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# Historical aspects of the problem of future teachers' scientific-research culture formation

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**ABSTRACT**
The article substantiates the topicality of the research problem, proves that a future teacher's scientific-research culture is becoming an important phenomenon in the context of modern ideas about culture under the conditions of fundamentalization of education, variable and polycultural character of educational systems, intensive growth of volumes of scientific and pedagogical information, frequent changes in scientific paradigms and pedagogical technologies, rapid renewal of scientific knowledge system. On the basis of narrative, historical-genetic and chronological methods the historical aspects of the problem of formation of future teachers' scientific research culture are covered. The coverage creates a methodological basis for its solution, makes it possible to trace the dynamics of the problem development. It is concluded that still in the eras of Ancient Civilizations and Classical Antiquity the requirement for educating a person capable of searching for the truth, who is able to "learn great-mindedness", came to the fore. The Renaissance Period was characterized by the tendencies aimed at raising the status of an educated person capable of independent thinking, critical judgment, research, self-education, self-cognition. The main requirements of pedagogical education of the Enlightenment Period are the cultivation of scientifically meaningful knowledge, activation of a person's mental forces, his self-disclosure through scientific knowledge, the evolution of pedagogical training of teachers, at the core of which there is scientific work. The main slogan of pedagogical developments of the first half of the XX century was to apply heuristic, research, and experimental methods as the means of formation of thinking skills, intellectual activity, and self-education. The second half of the twentieth century was marked by the systematization and generalization of knowledge on the methodology and methods of pedagogical research, organizational and practical principles of research training in secondary and higher school. However, the systematic study of various aspects of teachers' scientific research culture, the issues of pedagogical science methodology become especially important only at the beginning of the XXI century.

**Keywords:** history of pedagogical thought, scientific-research culture, critical thinking, mental outlook, mental activity, scientific work, research approach.

## TOPICALITY OF THE PROBLEM

Overcoming current global contradictions directly depends on the strategic resource of the development of civilization – intelligence - science, culture and education of new generations, the development of which is considered to be one of the most crucial issues of vitality of the European and world community. These socio-cultural challenges are confirmed by the main requirements of the Bologna Process for the European integration processes, determined in the Pedagogical Constitution of Europe, and aimed at the consolidation of efforts of scientific and educational community and European governments to increase the competitiveness of the European system of science and higher education in the world, to strengthen the role of this system for social transformations.

It is a future teacher's scientific research culture that is becoming an important phenomenon in the context of modern ideas about the culture under the conditions of education fundamentalization, variable and polycultural character of educational systems, intensive growth of volumes of scientific and pedagogical information, frequent changes in scientific paradigms and pedagogical technologies, rapid renewal of scientific knowledge system.

Under the conditions of post-classical science, co-evolutionary and globalization processes, epistemological horizon expansion, the isomorphism of scientific and cultural dynamics the problem of formation of future

teachers' research orientation in the field of pedagogical education acquires social importance. Future teachers have to be capable of a multi-vector, systematic study of pedagogical reality, evolutionary and prognostic analysis of the essence of socio-cultural and educational phenomena, heuristic analysis of available scientific knowledge, creation of an individual concept in solving scientific-pedagogical problems, which causes the necessity for a comprehensive study of the problem of formation of future teachers' scientific-research culture, namely referring to the historical aspects that lay the theoretical and methodological foundation for the scientific reflection of this issue.

The topicality of the outlined problem is confirmed by the *contradictions* that arise between: 1) the objective need of a society to obtain a competitive mobile teacher in the labor market, who can use scientific psychological and pedagogical technologies, different research strategies, possesses the system of value orientations, who is capable of permanent professional and personal self-creation and self-determination and a low level of actualization and activation of a future teacher's intellectual and research potential in the system of traditional professional training; 2) modern realization of culture creating, human-centered paradigm of education, recognition of culturological integration between culture, education and science and the lack of consideration of this relationship while preparing future teachers-researchers; 3) the need for the development of multifaceted theory and methods of formation of a future teacher's scientific-research culture and the lack of systematic research in studying theoretical and historical aspects of the problem.

**MAIN MATERIAL PRESENTATION**

The problem of formation of scientific-research culture in terms of educational practice has had a centuries-long history and an important national tradition. At various stages of the history of pedagogical thought certain issues regarding the activation of a person's cognitive forces, the research organization, the realization of the intellectual education of those who are studying, were raised.

**THE PERIOD OF ANCIENT CIVILIZATIONS**

The issue of the educational process research orientation, which affects a person's internal improvement, played an important role in the education of ancient civilizations. In Ancient India, during the period of Buddhism (VI century BC), in the book "*Bhagavad Gita*", which became a monument of religious and philosophical thought of that time, it was noted that the essence of education is in the fact that students should receive the tasks, the process of solving which should lead to finding the truth [7; 32]. In *Ancient China* of the same period, great importance was paid to students' independent work in knowledge acquisition. Education, according to Confucius, must be based on a dialogue between a teacher and a student, on the classification and comparison of facts and phenomena [23].

**THE PERIOD OF CLASSICAL ANTIQUITY**

In *Classical Antiquity* (V century B.C.), *Socrates*, being the founder of the research method, called for an independent critical analysis of truth. He was one of the first to use inductive evidence and to define concepts [33]. Considering the unity of microcosm and macrocosm, Socrates asserted: "Know yourself, and you will know the whole world" [8, p. 203]. This thesis summarizes a thinker's pedagogical views.

The theory of Socrates was actively developed and put into practice by his followers: *Aristotle*, *Plato*, *Xenophon*, *Marcus Fabius Quintilianus*. According to *Xenophon*, an educated person must master the arts of a dispute, be able to analyze, compare, interpret the discussed issues, and use analogies [16]. *Democritus*, having developed the foundations of a new theory of cognition, emphasized that "it is necessary to learn great-mindedness, but not the abundance of knowledge" [as in 18, p. 58]. He considered that the most important in education is not to gain knowledge but to educate intelligence.

**THE MIDDLE AGES IN WESTERN EUROPE**

In *the Middle Ages* the high social status of an encyclopedically-educated person became an important feature of social life. Such people were John of Damascus, Simeon the New Theologian, Gemistus Pletho. The vector of education was directed at learning about one's own soul, self-perfection. During this period, educational universities were open (University of Bologna, University of Paris, Cambridge and Oxford Universities), where scientific and research activities were in the first place.

The leading ideological movement of the *Renaissance Period* was humanism as an ideological principle, in the center of which there was recognition of a person's self-worth, his or her harmonious comprehensive development, the ability to change (Michel de Montaigne, François Rabelais, Rodolphus Agricola, Erasmus of Rotterdam, Juan Luis Vives). The tenets of humanistic pedagogy emerged in many European countries. Thus, the French philosopher and thinker Michel de Montaigne pointed out that a child became a personality not only thanks to the mastered knowledge, but, mostly because of the developed abilities to critical judgments. Erasmus of Rotterdam, Thomas More, Juan Luis Vives connected the organization of the educational process to the necessity to penetrate into the laws of cognition.

**EARLY MODERN PERIOD IN WESTERN EUROPE**

The growth of the social value of science and education in the Early Modern Period (XVI - XVII centuries) leads to the formation of pedagogy as a science with its own laws, research principles, experimental and theoretical bases. The new ideal of personality assumed the formation of a person capable of comprehending the world in its integrity and making practical conclusions on this basis.

Thinkers of that time could be characterized by confirming their pedagogical conclusions with the data of experimental research (F. Bacon, W. Ratke, R. Descartes, J. A. Comenius). Thus, the English scientist *Francis Bacon* considered mastering the forces of nature by means of successive experiments to be the purpose of scientific knowledge [15]. The German educator *Wolfgang Ratke* created a new science - methodology of education, developed criteria according to which it is necessary develop scientific pedagogical research and determine the content of education [29].

One of the prominent educators and thinkers, *John Amos Comenius*, who was the founder of pedagogy in its present-day understanding, focuses on the principle of systematic learning that allows a student to see the relationships between phenomena, the system, but not the chaos in their study. Special attention was paid to revealing causal relationships between the phenomena of the external world, teaching students how to discover and analyze them. There is an opinion in the treatise that knowledge of laws of the pedagogical process should serve pedagogical practice, which is designed to provide rapid and thorough learning, as a result of which an individual becomes a carrier of knowledge and skills [21].

The principle of conformity in didactics by J. A. Comenius received a consistent justification. By applying this principle, the scientist considers four stages of learning, which are based on the unity of the laws of nature and education: 1) independent observation; 2) practical implementation of knowledge; 3) implementation of knowledge, skills, abilities under new conditions; 4) the ability to present the results of the research independently. Thus, the main task of pedagogical theory, according to the scientist, is promoting a pupil's mental activity, developing his research skills [22].

*In the age of the Enlightenment* (the end of XVII – XVIII centuries) the idea of the necessary restructuring of society in accordance with the requirements of reason (John Locke, Wilhelm von Humboldt, Claude Adrien Helvétius, and Jean-Jacques Rousseau) was grounded. The English philosopher and educator *John Locke* noted that the ability to reason made a mind capable of acquiring knowledge independently; and that the most important way to improve mind was self-education. The philosopher and educator *John Locke* provides special methods and techniques of statements formation and thinking development in his work "*An Essay Concerning Human Understanding"* [36]. For example, he suggests relating each fact to the general provision, teaching to see all the data of the experience as a whole (the unity of the whole and its parts), not to allow the domination of any other combination of ideas (analogy, association), except the one which follows from the nature of things, etc. [as in 27, p. 199]. J. Locke expanded the idea of pedagogical means, considering not only the methods of teaching, but also the methods of moral influence, which is judgment.

*Jean-Jacques Rousseau*, a philosopher and an educator, in his work "Emile, or On Education" substantiates the need to treat the process of education as "the only possible and important way of new knowledge acquisition" [as in 27, p. 210], affirms the idea of activating teaching methods by referring to personal experience [31].

At the end of the XVIII century - at the beginning of the XIX century prominent educators and philosophers Johann Bernhard Basedow, Johann Heinrich Pestalozzi, Wilhelm von Humboldt, Johann Friedrich Herbart, Friedrich Adolph Wilhelm Diesterweg paid a great attention to the issues of educating an intellectually developed moral personality [20].

An outstanding Swiss educator *Johann Heinrich Pestalozzi* attached great importance to the developing education, highlighting its content and developmental aspects, which involved the introduction of new pedagogical tasks: the formation of students' clear concepts aimed at their cognitive forces activation. The scholar emphasized that a teacher should direct pupils' thoughts, but not with accordance to some pattern; it is possible to make the mind "more cultural" only by showing the students some methods and techniques; a teacher must "teach science" [38, p. 129]. Consequently, J. Pestalozzi raised questions about students' methodological thinking formation. Emphasizing the relationship between upbringing and development, the educator proceeded from recognizing the crucial role of appropriately organized education in the formation of a child's personality. From J. Pestalozzi's point of view it is important that a child's knowledge assimilation would not be detached from the ability to apply it. The main task of a rationally set learning, in his opinion, is in a pedagogically thought-out organization of a child's observations, and the learning itself should be based on the experience of observations as the basis of knowledge and a necessary condition for stimulating active cognitive activity. It is the interaction of mechanisms of cognition and skills that the educator considered the basis for personal development [1].

In the philosophical and pedagogical conception of the German scientist *Friedrich Adolph Wilhelm Diesterweg* special attention was paid to the organization of scientific research work of both a student and a teacher. Thus, in the "Guide for the Instruction of German Teachers" it is stated that a teacher himself must become a researcher, never stop his development, constantly enrich his knowledge and develop his professional abilities,

that is, "while taking care of his students' self-development, a teacher must develop himself" [27, p. 313]. In opinion of *F. Diesterweg*, knowledge it does not follow to report to the student, he is necessary to be brought to that he found them, independently seized by them. A teacher must direct a student to being of new knowledge and generation of new ideas [13].

*The first half of the XX century* was noted by the variety of pedagogical settings and trends which found their implementation in such areas as existentialist pedagogy (Jean-Paul Sartre, Émile-Auguste Chartier), social pedagogy (David Émile Durkheim, Wilhelm Dilthey, M. Macmileon), personality pedagogy (E. Weber, H. Gaudig, F. Gansberg), functional pedagogy (Édouard Claparède, Adolphe Ferrière), progressive pedagogy (John Dewey), humanistic pedagogy (A. Maslow).

A representative of progressive pedagogy, an American philosopher, educator, sociologist *John Dewey*, having developed a method of "activity-based learning" or "experimental method", advocated the practical orientation of education, putting forward the idea of creating "instrumental" pedagogy. According to this conception, learning involves a student's actions which become an instrument for his knowledge acquisition, his own discovery, an instrument of truth appreciation, which leads to his personality formation [37]. The final result of education, according to J. Dewey, should be the formation of thinking skills, the ability to educate oneself, "formation of a system of internal personal orientation" [14, p. 203].

The method of organizing such activities is a method of project-based learning, developed by J. Dewey's follower, an American educator *William Kilpatrick* [17]. Project-based learning presupposes such a system of education, when pupils gain knowledge and skills while performing a system of practical tasks that are constantly getting more difficult. That determines the direction of a teacher's research activity, which includes the following steps for the organization of purposeful acts: problem statement, drawing up a plan for its implementation, its implementation evaluation [14].

**The history of pedagogical thought in russia. Modern history.**

In the *history of pedagogical thought in Russia* the issues of the necessity to use different kinds and forms of research and scientific methods and ways of knowledge acquisition were put forward a few times. Following the development of education and science these issues became particularly important in the age of the Enlightenment (the end of XVII – XVIII centuries), characterized by a new understanding of education, penetration into the national pedagogical self-consciousness (I.I. Betskoy, M.V. Lomonosov, L.F. Magnitsky, N.I. Novikov, M.M. Popovskiy, V.N. Tatishchev ). The idea of a person's nature "self-revelation" through science was in the centre of attention [24]. The necessary attribute of the cognitive process was "reasoning", that is the actions of reason and mind.

Thus, *Vasily Nikitich Tatishchev* in his book "Talk about Benefits of Sciences and Schools" he emphasized the need for every educated person to learn about himself: looks, body, the internal and the spiritual [3]. This cognition is only possible only through science. Viewing science as a means of self-reflection V.N. Tatishchev asserted that the main science is the science which allows a person to learn about oneself, namely, "the essence of science lies in its practical usefulness, because knowledge is the ability to distinguish between good and evil" [as in 3, p. 69].

According to the scientist and encyclopaedist *Mikhail Vasilyevich Lomonosov*, there should be cognitive interest in the core of learning. This will cause the creative educational material acquisition and the development of research trends among students [34].

An educator, writer and journalist *Nikolay Ivanovich Novikov* draws attention to the need to master not only knowledge but also the methods of cognition that stimulate a child's mental activity, making him to think, ponder, explore, doubt, draw conclusions. The pedagogical work "On Educating and Bringing Up Children" emphasizes that "children's minds do not only have to exercise and enrich themselves with different kinds of knowledge, but also be such minds that children should acquire the ability to research what they want to know, to distinguish true from false [as in 3, p. 113].

*In the second half of XIX century – the beginning of XX century* outstanding teachers of that time (K.V. Elnitskiy, P.F. Kapterev, D.I. Mendeleev, V.P. Nedachin, D.I. Pisarev, V.Ya. Stoyunin, K.P. Yanovskiy, etc.) put forward the ideal of an individual, that is a free, educated person capable of mental activity, continuous self-development, life transformation. According to *Dmitry Ivanovich Pisarev*, the progress of social life is achieved mainly due to the spread of scientific knowledge and the increase in the number of "thinking individuals". It is emphasized that "only science can create a person who can think critically" [as in 3, p. 133].

In his work "Thoughts about Our Gymnasiums" the theorist and practitioner in the field of pedagogy *Vladimir Yakovlevich Stoyunin* reveals the problem of education, considering an educated person to be the one, who "by means of scientific knowledge developed higher concepts which determine human life in its relationship to everything around, that is nature and society, inside himself" [as in 4, p. 84]. The educator comes to the conclusion that science will provide mastering scientific method, which should be used by an expert in his researches.

*Pyotr Fyodorovich Kapterev* studied the problem of self-education and self-improvement, emphasizing that it is important for a person to be able to study oneself. The scholar stated that "intelligence is above knowledge as possessing intelligence it is always possible to acquire knowledge ..." [as in 4, p. 237]. In this context, according to P.F. Kapterev, the heuristic form of education becomes of special significance [4]. This form requires from a teacher to have a thorough knowledge of science, the ability to lead students to independent discovery of scientific truths.

A world-class scientist, a public figure *Dmitri Ivanovich Mendeleev* pointed out the importance of a future teacher's possession of scientific knowledge. In his work "On the Direction of Russian Education and On the Necessity of Teacher Training" a scientist emphasizes the development of a teacher's general philosophical outlook, which makes it possible to influence student youth. Attaching a high priority to teacher training, D.I. Mendeleev stated that "without being obsessed with science it is impossible to expect lots of clever teachers and appropriate results from the spread of schools" [as in 5, p. 431].

*Kirill Petrovich Yanovskiy* in his work "On the Issue of Our Higher Educational Institutions" emphasizes the importance of conscious, thorough and deep assimilation of scientific truth for the spiritual development of man. K. P. Yanovskiy emphasizes that a student's scientific knowledge can be seen in a student's scientific works which "are the only means that can let know how well a student is familiar with science, prone to it and is able to study it" [as in 5, p. 454]. The view that in higher educational establishments students should study some subjects independently and in this way reveal "scientific individual initiative" is expressed.

The same ideas can be traced in the works by *Vasiliy Pavlovich Nedachin*, who focuses on the issue of students' intellectual education, the impact of scientific knowledge on the development of a person's moral qualities. V.P. Nedachin considers the main task of general education to be the need to cultivate the skills to think and study independently, to find way in the received scientific material, lively interest and love for scientific knowledge. The researcher points out the relationship between these educational tasks and methods of communicating scientific knowledge, as well as the selected scientific material, which is the essence of scientific education [4].

*Pyotr Alekseevich Kropotkin* pointed out the usefulness of using teaching methods, their systematic character of application in order to master the subjects thoroughly and deeply. The main condition for successful learning, according to the scientist, is mastering new methods by a specialist. P. A. Kropotkin asserts the idea about the need for the development of research skills for a future professional's successful work: "if a person hasn't developed the ability to observe and describe precisely what he is observing, the ability to discover the relationship between the facts, and on the basis of it to formulate inductive hypotheses (that is predictions based on observation) and check them – he can't be a good specialist" [as in 4, p. 482].

*Vasiliy Porfirievich Vakhterov* in his work "Fundamentals of New Pedagogy" reveals the importance of a pupil's scientific research work while developing critical thinking. The scientist expresses the opinion about the need to develop the abilities to discover, invent, generalize, compare, classify and express findings in oral and written words. This requirement will allow a pupil to implement reflexive actions while dealing with each observation or experiment [4]. V. P. Vakhterov comes to the conclusion that new pedagogy should cultivate internal incentives for a pupil's self-development. The use of a pupil's scientific-research work in the educational process which teaches the mind to find laws in life and nature and predict the consequences serves this task. Doing research work develops pupils' abilities to find ways to solve each problem, consider steps in this direction, analyze facts, find his way in the facts, identify connections, bringing them to certain laws, and so on [4].

Consequently, summing up the above, we will make a *conclusion* that in the history of world pedagogical education some aspects of the theory and practice of the problem of forming scientific culture of both a teacher and a student were covered. Many philosophers and educators advocated the ideas about the necessity of research orientation of training in order create a personality capable of critical thinking, independent knowledge acquisition, self-education and self-cognition.In the works by prominent educators, attention was paid to the following issues of the outlined problem: the impact of science on an individual's moral, spiritual and mental development; application of various methods of scientific research activation and mastering scientific methods; theoretical aspects of science methodology, theory of cognition, revealing the essence of science, scientific education, etc.

**The history of pedagogical thought in ukraine. The middle ages and modern history.**

The problem of cognitive and research activities has a significant *Ukrainian background* in the history of pedagogy. As it is know, in the *X-XII centuries* pedagogical principles were reflected in the works of national authors (Ivan Vyshenskyi, Yuriy Drohobych, Stephan and Lavrentii Zyzanii, Pavlo Rusyn, Epifany Slavinetsky, Kyrylo Stavrovetsky). These principles became the components of doctrines of Christian ethics. The main methods of teaching at that time were "The Socratic Method" and the method of interpretation [19].

The orientation to the natural world cognition, mental activity activation was characteristic of Brotherhood Schools (in Lviv and Kyiv) *at the end of XVI – the beginning of XVII centuries*. Outstanding figures of the

Ukrainian culture (Innokenty Gizel, Yoanykii Haliatovskyi, Yosyp Horbatskyi, Lazar Baranovych, Symeon of Polotsky, Feofan Prokopovich) taught at the Kyiv-Mohyla Academy, actively influenced the formation of pedagogical thought, which developed in close connection with different branches of science. The Kyiv-Mohyla Academy was characterized not only by the high level of students' education but also by the high level of pedagogical theory [6].

The Ukrainian philosopher *Innokenty Gizel* spoke about the importance of educational process orientation at the study of phenomena. Paying special attention to the development of skills to understand and reason, the philosopher emphasized the need to "reason that is to think, because the one who thinks to concentrates on the object being studied" [as in 6, 108]. The "Work on the Integral Philosophy" clearly traces a familiar didactic principle that defines the path of knowledge from the known to the unknown. I. Gizel proves that intellectual cognition is a characteristic of only that kind of person who possesses volitional actions and conscious ambitions [6].

From the point of view of a well-known Ukrainian philosopher *Feofan Prokopovich*, science is a necessary way of cognition, it contributes to knowledge acquisition, gives advice on education. In his philosophical and pedagogical treatise "The Speech on the Merits of Science, that Equal the Merits of Arms" a philosopher points out that "a person who strives for knowledge starts a deeper study of nature. This study reflects on the processes of education and cognition of those who are studying." [28, p. 237].

In the opinion of a thinker and a humanist philosopher *Hryhorii Savych Skovoroda*, a person can reach happiness only through self-discovery. In the system of a philosopher's views, the concepts of "self-knowledge", "work", "happiness", "upbringing", "education" act in close connection as key concepts. H.S. Skovoroda points at a person's calling to serve a society, which is closely connected with intellectual development, educating the skills of intellectual and physical work. He considers intelligence as a major regulator of human activity [10].

In his works, *Yakiv Pavlovych Kozelskyi* noted the immensity of the process of cognition, its complexity, called for thorough cognition in sciences. The scientist interpreted the concept of "science" as "thorough knowledge of truth, … the ability of the human mind to undeniably prove everything that is asserted or denied" [as in 6, p. 156]. Y. P. Kozelskyi's merit is that he developed a classification of various branches of scientific knowledge. According to the scientist, human knowledge is threefold: 1) if we just want to know the truth, such cognition is called historical; 2) if we want to find out the causes of truth, such cognition is called philosophical; 3) if we measure the size of a thing, or its quantity, such knowledge is mathematical [6].

An outstanding theorist in the field of pedagogy and the organizer of public education *Nikolay Ivanovich Pirogov* thought a teacher's main responsibility was "to teach science not so much for science itself, but for the development of some intellectual or mental ability by means of science" [as in 34, p. 77]. In his work "A Teacher's Task at School" he emphasizes that the purpose of all scientific discussions is to exchange thoughts, views and convictions of those who take part in them. Scientific discussions contribute to finding out and interpreting the truth, and therefore to the improvement of science [34].

*Pamfil Danilovich Yurkevich* in his work "Methodology and Personality of a Teacher" [6] identified two main methods: analytical and synthetic. An educator and a philosopher thinks that "as methods is a form of knowledge, it is applied anywhere, it equally belongs to all the educational subjects, it equally leads to the movement of an intellectual force of a teacher and a student" [6, p. 177]. The first method – an analytical method – enables to divide the data in order to find their constituent parts and the simplest relations; the other method – a synthetic method – implies interpreting and deducing data from the constituent parts. A synthetic method is distinguished by its unity and consistency. In a scientist's opinion, the meaning of general concepts, clear understanding of which distinguishes an educated person from an uneducated person prevails in a synthetic method.

A democrat teacher, the founder of scientific pedagogy in Ukraine *Konstantin Dmitrievich Ushinsky* proves that anthropological knowledge makes it possible to correctly determine the content of education and the forms of its organization considering peculiarities of mental formation and development and physiological features of a pupil's personality. The main task of such education is a child's holistic, organic and comprehensive development. In the pedagogical work "Pedagogical Anthropology" it is noted that "one-sided direction of knowledge and thinking does not do so much harm as in pedagogical practice" [as in 4, p. 62]. K.D. Ushinsky considers the problem of the correlation of the scientific and the creative in pedagogy to be a priority, without which it is impossible to find an answer to any question connected with upbringing and education [40].

**The Period of Contemporary History in Russia and Ukraine (20s – 80s of the XX century)**

Socio-economic and cultural changes that emerged in the early twentieth century led to the increased demands on priorities of education, quality of knowledge and skills, forms of their acquisition and implementation in the world as a whole.

In developing the problems of education organization in the didactics of the *20s of the XX century in Ukraine and Russia*, special attention was paid to the possibilities of using the research approach borrowed from American pedagogy. In the opinion of educators of that time (*K.M. Venttsel, S.I. Hessen, S.T. Shatskii*) the

research approach was considered to be the general principle in the educational process, which must be reflected in all forms of students' educational work.

As *Sergey Iosifovich Hessen* [9] states, the purpose of education is not to transfer the foundations of science to students and to form practical skills, which is typical for advocates of real education, and not to form rational thinking on the basis students' mastering of logical methods of deduction and induction, which is characteristic of supporters of formal development of mind, but in teaching them methods of science, in other words, a teacher's task is to teach students how to acquire knowledge themselves, to use it in life.

*Stanislav Teofilovich Shatskii* spoke on the unity of a future teacher's pedagogical and scientific activities. A scholar asserted that "studying and researching pedagogical phenomena must be the basis for pedagogical institutions ... and a teacher must become an observer and a researcher of those phenomena that are taking place in front of him" [as in 18, p. 255]. S.T. Shatskii points out that further evolution of future teachers' training will necessarily lead to the fact that scientific work will be at its core [18].

The main criteria for choosing new forms and methods of educational work during the 20-30ies of the XX century in the USSR are the tasks of developing pupils' activity and independence. There was a noticeable trend towards research-based education. Soviet educators of the first half of the twentieth century (B. Ie. Raikov, O. P. Pinkevich) started measuring research and heuristic methods and pointed at some drawbacks of the latter one. However, at the same time, in the pedagogical literature of the USSR of that period the research-based method was often identified with "project-based learning" by W. Kilpatrick [17; 18]. That was the reason of wide-ranging debate over the issue who should determine the purpose of educational research – either a teacher or pupils; who should make the plan of research work, etc.

However, the lack of sufficient theoretical and practical development at that time, uncertainty of the ways of guiding an control of educational and research activities, overestimation of a pupil's abilities and underestimation of a teacher's role in the educational process combined with the recognition of universal character of research-based method led to the a sharp decline in students' success. That was one of the reasons why, starting from the 1930s, they refused using pupils' research activity in the educational process and the method itself was considered faulty [20; 30].

We cannot but agree with *Valentin Ivanovich Andreev*, who noted in the early 1980s: "The history of development and implementation of the research-based method, especially in the 1930s, teaches us the following: in pedagogy, as in no other field of human knowledge, an unprecedented phenomenon is possible: active "implementation" can take place earlier than "invention" itself takes place, that is earlier than thorough theoretical substantiation appears. It is in this way that the introduction of the research-based method took place in the 1920s and 1930s. The method itself as a theory was not developed and substantiated well enough. However, its active implementation was carried out by most teachers of the whole country" [2, p. 78].

The idea of applying the research-based method in secondary school was revived and further developed in the late 1950s – early 1960s of the XX century. At that time, teachers paid more attention to the activation of pupils' cognitive activity in the educational process. Pupils' research activity wasn't viewed as one of the teaching methods, but as the highest degree of scientifically substantiated hierarchy of methods, offered by *Isaac Yakovlevich Lerner* [25] and *Mikhail Nikolaevich Skatkin* [12].

In the pedagogical conception by *Vasily Alexandrovich Sukhomlynsky* research activity is viewed as a condition of effective pedagogical work. The scientist believes that "…according to its logic, according to philosophical ground, to its creative nature pedagogical work is impossible without the elements of research. It is important for the way of thinking to be based on the research so that the accumulation, analysis and comparison will precede the scientific truth realization". [35, p. 138] According to V. A. Sukhomlynsky, the scientific research approach to the phenomena of the outside world becomes especially important, since the process of learning about reality is an irreplaceable stimulus of thought. It is concluded that a teacher who is able to mentally penetrate into the essence of facts, to find out causal relationships, avoids a lot of difficulties and failures. Consequently, pedagogical work is close to scientific research [35].

During the 60s and 80s in the USSR a great number of important scientific works, which highlighted the problems using research-based method in education and the forms of its application for teaching different subjects appeared. A considerable influence on intensification of scientific research in this direction was done by the representatives of activity-based approach in education (V. V. Davydov, P. Y. Halperin, I. Y. Lerner, A. M. Matyushkin, M. I. Mahmutov, M. M. Skatkin, V. V. Uspensky, etc.), who made an important contribution to the theoretical and practical development of the ways of using pupils' research activity in the school educational process.

Thus, *Alexei Mikhailovich Matyushkin* [26] proved that the level of a pupil's understanding of a situation as a problematic one influences a pupil's research activity. The determining factor in this case is the internal personal need for knowledge, which is lacking. The lack of cognitive motivation, connected with the performed activity leads to the lack of independence in searching for and finding a solution to the problem. This, in turn, makes educational process to be of creative character. While tracing one of the laws of a pupil's learning material

acquisition – the dependence of its efficiency on pupils' intellectual activity, A. M. Matyushkin draws attention to the role of a teacher as the organizer of this research activity [26].

*Vasily Vasilovich Davydov* [11] spoke about the importance of research-based learning. However, he draws attention to the fact that such pupils' activity is not a real scientific research. In his opinion, it is "quasi-research". Pupils' learning activities in this case reproduce a researcher's work.

*In the 80s of the XX century* there appeared a number of scientific and pedagogical works devoted to the methodology and methods of pedagogical research (M.A. Danylov, V.I. Zahviazynskyi, V.V. Kraievskyi, N.D. Nykandrov, V.M. Polonskyi and others), organizational and didactic aspects of research preparation and scientific and research work of youth (Yu.K. Babanskyi, H.Kh Valeev, V.V. Davydov, V.I. Zahviazynskyi, A.A. Kyverliah, V.A. Slastonin, M.A. Sorokin, V.E. Tamarin, I.V. Usachova, A.I. Shcherbakov and others), covering the issue of research skills in a student's personal development (V.I. Andrieiev, A.M. Matiushkin and others). However, the cultural perspective of the problem remained underinvestigated and required special research.

**CONCLUSION**

Thus, the coverage of historical aspects of the problem of future teachers' scientific research culture creates a methodological basis for its solution, makes it possible to trace the dynamics of the problem development. Historical and pedagogical analysis allowed us to make the following conclusions: in the Periods of Ancient Civilization and Classical Antiquity the demand for the intellectual education of a person capable of searching for the truth, "learning great-mindedness" is in the foreground. The Renaissance Period was characterized by tendencies to increase the status of an educated person, capable of independent thinking, critical judgment, research, self-education and self-cognition. One of the main theses of pedagogical education of the Enlightenment Period is the cultivation of scientifically grounded knowledge, activation of a person's intellectual forces, his self-disclosure by means of scientific knowledge, the evolution of teachers' pedagogical training in the centre of which there is scientific work.

The main slogan of pedagogical developments of the first half of the XX century was the use of heuristic, research-based, and experimental methods as well as project-based learning as a means of formation of thinking skills, intellectual activities, self-education. The second half of the XX century was marked by the systematization and generalization of knowledge on the methodology and methods of pedagogical research, organizational and practical grounds of research-based training in secondary and higher schools. However, the systematic study of various aspects of teachers' scientific research culture, the issues of methodology of pedagogical science became especially important only at the beginning of the XXI century.

The prospects of the chosen research trend cover the issues of comprehension of the current state (the end of the XX – the beginning of the XXI century) of the outlined problem considering culturological methodology.

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