

Formation of the Future Specialists' Pedagogical Creativity

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Abstract

Background/Objectives: The article deals with the formation of the future specialists' pedagogical creativity by means of scientific research activities. **Methods/Statistical Analysis:** Methodology extensively focuses on the methods and means of efficient knowledge acquisition on practice, seeks out the methods and means for this knowledge development. As there is a system of knowledge in the basis of method (e.g. mathematical, philosophical, logical etc.), its methods may be diverse. **Findings:** The pedagogical creativity is the scientific research activities, ultimately focused on acquisition by a person of new material and spiritual values, uniting all the internal connections and meeting the requirements of the modern world. The future specialist's endeavor to improving his or her knowledge through the scientific research activities provides successful solution for the issues of pedagogical, social and professional activities, in other words it forms and develops professional creativity. **Applications/Improvements:** The ideas of Russian and foreign scientists regarding the aspects of the scientific research activities were highlighted. The authors dwell on the issue of the future specialists' pedagogical creativity and consider its concepts.

Keywords: Concept of Research Activities, Pedagogical and Psychological Creativity, Scientific Research

1. Introduction

The social structure of education has currently become one of the most important social elements. In the process of globalization the role of education has become more important all over the world and each country is now establishing its own educational system. But the system should be on a par with the experience and the national tendencies in education. In the Republic of Kazakhstan the comprehension of big changes in the education is an important step. That's why the Concept of Educational Development¹ is undoubtedly the most important document in the field of the educational system development, as the Republic of Kazakhstan approaches entering into the global educational environment.

The main goal of "The Concept of Educational Development of the Republic of Kazakhstan through 2015"¹ is the analysis and synthesis of the future specialists' creative work as well as the development of mental abilities, i.e. providing students with mental work in the

process of study and extra-curricularly, learning competition and independent reasoning. 1. Consequently, the acquisition of a future qualification is considered to be an important task of educational process in the educational institutions; we deem it expedient to dwell on the issue of theoretical and methodical content of the following terms and concepts, which are currently widespread in the institutions of higher education: "activities", "research", "scientific research activities", "creative work", "pedagogical creative work", used in the context of formation of the future specialists' creativity.

2. Main Part

According to the Big Soviet Encyclopedia, "theory of activities" is a way of human communication with the universe. In the process of activities a human gets acquainted with nature and environment, measuring it from the perspective of creativity. Thus, people form themselves as active, creative subjects and make the acquired natu-

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ral environment the object of the activities. There is a definition according to which the other kinds of human activities (playing, learning) are closely connected with labor.

However we see the integration of two scientific issues by generalizing the modification of pedagogical existence through the principles, methods, forms and ways of knowledge, correspondent with the pedagogical theory.

Firstly, we should create the conditions suitable for the research work tendency and determine the complex means of cognition of the pedagogical existence. Secondly, we should use the methods of obtaining the pedagogical truth through principles, methods, and ways of cognition. Consequently, the results of a pedagogical researcher depend on the consistency of scientific tools and the choice of various methods he or she is provided with. This is a combination of knowledge principles geared to acquire and modify objective laws, phenomena of the world around and the society both theoretically and practically.

However, there is an ideal image of the theoretically objective truth. Alongside with that, generalizing theory and practice, one may call it a teaching of common scientific principles, clarifying various social phenomena and information and also influencing them. Theory is the result of a cognitive process, while methodology is a way of creation of the knowledge and its achievement. This is the system of bases, methods of organization and formation of theoretical and practical scientific and educational work; this is a way of cognition of this system. The cognitive theory studies the common process of cognitive activities and primarily its conceptual base. A correctly laid theory is the methodology of cognition of new phenomena.

Methodology extensively focuses on the methods and means of efficient knowledge acquisition on practice, seeks out the methods and means for this knowledge development. Methodology, method and theory are always interconnected with each other. Every science has its own subjects and correspondingly its own methods. As there is a system of knowledge in the basis of method (e.g. mathematical, philosophical, logical etc.), its methods may be diverse².

Consequently, the science faced with the question of method classification. Classification is implemented according to method attributes (according to its field of application, consistent pattern and concepts). Thus, all methods may be divided in two big groups: method of

philosophy and method of certain sciences. The method of philosophy is connected with the cognitive theory and that's why it is common for all sciences.

A Russian scientist P.I. Pidkasisty gives the following definition: "the methodology in pedagogics is a theory of principles, methods, forms of cognitions and actions as well as becoming of the pedagogical truth". Thus, the methodology of pedagogics studies pedagogical phenomena and processes, as well as unifies basic knowledge and structures from the perspective of pedagogical theories. Methodology is a science and a teaching of theoretical system³.

Methodology of pedagogical science: firstly, it arises from common methodological science: secondly, it is caused by training and learning the development tendencies of the social scientific paradigm; thirdly, it studies theoretical rules of pedagogical conditions and methods of their research; fourthly, it is defined by integrating into practice of education, training, and acquisition of new acquired knowledge⁴.

While The Definition Dictionary of Scientific Sectorial Terms of the Kazakh language in the sector "Pedagogics and Psychology" gives the following definition: "activities: in the process of the social and historical human development it arose as a special need - theoretical activities, i.e. mental work. Activities consist of a motive, which drives the activities, a goal and result, directing the activities and the means, implementing the activities. The motive of activities serves to various needs, involvement, responsibility, senses and human consciousness. The motive directs the activities. Depending on the content and consciousness of the motive, a person may show stability and achieve the intended goal. The goal and motive of activities is to overcome difficulties and to achieve results. Any kind of activities takes shape as a goal, means, process, results by a subject. "Activities" caused by a human need, describe his or her personality from various angles. In social life a person uses the motive and goal for personal development. "Activities" play the leading role in human personal development. Human activities are reflected through physical and mental work. Physical work creates material values, while mental one creates spiritual values. The main activities for a human are learning. Through the activities a person collects experience, acquires truth, increases and develops his or her performance".

Having these definitions analyzed we make a conclusion, that through mental work a human develops his or her spiritual values, i.e. by means of learning the

future specialists acquire scientific and technical, methodological knowledge, which serves for their formation of responsibility, emotional senses, social consciousness and cognitive involvement in the scientific research work.

The originator of *pedagogism* is a German teacher V. Lei. On his opinion, the main principle of upbringing and learning is a principle of action. It goes through three stages: reception, processing and action itself.

Pedagogism or pedagogical activities is a teacher's influence on his or her pupil (pupils), which is a basis of personal development and self-improvement. It is focused on personal, intellectual and active development of a pupil. *Pedagogical activities* is a special kind of social activities, designed to transferring the experience and culture, accumulated by the mankind from generation to generation; it creates conditions for their personal development and prepares to play certain social roles. The pedagogical activities are a prerogative of the future specialists, who have chosen pedagogics as their specialty.

The pedagogical activities in educational institutions are implemented on the basis of the governmental standards, programs and regulatory documents.

The types of the pedagogical activities: upbringing, learning, development, social environment, self-cultivation, self-education, discipline, scientific competition, personal organization. I.F. Kharlamov defined the following types of interconnected activities in teacher's work:

A) *Diagnostic activities* – analysis of pupils and defining levels of their development and upbringing. A teacher should be able to control and master the diagnostic methods.

B) *Intent predictive activities* – setting of goals and tasks of pedagogical process considering availabilities, prediction of the end result.

C) *Instructional design* – design of educational work, selection of its content according to cognitive abilities of pupils, the ability to represent it clearly and interestingly. This kind of activities is connected with teacher's creative imagination.

D) *Organizational activities* – teacher's influence on pupils, the ability to be their leader, to involve them in a certain kind of work.

E) *Informational activities* – there are generally the social activities of a teacher: transferring the experience from generation to generation. During this type of activities pupils acquire knowledge, form their mindset, moral and esthetic ideas. Here the teacher acts not only as an information medium but he also forms confidence in pupils.

F) *Communication stimulative activities* – it is the teacher's ability to comprehend, to establish relations with pupils.

G) *Analytical and evaluative activities* – it consists of feedback, i.e. confirmation of efficiency of a pedagogical process and achievement of set goals.

H) *Research and creative activities* – it is defined by a creative nature of a pedagogical work. To implement this type of activities effectively, teacher should master methods of pedagogical research.

Term “*Research*” in The Big Soviet Encyclopedia is defined as “the processing of a new knowledge and a type of cognitive activities”.

Research is a familiarization with systematically and specifically targeted objects, resulting in formation of new knowledge about this object with using scientific methods and means. The most complicated type of the human activities is based on it – the cognitive activities of science. The cognitive activities of a pupil may be focused on memory (reproductive) and modification (creative). The cognitive activities of the future specialists are implemented as a way of a research called modification. The future specialists with high intellectual and creative abilities should have the opportunity of self-education, i.e. they learn, control and work by themselves.

Research is a way of creation of a new knowledge of a certain science as a special form of the cognitive activities. The reception, comprehension, reflection and other ways of research activities directly suppose a certain approval of a goal and ways of cognition and are guided by methodical forms of processing results, their accuracy and actuality.

There are the empirical and theoretical stages of a research. The empirical research is directly focused on the object and based on observation and the information of the experience. The theoretical research is connected with the improvement of the conceptual construct of a science. It is focused on the diversified development of a certain activities, the most important connections and laws. These both types of research are closely interconnected and identical to each other in the common structure of scientific cognition. The empirical research, by defining observation and new information of the experience, stimulates theoretical research and sets new tasks for it. The theoretical researches, by enlarging the theoretical content of a science and detailing it, open new perspectives of explanation and prediction of facts, direct it and give it empirical reference point.

At the stage of the empirical development of science (e.g. XVII, XVIII, partially XIX centuries, practical natural science) the main means of formation and development of scientific knowledge was the empirical research and logical processing as well as making conclusions from the results. However at this stage of regulation and classification of the empirical materials of cognition, the improvement and development of scientific abstractions was generally implemented. The content of further development of conceptual construct leads to originating logical forms beyond the scope of general conclusion and comparison (e.g. typology, original clarification drawings, models etc.). Formation of entire theoretical systems, differentiated inside, leads to the origin of a special theoretical model (e.g. model of molecular kinetic eye etc). The specified means of cognition are the reason of relative reflection modification to the empirical development level. The expansion of the theoretical content of science and creation of multilayered theoretical systems leads to a certain separation of the cognitive structure theoretical apparatus from its empirical basis, which in its turn creates a necessity of the empirical explanation of theory as well as theoretical explanation of the empirical information.

Taking into account that the difference between the research design and its organization regarding the object is rather "polite" type of activities, its main goal is to truly define "the core", not poaching on preserves if possible, to observe the object. "Let's consider that an important task of the education as means of its assessment and its possible researches is development of ability to take a research position in no way denying the necessity of the skills required for the improvement of a social realm".

Source of research as a type of activities is an endeavor to cognition, which characterizes the human nature. "Science is born from sense of investigation of the world around us". A. Angelgard points out that "an instinct of a constant search, an instinct of diminishing unknown is integrated into the mind of each human". Research as a type of activities is developed by animals not reflectively. Thus, P. Teilhard de Chardin notes, that a lot of animals "show their interest to the environment by means of research, enjoying it".

Unconscious research, not caused by external influence is typical to a human, being a powerful means of acquiring truth despite human abilities and social status. But it remains sporadic, intuitive. The culture of research was originated, began to develop and got its institute only

since the advent of science and by means of science. Since the advent of science, a separate social group of people have been formed - scientists, whose main type of activities is research.

Today an institution of higher education expects the future specialists not only to have knowledge of the certain subjects, acquired in the educational process, but also an initial sense and awareness of the whole world, based on the integral scientific knowledge, acquired in the process of creative activities and the experience of real life.

In the course of the future specialists' preparation in institutions of higher education, the necessity of using research methods is explained with their high natural involvement in the environment. Their independent research influences meeting their own requirements. The students, getting acquainted with the environment, cognize it by means of their own research, they don't just receive naked information, and it corresponds with the new requirements of the educational system according to the European Standards (three levels of education: bachelor degree course, master course and doctoral candidacy).

Thus, the main value of research is movement to the truth. That's why research is the main means of science development, designed to create the most real image of the world. A famous figure of the Russian and global science V. I. Vernadsky once said: "Comparing to literature or art, science is a bigger, more unique, incomparably complicated social masterpiece of the mankind, it has a global nature. It has a poor connection with government and social life. This is a common social human knowledge, because it's based on scientific facts and common conclusions, equal to everybody".

The main form of research works in the modern institutions of higher education is a type of the future specialists' scientific research activities as well as the most important element of the higher education specialists' preparation. That's why the main goal of the scientific research activities is development of personal research abilities in groups or individually. One can see "scientific conditions" in research and culture, used by some people.

The scientific activities as a component of the specialists' preparation process, embrace the teachers' and the student' activities as well.

Many Russian and foreign scientists mean "scientific research" by "scientific research activities"⁵⁻¹⁰. The definitions of these terms are given in pedagogical encyclopedias, reference books and the works of N.V. Kuzmina, A.I. Kochetova, A.Ya. Nayna, P.T. Prikhodko,

V.I. Ruzavina. However these definitions do not describe the peculiarities of the future specialist's scientific research activities to the full extent. For example, according to a Turkish scientist Buyuk Ozturk (1996), the scientific research activities are the principles of scientific exploration and accordingly the capability of using new technology connected with a certain research theme, performed works as well as the capability of finding ways of research optimization. The research training of the future specialists should not be only the problem of colleges and universities. Indeed, it should turn into a cultural principle, relevant for each structure of society. It should not be limited by preparations of scientists and researchers who conduct only researches, because it is important to prepare specialists-technicians, integrating scientific discoveries and cutting-edge technologies into production operation, managers who can use them properly. One may say, that this complex process is a sphere of interest for everybody: from government to an average citizen. The scientific research training of the future specialists is a way of developing common culture and achievement results in a certain specialty. For improving the mankind, the scientific research is closely connected with acquisition of the scientific research activities and deeper investigation of necessary questions. A person, succeeded in it, gains the opportunity of improving and renewing his or her own life.

The scientific research activities of the future specialists are closely connected with their educational activities. Let's analyze the future specialists' scientific research activities on the basis of the common structure of the educational process. According to Yu. K. Babansky, the structure of the educational process is an integral system of interconnected components: targeted, stimulative motivational, content-related, operant, observant controlling, estimate resultative.

The goals and tasks of scientific research activities are defined on the basis of the governmental standards of education, requirements of the professional educational programs as well as considering the level of preliminary preparation, the peculiarities and capacities of the future specialists.

The sense of scientific research activities is in dealing with arising issues and search of rational solutions of various scientific research tasks. In this case it is necessary to define more precisely such concepts as "problem of learning", "challenging task", "scientific research task".

The study and analysis of the works by V.I. Zhuravlyov, V. I. Zagvyazinsky, A.I. Kochetov, M.N. Skatkin, Z.P. Shulga give the opportunity to clarify the content of a stage regarding the scientific research activities in the following periods:

1. Intent

- selection of the research field;
- definition of the problem and research issue;
- definition of the research goal;
- definition of the research object and subject;
- prediction;
- selection of the research methods.

2. Implemental

- processing of the research plan;
- development of the research procedure;
- implementation of the procedure, argumentation of research tasks and their solution through theoretical underpinning;
- conclusions;

3. Observational

- testing of the identified solutions accuracy;
- defining the core of the identified solution for general concept of the object;
- defining the sphere of applications of the solution, implementation of the results;
- 4. Correctional
- supplements and more precise definitions for each period if necessary.

In the works of V.I. Andreev there is a term of "initial" period of the scientific research activities. At this stage in the research process a great importance is attached to the acceptance of the arisen problem as a personal one. In other words, the problem situation itself as an engine of a research process shall be accepted not only as an external factor, but also personally.

A peculiarity of the future specialists' scientific research activities is in "discovery" of a novelty in subjective view. Discovery of a novelty is closely connected with finding the problem solution, decision making and personal identification. This is proved with the reason in researches of many scientists. For example, Haris (1998) describes discovery of a novelty as ability, modification

and process. To his mind, it is ability, because in the process of discovery of something new there is a way to new thoughts, because all the previously known information about it has been categorized. Discovering something new, while adjusting to modifications and the process of discovery, has a good impact on testing new ideas and probable predictions, from a different angle (to the external perspective), on analysis of the events, taking place in the environmental structure and on further development of existing points of view. Discovery of novelty is a special process. The people, who perform the discovery of new things, are in a constant search of problem solutions and contradictions, but afterwards they find their own solutions, which is the result of a consistent research. If the researches raise the issues, which were unknown before, they highlight them through their own search and exceptional opinion. It means defining the issue, making its description, prediction and assessment in comparison with other circumstances. Torrens, who suggested the discovery of novelty, the concept of it (1974), acknowledged the necessity of being ready to constant problems, lack of information, defaults and lack of argumentation. In the course of a research the primary thing is to find drawbacks and defaults, then repeating the research correcting it until the result is achieved.

It is known that discovery of a novelty or alternative thinking plays an important role in the development of a society. Discoveries, inventions, driving the society forward, are bright examples of the process of discovering something new. Discovery of novelty means the ability to solve the problems a society faces with, by various means or achieving a goal through the methods unknown before. Additionally, according to Torrens, discovery of novelty may be the cause of such actions as “to reach the ball, to reach to depth, to dig a deep hole, to pass by crossroads, to consume energies, to smell, to be united with tomorrow, to be lightened by the sun”. He thinks that “feeling the problem or a drawback in information, composing thoughts and predictions, the prediction processing and further development” is a step forward to the discovery of novelty. Torrens (1964, 1969) and Guilford (1957) say that the researcher's own opinions and thoughts are transitional and are formed as part of four main phenomena.

Beetlestone (1998) points out the necessity of going through six main stages for discovering something new. This is a mind sense, sharing your opinion and views, writing down your knowledge, what in your mind is (imagination development), rescue (sharing innovative

thoughts, unknown before), comprehension of a problem as an invention and problem solution (suggestion the ways of solution, before unnoticed), the nature of discovering something new (spiritual interaction between a human and the environment).

Discovery, being simultaneously a positive solution of the hardest problem, is realized through the ability to think differently from other people, to see the problem before somebody else sees it.

To be able to discover, to think differently from others or to solve old problems is a way to innovation. The ability to think innovatively is significantly important on the way of social prosperity, development of science and education. The way of thinking differently can undoubtedly enhance such abilities of little children as comprehension of environment, creation of new things, sharing their thoughts and views as well as broaden their horizon.

Thinking differently, the ability to see drawbacks and defaults in information, increasing the ability to predict, to think independently, to note the resemblance and difference between thoughts and views, to find new ways by analyzing a problem, results in the discovery of novelty. It is a complicated process with successful results. There are various types of discovering new, depending on the problem. Generally, it is implemented through the recognition of a problem, its limitation, composing the plan of the problem, testing the prediction, conclusion, acceptance of the methods or their denial. While in the other spheres (e.g. art) this is implemented otherwise.

Discovery of novelty is the formation of new and efficient steps for the achievement of the scientific goal. Considering all the above said, Moravcsik (1981) defined the concept of discovering new as “taking new meaning and content in the scientific data, application of personal practical information for science development, discovering special aspects of scientific research, the ability to feel it, generation of plans for scientific research work, broadening scientific and environmental horizon of people and some other identical cases”.

Hu and Adey (2002) highlighted the following aspects of scientific discoveries:

- a scientific discovery begins upon special abilities;
- it is the result of deep comprehension of the scientific information;
- a scientific discovery consists of multitude data analysis, created before and being constantly changed;

- the researches, who enrich their experience, form their personality in science and who have just taken a path of science should investigate common laws when studying a certain issue;
- the innovative thinking and the ability to analyze are values originating from mind.

Alongside with that T.V. Kudryavtsev considers two types of creative work: for oneself and for others. M.M. Potashnik in his work "Pedagogical Creativity: Problem of Development and Experience" while analyzing research activities points out, that creative work of a teacher is an act of creative discovery, devoted to him- or herself and widespread in pedagogics.

A new knowledge is connected with a previous knowledge and experience. That's why, we believe, actualization of all knowledge, skills and creative experience plays the main role at any period of scientific research activities

Formation of personal traits and qualities of a future research specialist is realized in the course of scientific research work.

The fact, noted in the work of E.I. Regirer "Development of the Researcher's Abilities", that the definition of "personal traits" is deficient in the works of other scientists, gives an opportunity to show various characteristics of a scientist. Usually, the majority mentions involvement, cognitive self-consistency, creativity, capacity to scientific activities, high performance.

Analyzing psychological and pedagogical literature, a research scientist V.I. Andreev considers "the ability to make research for an educational problem solution in the course of a research task as the ability to apply means in accordance with the methods of the scientific cognition".

There are the researches in psychology and didactics for students' active development, showing a special significance in formation of ways of mental activities (E.N. Kabanova-Meller, V.A. Kondakov, A.V. Usova etc.). For example, in "Ways of Mental Activities Formation" by E.N. Kabanova-Meller there is a comparative analysis of the methods and means of educational works; the means of transferring knowledge, skills and mental activities are defined as the main indicator of the future specialists' mental abilities development.

In the process of educational and scientific research activities it is necessary to consider and develop various personal traits of the future specialists as defined and pointed out in the works of Yu.K. Babansky, I.G.

Gerasimov, V.I. Zagvyazinsky, N.V. Kuzmina. Based on the systematical and structural analysis of the components of research skills and abilities, the impact on the educational and scientific research activities is shown through personal traits appearing in the synthesis of the activities.

V.I. Zagvyazinsky highlights the following types of a future specialist's abilities in scientific research activities:

- motivational – describes participation of a person in the scientific research activities (the extent of the research interest formation, wish and endeavor to achieve the result in this type of activities);
- operational – means and operations, used by a person in the process of the scientific research activities;
- communicative – a future specialist's skills and abilities of applying the collaborative means in the process of the scientific research activities;

Sometimes in the future specialists' personal traits one may observe the impossibility to explain why some specialists succeed in "competition" or "research" or face some challenges. But it is the truth that it happens due to the certain reasons or some circumstances.

Considering various personal traits and qualities required for the future specialists' scientific research activities, it is necessary to pay special attention to the formation of skills and needs of active scientific search.

On the basis of such activities as competition or search there are the main principles, followed consciously or unconsciously by the future specialists when participating in it. These are the most important ones:

- compliance principle. All the new in science do not diminish the old things, because it is originated from it. This principle serves to establish continuity, connection, relationship, distinctions of the scientific research;
- principle of unknown. The assessment of the dynamical process circumstances is characterized by the unknown towards a constant change of these circumstances;
- principle of supplement. The limitation of the tasks solution in a scientific search system provides the opportunity to find new solutions in another, more developed search system;

- causality principle. Any phenomenon arises in a necessary connection between the cause and the result (the base and the action), develops and become stable. The causality is spread on the future specialists through the connection of logics and the methods of the research scientific development;
- principle of simplicity. It is originally referred to the choice of methods, principles and ways of learning as well as the scientific research. In the learning process, the complicated system of knowledge and actions of the scientific research require to be divided into simple categories. In scientific research work the simplicity is connected with the reasoning of the ways of solution.
- When a teacher watches from the sidelines him- or herself and the future specialists' scientific research activities, it causes conditions for a feedback, and this feedback provides regulation for the students' scientific research activities and introduction of changes in the form, methods and the ways of its organization.
- A controlling regulating component provides assessment and self-assessment of the teacher's and students' achieved results. A student may have some challenges in solution of a research task due to the following factors:
 - actual level of education is below needed;
 - actual level of abilities is below needed;
 - actual completeness of means is below needed.

In the process of the scientific research the task solution according to the needs of the future specialists, their actual level of education and skills is being increased, the means known before are being improved and completed. This statement proves the opinion of many researches about a subjective nature of the future specialists' creativity in the course of the scientific research work. Also an important indicator of the pedagogical creative work differentiation is a final paper according to the future specialist's qualification. The qualitative criteria of the papers may be the following:

1. Relevance of the issue and its compliance with the Government regulatory documents;
2. Methodical basis of the content;
3. Structural consistency;

4. Consistency of the research methods and the result processing;
5. Practical relevance;
6. Independent reasoning, generalization and conclusion;
7. Compliance with the Government Educational Standards;
8. Professional and orthographical literacy;
9. Correct and accurate formatting;
10. Defensible reasoning.

Thus, the main difference between the educational and scientific research activities is based on the goals, object and results of their realization.

To clarify our principle connected with the future specialists' scientific research activities we provide the analysis of the correlation and comparison of this term with such concepts as "educational activities", "educational creative activities", "educational research activities".

In the researches of T.V. Kudryavtsev, I.Ya. Lerner, P.I. Pidkasisty, V.G. Razumovsky and others there is a concept of "educational creative activities". It should be considered, that the educational creative activities may be different: educational, training and research, technical etc. It is the truth that term "creative work" may characterize any type of activity.

A deep analysis of concepts "educational creative activities" and "training and research" is carried out in the work of V.I. Andreev "Training and research heuristic programming". This analysis may be concluded as follows:

1. The training and research activities are organized by a teacher with using didactical methods, and the future specialists' activity is controlled directly or indirectly. It is focused on clarification and proof of regular connections and relationship existence, search of the facts obtained experimentally or analyzed theoretically, phenomena and processes. Finally, the future specialists acquire consistent knowledge, develop their skills and research capacities.
2. The concepts of "educational creative activities" and "training and research" are very close in meaning, but may be considered in different context.
3. These concepts can be neither equated nor correlated, because the process of the future specialists' training and research may include creative elements at various stages: logical, logical and heuristic, more heuristic.

The educational and creative activities are characterized by a certain significance of its results. It provides us with a perspective of the new psychological structures.

We can see that the concepts under consideration are distinct from each other. The research and training has its own peculiarities, among them:

- its goals dependence on the training goals;
- cognition is the main motive of training and research;
- it is realized under control of teachers and research scientists;
- formation of the future specialists' independent behavior, creativity in practical tasks solution in the process of the scientific research;
- enriching necessary information for successful solution of challenging situations which are likely to take place in future;

Considering the similarities and differences of the future specialists' various activities mentioned above in pedagogical institutions of higher education, we may note, that the formation of educational and creative activities as well as training and research activities make the basis for the scientific research activities development.

Analysis of a number of works designed for the future specialists' scientific research activities provides an opportunity to conclude, that any educational or extra-curricular research is a scientific research work. On our opinion, this fact makes it difficult to understand the goal and the place of the students' scientific research work in the system of the scientific research activities. It is shown by consideration of this concept from various angles. For example, A.A. Verbitsky by pointing out three main forms of the future specialists' activities defines their scientific research work as the educational and professional activity. V.A. Slastenin and L.S. Podymova consider the future specialists' scientific research work as the most important preparation to innovative activities. In other researches this concept is limited to some components description.

The future specialists' scientific research work is a competitive work of a scientific nature, designed to explanation of phenomena, processes, establishment of their connections and relationship, scientific rationale both from theoretical and experimental point of view, through scientific methods of cognition and finding common laws. And as a result of these activities the subjective character of "discoveries" acquires a certain objective significance and innovation.

The structure and the functions of the future specialists' scientific research activities are defined by the goal and its peculiarities of master's students preparation to pedagogical and psychological specialties in the institutions of higher education of this scientific field.

- Broadening and development of professional theoretical knowledge, their practical application;
- Acquisition of the independent scientific research conduction by all the master's students;
- Involvement of the most talented student in the solution of the relevant educational tasks;
- Providing the master's students with the opportunity to choose the scientific field, which is best demonstrates their creativity;
- Upbringing scientists, researchers and teachers within the walls of the institutions of higher education;
- Qualitative professional development of the future specialists.

Considering the future specialists' scientific research activities as a dialectical process and founding upon the methods of development from unknown to familiar, we guess that this type of activities is based on the system of the future specialists' common professional knowledge and skills. Nevertheless, study and analysis of the learning peculiarities, research and the scientific research activities proves that increase of necessary knowledge and skills in number does not always lead to quantitative change of the cognitive activities experience. M.A. Danilova concludes that the pupils do not see the perspective of lessons though they acquire knowledge there, they are not active and do not want to look for new knowledge by means of creativity.

A well-known rule of multiple motivation of any type of activities, including the future specialists' scientific research activities is the basis of the prioritized motives definition. V.A. Slastenin and L.S. Podymova, defining the motivation of the teacher's innovative activities, have realized the diagnostics of prioritized motives towards the following groups:

- external motive;
- motives of the teacher's external self-esteem;
- professional motives;
- motives of personal self-realization.

We cannot deny the most important similarity in the content of the innovative activities and the future specialists' scientific research activities, we can use the results of these researches in our own practice.

Thus, the knowledge and the skills of the future specialists' scientific research activities are necessary not only for those, who are into science, but also for everyone, who has a place for creativity in his or her work. The scientific research work is not currently a highly specialized type of activity and it does not pertain to a certain group of research scientists, but it is integrated into the way of life of modern people and may be a part of activities according to one's own perspective of his or her professionalism.

Our opinion is supported by Abay Kunanbayev in his "Book of Words", where the seventh word goes: "A child is born with two needs. The first one persuades him "to eat, to drink, to sleep", the second one – "to see, to learn" and as the child is growing up, he or she makes everybody restless, constantly asking "why is it this or that way?", even when a dog is barking or a cattle is making some noises".

Creativity is the most important characteristic of the research activities. Creative research is important for a person because of two reasons: on one hand, because a new thing is being created in the process of it, on the other hand the process itself is important. People may be satisfied with the process of the search and they may also enjoy the creative work and research. In the scientific literature the concept of creativity is connected with creation of something new, and in some sources the creativity is considered to be "a social phenomenon". While in pedagogics the concept of creativity – it is when a person creates something new for him- or herself, i.e. a subjective new or the highest level of human activity and independency.

The word "creativity" is originated from the word "to create", and in general it means to generate or invent something new, unknown before. Thus, creativity is a research. The creative elements take place in each type of the human activities: in technics, sewing, cooking, handicraft etc. Also, the future specialists' creative activities have been investigated as a scientific and pedagogical problem.

V.V. Davydov says, that the origin of creativity is formed on the basis of a separate person, B.D. Elkonin says, that creativity is an act of making, creation of something new, according to V.A. Molyako, creativity is an ability to new create, comparing knowledge.

According to the psychological dictionary, creativity is defined as the process of the new values creation, both material and spiritual. It has personal and procedural aspects, which are at the same time cultural historical phenomenon.

In psychology creativity is a type of individual activity of a person, it transforms from a model or stereotype (a copy) to an experiment, changes environment, thus, creates something new and valuable. From psychological point of view creativity is an action, resulting in creation of material and spiritual values. While, from pedagogical point of view, creativity is the highest form of activity and the individual activities of a human. It is valuable due to its social need and uniqueness.

According to the definition of an American psychologist Fromm, creativity is a capacity to acknowledge, the endeavor to learn something new and the ability to comprehend one's own experience.

In accordance with the conclusion of D.B. Bogoyavlensky, creativity is a phenomenon defined through development of any kind of activity, which allows going beyond a child's need by his or her own initiative.

I.Ya. Lernet tells about it the following: "Creativity is a human endeavor to cognize her- or himself as a part of life, he or she should learn how to make independent well-argued decisions. The development of human abilities and their support can help to strengthen a spiritual power and to find one's place in the world".

A common thing between creative activities of a natural scientist, inventor and the future specialists is the fact that, they all look for "undefined connections between the objects". While *the future specialists' learning to search for the undefined connections is their training to further work and creativity in general*.

Each person has the creativity, it just needs to be discovered and developed. The core of a creative process is the same for every subject. The difference is in creative materials, achievements and its social significance. A pedagogical improvisation is a special creative ability of a person. The pedagogical improvisation, according to A.K. Markova, is "a search and implementation of an unexpected pedagogical solution", there are four stages of it: 1) a pedagogical conception; 2) acquiring of the sense of a pedagogical goal and simultaneously the ability to choose the ways of its implementation quickly; 3) the ability to show a certain pedagogical thought before a live audience; 4) the ability to quickly analyze the generally represented pedagogical thought.

The discovery of a novelty is not performed by itself, but it may be inspired by hard work. The inspiration is a creative anxiety, the blossom of human spiritual forces. The creation of a new masterpiece begins with the inspiration.

Another issue, supporting the pedagogical creativity is a teacher's artistic quality. Surely, school is not a theater. Nevertheless, a teacher is a public person, working with the live audience. It means he or she should be able to control, convince and inspire it. The artistic quality is a teachers' ability to "play a role", the attractive appearance, getability of the language, artistry, simplicity, adequacy of his or her mimics to the speech. The artistry is an ability to think figuratively, to go into the situation emotionally; it is the inner and the outer culture, charisma. The goal of a teacher's reflection is the ability to remember separate components of a pedagogical action, to prove the obtained result to be "right" or "wrong", to point out his or her own opinion depending on the efficiency of the applied methods and means. It is the study of the result of a performed action. Only in this case it will be possible to set right goals in future activities, to create the project of creative advancement.

"Reflection" is a person's realization of the core of his or her actions, their comprehension and the ability to make a clear report to him- or herself of what they have done, the acceptance or refusal of rules and graphics, regulating the actions. Besides, philosophical thoughts of the reflection are generally limited to "research work of a person, focused on him- or herself", "self-control of mind and spirit".

Psychology offers a short formula of the teacher's creativity development as: "experience + reflection of the experience = development". In their pedagogical textbook, G.S. Sukhobskaya and Yu.V. Kulyutkina describe this process and note, that it is observed in the teacher's professional activities in the following cases: firstly, in the communication between the teacher and the pupil, focused on comprehension of their thoughts, feelings and actions; secondly, in definition and design of the goals of the educational process considering the age peculiarities, the pupils' development opportunities; thirdly, in the analysis of their actions as being subjects of these actions. And only afterwards, the way for creativity is opened in the teacher's activities.

The core of the reflection is the assessment of a person of his or her own knowledge, the basis of the knowledge and the ways of its acquisition. Considering that such cognitive processes as thinking, consciousness and mind characterize a human, they cannot be studied separately.

For development of a teacher's creative potential it is important to have skill of methodical reflection. It begins with the analysis of tenacity and is characterized by defining subgoals and differentiating today's situation from tomorrow's.

In the modern educational process of the institutions of higher education there are the programs, focused on the future specialists' creativity development (E.P. Torrens, K. Rogers, G. Smith, L. Haskell, J. Renzulli etc.). For example, according to the program by G. Smith, there are the following conditions for the creativity development:

1. *Physical conditions* (availability of the materials for creative work and the ability to work with them at any time)
2. *Social and intuitive conditions* (constitution of external safety, reward for manifestations of creativity)
3. *Psychological conditions* (constitution of internal safety and the sense of freedom)
4. *Intellectual conditions* (the ability to perform creative tasks, development of gut feeling, intuition etc.).

There are the following types of creativity in the scientific literature: 1) material – technical; 2) spiritual – theoretical; 3) social – organizational; 4) pedagogical; 5) art – creative etc.

According to M.M. Potashnik, the teacher's creativity is manifested in the following cases:

1. in ingenuity at a task solution;
2. in ability to create and apply new forms, methods, means and technologies;
3. in efficient application of the experience in new circumstances;
4. in the ability to improve, to change something in accordance with new tasks;
5. in successful improvisation based on the insight;
6. in the ability to foresee several ways of a task solution;
7. in the ability to transform methodical recommendations into the theoretical rules in a certain pedagogical affair.

While the level of the creativity, realized in the sphere of the higher education, is based on the personal motivation of learning the acquired personal traits. Alongside with that a special attention is paid to the motivational side of the scientific research activities, the future specialists' primary creative traits. The stronger and more stable

the professional motivation is, the higher indicators of professionalism are.

The search of the ways of solution of the future specialist's professional creativity preparation is considered to be the prerequisite of its structure determination. For example, O.R. Chernousova pointed out four stages of the pedagogical creativity preparation. These are the stages of the correspondent measurements, the content of the activities, the reasoning on the basis of the teacher's peculiarities, who works creatively, well-balanced creativity, scientific research activities.

The creativity begins when there are no known ways left for the issue solution. However it is not a chaotic action. The scientific research activities, leading to decision making in the perspective of a creative approach to the ingenuity is a complicated psychological process, which consists of several stages and various levels. The scientists investigating this question, defined, that the pedagogical creativity has the following stages:

1) a concept of a pedagogical thought; 2) the analysis of the end thought; 3) transformation of the pedagogical thought into the scientific research activities; 4) analysis and assessment of the creativity results from the scientific point of view (V.A. Kan-Kalik, N.D. Nikandrov);

1) apparition of a scientific novelty; 2) construction and modeling the pedagogical ingenuity; 3) improvement (V.I. Zagvyazinsky).

The creative activities become more successful when there are such qualities on these stages as: involvement, improvement, a skill to acquire necessary knowledge as soon as possible, oversight, the ability to make reasoning, ingenuity, enthusiasm, tenacity, freedom and self-reliance.

Having considered the main fields of the diagnostics of the future specialists' preparation to creative competition, A.I. Kochetov suggested his own diagnostics of the higher common culture, the efficiency of the creative activity indicators and professionalism of the future specialists.

As it was mentioned above, creativity depends on both internal and external (objective) conditions of socialization. The modern researchers designate them as social conditions and their future; the level of modern science; the state of common educational experience; methodical references to the programs, text-books, recommendations; potential and principles of a teacher or a teaching staff.

Thus, new conceptual creative tendencies show that this category becomes many-folded in its division in types, factors, and measurement of the future specialists' creative preparation.

It is notable, that the pedagogical creativity becomes the core of the living of the modern people.

3. Conclusions

We would like to conclude, that "the pedagogical creativity is the scientific research activities, ultimately focused on acquisition by a person of new material and spiritual values, uniting all the internal connections and meeting the requirements of the modern world".

The future specialist's endeavor to improving his or her knowledge through the scientific research activities provides successful solution for the issues of pedagogical, social and professional activities, in other words it forms and develops professional creativity.

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