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Problem methodology as one of the ways of innovative organization of educational process

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Abstract

The aim of this article is the consideration of the essence of problem methodology as one of ways of the innovative organization of educational process. The characteristics of problem methodology are analyzed. It is specified that the problem methodology focuses the person on work in the situation of uncertainty, which trains him to be self-contained, heuristic, independent person. Such properties are necessary for the modern specialist who should work in conditions of modernization of the Russian society, directed on formation of innovative progress. The contribution of the author is marking the peculiarities of an application of problem methodology in university-level education. Such peculiarity of its application is an auxiliary characteristic of problem methodology, an indispensability of its application in the ratio with traditional methodology of the educational process organization.

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1. Introduction

The aim of modern Russian education is the preparation of such specialists, which will assist an innovative progress as domestic economy so a society and culture as a whole (Ardashkin I.B., 2003). An innovation policy in area of education is the result of necessity not only economy modernization, but also internal demand of educational system to changes. Such requirements assume radical restructuring not only the character of the

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educational process organization, but also a way of life, cultural values and world outlook bases. The similar one follows from the meaning, which innovation in itself carries as activity guideline (Rumyantseva N.L., 2008). Innovation is considered today as multidimensional concept. For the author of this article it is important to emphasize that innovation is a fundamental concept, which affects various spheres of human activity. The main thing in it is that the innovation sets such standards of society functioning, which focus its members on continuous self-improvement and self-transformation. It follows from the content of innovative activity which, in particular, V. G. Budanov defines as follows: "Innovative activity is a qualitative new stage of personal self-development, process of self-updating of the individuals of educational process, becoming possible as the result of a self-education, and a self-reflection. Therefore for the educational institutions, carrying out an innovative activity, self-organization processes in the pedagogical and student's environment are especially typical. It can be an initiation of steady organizations (creative groups, associations), and the creative persons, being capable to creation of "personal and new ones", regardless of the previous social experiment" (Shmatkov R.N., 2009).

2. Motivation of students to scientific activity

The aim of this article is to show that the problem methodology can be one of forms of the innovative organization of educational process. Besides, it is important to comprehend positive and negative results of its application.

At first we will clarify how problem methodology in education can be defined. It can be defined as methodology, which is cornerstone of the orientation on training of the person in educational process to work with a problem. Work with a problem is not only ability to solve it (or to work with already ready decision – the answer), but also ability to put problems, to see knowledge as an open and pluralist one. In practice the most convenient way of problem methodology manifestation is training student's skills to ask questions, creatively to see all positive and negative results of the received knowledge. The problem methodology of education focuses the person on his own readiness to learn and be trained so that information acted for him as the motivating self-development source, but not simply ascertaining of existence of such information at the person. It represents the system of mechanisms of the creative relation of the person to himself and the world when he creates, but not simply receives ready knowledge. Such approach isn't enough for formation of innovation for a domestic education system today, for this reason this system isn't always capable to prepare creative specialists.

Education is the process of socialization, where the mechanism of assimilation of the standards and knowledge, developed by society, underlies. Education is such mechanism of socialization, which cannot consider manifestation of society life activity at all. A main objective of education is fuller assimilation of the standards and knowledge developed by society. However, today education can't be limited only by assimilation, as it represents open, spontaneous system. The society focuses not only on reproduction and repetition, but also on search of the new, changing ways of self-expression. And it means that the student not simply has to acquire the knowledge developed by society, he acts as the accomplice, the partner of society activity, as the innovator. Therefore it can't be limited only to passive participation; he is the same creator, as well as society. Creative abilities are those skills, which are demanded today by society, and, therefore, the innovative organization of educational system.

But creative abilities as one of the purposes of educational process change educational process as itself. In that case it turns into the process of joint search, where in the center there is not only knowledge as a ready-made product any more, but a figure of the person (his personality), which shows feature of mastering and application of knowledge by this person. Therefore the similar education system has to satirize the identity of the person, to emphasize specifics of his educational way on the basis of which and it is possible to find out how the last one operates with knowledge.

Creative abilities of the person as the most important factor of the innovative organization of educational process show that knowledge without person, without his opportunities are senseless and useless. It is important not simply to know, but to be able to approach creatively mastering knowledge, to receive them in the context of the personal life situation. In practice it does not always turn out. As I.A. Gerasimova writes, "once I happened to

be an examiner as a member of the commission at the state exam in philosophy at Philosophical faculty of Lomonosov Moscow State University. The graduates, future certified specialists, were passing the last examination, showing everything that was learned in the leading higher education institution of the country. One circumstance then very strongly struck me: at least, two of eight students, who were passing the exam, sitting down at a table of examiners, guilty muttered that they didn't know "this question". Let us suppose they couldn't review all material, something really important they passed during study, but, I was surprised why in this critical situation not to think over "an unknown question" and at least to offer something as the answer?" (Gerasimova I.A., 2006). And it occurs in the leading higher education institution of the country and what can occur in other educational institutions, where also the personnel staff of the teachers is less competitive, and educational and methodical ensuring for teaching is worse, it is only possible to guess.

But perhaps that's not the case. The situation described by I.A. Gerasimova is typical not only for education, it is peculiar for society life as well. After all at collision with the same "unknown questions", many people give in, they expect that someone has to appear and help them (for example, the state). And they also don't know that, first of all, they are interested in overcoming of such uncertain situations that it isn't necessary to wait for "miracle" from the outside, and to try to develop though any decision, the relation. After all only attempt of development of the similar decision is already the first step on overcoming of uncertainty of a situation. But many people don't try at all such attempt to carry out, at least mentally to present the arisen difficulties. And without such efforts the innovative development of society is impossible.

It is quite clear that such relation should be learned, it is necessary to prepare. But for us the main thing in the education is not to make a mistake. Not only the students, but the teachers are afraid of it most of all. It seems to them that it will worsen their image as experts, they "will fall" in the opinion of the students. Though the teachers are the same people and nothing human is alien to them. Not incidentally many philosophers, psychologists said about positive aspects of "mistake" and everything that with it was connected ("nonsense", "tomfoolery", etc.). After all anything as the mistake, won't be able to show us, if the students possess the knowledge, how they are comprehended to perceive the teacher: blindly (on trust) or it is critical, demanding the argument and justification. The innovative way of development is a way, where there are no guarantees of faultlessness in activity, therefore ability to work in an uncertainty situation, where risk to make a mistake is strong, most to him suit.

The problem methodology allows using a mistake not only as the moment, which should be avoided, but also as the methodological means, allowing increasing quality of education. This methodology changes the status of the teacher and the student, shows that innovation as the purpose of development equalizes them in the right for achievement of truth, in the right for equality of the statuses.

The formation of creative abilities is a result of the interpersonal mutually respectful relations, where knowledge is not the purpose, but means of their implementation (Kushtym E.A., 2009). This aspect is presented very well within humanistic psychology, which in the XX century acted as the initiator of change of psychological, philosophical and cultural purposes with understanding of the person and his place in the world.

K. Rogers, one of founders of humanistic psychology, says that work has to be carried out with the person (personality) only as "the helping relation". This is such relation by means of which the person starts understanding his importance and to understand that he is interesting only because he is a special personality (original and unique). As K. Rogers writes, the helping relations is "the relations in which, at least, one of the partners intends to promote another partner in personal growth, the development, the best activity, maturity development, ability to get on with others". "Others" are defined as a person or a group. Expressing it differently, it is possible to tell that the helping relations could be defined as such in which one of participants means that one or both members of the relations can have more an appreciation of the data soon, ability to express and use all potential internal opportunities of the individual" (Rodgers K.R., 1994).

The mistake in a prism of the helping relation (problem methodology of education) looks not as something negative, and as feature of a position of the person, which has to help understand its specifics better. The mistake loses the status of the "wrong", "false" knowledge here, and receives the status of "incentive", the "creative dope" allowing the person to understand as far as he well seized knowledge and is able to operate with it. In traditional

methodology of educational process the mistake acts as an assessment of insufficiently good possession of knowledge, where its character and essence as that aren't basic at all.

The problem methodology of education by means of a mistake, or by means of questions, tasks, practical experience, trainings and others will organize education as development not only substantial aspect (mastering of available knowledge), but also as manifestation of the personal relation of the student to a studied situation. The problem (problem manifestations) sets an uncertainty situation, a situation of absence of the ready recipe of knowledge and behavior. It focuses the student on manifestation of a personal initiative in a problem solution, promotes formation of innovative style of activity. It fixes the skill of the independent solution of problems, the creative relation to business. The problem methodology of education appears as a condition of formation of creative abilities in education. As A.K. Sukhotin writes, it "consists in considering any subject of studied discipline as a problem that is as a question on which the science yet doesn't know the answer as a contradiction in knowledge. That is the subject is presented so as if its solution isn't found yet, and the listener plunges into the situation similar to those in which there is a pioneer. And now, right on the spot, students, certainly, together with the teacher (the practical lecturer and others) have to resolve, solve a problem of this situation.

In a similar situation, naturally, activity of listeners increases, anyway it is higher than when the teacher simply gives information as something already ready, time forever given" (Sukhotin A.K., 2003).

The problem methodology of education not simply increases activity of the student, it sets heuristic character to his efforts in knowledge and behavior. The student realizes better that he possesses the same opportunities as the teacher, and also his contemporaries, understands better that it is possible to come to lives responsibly, but not on the basis of decisions of some abstract, "foreign" person, who once opened something. The student understands that the best way of self-realization is a problematization of the world, itself, the knowledge that anybody, except him, isn't capable to present better a problem, which is demanded by him, and ways of their decision.

Moreover, it allows also to the teacher to trust more to the students, so to show personal participation in their destiny. It forms such background, which involves the person in education process really more strongly, shows interest in student's destiny. And then the mistake, inaccuracy, a wrong move in education appear as process natural to the person, who emphasizes that it isn't necessary to treat any knowledge with an excessive piety, as it is only means.

The problem methodology of formation of the subjects also is good that it allows correlating optimum among themselves the personality and knowledge, to show interdependence of these two beginnings.

Problem orientation of innovatively organized education allows the person to receive complete knowledge, its interdisciplinary cut. At the maintenance of a problem there is a knowledge of different disciplines, which is contextually expressing a situation essence. It is easier to present a problem to the person, to remember, at least that it demands the personal relation. In it there is an importance of substantial influence of a problem at educational process.

However the problem methodology of education faces a number of difficulties, which specifies that it is necessary to consider at its use. The author emphasizes two such difficult aspects, which can be designated as subjective and objective.

The subjective factor is connected with that the problem methodology needs enough specialists, who could work in its course. It is very difficult to force the teacher, who already has a certain arsenal of receptions and ways of implementation of educational activity, to reconsider them and reconstruct. And without enough specialists the problem methodology will hardly be able to lead to necessary result.

The objective factor is connected with that the problem methodology doesn't carry the self-sufficient. It means that it can't be carried out in educational process as independent and self-sufficient methodology. To attract the students to the development of a solution by themselves, it is necessary though somehow to prepare all the same, differently they won't aware of that content of knowledge in the relation to which to be put a problem. The problem methodology has to be the mutually additional one in relation to traditional methodology of educational process. Only being combined, they are capable to express those qualities which will allow training the specialists, able to carry out innovative activity in various spheres of public life.

The designated features of problem methodology application in educational process allow understanding better the specifics of innovation as reference point of educational activity. Innovation can't act as a certain self-sufficient purpose as orientation to the new knowledge can be realized if the old knowledge as the basis is known. Innovation assumes some degree of conservatism. It confirms that fact, the problem methodology of the organization of educational process is possible only in combination with traditional methodology.

3. Conclusion

In conclusion I will note that the problem methodology really acts as a condition of formation of creative abilities, "spirit" of innovation in education. It is reached due to personal inclusion of the teacher and the student, who is trained, as a result of which skills and abilities of the creative relation to the questions, problems, difficult situations arising in the course of activity are formed and developed. This methodology functions as addition of traditional methodology of education more optimum, it forces to concern more responsibly to himself, to society, knowledge, as assumes education as the main objective. The problem methodology shows that the most harmonious realization of innovative development is possible through definition of an accurate measure of a ratio of innovation and traditional character (conservatism), heuristic and reproductive beginnings.

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References

- Ardashkin, I. B. (2003). Scientific problem in modern cognition process (Conference Paper). Proceedings of the 9th International Scientific and Practical Conference of Students, Post-graduates and Young Scientists - Modern Techniques and Technologies, Tomsk, MTT', pp. 260 – 262.
- Rumyantseva N.L. (2008). About the Education Development Strategy. In *Journal Philosophy of Education*, 4, pp. 41 – 48.
- Shmatkov R.N. (2009). Educational Technologies and Innovative Education. In *Journal Philosophy of Education*, 4, pp. 52 – 58.
- Budanov V.G. (2008). Methodology synergy in postnonclassical science and education. Moscow: LKI, 2008.
- Gerasimova I.A. (2006). Question, the answer to which is "impossible in principle". In *Journal Epistemology and Philosophy of Science*, 3, 2006, 178 - 187.
- Kushtym E.A. (2009). Education as the creation of subjective being and social relations. In *Journal Philosophy of Education*, 2, pp. 204 – 211.
- Rodgers K.R. (1994). Look for psychotherapy. Becoming a man. Moscow: Progress, Univers.
- Sukhotin A.K. (2003). The problem of "the narrowness of consciousness." Her decision in pedagogy and epistemology (Conference Paper). Proceedings of the II regional scientific-practical conference "Philosophy of social work." Tomsk: TPU, pp. 71 – 75