplished personal quality (set of qualities) and the minimum experience in relation to the activity in the designated sphere" (Khutorskoi, 2013). In many works (e.g. Khutorskoi, 2011; Komarova, 2008; Shadrikov, 2006; Skornyakova, 2013), various approaches to the concept of research competence are singled out: It is considered as a personality's integrative quality; as a personality's special property; and as an ability for research activity. Its fundamental elements are Research competence development of students © 2015 iSER, Mathematics Education, 10(3), 137-146 139 the body of knowledge, skills and habits that the student has in a certain subject sphere, and the ability for independent cognitive activity. Some authors (Khutorskoi, 2009; Lebedev, 2009) propose the classification of educational competences according to three levels that correspond to the content of education; subject, all-subject, and Meta subject; which all relate to the general education content.

Research competence – is a complex, stable, multi-formation in the psyche of the individual, which is acquired during a specially crafted learning process, which allows her to know objective reality through scientific instruments, and have more or less reliable information about it. *Competence* means that you have the ability to do something well. You are capable of performing a task or job effectively.

Competence can include the knowledge and skills needed to solve a quadratic equation. Or, it can comprise the much larger and more diverse clusters of skills, or *competencies*, needed to lead a multinational corporation.

The concept of competence is creeping into our lives, pervading our thinking about developing people of all ages – from new babes to weathered professionals. We find it in modern human resources departments in our workplace, and in innovating schools experimenting with competence-based education.

But where is this concern with competence coming from?

Is it the right way forward, or just another buzzword?

In fact, *competence* has been around for some time now. The roots of competence lie in a debate about general intelligence – IQ or *g*.

David McClelland of Harvard wrote a classic paper on the issue: *Testing for Competence Rather than Intelligence*. He published it in the journal *American Psychologist* in 1973. Forty years later, it's still as punchy and pertinent as ever. Let me tell you about my favorite line of his argument...

The research competence is an example of meta-subject competence. It includes the whole complex of educational competences directly connected with thought, search, logic, and creative processes of students' knowledge mastering. Some authors (e.g. Edwards & Osipova, 2011) pay attention to the converting nature of research competence and represents it as an integrated personal quality. This is expressed as the readiness and ability to master and receive systems of new knowledge independently, as a result of the transfer of an activity semantic context, from functional to converting, on the basis of already available knowledge, abilities, skills and ways of activity. In our opinion, spontaneous teaching of some skills of research activity during traditional training sessions and extra curricula work cannot serve the basis for competence formation of the designated competence. Only systematic use of opportunities of several modern pedagogical technologies (research, design, information and communication, etc.) may provide the solution to the objective. Many scientists speak about the availability of a huge potential in the research competence development on the material of different areas in mathematics. To solve the issue of research competence development of students trained in the mathematical direction it is necessary to do the following:

1. Change the system analysis of the research competence structure to select methodological and methodical justification of its development process;

2. Define the body of student's research competences and their characteristics within professional and mathematical training in higher education institutions;

3. Construct the model of research competence development where goals, tasks, structure, logic, content, methods, forms, and means of implementation are the body of this process;

4. Select traditional and innovative technological strategies to involve students in research activity;

5. Develop techniques aimed to develop research competence based on the modeling of educational researches and arrangement of independent research activity;

6. Develop a compendium of research projects that unite content and technological aspects of the research activity on the material of specific mathematical disciplines;

7. Formulate criteria to assess the level of students' research competence;

8. Develop the technology to realize the model and to verify experimentally its efficiency in regard to students' motivational increase in educational and research activity, and their involvement into the research process.

The experiment was applied to verify the efficiency of the developed technology to realize the model of students' motivation increase in the research activity and their involvement in the research process. The requirements to the level of research competences development are presented in FSES of higher education in Russia. The analysis of FSES of higher education on the training directions "Physics", "Mathematics and computer sciences", and "Applied mathematics and informatics" allowed to bring about research competences which we have expressed through the following abilities:

1. To increase professional competence in the area of performed scientific research (the latest theories, interpretations, methods and technologies);

2. To reveal and formulate relevant scientific problems in the sphere of future professional activity of the mathematical profile;

3. To work out a plan and program of educational/scientific research;

4. To apply techniques and technologies from adjacent fields of knowledge in order to carry out research in the field of mathematics;

5. To interpret scientific research results and to reveal their practical importance;

6. To generalize scientific research results and to present them in the form of articles, reports, and abstracts;

7. To report scientific research results in public with the presentation of the report. 60 students of the specified training directions took part in the experiment.The assessment of the research competence development level was carried out on a threepoint scale: perfect mastery – 3, mastery– 2, mastery is poorly expressed – 1, does not master – 0. The correlation of the indicator with the criteria of competence developed level: 75–100% –optimum, 55–74% –admissible, 25–54% –critical, 24% and below – inadmissible level. According to the results of the experiment, the following data shown in Table 3 was obtained. From analyzing these tables, we were able to correlate them to the criteria of research competence development level.