

EDITORIAL

The Sophia Journal is pleased to present the 26th publication of its collection, this time the reflection focuses on *Biology and Education: neuroeducation*. This volume intends to glimpse the philosophical foundations of biology, its interdisciplinarity with the sciences of education, the approaches and perspectives of the biology of education, the value and limits of sociobiology.

In the philosophical approach to biology and education, several questions arise: What have been the educational consequences of social evolutionism today? How to sustain educational processes in biological development without falling into biological determinism? Is full freedom for learning possible from the biology of education? How has the theory of evolutionary/genetic epistemology influenced the development of teaching-learning strategies? Is education a process of biological adaptation? What are the philosophical foundations of neuroeducation? What contributions and strategies have emerged from neuroeducation to improve learning processes? What are the problems or limits of neuroeducation? What biological mechanisms of learning link mind and brain in contemporary neuroscience? among others.

Philosophy of education, as well as the different pedagogical theories that determine the content of it, are marked by a fundamental anthropological preconception, by a model of man to respond to and to which it is intended to reach through the educational process; thus they find themselves: the new man as an anthropological ideal of Christian pedagogy, the free and spontaneous man of anti-authoritarian pedagogical theories, the social man of Marxist pedagogical theory, etc. and yet, in the search for an exemplary anthropological model, idyllic stereotypes disconnected from reality, from the contexts and from the dimensions that make up the human being have been erected.

All philosophical reflection on education has as its starting point and arrival to the subject that is educated, therefore it is necessary to cover it from all the dimensions that make up its integral being, in this sense, one cannot leave aside the corporeal or biological reality on which the cognitive and learning processes are based.

Among the dimensions scarcely addressed by the philosophy of education is the body or biological dimension of the human being, whose study includes subjects such as hereditary faculties, human phylogenetics

(evolution, biology and environment) of evolution and physiological and cognitive development stages that determine in a decisive way the learning processes in the individual, and that, with a correct understanding of their functioning, would allow the creation of integral educational models that are pertinent to the biological needs of the human being.

Regarding the biological sustenance of learning, the problem of knowledge is highlighted as a product of biological evolution determined by the human phenotype itself that is constituted by the organic or hereditary morphology, whose behavioral and cognitive components are the result of the inherited genotype, and, formed by the behavioral movements of learning morphology or behaviors that are acquired according to the scales of environmental situations perceived and modifiable by their condition. . According to the Darwinian theory, everything that can happen from one generation to another is nothing more than the organic morphology with its corresponding hereditary physiological functioning. In other words, the faculty of openness to learning is inherited, while the behavioral notions are determined by the medium in which the individual develops (culture, geographical environment, social situation, etc.) by its way of understanding this medium and by the relationship in general with the outside world.

True to the phylogenetic theory, it is understood that the biological structures of knowledge would be governed by laws such as evolution by natural selection, progress and adaptability, and that by understanding their functionality and incidence in the basic processes of learning, a broader perspective on education would be obtained. As explained by Asensio (1987), understanding the biological foundations of learning in the educational process enables the educator to respond to educational goals, because:

... knowledge of the trace left by evolution in the governing body of our behavior, as well as certain aspects of brain dynamics linked to learning processes, becomes an object of interest for the pedagogue to the extent that knowledge contributes to the structuring of better means to achieve the proposed educational objectives (p.7).

Biology, in addition to helping to understand the human structure from the genetic point of view and its undeniable dependence on the environment, allows us to interpret the different stages of cognitive development that the human being goes through and, along with them, the processes of biological adaptation that it entails, as stated by Castiorina (1972). According to Cortés and Gil (1997), Piaget affirms that there

is a “passage from states of less knowledge to states of more advanced knowledge” (p.67). Piaget asks about how the subject knows (how to pass from one level of knowledge to another). Piaget (2015) would call *genetic epistemology*, understood as a theory based on the adaptive phenomenon of succession of knowledge structures or phases of intelligence in the human being, is closely linked to the stages of cognitive development and the bases of biological development. Understanding the different stages of biological development enhances the development of content and learning methodology adapted to the specific needs of students according to their level of development.

In recent times, the study of human biology for the improvement of educational processes, has been strongly marked by neuroscience, cognitive sciences and new approaches to the philosophy of the mind, which provide a biologicist explanation of the process of learning. Hence, as stated by Ortiz (2009), the basic functions of learning in education are defined as “a series of new connections that organize a new neural network or the strengthening of part of the existing ones” (p.27), which must be stimulated and boosted in specific periods of biological brain maturation to achieve the full development of the individual.

Among the main theories on which the neurosciences applied to education are based are: cerebral plasticity, critical and sensitive periods of biological maturation, production and understanding of language through brain centers (Broca, Wernike, Exner), the development of motor functions and the relationship with the outside world from the motor areas and the conjunction of the different functional lobes of the brain. These and other neurobiological processes are closely related to education, since as Ortiz (2009) states, understanding the functional bases of the brain in the educational process can promote the development of:

... non-invasive diagnostic techniques that allow the construction of images related to the activation of different brain areas because of cognitive or emotional processes (...) providing significant information and relevant findings to understand, from their foundations, the learning processes and better guide the educational policies and practices (p.17).

In the following paragraphs the different perspectives and lines of thought are exposed with respect to some of the philosophical problems on neuroeducation and the main approaches (biology and education) previously noted.

The road of reflection of this issue is started by the article *Embodied freedom as a key to moral neuroeducación*, by Javier Gracia and

Vicent Gozávez, who believe that freedom is one of the main attributes with which traditionally has characterized the human being. The objective of this document is to analyze whether in the light of research and neuroscientific experiments it is possible to continue characterizing the human being as a being with freedom. From a hermeneutic methodology the authors denounce the neuroscientific reductionism that aims to deny freedom based on empirical evidence and from there it is proposed to complement the neuroscientific discoveries about the functioning of the brain with the moral perspective of the active subject; they consider that from here it is possible to speak of an embodied freedom that overcomes the irreconcilable vision between nature and freedom as a reductionist vision of the nature of freedom. In addition, they argue that by considering the phylogenetic explanation of morality as the cultural dimension of moral education it is possible to more comprehensively illuminate the phenomenon of moral neuroeducation.

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For its part, the document *Transdisciplinary epistemological foundations of education and neuroscience*, presented by Adela Fuentes Canosa and Javier Collado Ruano, argues that the process of emergence of the new area of knowledge, product of the convergence between the fields of neuroscience and education, is still in its consolidation stage. In this sense, the researchers state that it is essential to define a multidimensional framework for the construction of knowledge, in order to achieve consilience among the involved academic fields. In this work, a critical review of the literature associated with epistemological issues is carried out, which underlies the attempt of communication between disciplines, providing a theoretical framework that starts from basic epistemic issues, to be concretized in a basis that contribute to the synergy between the sciences. of education and brain sciences.

Likewise, the manuscript *Genetic epistemology and the (in)visibility of constructivist approaches in neurosciences*, prepared by Taís Oliveira Martins and Marcelo Leandro Eichler, discusses the current debate in the area of cognitive neuroscience, its possible relationship with the Genetic epistemology of Jean Piaget and the reasons why constructivist approaches in the neurosciences have not been widely used. To demonstrate that neurosciences do not constitute a singular, unanimous and finalized area as instituted by enlightened common sense, a theoretical revision of Piaget's stages of development and the discussion of the psycho-physiological parallelism defended by him are presented. In the words of its authors, the article aims to draw possible approaches between Piaget's genetic epistemology and cognitive neurosciences, demonstrating that

human cognitive development is structured in the psychological and biological pillars, and that these are linked to social, cultural, educational and genetic factors.

In this path of reflections, the paper *On the “neuro” in neuroeducation: from psychologization to the neurologization of school*, structured by Juan Carlos Ocampo Alvarado, aims to analyze the triadic relationship between education, psychology and neurosciences within the framework of neuroeducation; He argues that the irruption of the neuro in the culture and the advent of the new neurosubjectivities ended up dethroning the psychology of its privileged position in the educational space. Under promises of liberation, independence and scientificity, neuroeducation prospered precipitously without addressing the multiplicity of philosophical, methodological and ethical difficulties that still plague it. He affirms that from counterpsychology, it can be argued that the neuro, more than an independent stage, is an extension of the psi conditioned to the time. From this point of view, neuroeducation is not an alternative to psychological predominance but a return to it that threatens neurologization. He suggests as an imperative the re-linking of learning to culture, the reconquest of educational spaces and the awareness of teachers.

To close the section of the articles related to the central topic, the work *Biological mechanisms of learning and neural control in sensitive periods of child development* is presented, developed by Vinicio Alexander Chávez Vaca. The study aims to describe the biological mechanisms of learning, fundamentally those that affect sensitive periods of child development; he argues that the learning process is based on a genetic and biological condition that manages to transform itself from the social interaction that the child gets with his or her peer and with the adults who participate and guide the teaching process. From this perspective, the construction of knowledge is an eminently active process not only because it responds to neuronal exchange but also because it varies according to the social historical context that stimulates child development.

After the studies that emerged because of the central theme proposed for the structuring of Sophia, 26 a diversity of approaches and perspectives are presented that open the way for new research on science, education, thought and subjects in general. The main guidelines that guide this new group of documents are briefly explained below.

Thus, the article *Natural Sciences as an integrating knowledge*, prepared by Lilian Mercedes Jaramillo Naranjo, aims to analyze modern pedagogical trends and contribute with innovative methodologies for teaching and learning in the area of natural sciences. The study aims to

support the integrative approach and interdisciplinarity as points of view that allow lasting, integral and holistic learning.

For its part, the text *The educational relationship is a concept with own meaning, that it requires concordance between values and feelings in each interaction*, presented by José Manuel Touriñán López, it argues that the educational relationship is a concept with its own meaning, related to the character of Education requires an agreement between values and feelings in each interaction. At the same time, he affirms that the educational relationship is the substantive form of educational intervention and that it is necessary to pass from thought to action, from the value reached and attainable to effective achievement.

In this same direction, the manuscript *Complex thinking and trans-discipline*, constructed by María del Carmen Calvo Cereijo, focuses on the route drawn from the conceptualizations of rationalism and the postulates of classical science regarding the conception of man and life, towards the paradigms that opened the way to think about the current challenges. In addition, the author argues that the entry of the sciences in a process of evolution breaks with the conceptualizations of isolated processes, pointing to the transversal communication between the heterogeneous.

Finally, the article *Perceptions regarding the attention to diversity and educational inclusion in university students*, proposed by Patricia Bravo Mancero and Ofelia Santos Jiménez, analyzes the perceptions of university students in the face of attention to diversity and educational inclusion. In recent years, at the international level, important efforts have been made to establish policies that specify the principle of “Education for all”. The researchers intend to determine the perceptions that students have regarding attention to diversity and educational inclusion.

Once again, we hope that the ideas presented here will become guidelines for the generation of new questions, research and proposals that vivify in an analytical, critical, reflective and proactive way the task of philosophy of education, in particular, and the thought of the human being in general.

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Jefferson Alexander Moreno Guaicha

Bibliography

ASENSIO, Josep M.

1987 Biología y Educación. *Educación*(12), 7-25. Recuperado de <https://goo.gl/x4WyNR>

CASTIORINA, José Antonio

1972 Biología y conocimiento de Jean Piaget. *Memoria Académica*, 73-90.

CORTÉS, Fernando & GIL, Manuel

1997 *El constructivismo genético y las Ciencias Sociales: Líneas básicas para una reorganización epistemológica*. Barcelona: Gedisa.

ORTIZ, Tomás

2009 *Neurociencia y Educación*. Madrid: Alianza Editorial.

PIAGET, Jean & INHELDER, Barbel

2015 *Psicología del niño*. Madrid: Morata.

