

Pedagogical Conditions for the Development of Students' Intellect within the Framework of the Research Culture

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The article presents different opinions for the concept of "research culture", gives the characteristics of this phenomenon from the point of view of the pedagogical science including the functions, components of this phenomenon; the article studies the complex of research skills as the basis of the research culture. Special attention is paid to the intellectual component of the research culture. Practical investigation aimed at defining pedagogical condition for the intellect development of the students within the framework of the research culture is performed.

The article concludes that it is reasonable to use pedagogical conditions of development of students' intelligence in the framework of a research culture in the learning process.

Keywords: research culture, research culture functions, research skills, intellect, pedagogical condition, students' intellect development.

INTRODUCTION

Nowadays the addressing of the modern higher education to the problems of the cultural development of a person becomes a leading tendency of the educative process of the higher school. In our research we selected research culture out of the wide range of culture types since it takes a special place in the process of an individual's learning of the surrounding world.

In the works of the modern authors the concept of the "research culture"

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(hereinafter - RC) is explained in different ways.

According to the definition of V. V. Balashov RC is a complex psychological formation which is characterised by the ability of an individual to solve the set problems using the methods of scientific cognition (Balashov, 2002). According to the opinion of V. V. Kraevskiy, RC is the combination of methods of surrounding world cognition which are mastered by a human on a certain stage of the scientific development (Kraevskiy, 2001). V.S. Lazarev understands RC as a definite personal quality characterised by the general nature of the understanding of a single world view, methods of scientific cognition mastering, value orientations in relation to the acquired results which at the same time provides creative self-development of a personality (Lazarev, 2007).

The analysis of the different understandings allowed E. N. Kuklina to generalize different definitions of this term according to which RC can be considered as:

- a way or the result of creative self-realization of a human in the process of his/her professional activity;
- a quality of a person based on a certain level of methods mastering and ways of performing professional activity;
- skills which are implemented when performing creative activity and characterise the specific nature of the professional thinking (Kuklina, 2008).

Based on the different psychological and pedagogical definitions of RC we can offer the following definition of RC of the personality of a professional specialist according to which RC is a quality of a personality which can be characterised by the orientation to the value of research activity, constant need of research activity, presence of a complex of methodological, worldview and subjective research knowledge and skills, high level of research skills.

Thus, RC is characterised, first of all, by the presence of students' active need of searching, combination of certain knowledge, skills and abilities and research skills, formedness of which allows performing investigative activity.

According to the opinion of O. N. Krutikova RC is based on the research activity and research behaviour but unlike them it is intended, aimed and integrated cultural means. The development of RC depends on the intensity and variety of realia of being as well as on the fact of presence of the human value research activity in interaction with this realia in the social and cultural norms. In the course of research activity implementation the development of research positions is very important. Research position is an important personal basis according to which a human does not just react to the changes which take place in the world, but can also search and find the unknown (Krutikova, 2010, 2011).

According to the opinion of S. L. Belykh there are two forms of RC - social and personal. The essence of the latter consists in the fact that it is a modification of the general human RC which, in its turn, is a part of the whole society culture, being at the same time a component of the certain professional culture. Due to this fact the social form of RC is a combination of norms of research activity of the whole society, personal form of RC is a norm of research activity of an individual specialist within the frameworks of his/her professional activity. The acquiring of the social RC leads to the formation of its personal form (Belykh, 2008).

Thus, RC of the future teacher is a component of the general RC, a combination of norms and methods of cognition, ways of professional realization of research activity, whole education, which is being formed and developed in the course of professional pedagogic activity.

According to the researchers' opinion the functions of RC of the future teacher are as follows:

- gnostic, which provides single understanding of the methods of cognition and studying surrounding world;

- informational, which translates social experience of cognition of the surrounding world;
- communicative, which allows contacting with the certain people for the purpose of research;
- humanistic, which is aimed at the development of the creative personality;
- regulative, which serves as a system of normative requirements to the subjects of research activity (Mareev, 1999).

According to the opinion of A. V. Moskvina, being one of the components of the single culture of a personality, RC has the following components:

- first, research worldview which is a component of the scientific worldview - a single system of views on the surrounding world;
- second, research thinking which is an ability of a human thinking to perform research activity the result of which is the acquiring of knowledge;
- third, the research ethics, which is the complex of ethic norms and partner relationships in the research environment (Moskvina, 2004).

The basis of the RC structure of the future teacher are the research skills and abilities (hereinafter - RSA) which are the targeted actions based on the complex of the knowledge, skills and abilities acquired previously in the course of educative and cognitive activity and corresponds to the aims and tasks of research activity.

In the classification of RSA the researchers point out the following components of their structure (Milash, 2013):

- intellectual (RSA for both perception of the acquired information and social experience and their adequate transformation by means of thinking operations);
- practical (RSA for the use of theoretical provisions of the subjective disciplines according to the tasks of the research process, including the abilities of acquiring new data from the different sources, processing and setting of the acquired data using different methods);
- self-organisation and self-control RSA for the effective organisation of the research activity, defining its methods, means, the order of implementation and terms as well as evaluation of the quality and results of its implementation).

Considering the structural model of RC of a professional specialist the researchers pointed out the following components. (Petrova, 2007, 2008):

- intellectual (cognitive) which is a combination of interconnected knowledge: methodological, which provide general direction of the research in the uniformity of principles, methods and means; worldview which orients a personality to the certain relation to the surrounding world in general and to the object of research in particular; reflexive, which helps to define the borders of personal abilities while performing the research;
- operational which provides the presence of certain research skills such as defining a problem, making hypotheses, defining concepts, ability to classify, observance, conducting experiments, drawing conclusions, structuring of the research material;
- creative which speaks for the presence of creative potential, ability to produce the biggest amount of ideas, ability to transfer from one phenomena to the other, even different ones, presence of the original thinking;
- motivation-valuable which includes such values of research activity as the value of the true result and its getting; value of the active character of the research; value of communicative processes aimed at connecting the positions of different subjects of the research in the general research process; value of productivity of the research embodied in the certain result which is finished and has sense significance.
- and finally, personal component, which represents such qualities of an researcher 's personality as sensibility to the research problems; ability of constant wish to discover the root of the problem of the research; significant level, flexibility and productivity of thinking; ability of reproduction of the original ideas, making

connections between objects of research; ability of predicting; developed understanding; direction to the self-actualization and developing of one's own potential.

While analysing intellectual component of RC of the future teacher we'd like to say that according to M. A. Kholodnaya - the author of the fundamental investigation of the intellect psychology (Kholodnaya, 2002) there is no general approach when defining the concept of "intellect", which is defined by the researchers as a general ability of an individual to consciously set his/her thinking in accordance with the appearing requirements, intellectual adaptation to the new conditions of life (V. Stern); as a combined and general ability of individuals to act adequately, think logically and interact with the life realia (D. Veksler); as an ability to process information under which one understands as the whole range of human perception (P. Guilford).

Thus, we can base on the fact that the intellect is an ability of a person to perform cognitive processes and solve problematic tasks including setting previously unknown tasks.

As we have already pointed out, an intellectual component of RC is a total of interconnected knowledge which in its turn can be considered as a result of the mental and practical activity of a human which is represented by the system of empiric facts, theoretical concepts, scientific laws and theories. The purpose of the knowledge is the organisation of the cognitive process and explanation of the processes and events occurring in the surrounding world. While analysing an intellectual component of the RC it is necessary to define both the types of knowledge acquired by the future teacher while forming RC and methods of cognition applied for this. The scope of knowledge acquired by a human has a tendency to constantly increase, which depends on the activity of a human.

Human intellect can be changed with the course of time. It is influenced both by the internal (e.g. good memory, creative activity) and external factors. The latter in their turn it can both accelerates and slows down. The factors which accelerate the intellectual development are stimulation, encouragement, ambition, recognition by the society, discretion etc.; the slowing once are punishment, accusation, conviction, absence or lack of ambition etc.

The degree of RC formation depends directly on the intellectual level of a future teacher. Due to this fact it is necessary to take into account the above mentioned factors when stimulating a cognitive process.

According to the data of M. F. Shklyar we can point out the following forms of cognition: empiric and creative. These forms of cognition do not oppose but mutually complete each other since the spheres of their use often meet. (Shklyar, 2012).

The empiric form of cognition is primary, it is initially present in any practical human activity. Historically this form of cognition supplied a human with all the necessary sum of knowledge in different spheres of his/her activity up to the appearance of special ways of cognition. The specific nature of the empiric form of cognition is in the absence of the systematic nature and goal as well as in the unconscious use of empiric methods of research. In the case of empiric cognition the latter often occurs intuitively, partially with the support of the primary knowledge of the subject of research. Due to this fact one should include the presence of the intuitive knowledge of use of the empiric methods of research and primary knowledge in the sphere of research in the RC component.

While forming RC of the future teachers the use of the empiric methods is necessary but insufficient condition. The inclusion of the future teachers into the research activity needs the use of theoretical form of cognition which is based on the theoretical thinking using sensually-specific perception of the reality but such which

goes beyond its boundaries. In the result of the use of theoretic thinking the new concepts and models, hypotheses and theories appear.

Theoretic form of cognition evokes the future teachers' necessity of knowing social research terminology, such as urgent character, object, subject, goal, tasks, hypothesis, methods of research etc.

All the variety of methods of research within the framework of RC can be divided into:

- philosophic, which sets the single investigative strategy;
- general scientific (analysis, synthesis, generalisation, abstracting, analogy, idealisation, modelling etc.) which are used in any scientific research and are an intermediate stage when transferring from philosophic to the specific scientific methods; and finally
- specific scientific methods (literature analysis, analysis of the results of life activity, analysis of the experience concerning the problem of research, observation, interrogation, discussion, experiment etc.) which are the total of the methods, ways and principles of research in the specific sphere of science, among which one can point out disciplinary methods, used only within the frameworks of some scientific sphere, and inter-disciplinary which are used in the complex research.

The future teachers need to know different methods which can be used for the transformation of the acquired information in the process of research. It should be noted that the processing of the acquired data during research can be performed either with or without the use of technical means. In this case the future teachers should have the basic knowledge of the work on PC.

The result of data processing is the final scope of information which has no value without the proper knowledge. Due to this fact the future teachers should have the knowledge of the methods of systematization of the research results.

Except the theoretical knowledge one should point out the knowledge which can be used in practical sphere of RC, such as the knowledge of the requirements to the illustrative presentation of the results of research which should be arranged in accordance with the set standards that define the structure and norms of research organisation.

Thus, when forming RC the future teachers should have the following theoretic knowledge: special terms and concepts; methods of acquiring information, data processing, systematization and analysis of the results of research; requirements to the illustrative presentation of the research results.

METHODS

Due to the fact that the topic of our research is the analysis and defining of *pedagogic conditions* of the students' intellect development within the frameworks of RC, let us detail this definition.

It should be noted that there is no general approach to the definition of the concept of "pedagogic condition" which is considered by the researchers as:

- circumstances or a situation which assists or prevents the development of educational process;
- the complex of objective opportunities, factors and measures of educative process which are the result of the targeted choice, creation and use of content components, means and organisational forms of educative process aimed at achieving certain goals;
- circumstances, which presuppose a definite direction of education process development;
- combination of forms, methods and pedagogic skills aimed at the formation of certain professional and personal qualities of the future teachers etc. (Bim-Bad, 2005).

We are to study pedagogical conditions for the students' intellect development within the frameworks of RC as a complex of potential opportunities of intellectual and creative investigative environment of a higher education institution, aimed at development of RC and intellectual level of the future teachers. Let us imagine an intellectual and creative environment of a higher education institution as a system which components, characteristics and structure contribute to the formation and development of the intellectual potential of the education process participants and, consequently, to the formation and development of RC of the future teachers.

Such intellectual and creative research environment is characterised by the following specific features:

Firstly, it should provide motivation of the research activity by means of formation of intra-personal motives for self-cognition and development of the personality of the future teacher in the process of multi-sided educational activity. This can be done by means of formation of the positive attitude towards the skills, abilities and knowledge, acquired in the higher educational institution and applied when performing pedagogic activity. The mentioned indicator of the intellectual and creative research environment is needed on the one hand for the orientation of the future teacher to the self-cognition, and on the other hand for the acquiring of the whole content of the pedagogic work (Kuanova, Sherimova, Esenova, Urazalieva, Tauipbaeva, 2015).

Secondly, the intellectual provision of the education environment by means of filling intellectual and creative research environment with a complex of creative problematic tasks with the sufficient content of intellectual component (Mosunova, 2008).

Thirdly, organisation of conditions for intellectual activity. This indicator of the intellectual and creative research environment should take into account inner conditions of the cognitive processes, laws of intellectual and creative development of subjects of the education process, psychological age features of the future teachers, individual potential of every student (Goloviznina, 2002).

Fourthly, emotional provision of the education activity by means of creation of the positive psychological micro climate (Shmachilina, 2009).

Fifthly, personal provision of the education activity by means of axiological assistance to the development of the intellectual potential of the students and their orientation to the brand-new level of professionalism in the future (Demchenko, 2012, 2012).

The analysis of investigations in the sphere of defining pedagogical conditions which contribute to the students' intellect development allowed us to state that they have a non-investigated problem of the future teachers' intellect development within the frameworks of RC. Due to this fact little attention is paid to the mutual dependence of the intellectual and creative component on the one hand, emotional and motivation component of the personal education on the other hand. It is prevented from pointing out these components of the unity of pedagogic conditions of development.

To our mind, when organising the educational process it is necessary not only to consider the psychologically-pedagogical laws of interconnection of the intellectual potential components of the students, but also to create conditions under which the future teachers' intellect will develop.

According to the aim of the research we explored a complex of pedagogical conditions which contribute to the development of the future teachers' intellect in the course of education process. We have also conducted a test for the effectiveness of the formed pedagogical conditions which contribute to the development of the future teachers' intellect within the framework of RC. They are as follows:

- I. Formation of the intellectual and creative investigative environment;
- II. Psychologically-pedagogical provision of the research activity;

III. Motivation for the investigative activity;

IV. Activation of the multi-aspect education activity of the students.

The creation of the intellectual and creative research environment means the realization of the situations of problematic nature and uncertainty in the course of education process as well as the procedure of the intellectual and creative research environment, positive psychological micro-climate of the research activity, introduction of the research and creative component with the intellectual content.

RESULTS

The confirming stage of the experiment included the research of the intellectual development of the future teachers in such aspects as:

1) diagnostics of the level of development of the students' "general intellect" (Brief Selection Test (KOT));

2) diagnostics of the intellect structure (R. Amthauer test).

Brief Selection Test (KOT) refers to the "general intellect" test category, it aims at diagnostics of the integral index of "general abilities" and means the diagnostics of such "critical points" of intellect as the ability to generalise and analyse material; flexibility, passivity of thinking; emotional components of thinking and distractibility; speed and accuracy of perception, distribution and concentration of attention; use of language means and general literacy; spatial perception.

R. Amthauer test includes the diagnostics of the logic, linguistic, spatial types of intellect.

In the course of the further work we implemented the total of the pedagogic conditions, which contribute to the students' intellect development within the frameworks of RC.

When conducting the forming experiment we made an attempt to create an intellectual and creative research environment by means of its provision with the problematic nature and uncertainty with the help of introduction of the problematic tasks into the content of education material. The main characteristics of the latter are the contradictory nature of circumstances which were to be analysed in order to choose the right way of problem solving.

Procedure of the intellectual and creative environment was provided by means of redistribution of the direction of research activity to the process itself but not to the final result.

Positive micro-climate of the research activity was provided by the creation of psychologically comfortable environment, emotionally positive background as well as human and democratic interrelations which are characterised by the mutual respect, mutual help and mutual understanding. The formation of the above mentioned conditions led to the appearance of the situation of success, implementation of axiological attitude towards the potential abilities of the students, encouragement of the searching, active work, development of proactivity and independence in developing ideas.

During the experiment the intellectual and creative component of the activity was provided by the filling of the intellectual and creative research environment with the creative tasks with intellectual content. The formation of the intellectual and creative component of the activity consisted in the use of creative and reproductive tasks, use of logical and heuristic methods of their solving, intellectualisation of the tasks, presence of creative elements in the education activity of students in general.

Due to this fact it was necessary to rationally combine different forms of educative activity: frontal, group and individual. The tasks of different degrees of complexity were included into the system of individual creative tasks at the same time.

The favour of the creative atmosphere was provided by means of joint creative work of the students and consisted in the limitation of the template thinking, motivation for the creative initiative, non-standard and original approach when revealing new problems and searching the ways of their solving. The above mentioned approaches to the creation of the favourable creative atmosphere were achieved by means of setting tasks in such a way that they could lead to the use of non-standard thinking, performing analysis of the typical objects of research in a new perspective, searching of the unusual interconnections between different essences etc.

Mutual communication of the participants led to the creation of the atmosphere of collaboration, activates the students for the generation of idea, interchange of the concepts and experience.

In the course of forming experiment aimed at strengthening of the future professional activity a modelling of different pedagogical situations was performed which led to the creation of conditions for the practical use of the acquired knowledge. The students had to develop detailed notes of the classes, mass events, didactic materials, methods of diagnostics the students' intellectual potential.

The future teachers made reports devoted to the insufficiently researched pedagogical problems, the workshops were conducted in the groups of students, they took place in the exhibitions of scientific and research works, in the scientific conferences, competitions, academic competitions etc. The realization of this pedagogic condition turned out to be effective in combination with the development of the future teachers' motivational and axiological attitude towards the pedagogical innovations.

Activation of the multi-aspect educational activity of the students was provided by means of material-technical and scientific-methodological support.

In the course of the forming experiment the implementation of this condition was performed by means of the following educative methods at profession-oriented classes: active (heuristic, problematic, exploratory and research), interactive ("brainstorm", "solution tree", "general circle" etc.), projective, activation of intellectual and creative activity.

DISCUSSION

The complex of the developed and applied pedagogical conditions of the students' intellect development within the frameworks of RC was based on the principles of different pedagogic approaches.

The use of traditional approach meant mastering knowledge, skills and abilities necessary for the future pedagogic activity. Personality oriented approach meant that the education process was directed to the defining of the individual peculiarities of the students, development of the personality of the future teachers. Active approach was based on the recognition of the students' constructive educative-cognitive activity as a basis, means and condition for the personal development. The use of the active approach provided the mastering, perception, approval and practical use of the acquired knowledge, skills and activities. Implementation of the problematic approach was performed by means of problematic tasks and professionally-oriented situations in the education process. The provision of the developing approach was performed by means of qualitative and quantitative changes of the students' intellectual parameters which were implemented by means of the different methods of activation of the intellectual-research activity in the education process.

The benchmark test with the use of the same diagnostic methods (Brief Selection Test (KOT) and R. Amthauer test) as well as the observing students' activity allowed

us to diagnose significant changes of the intellectual development of the students who took part in the experimental investigation.

In the course of statistical processing of the results of the students intellectual development diagnostics we pointed out significant differences in the level of development of "general intellect" and in the structural components of the intellect towards the increase of all the diagnosing indices of the intellect. Observing the activity of the students allowed us to point out the facts of the increased students' activity in the process of education activity and decrease of the time of solution finding for the tasks.

REPORT

In conclusion of the research we should note that students' RC is a component of the general professional pedagogical culture. The formation of RC should be based on the future teachers' performing of the scientific-investigative work.

The process of the students' intellect development within the framework of RC gives the opportunity to define the most effective methods of solving today's contradictions between the changes in the society and the level of the future teacher's readiness for the professional activity; between the constant increase of the amount of information and abilities of its perception; between the state demand for the teachers with the formed RC and insufficient working out of this problem in theory and practice.

Unfortunately, educative technologies that are used nowadays in pedagogical high schools are not always sufficiently aimed at stimulation of the intellectual and research activity of the future teachers. Due to this fact it is important to pay special attention to their development within the framework of RC by means of motivation to the research activity in the course of professional training.

The future teacher becomes a researcher if constantly studies scientific achievements in the sphere of his/her professional responsibility, integrating them into one's own practical activity; orientation to innovations; analysis of his/her research experience and use the methods of diagnostics to the subjects of educative process; approving of the productivity of the author educative method by means of proved data.

A teacher usually masters such skills after having worked as a teacher for - years during which he/she becomes a teacher- researcher. However, in a higher school the future teacher can master skills and abilities of the research work.

The results of the experimental investigation allow us to speak of the practicability of the use of pedagogical conditions of the students' intellect development within the frameworks of RC in the process of education as well as of the fact that the effective implementation of these pedagogical conditions can be possible if using them during practical classes.

This research can be the basis for the further development in the sphere of didactic provision of the students' intellect development; the use of information-communication technology and the Internet developing an intellectual level of the future teachers within the framework of RC; as well as the research of the intellectual development of the pedagogical high schools graduates.

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