

# The Necessity of Forming the Skills and Habits of Educational and Research Activity as a Foundation of a Gnostic Criterion of the Evaluation of the Readiness of a Future Teacher for Innovative Activity

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## Abstract

The study mainly concentrates on identifying the need to form the skills and abilities of educational and research activity of future teachers as the foundation of the Gnostic criterion to evaluate their readiness for innovation. Through the research, the subsequent tasks were established: the investigation of the literature on the research issue, determination of the leading indicators of the gnostic criterion of the future teacher's readiness for innovation, construction of a questionnaire for teachers to recognize their readiness level for innovation, performing a survey, examining the outcomes. To address the issue, we applied particular methods as analysis, questioning, mathematical investigation of data. The author put forward the following hypothesis: if the future teachers do not improve the skills and capabilities of educational and research activity, then the Gnostic criterion for evaluating the teachers' readiness for innovative activities would demonstrate a low level. The study's conclusions revealed a low level of teachers' mastery in the skills and experiences of research and educational activity. As a result, a low level of teachers' readiness for innovation from the Gnostic criterion, which confirmed the theory put forward.

**Keywords:** innovative activity, research activity, Gnostic criterion, teachers' readiness, critical thinking, analytical skills, innovation

## 1. Introduction

The readiness of a person to effectively perform basic production functions becomes the main result of professional education. However, global processes such as globalization, increasing the speed of information flows required to change the direction of the development of the educational system towards the formation of a mobile, creative and independent personality. Great importance is attached to finding new ways of training teachers, meeting the demands of modern society (Ellis, 2005). The social order or demand for specialists with pedagogical education brings about the necessity of training a teacher of a new type that is a teacher-researcher, a teacher who can develop new technologies in education and upbringing (Petrova, 2011). Due to this fact, we analyzed the literature to state the problem.

The analysis of the literature shows that secondary school teachers represent conservative circles who oppose any changes in the educational process as well as to any innovations (Fullan, 1993; Fullan, 1998; Rudduck, 1990). However, according to G. Ogilvie the profession of a teacher is a dynamic and constantly developing notion. That is why the program of training future teachers for the innovative activity must not only include innovative approaches to education but also develop the ability of the students to overcome various difficulties in the process of realization of creative activity (Romanov et al., 2019). It is also vital to develop the skills to investigate one's own professional pedagogical activity, indicate and formulate the issue, to make suppositions concerning solving them, be capable of setting a task, distinguish the circumstances and new components in it, choose and create the variants of resolving it. (Ogilvie, 2008; Klieba et al., 2020).

## 2. Methods

The formation of readiness of a future teacher to perform an innovative activity is seen as an essential condition of professional development and is possible in the process of getting the skills and habits of educational and research activity at the university. The formation of skills and abilities of educational and research activity is a multi-dimensional integrated process that involves a particular set of teaching and learning methods. It has “limits to the application of the research method in the educational process” and is characterized by specific goals, principles of functioning and formation of educational and research activity, types and functions of teaching and research tasks, as well as the development of student’s creative and research abilities (Bochkareva et al., 2017). By the implementation of educational and research work students are attached during the entire period of study at the university, in the process of studying the theory of the chosen field of study, in solving educational and research tasks, listening to lectures, analyzing literature recommended by the teacher and selected independently, during the presentation of reports at special seminars, participating in the discussion of issues of a research nature.

As with any activity, the educational and research activity of students have several features:

- learning problems must meet personal and professional needs;
- the leading role of the teacher is preserved, but the students should have a feeling that the problem and the ways of solving it are chosen by them independently;
- the problem should be consistent with the psychological and age characteristics of students and professional orientation (Erdosne, 1996).

There is a controversial view that the teaching and research activities of students only teach students the elements of real scientific activity, which involves obtaining a new result for science. Educational and research activity is, first of all, educational activity, consisting of mastering the components of research activities, as well as the formation of basic skills and abilities that contribute to successful research activity. The result of the process of mastering skills and abilities will be subjectively significant knowledge about the object of study, its subject characteristics, ways of acting, that is, knowledge correlated with real-life circumstances in connection with the results. It is evident that the emerging distinction between educational and research activity and research activity of students really exists.

After analyzing the definitions of the concepts of “educational and research activity” and “research activity”, we concluded that the educational and research activity and research activity of students have only a superficial resemblance. The difference arises from the fact that education and research activity encourages students to become involved in research of a scientific nature, thereby forming certain skills and abilities of research activity, while research activity on the contrary, based on real facts, contributes to the formation of the necessary qualities of a modern student and researcher. In addition, the essential difference between educational and research activity and research activity is that the educational and research activity is carried out by students under the direct supervision of the teacher and often through the use of simplified data processing techniques. The end results of the learning and research process are usually known to the teacher in advance (Lamanauskas, 2009).

Furthermore, the distinction between the concepts of “educational and research activity” and “research activity” is also due to the principle of continuity in the organization of educational and research activity at schools and universities. At high school, it is a means of shaping students' need for self-knowledge and the need for scientific creativity. Educational and research activity of students at the university is a preparatory stage of the transition to scientific research. At school, educational and research activity is focused on the upbringing and development of students, on the creation of conditions for their self-determination and self-realization.

The main goal of research activity is to obtain objectively new knowledge. In the process of implementing educational and research activity, the main thing is to achieve a higher educational result. This means that the goal is the development of personality, personal self-determination, the choice of independent actions of self-realization, that is, the identification of one’s own resource (intellectual, personal, moral, etc.) as the source and foundation of one’s own activities and the subjectivation of one’s self. Thus, educational and research activity is quite a long process organized by the teacher in order to achieve significant educational results: a high level of formation of skills and abilities in conducting research, using the methods of scientific knowledge (Maggi, 2000).

Comparative analysis of educational and research activity and real research activity shows the identity of research stages and common developmental goals: the development of a person’s natural need for cognition, the disclosure of his creative abilities, the improvement of research abilities, the formation of the value significance of research results. It allows considering educational and researching activity and research activity as two interconnected units of real research activity. In addition, it must be noted that “the goal of research activity is to acquire a functional

research skill as a universal way of mastering the surrounding reality, developing the necessary capacity for a research type of thought processes, enhancing personal position in the educational process based on the transformation of subjectively new knowledge.

Characteristic features of the concept of "educational and research activity" based on cognitive activity are manifested in the following:

- In solving any problem search/research task;
- In the focus on obtaining subjectively/objectively relevant knowledge;
- In the development of knowledge and skills using the techniques of logical thinking - research procedures;
- In the formation of the student's motivation to search for alternative solutions to the problem;
- In the independence of the student in conducting educational research;
- In the reasoning and structured process of educational research, hypothesis and its proof;
- In the analysis of the data;
- In the practical application of the results;
- In the accounting of age and individual characteristics of university students;
- In the development of creative independence of students (The benefits of undergraduate research: 2013).

Educational and research activity is the process of solving a problem on the basis of independent search activity, accompanied by the acquisition of theoretical knowledge, as well as requiring forecasting of both the results of the solution and the processes and methods of activity. As a result of educational research, a comprehensive study of its objects takes place, including the formulation and achievement of a goal, the solution of the tasks of the research being conducted, the nomination and proof of a training hypothesis. The practical significance of educational research lies in the development of analytical and critical thinking of students, the formation of skills of independent orientation in a stream of constantly changing information, algorithmization of actions to solve problematic tasks (the ability to analyze, compare, find the best solutions), to create psychological and pedagogical conditions for the disclosure of creative opportunities, self-education and personal development.

### 3. Results and Discussion

It must be noted that the formation of skill and abilities of educational and research activity becomes effective when it starts during the first years at the university as not all talented students are willing to do the research even during the last years at the university. Finding such students during the first years allows involving them into research procedure, and encouraging them to attend postgraduate schools.

As a teacher serving in the traditional system, it is satisfactory to master the pedagogical technique, such as the training skills system that enables them to perform educational activities at the expert level and to obtain somewhat successful training. Nevertheless, the teacher's readiness for creative activities is crucial for the shift to the innovative mode. Nowadays, many teachers are obliged to acknowledge that it is improbable to gain massive productivity of teaching activities with minimal labour and time expenses without the capacity to generate an environment conducive to the independent and productive work of the learner and the teacher as well. Historically acquired beliefs concerning scientific work as the activity of the elite pedagogical form stereotypical ideas that conventional teachers are effortlessly able to do with prepared scientific and methodological suggestions. Simultaneously, many practitioners cannot afford to obtain the latest scientific and pedagogical developments, and the practical implementation of an innovative method to resolving a pedagogical issue unavoidably enters into specific contradictions with the particular circumstances of a unique educational institution. Furthermore, this implies that a modern teacher cannot but be a researcher who, having known the theory and technology of innovation, understands how to practically utilize them in his professional activity (Fullan, 1998).

Today there is a demand for teachers, who can creatively approach the solution of any issues, to contrast, investigate, research, and who can figure a way out of atypical situations. Following this, it became necessary to search for new ways to develop the creative personality of the teacher. One of them is a research activity. The analysis element has been, and, we assume, will be even more so a fundamental part of practical pedagogical training. The teachers who have mastered the research function, able to creatively resolve several pedagogical issues, seek out new answers to pedagogical circumstances, can arrange the learning procedure at a level that fulfils the demands of current society.

Throughout the activity, the teacher frequently starts to examine not only the outcomes but also the development of his work and the activities of his co-workers at school. In this stage, they are involved in research activities, which demand the development of specific skills and by the teacher.

Nonetheless, it should be noted that not every teacher can get involved in research activities, since often the skills and abilities necessary for its implementation have not been formed. It can be assumed that the causes of these challenges should be explored in teacher's training. Pedagogical universities seldom pay enough attention to the organization of students' educational and research activity, which presupposes the creation of particular skills. These skills basically include to detect and determine issues, to make assumptions regarding their resolution, to be able to arrange a question, choose and design solutions be able to speculate about the potential reasons and outcomes of the phenomenon of the material and perfect world, to recommend and substantiate hypotheses; established purposes, examine the circumstances, get and practically implement the completed product, perform reflection and self-assessment; to reflect on their activities, behaviour and values (Ellis, 2005). Often in high school, such work is executed individually or not whatsoever.

In pedagogy, innovation activity is regarded as a helpful pedagogical activity given the comprehending one's own pedagogical experience with the aid of observation and research, improving and enriching the teaching and educational process to obtain better outcomes, earn new knowledge, offer a diverse pedagogical practice (Fullan, 1993; Garunov, 1978).

An assessment of the readiness of school teachers to innovate can be carried out using various criteria. Thus, I. B. Belyavskaya offers three criteria: motivation and value (awareness of modern progressive tendencies in education and concretization of the tasks of their professional activities in this regard; the need for self-education, self-improvement and creative self-realization in activities; a steady positive attitude to innovation activity), cognitive (basic scientific-pedagogical knowledge about the essence of innovation activity, about its laws, principles, technologies; teacher's assessment of his personal qualities and opportunities necessary for the implementation of innovation, professional reflection), substantive and operational (the ability to implement project-prognostic activities in the field of pedagogical innovation; possession of situational and supra-situational ways of solving pedagogical situations; creating a model of probabilistic professional behaviour in the context of innovative activity; pedagogical innovations in educational practice). For each criterion, the author of the study identified three levels: reproductive (low), adaptive (medium) and system-modelling (high) (Belyavskaya, 2010).

N. I. Raitina in her dissertation research (Raitina, 2011) proposes to consider the teacher's readiness for innovation as an integrative, professionally significant quality of the teacher's personality that has structural (motivational and axiological, cognitive, operational-activity, emotional-volitional) and functional (functions - motivating, executive, regulating ) components that can be considered as criteria for assessing the readiness of the teacher to innovate. For each criterion, she identifies four levels: low, medium, high, and highest.

Using the system-structural approach to the study of professional-personal readiness of the teacher to innovate, L.T. Chernova proposes to identify the essential characteristics of this phenomenon according to three criteria: motivational-value, cognitive, procedural (Chernova, 1997).

E. E. Voropaeva defines four main criteria for teachers' readiness for innovation activity: 1) motivational (need and desire for professional self-development in the field of innovation activity, personal growth through raising the educational level in innovation issues); 2) cognitive (knowledge, degree of awareness on innovation issues); 3) personal (the ability to adequately assess yourself as a person, professional, subject of the educational process in the field of innovation, creative abilities); 4) activity-based (degree of knowledge and skills in the field of innovation). The degree of expression of the selected criteria ultimately determines the level of the teacher's readiness for innovation (Voropayeva, 2013).

To identify the preparedness of future teachers to innovate, N. Plakhotnyuk proposes to identify motivational (cognitive interest in innovation through the design process, the need to apply and implement projects as a way of innovation, the development of goals for their own innovative activities, susceptibility to innovations; a desire to actively participate in creation, dissemination of pedagogical innovations), cognitive-operational (knowledge of the essence and specifics of innovations, and their types and signs, knowledge of the essence of pedagogical design and the logic of building its stages, the ability to formulate a design problem and the project goal in accordance with it, the integration and transformation of one's own and other pedagogical experience, the ability to design a project according to the logic of building its stages, forecasting the results of design, its positive and possible negative aspects), creative (the ability to find non-standard solutions to pedagogical problems, the ability to develop creative imagination and creative thinking (combine, find analogies, associations), creative (non-standard) approach to the

implementation of the pedagogical process, the ability to express a significant number of diverse ideas, the ability to create innovations in the pedagogical process), reflexive (the ability to analyze one's own activities, analysis and evaluation of the activities of others, assessment of own activities and planning further actions in accordance with the results obtained, the ability to adequately evaluate the project according to the set purpose) criteria (Plakhotnyuk, 2015). These criteria are closely interrelated and interdependent. According to N. Plakhotnyuk, their integrity indicates the development of those personal and professional qualities of a teacher, which characterize his innovative potential. Given the ratio and degree of manifestation of criteria and indicators of the formation of preparedness, he defines the following four levels of readiness for innovation: low, medium, sufficient, high.

Most fully, in our opinion, the criteria and indicators of the formation of teachers' readiness for innovation were developed by N. Plakhotnyuk, which gives grounds to consider them as a kind of integrity. However, firstly, the unification of cognitive and operational criteria seems unjustified, since it should be considered as independent composite knowledge, which is the basis of the teacher's readiness for innovation, and actions that are formed and carried out by the teacher based on this knowledge. Secondly, it is necessary to formulate the name of criteria more precisely. The term "operational" implies the performance of individual actions, and this refers to innovation. Third, creative criteria must precede the operational one, since, in essence, are important conditions for the implementation of innovation.

#### 4. Summary

In our study conducted Given the research laboratory of innovative educational activities of the Elabuga Institute of the Kazan University, we singled out the following criteria for teacher's readiness for innovation and their indicators:

1. Motivational: the need for intellectual self-development and self-realization, personal and professional growth in order to achieve success; the need for a creative transformation of the educational process and for a systematic increase in its effectiveness in terms of cooperation with creative teachers; interest in finding new ways and means of developing a student's personality, as well as raising his interest in learning activities; interest in the creation and use of copyright educational innovations.
2. Personality: formed the internal setting for innovation activity; the ability to produce highly intellectual work; search activity and pedagogical initiative; ability to navigate and adapt in the innovative transforming educational space; leadership skills.
3. Cognitive: the presence of a body of knowledge about the essence of innovative educational activities; possession of a fund of new psychological and pedagogical knowledge necessary for creative and innovative activity; knowledge of pedagogical research methodology; ability to the structure-system vision of the objects under study (establishing connections of objects and their causes, related problems, mastering a common approach to clarifying the essence of any objects and phenomena); establishing similarities and differences between their ideas and ideas and innovations of practising teachers, the ability to determine the feasibility of their refinement.
4. Gnostic: the ability to identify the causes and patterns, the consideration of which will help improve the efficiency of the educational process; the ability to open the contradictions that cause the problem of research; the ability to predict the result of training or education and design activities that guarantee its achievement; the ability to study innovative experience to find ways and means to improve the efficiency of the educational process; the ability to observe, analyze and summarize pedagogical phenomena.
5. Creative: developed pedagogical imagination, originality and originality of thinking; ability to produce ideas both individually and in communication with other people; the ability to see new features in the object and find new uses for them; ability to solve original pedagogical problems; the ability to create a new, copyright educational product.
6. Technological (operational activity): the ability to develop the logic of the process of creating copyright educational innovations; the ability to independently design new technologies, learning models and educational systems and other educational innovations; the ability to independently develop research tools (questionnaires, tests, interview plans and observations, questions for interviews); the ability to gradually plan and implement a pedagogical experiment aimed at determining the effectiveness of innovation; the ability to generalize and interpret the data obtained during the pedagogical experiment.
7. Reflexive: the ability to analyze the educational process and its results; the ability to determine the effectiveness of the author's educational product; ability to subjectively evaluate the results of its activities; awareness of their

competitive advantage and desire to build them up; the ability to assess the compliance of pedagogical technologies used by a teacher with modern requirements.

The Gnostic criterion presupposes the mastery of skills and abilities not only to cognize but also to analyze (research) the teacher's own professional activity, which contributes to the professional qualification of a teacher. On the one hand, the Gnostic character of pedagogical activity is considered as a kind of creative, search or research activity. On the other hand, and this coincides with our point of view, it means mostly the analysis of advantages and disadvantages of the teacher's work, knowledge of aims of a pedagogical system based on the social demand. The Gnostic criterion for assessing the readiness of a future teacher for innovative activity involves the teacher's readiness to analyze the weak and strong sides of the professional activity and readiness to improve him/herself. The teacher must be able to formulate educational tasks based on the targets of the pedagogical system. He should be ready to make a psycho-pedagogical analysis of the teaching material and forms of work so that to assess its efficiency. Moreover, the Gnostic criterion for assessing the readiness of a future teacher for innovative activity requires that the teacher-innovator is able to analyze the work of his/her colleagues in order to generalize and use the effective forms of work and correlate his/her experience with pedagogical theory.

Our study of school instructors (random sample - 562 teachers, the overall group - 1390 teachers) notes that several teachers are not prepared at the Gnostic level for creative activities, as for the making of highly intellectual results. Hence, almost 11.81% of teachers responded that they had improved their analytical skills. A vision of obstacles is increased by 13.73% of respondents. Critical thinking is done only in 17.25% of teachers. Just 13, 56% of teachers have earned knowledge in the study. Around 16.21% of teachers said that they foresee the improvement of their productive potential with the aim of more fruitful self-realization. Roughly 13, 92% of teachers willingly master the research methods.

## 5. Conclusions

Therefore, given the consequences of our questioning, we arrive at the conclusion that the issue of the development of future teachers' readiness for innovation really endures. It seems crucial to seriously reconsider this procedure and make a meaningful bias on the creation of the skills and expertise of research and educational activity in providing students with innovative activity. Being an urgent task of higher education, the formation of skills of educational and research activity of future teachers is necessary both as a means of learning pedagogical phenomena and as the basis of the Gnostic criterion for assessing the readiness of a future teacher for innovation.

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