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Epistemological analysis of concept extrapolation as a method of creating a glossary

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Abstract

The study analyzes term creation in educational sciences and the transmission of its results into the segment of the theoretical humanitarian norm. Based on the representative content analysis of the pedagogical and scientific literature, positive and negative results of the extrapolation of various scientific concepts into educology are typified.

As a result, the attempts to theoretically build educational science are substantially complicated by the problems of educological inductivism. In conclusion, the correctness is also complemented by the requirement of constructiveness; the meanings of well-known terms are being repeated and it is included in the scientific perspective reflection.

Keywords: Scientific terms, Content field, Extrapolation.

Análisis epistemológico de la extrapolación de conceptos como método para crear un glosario

Resumen

El estudio analiza la creación de términos en ciencias educativas y la transmisión de sus resultados al segmento de la norma humanitaria teórica. Con base en el análisis de contenido representativo de la literatura pedagógica y científica, se tipifican los resultados positivos y negativos de la extrapolación de varios conceptos científicos a la educología. Como resultado, los intentos de construir teóricamente la ciencia educativa son sustancialmente complicados por los problemas del inductivismo educológico. En conclusión, la corrección también se complementa con el requisito de constructividad; se repiten los significados de términos conocidos y se incluye en la reflexión de la perspectiva científica.

Palabras clave: Términos científicos, Campo de contenido, Extrapolación.

1. INTRODUCTION

The analysis of the literature on educational issues clearly shows that the glossary of educology is being intensively expanded and saturated with the concepts from the general scientific methodology, philosophy of education, social philosophy, cultural studies, technology, and production. Pedagogical texts contain scientific terms,

artistic and journalistic clichés, metaphors, hyperbole, and everyday vocabulary. Thus, it makes them difficult to interpret. On the one hand, this tendency seems to be positive as one of the main characteristics of the modern post-non-classical stage of development of scientific knowledge is the integration and interpenetration of humanitarian and natural science knowledge. The saturation of educology with the terms and concepts from other sciences also seems to be positive from the perspective of the fulfillment of social order by the educational sciences: education inevitably covers wider and more diverse fields of science and practice; therefore, the expansion of the glossary of educational theory and its practical application is almost inevitable (ALEXANDER, 2018).

In recent decades, the indicated problem of interpretation has been aggravated by intensive extrapolation of the concepts from various fields of knowledge to educational sciences. The core of the existing pedagogical glossary is being blurred; there is a lack of competent scientific and reflexive assessments of the scientific community regarding the correctness of the design of the term extrapolated into educology in the field related to the study of education and the ways of its positive transformation. This is revealed by a number of these:

— Sometimes there is a purely mechanical transfer of a concept from engineering, technology, psychology to pedagogy (there is no attempt to identify and display the specifics of its educological tone; it is not properly matched with the concepts already found in the glossary of educational sciences);

- Sometimes when a concept from related sciences is extrapolated into educology, its original meaning is distorted. This section includes the vulgarization of the initial meaning of the concept; this phenomenon is common in educology;

- There is sometimes an unproductive articulation of a concept from educology with some external concepts; thus, hybrids are formed. They are expressed by compound adjectives (competence and activity approach), which violate the correctness of the connection even with a superficial analysis (two-in-one);

- Finally, sometimes a psychological concept is extrapolated into educology without any content filling (CARNOY, 2019).

All these facts negatively affect the content and methodological attributes of pedagogy. Besides, they significantly complicate the reading of educational texts, as well as the mutual understanding of partners and their constructive scientific dialogue (GIROUX, 2020).

Particular attention should also be paid to the fact that the glossary of science is its substantive core, the indicator of its methodological structure and the vector that determines its scientific development. This confirms the importance and relevance of the study. Consequently, there is every reason to assert that the terminological problems of educology require active epistemological intervention; therefore, the purpose of the research is to identify the criteria for the

correct extrapolation of the terms and concepts from various fields of knowledge into educology that demonstrate expansion in the field of the scientific description of education (BREZINKA, 2012).

2. METHODOLOGY

The following methods and materials were used in the study:

- a) The analysis of the literature on the formation of the glossaries of various sciences; listing of the main methodological regulations in the process of forming glossaries and the degree to which they are observed by researchers;
- b) The analysis of pedagogical thesis research, monographs, and articles to identify the correct presentation of pedagogical terms and terminological author's work;
- c) The construction of the topic problem based on socio-humanitarian sciences combining theoretical and practical cognitive strategies and scientific methods;
- d) The identification of the author's problem field (research segment), which can be constructively investigated based on the scientific capabilities of the publication participants;
- e) The author's theoretical project revealing the possibilities of

constructing a methodological framework for extrapolating terms from various fields of knowledge into the pedagogical glossary; f) reflection of the results obtained (GARDINER, 2015).

3. RESULTS

The extrapolation of concepts from several other scientific disciplines into the pedagogical glossary is one of the emerging trends in modern pedagogical knowledge. The literature analysis shows that the scientific sources of such extrapolation procedures are:

- General scientific and humanitarian methodology, and sometimes epistemology;

- Cultural studies and sociology that have an impact on the scientific construction of pedagogy;

- Personality psychology and pedagogical psychology that is immanently included in educology;

- Technical sciences and production (KORJUEV, MADZHUGA, KISLYAKOV, AMIROF, SOKOLOVA & IKRENNIKOVA, 2017).

Let us consider this list based on the examples. Let us discuss

epistemological extrapolation and address the concept of paradigm, which is intensively being introduced into the pedagogical glossary; the concept was introduced by the American Philosopher T. Kuhn. The author positioned the development of science as a paradigm shift and filled the concept with a set of methodological standards in the approaches to solving scientific problems, a system of values shared by the scientific community, and scientific search regulators, thereby manifesting a synthesis of the cognitive and normative functions of the paradigm. The cliché paradigm shift described by the researcher is of particular interest. This is explained by the fact that it is massively and improperly transmitted into educology; for example, by stating the change of the knowledge paradigm into a personality and pragmatic paradigm (BARCZYŃSKI & KALINA, 2015).

The correct manifestations of the paradigm shift idea could include methodological concepts in historical development. For example, at the beginning of the twentieth century, logical empiricism was fixed in the methodology of science: the importance of a scientific pedagogical product was evaluated based on the academic performance of the subjects of education; the introduction of one or another innovative methods or technologies into educational practice led to positive dynamics and the developed theoretical schemes were recognized as valuable (verificationism). In this case, the paradigm shift idea (according to Kuhn) can be illustrated by the works of another philosopher of science, K. Popper, who showed the limitation of logical empiricism and verificationism. Popper substantiated the insufficiency of empirical research on the theoretical results of pedagogy - he

replaced the cliché science is focused on the attainment of truth with science helps to get rid of illusions. In the context of educology, Popper introduced the concept of a hypothesis, its theoretical verification and the derivation of the experimental confirmation into pedagogy (CONEY, 2015).

These ideas were accompanied by the abductive model of the development of science cliché (Ch. Peirce), which involves the hypothesis development by the educologist, its theoretical and experimental verification, the correction of the initial hypothesis and the repetition of the presented cycle. The paradigm shift being discussed implied the attempts of educology to integrate into the humanitarian theoretical format and introduce a triad of justifications into its scientific routine: theoretical, empirical, and contextual. At the same time, according to the scientific community of educologists, in most cases, the theoretical justification was related to the awareness of the degree of certain pedagogical conclusions coming out of the patterns observed in the psychology of education.

The empirical justification was regarded as statistical data recorded in analytical reviews related to education, as well as to the conclusions of the analysts empirically examined one or another segment of the educational environment. At the same time, the two types of scientific justification of educological conclusions were supplemented by contextual justification (an argument to tradition, common sense, scientific authority). The paradigm shift was gradually recognized by the community of educologists in the context of the

transition of the science of education from Arts and Humanities to the status of the social and humanitarian field of scientific knowledge.

The idea of the pedagogical research paradigm shift is complemented by the rationalist concept of St. Toulmin, who actualized the idea of reflection of scientific knowledge: the researcher was focused not only on gaining new knowledge but also on studying the ways and methods for doing it; he wondered how the obtained result could be methodologically correctly marked and embedded into the existing knowledge system. Thus, Toulmin's idea actualized the concept of scientific humanitarian reflection or the methodology of pedagogy (educology) aimed at the understanding of pedagogical glossary, the mechanisms of its formation, as well as the methods for obtaining new knowledge that combines scientific socio-humanitarian, theoretical and practical cognition strategies. Methodological reflection in educology can be illustrated by the recognition of the concepts of law and principle in education by the scientific community. Based on the understanding of a scientific law as a reflection of stable connections between phenomena, the scientific community realizes the illegitimacy of the ideas of inheritance of culture, self-determination of the learner, socialization of the individual being educated and several other similar concepts. In educology, the following principles cannot be addressed as scientific laws: a person masters the culture of mankind in the learning process, self-determination plays a significant role in the process of education, it is through communicating with other people that a person acquires their human essence (KORNIENKO, 2015); they are principles expressed through metaphorical stylistic forms.

The extrapolation of general scientific concepts into the glossary of educology mainly fills the methodological content of the science of education with some degree of correctness. Of course, the phenomenon of extrapolating various concepts from other fields of knowledge to pedagogy is not limited to this - it is logically continued by the analysis of the transmission of various concepts from pedagogy-related disciplines. Revealing the saturation of the informative component of the sciences of education with the terms from other fields of humanitarian knowledge, let us address the concept of the value and briefly describe the content of philosophical knowledge, which is called the epistemology of values and important for further discussion.

In the presented scenario, educology extrapolates the concept of value into the educational format and correctly positions it in the educational research field: the value is embedded into the basic categories of educology, namely, education and mentoring through the following clichés: the educational result is personally or socially significant, educational skills are valuable in terms of preparing for the performance of professional functions, the educational strategy is valuable in terms of functional literacy, personal qualities are valuable in terms of the culture of the subject of education.

Such extrapolation allows building a different effect of student's education compared to the traditional approach: for example, by introducing the following phrases a student familiar with the value aspects of the offered knowledge, a student involved in the activity of a value-oriented nature, a student designing his/her own cognitive and

transformative activity based on its recognition as an intellectual value, etc.

In educology, the extrapolation and concretization of the concept of value as an integral part include the subject's awareness of the cultural significance of a particular fragment proposed for the assimilation of knowledge or skill. In the 1980s, this was reflected through the creation of a culture-congruent concept of the content of education by several authors in many post-Soviet countries (for example, in Russia). It included the assimilation of knowledge as a component of human culture, the experience of reproductive and creative activities to preserve the cultural heritage of mankind, the experience of an emotional and value attitude to cultural achievements reflected in educational knowledge and the methods of its assimilation and application. The authors of the discussed concept considered education as a value-oriented process; the content of education was cliched in a new way, namely, as a cultural-didactic text. The clichés, such as humanitarian functions of education, axiological educational resources, value-loaded educational knowledge appeared in the theory of pedagogy.

Recent rapid technical and technological progress, as well as the saturation of the educational process with numerous diverse technical means, the need to involve a pupil and a student in the technological space, have led to the introduction (extrapolation) of the educational technology cliché into educology. This concept was extrapolated to educology from the field of technology and production when several

companies that sold their know-how products along with detailed step-by-step instructions to various users appeared in the production sector. Today, in engineering and production technology is understood as a set of organizational measures, operations, and techniques aimed at manufacturing, servicing, repairing and operating products with nominal quality and optimal costs. The extrapolation of this concept in educational sciences was determined by the requirement of society to the educational system developers to focus on specifically substantiated and logically clear step-by-step stages of the activities of the teacher and student rather than on general ideas and directions of the activity. Today, the concept of technology is broadly used in educology; however, unlike previous cases (when it occurred based on the focus on the initial concept), this extrapolation involves a certain degree of analogy between the process of proper exploitation of the technical device and the process aimed at achieving the expected effect of the pedagogical impact on the subject of education.

The list of the concept extrapolation examples is complemented by the assimilation of the management theory glossary. This brought the following clichés into educational sciences: learning as a controlled process, subject of pedagogical management, managing elements, the content of pedagogical influence – the latter includes a fragment of knowledge, educational skills, segment of activity, etc. The extrapolation of the management theory concepts into the science of education is continued by the emergence of the feedback cliché in educology; it reflects the teacher's ability to obtain information on how his/her pedagogical management determines the increase in the

proficiency of schoolchildren or students, as well as the educational outcome that fits into the cognitive-emotional or volitional sphere of the personality of the subject of pedagogical impact.

The trend of the correct assimilation of the philosophical and cultural content of the value concept by the pedagogical glossary, as well as the extrapolation of the technical and production terms of technology and project, the general scientific terms of problem and research can be assessed as positive phenomena. It is appropriate to transmit the management theory terms into education. At the same time, there are cases of incorrect interpretation of general scientific constructs by educology and incorrect connection of educological terms with the external ones. Summarizing the examples mentioned above, the cliché of extrapolation correctness can be put forward as a criterion. Concept extrapolation is correct if:

- a) The meaning of the transmitted concept which has been put into it by the external science (does not contradict the original meaning) can be considered in the content field of education;
- b) The term extrapolated into the field of education can be filled with clear content, allows providing an educational perspective and can be used in the theory/practice of teaching;

The analysis of the extrapolation of terms into the pedagogical glossary allows us to talk about the positive integration of educology and related sciences. On the other hand, saturating the educological

glossary with the terms from related sciences substantially blurs the field of education, and the search for an appropriate degree of conceptual and terminological saturation of educational knowledge with the concepts from other sciences is an actual problem of the philosophy of humanitarian knowledge.

The search is promising and rich in content. We believe that a significant vector of the search is creating a glossary related to the educological theory and the theoretical norm of educology. The clichés immanently inherent in theoretical knowledge that fill the content of the methodology of educational sciences include original positions of the theory, the empirical basis of the theory, consequences of the original positions (postulates) of the theory, mechanisms for deriving consequences, and pedagogical scientific-subject reality, logical and substantial completeness of the results. Almost all of the clichés are projected into the field of educational sciences with great difficulty. Today, an empirical basis can be revealed with a sufficient degree of clarity and meaningfulness: facts, generalizations of the data observed, statistical databases. The original positions of various theories in education are either excessively generalized and unspecific or represent a set of trivial statements. The methods for deriving the consequences of some original statements are deductive and can hardly be attributed to educational science.

The problematic content of the topic under study is pedagogical scientific-subject reality. In natural sciences, this category was defined long ago; in socio-humanitarian sciences (to which the educational

sciences belong), the construction of such a reality is associated with great difficulties. For example, the immanent affiliation of the scientific-subject reality as an ideal object is traced in physics; it has stylistic representations that have been well-established and conventionalized by the scientific community (ideal gas, absolutely black body, material point). In educology, the attempts to introduce such stylistic representations have not been successful. It is very difficult to stylistically distinguish between a pedagogical event (objective pedagogical reality) and a scientific pedagogical fact.

All the considerations given in this section can reflect the problematic content of the topic under study and indicate the vector of its further research.

4. CONCLUSIONS

Modern pedagogical knowledge, reflected in the text and positioning the inevitable synthesis of science, art and everyday practice based on the educology humanitarian concept, involves correct term creation in contrast to the chaotically filled-up glossary of educational sciences; the extrapolation of concepts from several sciences into educology is one of the possible methodological limitations of such creativity. The extrapolation procedures are fitted into the methodological framework with the help of the two mechanisms: a) the scientist determines the correctness of the extrapolated term and its possible use in the educational field, which is usually realized through

the part-to-whole ratio; b) the use of analogy by the extrapolation addresser (as in the example with the introduction of the term technology in the educational sphere).

Extrapolation terminological correctness is mainly revealed through a) the consistency of the term extrapolated from other sciences with its original (cultural, philosophical, epistemological, psychological, technical, production) semantic content; b) the meaningful embeddedness of the extrapolated concept in the problem field of education; the ability to make developing and emerging educology theoretically correct and able to mediate new practical solutions. The correctness is also complemented by the requirement of constructiveness; the meanings of well-known terms are repeated and it is included in the scientific perspective reflection.

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