

## Characteristic aspects of system approach in pedagogy



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### Abstract

Characteristic aspects of system approach in pedagogy are defined and leading scientists' points concerning the pedagogic processes efficiency and pedagogical systems development are investigated in the article. Philosophical ideas about characteristic aspects of system approach are under consideration. Stages sequence for progress to the system essence of any cognition object was found. It is found that problem definition of pedagogic systems characteristic aspects and implementation of system approach into education chronologically disagree. It is determined that realization of system approach for specific pedagogical objects includes developing some scientific steps, which allow seeing and investigating the object of cognition as a system. Analysis of systemological searches of researchers in education gives the opportunity to believe that general scientific approach was not transferred on the pedagogical ground and got the further development in pedagogical researches both on the level of methodological program and on the level of method of realization of the program on the basis of identification of characteristic of pedagogical objects of system research. Experience generalization of system research objects enables us to present a holistic model of teaching methodology of system approach that reflects the general approach to pedagogical knowledge objects system; stages of the program system-pedagogical research as its common strategy invariant; understanding the methodology of systems research at certain stages of the program as its variable portion, knowledge tactic determined in accordance with the objectives of the specific situation.

Keywords: CHARACTERISTIC ASPECTS, SYSTEM APPROACH, PEDAGOGY, PEDAGOGICAL PROCESS, PEDAGOGICAL SYSTEM, METHODOLOGY

«Pedagogical version» of system approach was developed from two sides: scientists (teachers) within Pedagogy and philosophers within general systems approach. Let's consider the philosophical understanding of characteristic aspects of the system approach. Philosophers explained the features of the system approach not in specific sciences, but in social sciences, nature, and ideation. Since pedagogy in this classification related to social sciences, let's focus on examination of ideas about originality of the system approach in social studies. Development of pedagogic methodology of the system approach starts with the definition of pedagogical phenomena and processes as objects of system research.

The research objective is to find out the characteristic aspects of the system approach in pedagogy.

Development of the research program based on a system approach involves promotion to the system essence of certain object. From the point of modern methodology, the logic of promotion to the system essence of any cognition object defines the following sequence of stages:

1. Provement that the object is a system (ontological position) or can be considered as a system (epistemological position).

2. Provement that the object is a system of a particular class (level of general scientific methodology as a synthesis of ontological and epistemological positions).

3. Provement that the object is a certain kind system, which refers to a particular class (definite scientific methodology level).

4. Identification of characteristics of the object as a unique system in specific situation (praxeological level).

There is an evident logic of provement of specific system essence of pedagogy.

The problem of systems classification and system objects characteristics of any object was first set up within the ontological and epistemological development levels of general methodology for the system approach. The problem of pedagogical specific systems and implementation of the system approach into pedagogy do not chronologically match. The first works about the opportunities of system approach application in pedagogical research, mainly had evidence that pedagogical phenomena and processes have system nature, based on which there was deduced the possibility and need to use a system approach in pedagogy.

Provement objective of the system approach legality in pedagogical phenomena and processes postponed the problem of specific pedagogical objects;

there was an emphasis on typical pedagogical systems. Korolev F. F., had as a target to develop «such conceptual apparatus and such methods which meet the specific features of systems research in pedagogy», described pedagogical objects as systems within answers the question: «whether class systems include pedagogical phenomenon». The methodologist showed that pedagogical phenomenon relate to large (or complex) systems and have a number of common features such as: integrity, which he interpreted as a service of all complex system parts for common purpose, the effects of one parameter change on all others and the necessity to scientifically proven system control [6; 209–222].

The main feature of Pedagogy is a specific focus on practice improvement. It traditionally solves the problem of introducing the theoretical research results to the pedagogical reality in order to improve pedagogical processes, pedagogical systems development. Therefore, all pedagogical researches have praxeological part containing scientifically grounded recommendations for changing practices.

Between theoretical findings of pedagogical objects system research held through cognitive properties of the system approach its methodology and program at high level of abstraction, and possibility of their practical implementation there is a barrier, overcoming of which requires special instrumentation. The problem of the using the systems research results in pedagogical practice with the target of its system converting is essentially a problem of ideal schemes of pedagogical phenomena and processes ontologization built on the basis of a system approach.

Ontologization problem of ideal schemes, theoretical constructions is one of the main problems of knowledge philosophy, which makes the principles normalizing connection of a theorist with practice improvement: principles of conditionality, tolerance, indifference towards politics, antiactivism, humanism. According to Anisimov A. S., the main idea to be aware of pedagogical theorist referring to practice is that «any scientific activity is obvious, one-sided, and therefore the best and the most advanced scientific knowledge remain inappropriate to practice» [1; 143]. Thus, synthesis of all visual knowledge is necessary before their use in practice.

As it was noted by Ilyin V. V., «reflexive position according the differences between real and historical, social and theoretical range and fret enables typical ontologization save from an abstract theoretical schemes in naive realism spirit» [3; 124].

System approach implementation into specific pedagogical objects involves development of certain

research steps logic that allow to see and study the object of knowledge as a system. As in general systematology, pedagogical program of system research and its methodology lined on the basis of specification of system approach essence: consideration of interconnected elements as integrity in relation to the environment; as a synthesis of all the «parts» of polysystemic polystructured object in the whole picture; as analysis one, significant, determining system-side object.

Pedagogical systems characteristic causes some correction of general system approach program. Experience of system research objects summarization enables presenting pedagogical methodology model of the system approach, which reflects general approaches to the system knowledge of pedagogical objects and program stages of system-pedagogical research as its strategy invariant, and understanding of system research methodology at certain stages of its variable part, knowledge tactic, determined in accordance with the specific situation objectives.

Characteristic of the pedagogical system approach becomes more evident on the level of systems research methods development. The concept «method» in modern methodology is defined from different points of view: the praxeological – as a normative order of actions in some specific field: a) as a complete image of productive activities in people's minds as the norm, so that human activity is regulated and there is logically constructed process; b) as a verbal reflection of a certain image and ways of action as a description, directions, performances; c) the epistemological point of view – as a special branch of knowledge about activities in a particular field [5; 8].

Thus, analysis of system searches gives reason to believe that the general scientific system approach was not mechanically transferred to pedagogical ground and got further development in pedagogical research at both levels of methodological program and realization methods of this program on the basis of finding pedagogical objects of system research characteristic. Differences in terms of the system approach nature, pedagogical paradigm, which evolved cognitive scientist installations and norms, different levels of methodological reflection of teachers determined the differences in system research methods, measure of these methods performance.

Since, in terms of general system approach, any system may include number of systems that can be represented in a number of «parts» reflecting the different versions of “division”, for development of system research program it is necessary to agree on methodological rules of system composition description.

Kagan M. S., proved dialectical connection between structure analysis and system structure, linked two procedures within one task, specifying this part of cognitive actions as a visual aspect of system research. According to his position describing the system composition, it is necessary to be guided by the principle of necessary and sufficient set of selected elements and subsystems for the system existence allowing studying the internal organization and system structure. But «We must proceed not from empirical selection of some elements in the system being studied but the representations of the whole system» [4; 121]. The only way to represent the whole system according to the philosopher is an approach to the system which is studied as a part of some meta-system from the outside in the environment it exists and where operates.

Considering the fact that most system research in pedagogy began with meta-system as a subsystem which considered certain pedagogical object, the general scientific methodology demand was perceived by pedagogy and put as a basis of invariant of systemic research program.

Thus, in cognitive program of system research aspect of system study should be pointed. This procedure transfers research to epistemological basis.

It should be noted that this step is not the beginning of system study but it's second. Meta-system should be noted first. Depending on the choice of meta-system, pedagogical and didactic systems will be different – from authoritarian to humanist from oriented on rigid public procurement or «market» requirements to culture forming.

There can be found some consistent implementation of these methodological requirements in several studies. Thus, Bim I. P., having found meta-system for system for teaching foreign languages in secondary school pedagogical system (the view called «macroapproach» further indicates that the most significant feature of this macro system is its informational nature, focus on transmission and reception, accumulation and processing of information about real environment for individual integration into previous generations social experience with the aim of his personal experience forming. This definition of meta-system set specific angle of review of teaching foreign languages system, description in terms of its informational nature [2].

The first and the second methodological requirements provided can not only find out the system structure, but also determine connection between its elements and subsystems to describe its structure. Description of the system makes no sense, but also im-

possible without its structure description as elements necessity and sufficiency for integration properties of the system due to their connection with the whole and to each other. Perhaps that is the reason why many pedagogical research authors do not focus on distinguishing between the concepts of «composition» and «structure», and, characterizing pedagogical system structure, give its elements list, sometimes providing the scheme that graphically displays connection between elements of the system.

### Conclusion

Characteristic of system approach in pedagogy research is prospective as far as system approach implementation allows identifying such variative component of pedagogical knowledge as pedagogical system with all its characteristics: integrity, connection, structure and organization, system levels and its hierarchy, control, purpose and appropriate system treatment, system self-organization, its operation and development.

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