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Pedagogical research as subject-practical and scientific knowledge synthesis and its determined format

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Abstract

The article substantiates the possibility and expediency of a scientific concept development called scientific and subject pedagogical reality via synthesis of generalized philosophical and scientific ideas, ideas of the subject methodology of research and their impact on the educational methodology. As a result, the authors are committed to the theoretical burden of pedagogical facts and consider the proposed stages for fact manifestation to be the most optimal. In conclusion, the opposition between ordinary and scientific-pedagogical

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knowledge can be attributed to opposites at the level of mutual transition.

Keywords: Ordinary, Scientific, Subject-practical, Pedagogical, Knowledge.

La investigación pedagógica como síntesis de conocimiento práctico y científico y su formato determinado

Resumen

El artículo corrobora la posibilidad y la conveniencia de un desarrollo del concepto científico llamado realidad pedagógica científica y temática a través de la síntesis de ideas filosóficas y científicas generalizadas, ideas de la metodología de investigación temática y su impacto en la metodología educativa. Como resultado, los autores están comprometidos con la carga teórica de los hechos pedagógicos y consideran que las etapas propuestas para la manifestación de los hechos son las más óptimas. En conclusión, la oposición entre el conocimiento ordinario y el conocimiento científico-pedagógico puede atribuirse a los opuestos en el nivel de transición mutua.

Palabras clave: Ordinario, Científico, Sujeto-práctico, Pedagógico, Conocimiento.

1. INTRODUCTION

Everyday knowledge in practical pedagogical activity is aimed at momentary problems of pedagogical reality solution. The latter bases on random uncontrolled observations and the use of practical experience, uses inaccurate tools and subjective measurements, puts

forward the hypotheses that are not tested for the possibility of predicted conclusion obtaining. Pedagogy is an applied field of knowledge and relies on all of the described content. However, at the same time, it is detached from it, trying to enter the area of social and humanitarian sciences. In this sense, practical and scientific knowledge recognized as the opposite in the case under consideration is displayed as the opposites at the level of mutual transition, which illustrates the thesis of pedagogical knowledge as the synthesis of subject-practical and scientific segments. The noted transition means the movement of pedagogical knowledge and the methods of its acquisition from the field of pure practice to science, which nowadays is designated in epistemology as a weak epistemological version and causes a lot of criticism and doubt. Some do not recognize pedagogy as science at all (KORZHUYEV & ANTONOVA, 2018: SADEGHPOUR ET AL., 2017).

As for the natural sciences and psychology, this topic has long been discussed by scientists from these fields of knowledge and by the philosophers of science. For example, in the work by ROSS & NISSBERT (1980) the question of the naturalistic and sociocultural dialectic approach is raised. The first is focused on the thesis that the world of knowledge objects is independent of a person as a subject of cognition. The second states that human him/herself constantly completes the world of knowledge objects in the process of cognition due to the presentation of the studied fragment as objective reality by the means of a specific science. PRITCHARD (2013) discusses the

development of subject-scientific reality in biology in his work. The analysis of the relationship between two approaches in the work by ROSS & NISSBERT (1980) determines the need to contrast objective reality and the objective reality of science.

Subject-scientific reality widely manifests itself in physics and includes:

a) Idealized objects that are developed under the assumption that they do not have a number of properties and characteristics of real objects;

b) The model descriptions of physical processes (absolutely elastic impact, adiabatic expansion of a gas into a void, particle behavior in an infinitely deep potential well and others);

c) The rules for operation with model objects and processes, - in fact, closely related to the mathematical apparatus indicated above, which displays the regular relationships between idealized objects and physics phenomena.

Nowadays, all this is somehow projected onto the humanitarian field. The latter conclusion is supported by the fact that in the past several decades, research teachers and practitioners have been confronted with the fact of a multitude of alternative theoretical schemes of pedagogical reality, views, the concepts prescribing

pedagogical reality different systems of ideal objects in scientific sources (SHAFRANOV-KUTSEV, EFIMOVA & SEMENOV, 2018). This clearly indicates the complex and very ambiguous way of the indirect connection of scientific-pedagogical knowledge with the empirical world of the educational field (HANAN, 2018). At the same time, we consider it is possible to assert that the concepts of contemplative reflection by scientists no longer correspond to the current vision of pedagogy (MOOSAVINIA & BAJI, 2017).

The multiple methodological analysis naturally raises the question of the introduction of the differences between reality, objective and subject-scientific pedagogical reality into the scientific arsenal of pedagogy (LATOURE & WOOLGAR, 1986). Such a reality can be described as being achieved in the process of a research appeal to a segment of pedagogical reality chosen for the study. This appeal consists in scientific processing of the pedagogical segment to give it a form convenient for research, the purpose of which is to obtain knowledge of a new, previously unknown, or the modification of existing knowledge of an insufficient degree of logical-substantive alignment or generalization (BREZINSKA, 2012; KOSKINEN, 2018).

The relevance of the analysis concerning the possibilities of inclusion in the content of pedagogical research of subject-scientific reality is justified by us by the idea of the full membership of pedagogy in the humanities community, which is recognized more and more by the scientific society (LEŚ, 2017). This idea is revealed:

a) By the possibility of classification, the properties, qualities, various manifestations of pedagogical reality phenomena, giving them the status of generalization;

b) By the manifestation in the range of pedagogical phenomena of a logical form, expressing their judgments and conclusions by the basic logical laws (identity, excluded third, sufficient reason and a number of others) via accompaniment;

c) The ability to outline the theoretical and empirical levels of pedagogical knowledge, to trace the transition from phenomenon to essence;

d) The vision of the pedagogical theoretical format and theoretical norm, which is accompanied by three functions of a scientific theory (descriptive, explanatory, and predictive) (KORZHUEV, PASHANOVA, LOPATINA, RYAZANOVA & SEMYONOV, 2018), and which is gradually forming among teachers and methodologists.

The problem of subject-scientific reality, studied and presented in the philosophy of mathematics and science, in the methodology of pedagogy, is relatively new, but very acute. For example, in recent years, the lack of understanding of the links between objective pedagogical reality and the reality of scientific subject matter has provoked the widespread introduction of the following terms. These

terms include educational space, educational environment, educational continuum, educational field and the like, which have received a lot of conflicting interpretations, definitions, meaningful disclosures since their origin, and they confused the theoretical content of pedagogy (CONEY, 2014).

In this regard, the discussion of subject-scientific reality allows us to identify and specifically reflect the transition from pedagogical knowledge of everyday to scientific, to indicate the scientific status of pedagogy and pedagogical research. GARDINER (2015) studies confirm this possibility for the theory of education. Based on the indicated problem, the aim of the study is the identification of the relationship between every day (subject-practical) knowledge and scientific one. In order to achieve the goal, the following tasks should be met:

- Identifying the logic of fixing scientific and pedagogical fact;

- Determining the features of scientific and pedagogical dialogue;

- Considering the thesis of the social determinism of pedagogical knowledge;

- Identifying the benefits of the transition from everyday pedagogical knowledge to scientific.

2. METHODOLOGY

The study uses a number of domestic and foreign scientific materials, and methods, among which:

— Method of abstracting and ascending from the abstract to the real;

— Logical analysis of scientific literature on the topic of the article;

— Synthesis of generalized philosophical and scientific ideas, ideas of the subject methodology of research and their impact on the educational methodology;

— Clarification of the content of modern pedagogical knowledge, its presentation to the scientific and professional community, as well as ways to obtain new pedagogical knowledge:

— Descriptive method;

— The diachronic method has helped to consider the concepts of pedagogical scientific fact, scientific and pedagogical

dialogue, scientific and subject pedagogical reality in formation and development.

3. RESULTS AND DISCUSSION

During the analysis, the authors have tried to determine the difference between objective reality and pedagogical subject-scientific reality and have come to the following results:

— The pedagogical subject-scientific differs by the presence of ideal (idealized) objects, which will be discussed in detail below.

— Objective reality is filled with objective pedagogical events, and pedagogical subject-scientific reality is filled with scientific and pedagogical facts, which bring the researcher to the formulation of the scientific problem, which in turn will formulate the scientific hypothesis, based on the revealed scientific facts;

— The subject-scientific pedagogical reality is inevitably inlaid with a general methodology for the implementation of scientific

research, the particular scientific principles arising from them, the rules of research interaction and scientific dialogue.

In modern scientific studies, the problem of fact and theory correlation is emphasized particularly. One of the extreme forms of its solution is methodological factualism, which takes the independence of a scientific fact from theory as its basis; the opposite concept, called theoreticism in science studies, preaches organic, immanent embeddedness of facts in the structure of the theory. Both points of view have a lot of historical and philosophical confirmations, however, both indicate the unproductive approaches that completely reject those or other properties, features of manifestation, the quality of phenomena and the objects of the surrounding reality, as well as the constructs describing their knowledge. Factualism pushes aside the role of the creator of a particular theory, revealing the green light to those who discover new facts. At the same time, the possibility of interpreting the facts found theoretically, embedding them in existing theories or hypotheses, remains unclear (LETICHE, 2017).

However, this direction opens the way to the creation of new theories and hypotheses, correlating them with already existing theories. Theoretism, on the contrary, overloads the theoretical saturation of facts and firmly ties them to theories and hypotheses. One of the philosophical and methodological reinforcements of this thesis is the positivist concept by T. Kuhn, who proves in his work After the Theory of the Structure of Scientific Revolutions the determinability of

facts by scientific theories, as well as partly the concept of the modern methodologist. Finding a middle ground between the two extreme points of view is an urgent problem of both sciences in general and pedagogy in particular. Based on the latter, several steps are highlighted in identifying the pedagogical fact (Table 1).

Table 1: Steps of a pedagogical fact identification

Step	Action
1.	The objective fixation of the pedagogical reality of the event and its linguistic fixation.
2.	Pedagogical facts should be classified into single and with one or another degree of prevalence in educational reality. The non-assimilation of this or that knowledge can be recorded both in a single manifestation found in a particular student's manifestation and in a mass manifestation.
3.	The use of applied tools to verify a statement claiming to be a scientific fact. These tools might be, for example, the check of the ability to perform actions, mathematical operations or related to the integration of functions.
4.	The use of theoretical tools by the researcher to discover the fact under discussion and interpret it.

In the authors' opinion, the first step in the pedagogical fixation of mass facts is advisable to carry out similar to the one proposed by ROSS & NISSBERT: "... during the development of conclusions, the mind seeks to reduce a huge variety of knowledge to the smallest number of principles and thus achieve their highest unity ..." (ROSS & NISSBERT, 1980: 10). The noted analogy sounds like this: when they designate a particular pedagogical fact, all the multitude of

manifestations recorded in educational reality should be reduced to the least number of typological notations.

An important condition for the third stage is to work with those functions, actions or operations that students cannot cope with, according to the alleged fact (OSMOLOVSKAYA & KRASNOVA, 2018). Thus, it is possible to confirm a scientific fact, supplement it with new information or refute it. However, it is important to consider the possibility of situations when an individual analysis is not needed since a fact can be relevant only for a certain person.

The fourth step itself automatically shows the authors' position regarding the theoretical load of pedagogical facts in the logic of the dyad factualism - theorism: we tend to recognize the close connection of facts with pedagogical theory as objective fact.

In some cases, the pedagogical fact identified by the researcher is not consistent with the already existing pedagogical theory. For example, very often following the theory of phased education by schoolchildren or students for mathematical or physical problem solution does not lead to teacher-researchers expected the result. In this case, the discovered scientific fact after all steps described above requires the analysis of the circumstances, which has led to the fact of the particular educational process. Depending on the results obtained, it becomes necessary to either correct the theory, in terms of redefining the pedagogical and methodological conditions for a predicted positive

valuable result achievement. Otherwise its refinement and correction by specifying the field of theory applicability, clarifying the age format of students, or required starting level of students and the level of teacher training for the practical implementation of the developed theory. Indeed, there are known examples of awareness of the need for a fundamental revision of the very foundations of pedagogical theory, its core ideas.

The situation is particularly difficult when the first three steps discussed above to identify a scientific and pedagogical fact are being successfully implemented (and it seems that the fact is almost ready for its confirmation), and there is no correct theoretical confirmation.

One of such example is found in the book Methodology: Formation and Current State. In which the author discusses the criticism of the psychological and pedagogical concept of Piaget. Vygotsky do not agree with the data expected by the author from the results of observations that follow from these theories. It seems that a scientific fact is obvious, but its theoretical support is not revealed. As a result, the authors are committed to the theoretical burden of pedagogical facts and consider the proposed stages for fact manifestation to be the most optimal.

4. CONCLUSIONS

The correct presentation of pedagogical scientific and objective reality allows us to make the transition from everyday pedagogical knowledge to scientific. The advantages of the transition to this type of scientific knowledge are the following:

a) It transforms random and uncontrolled everyday observations of pedagogical events into meaningful, planned and initially focused scientific observations. It allows the transition from a pedagogical event to a pedagogical scientific fact described in the main part of the article. At that, the opposition between ordinary and scientific-pedagogical knowledge can be attributed to opposites at the level of mutual transition;

b) It transforms ordinary hypotheses, which cannot be tested for the possibility of obtaining generalized and predicted conclusions, into scientific ones that have the possibility of basic verifiability, competent confirmation or falsification;

c) It makes it possible to establish the limits of applicability of empirical pedagogical laws, apply theoretical justification to such laws, accompanied by a correct scientific explanation of pedagogical phenomena and a forecast for the development of the studied segment of educational reality;

d) It makes it possible to design verified pedagogical scientific knowledge against the background of the noise that is inevitable

for the applied humanitarian subject area due to the high degree of social determinism of pedagogical knowledge.

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