SOME IDEAS ON ACTUALIZATION OF TRANSDISCIPLINARY APPROACH IN UNIVERSITIES OF RUSSIA

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Abstract:
The article deals with the problem of transdisciplinary approach implementation in the universities of the Russian Federation. Some definitions of the conceptual term `transdisciplinarity` are cited, the history of the term development is traced, examples of successful application of transdisciplinarity by Russian scientists are submitted. Although the trend to the transition to the transdisciplinary approach in science and educational techniques can be observed at present, the transdisciplinary approach hasn't yet got a mass character in Russia. Ordinary higher schools in the RF are facing a problem of realizing the necessity of such approach and development of necessary measures on transition to the principle of transdisciplinary approach in education and scientific research. Practical measures, which, in the author`s view, are to be taken by ordinary higher schools in order to pass on to the transdisciplinarity approach application in their scientific activities and educational process, are described.

Key Words: Transdisciplinary approach, information society, challenges of globalization, sustainable development concept, transdisciplinary scientific research centres, transition tempo

The modern information society has a feature that wasn`t inherent in the industrial society, namely, we can observe an accelerated inner social transformation and accelerated scientific-technical and economic development. Under the conditions, the role of universities as centers of knowledge and scientific research has been considerably growing, the degree of responsibilities that universities have is higher, they are getting some new, unknown before, functions, such as responsibility in the field of culture and social relationships, they are required to become something like mediators in conflicts, to contribute into development of democracy, to be centers of social discussions, epicentres of regional and global development.

Another interesting feature of our time is that research works carried out within the universities are becoming equally valuable for companies and corporations no matter whether they belong to the sphere of exact and natural sciences or to the humanitarian sciences. For the most part, the investigated problems in our days have a complex character, so, the problem of integrity of knowledge gets paramount value, becoming more than ever before actual in connection with features of the information society. Transdisciplinarity of scientific problems is such characteristic of the post-classical interpretation of scientific knowledge which holds that science has become essentially intertwoven with other cognitive kinds of modern culture practice, and the destiny of modern civilization can't be considered out of the factor of science and its importance for the modern world.

The interest to the theme of transdisciplinarity and its philosophical realization can be traced from remote times. It is sufficient to remember the humanistic ideal `homo universal`, then, perhaps, Encyclopaedism of Enlightenment epoch. One of the philosophers who spoke about insufficiency of specialized knowledge was the French philosopher Auguste Comte (1798-1857), the founder of positivism, asserting that it is necessary to create for studying of general scientific provisions (généralités scientifiques) a new separate discipline. One of later attempts of constructing a model of general, uniform knowledge could be found in the novel `The Glass Bead Game` by the German-Swiss novelist Hermann Hesse, where universality of education is seen in the ability to establish conformity between languages of various sciences and to understand principles of their translation from one to another. Unfortunately, within the framework of this article it is impossible to consider the history of the issue in full detail

Today, the urgency of the transdisciplinary approach application in the field of higher education and scientific research has become obvious. According to definition of the essence of higher education which can be found in the World Declaration on Higher Education for the XXI century [1], higher education should strengthen its functions, mainly, by application of the interdisciplinary and transdisciplinary approach to the analysis of problems and issues. Education`s reorientation is necessary in the interests of rejecting unstable models of manufacture and consumption, for the sake of solicitous attitude to environment, achieving mutual understanding and social stability, as well as a number of other problems by solving of which the mankind will promote its transition to a sustainable development. The sustainable development concept through applying a transdisciplinary approach is getting widely spread at the universal level, including Russia, with the most progressively minded scientists and organizations as well as the world community acting as its ideologists.

For the first time the term "transdisciplinarity" was offered by the Swiss psychologist and philosopher Jean Piaget in 1970 in his report at the international workshop "Interdisciplinarity - Teaching and Research Problems in Universities", organized by the Organization for Economic Co-operation and Development (OECD), in collaboration with the French Ministry of National Education and University of Nice. According to Piaget`s interpretation of the term, transdisciplinarity is not limited to recognize the interactions and or reciprocities between the specialized researches, but it will locate these links inside a total system without stable boundaries between the disciplines.

At present, there are several definitions of the term "transdisciplinarity" in the world science, one of which is reduced to that transdisciplinarity is considered as a principle of the organizing scientific knowledge, which provides ample opportunities of interaction of many disciplines at solving complex problems of the nature and society. It is necessary to notice that such definition of the term allows scientists to carry out their research beyond the boundaries of their discipline, without being afraid to be accused of amateurishness. Depending on in what quantity and in what combination scientists will use other disciplines in the disciplinary research, transdisciplinarity may be called interdisciplinarity or multidisciplinarity.

According to results of researches of Belgian scientist A. Judge [2], there exist four kinds of transdisciplinarity in the modern science. He organizes his classification according to the growing degree of the term`s complexity. So, transdisciplinarity-1 is the most general notion. This kind of transdisciplinarity is based on efforts of formal interrelation in comprehending separate disciplines. It provides formation of logic meta-frameworks by means of which, knowledge can be integrated at higher level of abstraction, than it occurs in multidisciplinarity. Transdisciplinarity 1 is often used at work of various expert systems, and expert groups. Transdisciplinarity 2 has closer internal communication with the personal experience of the researcher, including meditation. The next kind of transdisciplinarity (Transdisciplinarity 3), is connected with using general metaphors having fundamental informative value. And, finally, on the top of the hierarchy there is the highest kind of transdisciplinarity (Transdisciplinarity 4), that assumes the system approach according to which the world is a uniform ordered environment where elements are an aggregation of causes and consequences of its existence; general and private regulations and laws; phenomena, objects and processes, as well as their properties, communications and interactions at any level of the reality.

The key category of transdisciplinarity philosophy is the category `trans-uniformity` - such kind of uniformity which isn't isolated from the surrounding phenomenon but reflects it as another essence, incorporating its definitions and acting as a category of the multi-uniformity[3].

Undoubtedly, the concept of disciplinary approach in science and education has not yet entirely disappeared. Due to the pressure for academic specialization, new disciplines and sub-disciplines are appearing at present. On the other hand, social development is a strong stimulus for emerging of new forms of transdisciplinary cooperation, such as transdisciplinary scientific research centres, it causes alteration of university organizational structure, there are found new forms of financing scientific investigations, etc.

Starting from mid - 1980-s, in developed industrial countries such as the USA, Japan, EC countries, there have appeared a number of transdisciplinary institutions and research centers, transdisciplinary subdivisions are being established at universities, the size varying from several scientists up to big scientific research structures having a formalized status in the university structure.

As for Russia, the trend of coming to the transdisciplinary approach in science and education can also be observed, although the transition tempo is rather slow. According to the Long-Term Forecast of scientific-technological development of the Russian Federation[4], (till 2025), growing significance is attached to interdisciplinary research in Russia as it is associated with new breaks in science.

A good example of the trend is Scientific-Educational Centre on Nano-Technologies established at the Moscow State University. In the research work being carried out at the centre, there participate specialists from different departments and faculties such as physical, chemical, biological, sciences about materials, bioengineering and biocomputer science, fundamental medicine departments.

Another good example is the Russian Centre of Fundamental Research which is also actively engaged in interdisciplinary investigations on the joint of medicine and physics, in the field of creation of biocompatible to the human body implants, which have already received wide recognition.

However, the transdisciplinary approach hasn't yet got a mass character in Russia. But it should be emphasized that historically interdisciplinary approach has been present in Russian science since the time of Mendeleyev and Vernadsky. The success of I. R. Prigogine, a Belgian physical chemist and Nobel Laureate of Russian origin, noted for his work on dissipative structures, complex systems, and irreversibility) is in many respects connected by that he has introduced these traditions in the Western science. These traditions are alive in Russian science. Moreover, on their basis in the USSR, there emerged a new scientific trend known as synergetics which is the empirical study of systems in transformation, with an emphasis on total system behavior unpredicted by the behavior of any isolated components, including humanity's role as both participant and observer. Within the trend`s frameworks, informal groups are created, scientific research works are carried out and published, seminars and conferences are organized. The basic subjects and the purposes of synergetics are similar to those of the the American Santa Fe Institute, research and education center dedicated to the multidisciplinary study of the fundamental principles of complex adaptive systems. Unfortunately, at present there is no scientist in Russia who could be so grand-scaled in his activities that he would undertake an enormous task of creating an organization like the Santa Fe Institute as Murray Gell-Mann, an American physicist, one of the leading figures in the SFI, which he cofounded in 1984.

As for ordinary higher schools in the RF, it should be noted that they are facing a problem on realizing the necessity of transdisciplinary approach and development of necessary measures on transition to its principle in education and scientific research. As it appears, the model of such transition for each higher school is exclusively individual and depends on many circumstances, but there are some general points which the higher school management should take into consideration.

First of all, it is a question of non-state sources of financing. Russian businessmen (certainly, only few of them) sponsor science, but in a smaller scale than businessmen abroad do. They are guided by formal criteria (citing index, international recognition, etc.). They haven't reflected yet over the question in what the purpose and meaning of life is. Probably, if they did, there would be an analog of the SFI in Russia. So, in order to provide financing of transdisciplinary research and educational process` expenses, an ordinary university should form an alliance with various organizations, business companies, funds, expert agencies, manufacturing enterprises etc. To be able to do all this, the higher school in the Russian Federation should abandon its familiar former command-administrative model of management which it has got in the inheritance from the Soviet period. The mechanism of the university management should be modernized on principles of so-called `organic management`, which means supporting on the initiative of the teaching staff and understanding of the purposes and problems of the higher school development by all members of the academia. University professors, who were previously deprived of opportunity to solve the problems of financial flows` provision, should now be actively engaged in these new for them spheres and they should be delegated all necessary rights by the university to do so. It means more work to be done, but certainly it will benefit the university.

Secondly, in order to raise money for its research activities and educational process on the innovation base, the university should take measures on strengthening its image both in the RF and abroad. This would mean further costs on various PR activities (radio- and TV advertising, participation of the staff in various TV talk shows, releasing films, setting up a magazine for the prospective students, etc.) that would increase the human flow to the university, and consequently, there would be some additional financing for the transdisciplinary research on the base of the university.

And, finally, it would be a good idea to follow advice given by the Romanian physicist B. Nikolesku [5] who recommends creating at universities a transdisciplinary department in which experts from all other university departments would work independently from the work in their own departments spending there about 10% of the working hours.

However, neither in Russia nor in other countries can a positive attitude to the creation of transdisciplinary departments in universities be regarded unanimous. In some sources, there can be found severe scepticism to the creation of transdisciplinary departments at universities. So, for example, in K. Sherren's research[6] the authors express their doubt in the necessity of creating interdisciplinary branches at universities. Analyzing activity of two interdisciplinary university departments, they underline problems of keeping up of working conditions within such departments. In any case, it seems reasonable for any university in the RF, before transition to the transdisciplinary approach, to make clear for every member of the teaching staff the following questions and attempt answering them:

- What do we need transdisciplinary approach for?
- What exactly should be done in my department/faculty/ for providing this approach?
- How should we update the management system of the university so that not to damage the valuable elements of the structure which have been solving the task of keeping up the fundamental research in our university?

To conclude, in combination with other innovative forms of scientific research and education, transdisciplinarity will allow the whole system of higher education in the Russian Federation, which is unfortunately lagging behind most of the EC countries, to meet the challenges of globalization in the XXI century and occupy a worthy place in the system of global education.

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