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**FORMATION OF RESEARCH COMPETENCE OF
UNDERGRADUATES IN THE DIRECTION OF "PEDAGOGICAL
EDUCATION"**

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Abstract

The contradiction between the objective need for the formation of research competence of undergraduates, on the one hand, and the low level of this competence of a significant part of graduates of the Master's degree course 'pedagogical education', on the other makes this topic rather challenging. The aim of the study is to develop and justify the didactic conditions that contribute to the effective formation of research competence of undergraduates in the course of studying the module 'Methodology and methods of pedagogical research'. Methods of research are empirical (pedagogical experiment, testing to determine the level of development of research competence), theoretical (analysis, synthesis, comparison, generalization, etc.), methods of mathematical data processing.

A set of didactic conditions that contribute to increasing the efficiency of forming the research competence of undergraduates in the process of studying the discipline 'Methodology and methods of pedagogical research' is singled out and experimentally substantiated.

The results of the research can be used by high school teachers working with undergraduates to improve the teaching and educational process in order to form a productive-activity position among the learners in teaching (through an integrative combination of different forms of problem-project training in the course of classroom and self-directed work of students) that fosters the development of experience in the design and implementation of research activities.

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1. Introduction

The character and content of modern requirements to quality of training of specialists foregrounds the system of the higher education questions of ensuring the motivational involvement of students and strengthening of activity orientation of educational process on formation of students' research competence allowing graduates to be susceptible to changes in the sphere of work, capable to work in situations of uncertainty and discrepancy, focused on the creative approach. Meanwhile 'purposeful work on development of competences of the sphere of research and development and also motivations to innovations in the Russian educational institutions is begun only in recent years', is noted in the Strategy of innovative development of the Russian Federation for the period till 2020 (The Russian Government, 2011).

The phenomenon of research competence was studied by a number of works by Russian scholars (Chechel, 2003; Hajrullina, 2007; Ushakov, 2008; Kudakov, 2009; Rubcov, 2009; Karpov, 2011; Savenkov, & Osipenko, 2013) where questions of maintenance and structure of research competence are considered as a pedagogical concept. Its pedagogical means and conditions of formation at the studying educational organizations of different levels are also proved. This issue is also analyzed by foreign researchers (Stone, Alfred, & Pearson, 2001; Mayer, 2002; Jessup, 2014). At the same time we should notice insufficient number of the researches concerning development of research competence of graduate students studying the course 'pedagogical education'.

Within the development of the program of a Master of Education, graduates have to be ready to solve research tasks in their professional field of studies, according to the requirements of Federal State Education standards of higher education (Rubcov, 2009). In particular, graduate student has to have 'systematic and critical thinking, ability to carry out the critical analysis of problem situations on the basis of systematic approach, to develop strategy of actions (UK-1) and also ability to project pedagogical activity on the basis of special scientific knowledge and results of researches (OPK-8)' (Rubcov, 2009).

In order to be ready to organize pedagogical activity on the basis of results of researches, graduate students need to be able to conduct researches and to receive objective results. For this purpose it is necessary to form not only the system of knowledge about what is the pedagogical research, its technology of preparation and carrying out, but also to develop positive motivation, skills of research activity, what includes the maintenance of the concept of 'research competence'.

However, studying the level of readiness of graduate students for design and carrying out pedagogical researches shows the existence of such gaps as insufficient development of abilities to isolate contradictions and to formulate a research problem, its object, the subject and other elements of the scientific research; to choose necessary methods of a research, to process the received results, to analyze and comprehend them taking into account the available scientific data; to interpret results of a pedagogical research. Low level of methodological culture leads to the fact that results of researches cannot form a reliable basis for design of effective pedagogical activity.

Such condition of practice exists in spite of the fact that in scientific and pedagogical literature the issue of methodology and methods of preparation and carrying out scientific research in the field of pedagogics is rather investigated (Pidkasisti, 1998; Zagvyazinskij, 2001; Novikov, 2002), and studying of discipline 'Methodology and methods of pedagogical researches' which is directed to formation of

knowledge, skills of preparation and carrying out a pedagogical research is provided in curricula of training of graduate students.

The question is why, despite studying the special course on preparation for carrying out pedagogical researches, graduates are not ready to perform this activity appropriately? Our analysis shows that one of the important reasons is low degree of the involvement of students into productive independent cognitive activity. The last is caused, by domination in the course of studying of discipline 'Methodology and methods of pedagogical researches' of passive forms and methods of training, insufficient attention to accounting of individual interests and needs of students and also traditional approach to control and assessment of results of training in the form of ordinary examinations directed, mainly, to identification and assessment of student knowledge.

2. Problem Statement

There is a contradiction between objective orientation of discipline 'Methodology and methods of a pedagogical research' on development graduates' research competence, on the one hand, and the low level of formation of this competence at a considerable part of graduates of the 'pedagogical education' major, in another. From this point we can form the research problem: what are the didactic conditions promoting effective formation of research competence of graduates in the course of studying 'Methodology and Methods of a Pedagogical Research?'.

3. Research Questions

To select and experimentally substantiate a set of didactic conditions that contribute to improving of the formation of research competence of graduate students in the process of studying the discipline "Methodology and Methods of Pedagogical Research".

4. Purpose of the Study

The purpose of the study is to develop the didactic conditions promoting effective formation of research competence of graduates in the course of studying 'Methodology and Methods of a Pedagogical Research'..

5. Research Methods

Research methods are empirical method (pedagogical experiment, testing for identification of the level of formation of research competence), theoretical (the analysis, synthesis, comparison, generalization, etc.), methods of mathematical data processing.

6. Findings

The research competence acts as the readiness and ability of the personality to implementation of research activity based on integrative application of valuable installations, personal and intelligent knowledge in a certain area and research abilities (to be guided in new situations, to set the purpose and to plan activity, to put forward and prove hypotheses, to choose the most optimum methods of the proof of a hypothesis, to carry out self-checking and a self-assessment, to represent results of a research) for the

solution of problems of theoretical and practical character. As an integrative concept the research competence structurally includes four interconnected components (motivational, cognitive, activity and reflexive) which purposeful synthesis provides formation of experience of the research activity. The motivational component of research competence reflects the degree of formation of orientation of the personality (assets of the steady purposes, motives, requirements and interests) on implementation of research and searching activity. This component is based on awareness by students of the readiness for research activity as subjectively and objectively significant value which is a subject of aspirations. The substantial component of research competence represents set of knowledge about what is science, research activity as process and result, i.e. logic, structure and the main characteristics of scientific research in pedagogics. The knowledge of methodological approaches and methods of a theoretical and empirical research is also included here. The procedural component of research competence is, first of all, skills of students in the field of research activity. Here, in particular, included the following abilities: ability to prove relevance of a research, ability to isolate a contradiction, to formulate a research problem on its basis; ability to formulate a research objective, its object and subject, a hypothesis and research problems. An important part of this component is also abilities to interpret results of a research with application of qualitative and quantitative methods, to formulate conclusions and to generalize, etc. The reflexive component of research competence represents abilities to reveal and estimate initial and final states: a) object of the productive activity, i.e. results of the research activity, their compliance of a goal on in advance established criteria; b) the subject of activity, i.e. reflection.

The research competence of students is formed, first of all, in the course of studying and development of the main educational program realized within various forms of the organization of training where the noticeable role is carried out by lectures and seminars, various types of practice and independent work. Our approach to formation of research competence of undergraduates is based on the general idea that high-quality formation of this or that competence is possible only when they directly join in that activity which corresponds and is adequate to this competence. Therefore for formation of research competence of students, educational process should be organized so that they carry out research activity directly. At the same time it is important that the research activity must not be consistent, but should be an integral part of educational process.

In this regard the question is how to provide inclusion of students in research activity during educational process. The problematical character of the matter is in finding didactic integration tools of educational and research activity of students. The problem is that at educational process and research activities have the different purposes and objects of studying.

Educational process aims at formation at knowledge and abilities of the studied subject, studying systems and also the universal competences formed in the course of studying of discipline. A subject of educational activity is the training material on subject in the form of concepts, the facts, common factors, theories, etc. which is presented in textbooks and manuals.

As for the research activity, its purpose is obtaining objectively new knowledge of reality, and object of activity is the objective reality. For example, in pedagogics identification of features of motivation of educational activity of modern school students or undergraduate students can be the purpose of research activity. The motivational sphere of students which needs to be investigated with application of special methods (questioning, observations, conversations, testing, etc.) will be an object of research in this case.

Studying the question has shown that discipline 'The methodology and methods of a pedagogical research' owing to the target orientation and specifics of content of the studied material can act as an objective didactic integration tool of educational and research activity of students. The model of formation of research competence of students in the course of studying of this subject provides consecutive and stage-by-stage implementation of requirements of the principle of problematical character in the course of the classroom lessons (lectures, seminars) and out-of-class independent work. At the same time in the course of the classroom lessons students in the different forms of educational activity (frontal, individual, group, pair) directed to activation of their independent cognitive activity, master theoretical bases of research activity. Besides, on class work on formation of receptions and ways of research activity – abilities to ask questions, to see a problem and to formulate it, to prove the point of view, to compare various points of view on this or that question, to make the assumptions, to prove a hypothesis, to formulate conclusions and to do generalizations, to carry out introspection of cognitive activity, etc. are carried out. For example, pedagogical opportunities of seminar classes in formation of research competence of students are connected with the fact that they objectively assume independent active work of students as in the course of preparation (work on primary sources and other literature, registration, etc.), and during the class (the report, the message, determination of questions, estimated judgments, etc.) Ibragimov, 2016; Ibragimova, 2016).

Integration of educational and research activity assumes that students can use theoretical knowledge of bases of research activity in real practice of creation and implementation of the research project. To the contrary, they are capable to apply those research skills which are formed in the course of implementation of the project in educational cognitive activity. Taking into account this fact, an act as didactic conditions of effective formation of research competence of graduates in the course of studying the 'Methodology and Methods of a Pedagogical Research': performance by students of through creative mini-researches (projects) during the term of studying of discipline (one semester) and which are coming to the end with preparation (as a rule, in team's line-up) the scientific article; a combination of individual and command forms of independent activity in work on the project; use of 'the turned training' technology; interactive nature of training; a reflection at the end of each occupation.

It should be noted that orientation of educational and research process to formation of subject knowledge and abilities in unity with research competence, has demanded change of approaches to control and assessment of training results. So, during the classroom activities not only knowledge of discipline, but also receptions and ways of research activity (ability to ask questions, to see a problem and to formulate it, to prove the point of view, to compare various points of view on this or that question, to make the assumptions, to prove a hypothesis, etc.) was controlled and estimated. An obligatory element of each educational activity was also the reflection of students directed to self-checking and a self-assessment of results of own educational activity.

As for forms of intermediate control and assessment of results training, new approaches to holding examination in discipline have been used here: at the first stage – protection of the project (which was carried out on one of the last occupations); at the second stage – disclosure and deep justification of previously defined one question on discipline with the critical and comparative analysis of several (not less than three) sources of information (Mahmutov, 2016; Ibragimov, 2017).

These didactic conditions have undergone skilled and experimental testing on the basis of department of pedagogics of the higher school of Institute of psychology and formation of the Kazan

(Volga) Federal university. The experiment was made in the course of studying of discipline ‘Methodology and methods of pedagogical researches’ at the first year of the Pedagogical education major for graduate students.

The purpose of an experiment is the reasons for efficiency of didactic conditions of research competence formation graduate students in the course of studying ‘Methodology and methods of a pedagogical research’ subject.

Independent variables are the didactic conditions promoting effective formation of research competence of graduates in the course of studying ‘Methodology and methods of a pedagogical research’ subject.

The level of development of research competence is used as dependent variable.

11 groups, the general selection is 98 people took part in the experimental training (50 people – the experimental groups; 48 – control groups). The diagram of an experiment was traditional here: in the experimental group training was built with switching on of the checked didactic conditions, and in control groups training was carried put without special use of these conditions, or if used it was sporadic, on the course of occupations. Thus, one of the main requirements to a pedagogical experiment was provided. In both groups operation was carried by the same teachers so the factor of the identity of the teacher was not to be eliminated.

The complex test was applied to diagnostics of the levels of research competence development of students. It allows to reveal the competence of the future teacher in research activity, and to make it irrespective of competence of other aspects of pedagogical activity.

For comparison and assessment of reliability of research results, nonparametric methods which are recommended to be applied in pedagogical researches were used to work with small selections and have a limited set of quantitative indices (Kyveryalg, 1980). In our research the sign test (criterion of signs) which allows revealing whether the results of the testing held in experimental group authentically better than the results of control group.

Comparative results of a research at an initial and total stage of experimental work are presented in the Table 1.

Table 01. Dynamics of research competence formation levels of students during the forming experiment (in %)

Groups	Levels of research competence							
	I		II		III		IV	
	Beginning	Result	Beginning	Result	Beginning	Result	Beginning	Result
Experimental group (50 people)	5,5	2,0	39,5	7,0	49,5	65,5	5,5	25,5
Control group (48 people)	4,2	2,2	41,6	35,4	50,0	50,0	4,2	12,4

Apparently from data given in the table, at a total stage of an experiment the number of graduates at the third and fourth levels of formation of research competence of experimental groups includes 91,0%, and 62,4% in control group. The difference almost in 30% says that purposeful realization of didactic conditions of research competence formation of process of classroom activities and productive (the problematical character based on the principles and project work) independent work on studying of

discipline 'Methodology and methods of a pedagogical research' contributes to more effective research activity experience development in students.

Thus, skilled and experimental work has shown that efficiency of research competence formation of graduate students in the Pedagogical education major in the process of studying 'The methodology and methods of pedagogical researches' subject, significantly increases if the complex of didactic conditions including is implemented: performance by students of through creative mini-researches (projects) during the term of studying of the subject (one semester) and which are coming to the end with preparation (as a rule, in team's line-up) the scientific article; a combination of individual and command forms of independent activity in work on the project; use of "the turned training" technology; problem and interactive nature of training; a reflection at the end of each lesson; holding examination in the form of the project defense.

7. Conclusion

Formation of research competence of graduate students objectively assumes the search and realization of the didactic means and conditions providing motivated inclusion of students in research activity. In the educational program of training of graduates for the Pedagogical education major the approximate basis for formation and development of research competence is carried out by 'Methodology and methods of a pedagogical research' course. The efficiency of research competence formation of graduate students in the course of studying of discipline 'Methodology and methods of a pedagogical research' statistically significantly increases at realization of the complex of didactic conditions including performance by students of through creative mini-researches (projects) during the term of studying of the subject (one semester) and which are coming to the end with preparation of (in team's line-up) the scientific article; a combination of individual and command forms of independent activity in work on the project; use of 'the turned training' technology; problem and interactive nature of training; a reflection at the end of each lesson; holding examination in the form of the project defense. It is possible to recommend to teachers to use as the main direction of updating of substantial and technological components studied disciplines – formation of the productive and activity position in the course of training (through an integrative combination of different forms of problem and design training during classroom and operated independent work of students) promoting formation of experience of design and realization of research activity.

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