

ICEST 2021**II International Conference on Economic and Social Trends for Sustainability of Modern Society****CONCEPTUAL FOUNDATIONS OF EDUCATION FOR
SUSTAINABLE DEVELOPMENT IN OVERCOMING
TRANSFORMATIONAL SOCIO-TECHNOGENIC PROCESSES**

Elena A. Dergacheva (a), Taisiya A. Kolesnik (b)*

*Corresponding author

(a) Bryansk State Technical University, Bryansk, Russia

(b) Bryansk State Technical University, 7, 50 Let Oktyabrya Boulevard, Bryansk, Russia
077767475@mail.ru**Abstract**

The technocratic liberal-economic vector of development of modern society leads to the increasing destruction of natural environment – the biosphere. The role of education in addressing this problem has been repeatedly emphasized during a number of UN conferences on environment and development. However, to date, the issues of forming a worldview and skills of socially- humane economic activity that allow preserving biosphere life remain unresolved. Therefore, there is an urgent need to correct the educational strategy. In our research, we rely on a systematic socio-natural approach. The analysis of theories of sustainable development shows that they have significant gaps associated with a lack of understanding of the essence of the socio-technological processes occurring on our planet, associated with the change in the evolution of life from natural to artificial. These theories do not analyze the human transformations that have arisen as a result of the changed environmental conditions, the transition of life to the urban technosphere. All this does not allow us to develop a full-fledged philosophic strategy for the development of education based on the theories of sustainable development, which could help a person not only to act without destroying the biosphere world and life, but also to adapt to the conditions of changing development. In solving the given tasks, social pedagogy can provide effective assistance. On the basis of this scientific discipline, it is possible to develop a practically oriented strategy for the socialization of the younger generation based on the values of ecological culture.

2357-1330 © 2021 Published by European Publisher.

Keywords: Education, social pedagogy, sustainable development, technosphere

This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 Unported License, permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

1. Introduction

The process of development of the technogenic society is accompanied by the aggravation of global problems that threaten the existence of the biosphere world and life. Hopes for overcoming negative trends in development are increasingly associated with the prospects of reforming education, focused on overcoming the global anthropo-technogenic crisis. The importance of education in solving the global problems of our time was justified during the Stockholm Conference on Environmental Protection in 1972, which adopted recommendations for the creation of an international program for environmental education. This program had been created by UNESCO together with the United Nations Commission on the Environment (UNEP) by the beginning of 1975). In 1992, the United Nations Conference on Environment and Development in Rio de Janeiro in its outcome document "Agenda of the XXI century" set the task to promote the transformation of the concept of sustainable development into a system of fundamental professional and spiritual attitudes of humanity through education, enlightenment and appropriate training (Koptuyug, 1992). The next UN Conference on Sustainable Development in Rio de Janeiro in 2012 adopted the declaration "The future we want", which contained the section "Education". This section focused on enhancing the opportunities of education as a resource that can prepare people to meet the challenges of the transition to sustainable development, and emphasized the need to improve training of teachers (UN Conference on Sustainable Development "Rio +20", 2011).

All this shows that the world community understands the crucial role of education in overcoming the negative consequences of human economic activity.

2. Problem Statement

However, despite such a broad discussion of the need to develop education programs for sustainable development (hereinafter – EPSD) on the international stage, in practice, these ideas have not yet found the necessary implementation. This is evidenced by the absence of significant changes in the worldview and practical activities of a person, which would make it possible to lay the foundation for the transition to a safe path of development for the biosphere life.

3. Research Questions

A) To identify the true causes of the unstable development of life and the world, leading to the change of evolution from natural to artificial.

B) To show the need to change the priorities of education as the basis for the formation of worldview orientations that allow us to overcome unfavorable technogenic transformations that lead to instability of the world and life.

C) To show the necessity of introducing social pedagogy into the educational process as a discipline that allows correcting the processes of adaptation and socialization of the younger generation

4. Purpose of the Study

In this regard, we think that additional measures are needed aimed at correcting education, in order to train future generations with the skills of socially-humane economic activity and value orientations that allow preserving the biosphere world and biosphere life.

5. Research Methods

In our research, we will rely on a systematic socio-natural approach, the founder of which is V.I. Vernadsky. The scholar linked the achievement of harmonious social and natural development with the transition of the biosphere to the noosphere as a result of intelligent human activity. Based on the analysis of the ongoing changes characteristic of his time, he comes to the conclusion that the transition to the noosphere will improve the qualitative characteristics of the biosphere (Vernadsky, 2004). However, Vernadsky's (2004) forecasts did not come true. At the present stage of development, a globalizing technogenic society forms an artificial post-biosphere world of technosphere in cities where socio-natural life develops. This world is being built chaotically and in an unorganized way, giving rise to multiple negative technogenic transformations that question the very possibility of the biosphere's existence in the future. The formation of an artificial world is not consistent with the understanding of the noosphere, which was mentioned by V. I. Vernadsky (2004). Rather, it can be argued that a global techno-noosphera technogenic socio-natural reality of life is being created (Demidenko & Dergacheva, 2017), and with it integrated socio-technological processes are spreading on the planet (Dergacheva, 2016). These evolutionary processes are in the center of the study of scholars of the interdisciplinary scientific and philosophical school of socio-technological development of the world, socio-technological processes and changes in the evolution of life, their supporters and followers (Liseev, 2018; Trifankov & Dergachev, 2016). Vernadsky's (2004) conclusions that "humanity, taken as a whole, becomes a powerful geological force", processes the living matter of the planet with the help of machinery equipment and technologies, and thus cultivates the biosphere for the habitation of "associated humanity" (p. 576), are the keys to further analysis of the interrelated development of society and nature.

6. Findings

The reform of the technical and economic component of society in accordance with the carrying capacity of the biosphere ecosystems is a key point for the developed theories of sustainable development. Meanwhile, the issues of changing the global socio-natural transition of life from the natural biosphere to the artificial post-biosphere, or its socio-technological form, are overlooked by the world community, as researchers of the socio-technological development of the world write (Demidenko & Dergacheva, 2017). As a result of this transition, the original conditions of human existence are radically changed. Human life and activity no longer depend on the socio-natural conditions, which is typical for an agrarian society, but on the technogenic socio-natural conditions of the urban environment – the technosphere, in which at the beginning of the XXI century more than half of the world's population lives. As a result of these changes, the natural (biosphere) man himself is subjected to technogenic transformations. The man is traumatized by the unnatural conditions of living in cities (including artificial chemicals and electromagnetic fields), which

leads to the loss of population health. However, the issues of technogenic transformation of man are dropped out of sight of theories of sustainable development. Such a gap, in our opinion, does not allow us to form a full-fledged theory of education in favor of sustainable development. The theory of education, which covers the issues of the socio-technological development of the world and the change in the evolution of life, would help to preserve not only the biosphere world and life, but also to help the biosphere man himself to adapt to the conditions of rapidly changing development. The diversity of views on the interpretation of the term "sustainable development" also makes this problem worse.

The most common definition of the term "sustainable development" is "development that meets the needs of the present, but does not threaten the ability of future generations to meet their own needs" (Our Common Future: Report of the International Commission on Environment and Development (ICED), 1989). Analyzing this understanding of the term "sustainable development", D.I. Danilov-Danilyan emphasizes that, it is impossible to determine the needs of future generations, just as it is impossible to determine the ecological capacity of the biosphere, which has the ability to replicate (Danilov-Danilyan, 2006).

The term "sustainable development" is also understood in a narrow and broad sense. In the narrow sense, special attention is paid to the environmental component of this term. In a broad sense, it is understood as a transition to new economic, environmental, social, and cultural parameters that allow us to preserve the biosphere nature (Ilyin et al., 2015). Such multivariance and multicomponence of this term, not only creates difficulties in understanding it, but often gives priority to one of its components, for example, the economic one (Yurchik, 2006). Meanwhile, we can agree with E. N. Dzyatkovskaya that the sustainable development of certain aspects of life of socio-natural ecosystems in the global world is simply not possible (Dzyatkovskaya, 2019). Terminological immaturity, lack of strictness in the definition of this concept disorient even teachers, who often ask the question: "Sustainable development of what?" (Dzyatkovskaya, 2019).

The question of adapting the term "sustainable development" to the subject form of modern education remains open, which, as E. N. Dzyatkovskaya notes, contradicts the "cross-cutting" aspect character and vector nature of all disciplines, which is necessary for the implementation of EPSD programs. This contradiction, as the author notes, leads, on the one hand, to a decrease in the quality of the subject content of education, and on the other, to the imitation of EPSD, since in practice it is mainly reduced to education about sustainable development, which does not solve the problem of forming a new ecological culture of values (Dzyatkovskaya, 2014). E.N. Dzyatkovskaya notes that in order to change the current situation, it is necessary to develop and implement technologies of transdisciplinary education in the educational process, which are still poorly studied (Dzyatkovskaya, 2014). It is thanks to transdisciplinarity that it is possible to form a worldview that goes beyond the subject area, thereby combining natural science, humanities and technical knowledge.

But if E.N. Dzyatkovskaya proposes to change the entire structure of modern education in order to implement EPSD programs, then N.N. Moiseev speaks of the need for "cross-cutting ecologization of education", which should represent an integral system that covers the entire life of man, and form a worldview based on the representation of its unity with nature (Moiseev, 2012). And although

N. N. Moiseev does not speak about the transdisciplinary model of education, in our opinion, it is obvious that the "cross-cutting ecologization of education" cannot be based on the old subject form of its content.

However, we would like to note with regret that the ideas of both transdisciplinary and "cross-cutting ecological education" currently remain methodologically and methodically unresolved. These ideas can be implemented in practice, in our opinion, only with a change in the philosophical strategy of the development of society, which should be aimed at overcoming the contradictions of market technogenic rationality. The phenomenon of contradictory technogenic rationality is studied in detail by one of the authors of the article (Dergacheva, 2016) and is an integrated complex of market economic, scientific, and technical-technological rationalities. In its intention, it is the market economy and its rationality that determines the key, most effective directions for the development of science and technology, and at the same time, education, since investments in scientific and technical innovations (and the training of appropriate specialists) give enormous profits, lead to the acceleration of the progress of a technogenic society. It would seem that the market has set a humane task – to increase the relative socio-economic well-being of the world's population and the comfort of the living environment. However, such "efficiency" of business decisions turns into contradictions in the development of rationality itself – the growth of inhumane negative socio-natural tendencies. Among them are the growing socio-economic polarization in society, the overexploitation of natural capital, the destruction of the biosphere and its organisms, and the violation of the closed nature of global biogeochemical cycles. All these changes lead to the formation of an urban technogenic environment unsuitable for human activity, as we can judge from the state of the atmosphere in modern industrial China, when the population even buys clean air tanks to make up for the lack of oxygen. Therefore, an all-encompassing philosophical strategy for the development of society is needed, which will be filled with an understanding of being not only in the present, but also in the future, dangerously transforming socio-technological world. Such a socio-biosphere philosophical strategy should be aimed at the formation of a new type of rationality that fixes the phenomenon opposite to technogenic rationality and includes in its complex socio-humane, biosphere and ethical issues of world development.

To overcome the instability of the development of the biosphere life, it is necessary to create a new educational strategy (as a component of the socio-biosphere philosophical strategy), aimed at training specialists who will have fundamental knowledge that ensures the social equality of people, the successful humane development of society, the preservation of the biosphere life and other important parameters. However, such "inclusiveness" of education contradicts the selfish interests of the elite layers of the liberal-democratic development of society, who are interested in further commercialization of the educational space and unilateral training of functionaries serving the objects of the technosphere (Kolesnik, 2017). Therefore, the strengthening of the technocratic orientation of education leads to the expansion of the technogenic development of the world and the expansion of the spaces occupied by the technosphere to the detriment of the biosphere nature. The modern capitalist educational strategy is becoming dangerous both for the development of science itself and for the biosphere world as a whole.

Thus, reflecting the main features of the development of technogenic society and evolving with it, education also takes its typical contradictions. The described tendencies are expressed in the technocratic nature of modern education and its orientation towards the reproduction of dangerous technogenic living conditions. These negative trends can lead to an evolutionary change in the biosphere with new pathological

geochemical properties, in which the reproduction of the biosphere life will be impossible (Demidenko & Dergacheva, 2020). The reorientation of evolution from natural to artificial, as noted in the research of E.S. Demidenko and one of the authors of this article, leads to the destruction of the biological foundations of life on the Earth (Demidenko & Dergacheva, 2017) and cannot be ignored by the modern education system. Education should help people survive, preserve and multiply the biosphere world and the biosphere life. This is hindered by the market-capitalist system of management, which is focused on maximizing profit without taking into account the need to preserve the biosphere world for future generations. The existing world order does not benefit from the enlightening work in this direction, so it is not actively conducted. Children, parents, and teachers know little about the strategy of sustainable development.

These ideas do not fit into the modern educational process, the main task of which is to reproduce the class structure of capitalist society, which needs the professional staff capable of performing highly specialized tasks. That is why many scholars write about the decline of modern education. Thus, V.A. Kutyrev and N. V. Popkova believe that it is difficult to talk about the ecologization of education when education itself requires ecology (Kutyrev, 2012; Popkova, 2017). Although V.A. Kutyrev does not explain the meaning of the term "ecology of education", however, from his text we can conclude that this concept implies a humane correction of education in order to prevent its unilateral programming by technocratically oriented disciplines and ideas, which leads to a flawed understanding of transformations in society and nature.

Indeed, the decline of cultural and moral values and their replacement with rational pseudo-values of the consumer culture of the capitalist technogenic society could not but affect the educational system, which is the main means of cultural reproduction. The majority of scholars speak about the destruction of culture, the need for its humanization and protection. Describing its current state, researchers point to the decline in the role of "high samples" and the growth of information garbage – vulgarity and banality (Demidenko et al., 2007).

Education is one of the social institutions that can neutralize such trends, directing them in a humane direction. Thus, it contributes to the comprehensive improvement of the individual during the educational process. Therefore, it should not be the subject of purchase and sale in the market of educational services, along with other utilitarian values. The main task of education, in our opinion, is to become the basis for effective socialization of the younger generation, which makes it possible not only to adapt to the technogenically altered reality, but also to form a high level of consciousness and self-awareness that would allow us to positively act and transform the world based on the values of ecological culture. In our opinion, it is possible to achieve this level of socialization only through the introduction of social pedagogy into the educational process—the science which key concept is "socialization". On the basis of social pedagogy, it is possible to control and correct not only the processes of already manifested disadaptation, but also to coordinate the processes of socialization and adaptation in general, directing them in a humane direction (Kolesnik, 2019).

We regret to note that the use of social pedagogy to socialize the younger generation based on the values of ecological culture was not discussed at the UN conferences on environment and development. The possibilities of social pedagogy in the situation of the growing global epidemic of stress, connected with the discrepancy between the adaptive capabilities of a person and the accelerating socio-technological

conditions of development, were also not studied. This circumstance, in our opinion, is a significant obstacle that prevents us from developing a full-fledged strategy of education for sustainable development, which allows us to overcome the negative transformations of the world and life. We also think that we should not hope that the logic of the development of technogenic society and its evolution towards replacing the natural with the artificial will soon change. Therefore, the main task of education is to direct the ongoing processes in a humane direction, stopping their destructive nature.

7. Conclusion

Naturally, the humanization of education requires a set of measures aimed at overcoming the technocracy of the development of society itself and the formation of a new type of its rationality, covering socio-humane, biosphere and ethical issues of the world development (Dergacheva, 2016). In this regard, we would like to note that, despite the fact that the formation of a new type of rationality is a fundamental task of education, it still goes beyond the its capabilities. Within the framework of this article, we summarize the strategic measures that should become fundamental for the humane correction of education itself in the conditions of social and technogenic development of the world and changing the evolution of life.

These measures include the following: humane correction of education and enhancement of its predictive nature; fundamentalization and practical orientation; inclusiveness and accessibility of education; continuity of education and self-education, including the continuity of ecological education (end-to-end ecologization and the use of technologies of transdisciplinary education); valeological education; the formation of creative (individual) potential of a person; the formation of skills of collective work (creativity); the quality improvement of teachers' preparation for classes; diagnostics of ecological competence of students; integration of efforts of formal, non-formal and informal education in the struggle to preserve the biosphere world and life; active use of health-saving technologies in the educational process; creation of ergonomic educational conditions.

References

- Danilov-Danilyan, V. I. (2006). Sustainable development. In I. I. Mazour and A. N. Chumakov (Eds.) *Globalistics: International interdisciplinary encyclopedic dictionary*, (pp. 921-922). Elima; Piter.
- Demidenko, E. S., & Dergacheva, E. A. (2017). *From global degradation of the biosphere to changing the evolution of life: a scientific report*. Retrieved 27 April 2018 from <http://www.ras.ru/publishingactivity/issues/collections.aspx>
- Demidenko, E. S., & Dergacheva, E. A. (2020). Biotechnological Processes in the Changing Evolution of Life on the Planet Earth. *IOP Conference Series: Materials Science and Engineering*, 753(5), 052066. <https://doi.org/10.1088/1757-899X/753/5/052066>
- Demidenko, E. S., Popkova, N. V., & Shustov, A. F. (2007). *Technogenic development of society and life on the Earth. In 2 books. Book 2. The main trends in the technogenic development of life*. Publishing House of BSTU.
- Dergacheva, E. A. (2016). *The concept of socio-technological and natural globalization: an interdisciplinary analysis*. Lenand.
- Dzyatkovskaya, E. N. (2014). Transsubject model of education for sustainable development. *Astrakhan Bulletin of ecological education*, 3(29), 17-22.
- Dzyatkovskaya, E. N. (2019). A new direction of educational activity – education for sustainable

- development. *Modern pedagogical education*, 11, 16-22.
- Ilyin, V. I., Los, V. A., & Ursul, A. D. (2015). *Sustainable development and global processes*. Moscow University Press.
- Kolesnik, T. A. (2017). Philosophical understanding of technocracy in modern education. *Context and reflection: philosophy about the world and man*, 6(6A), 118-127.
- Kolesnik, T. A. (2019). Philosophy of social pedagogy as the main direction of human adaptation in technogenic society. *Social Pedagogy in Russia*, 4, 3-13.
- Koptyug, V. A. (1992). Information review. *UN Conference on Environment and Development Rio de Janeiro, Section IV Means of implementation. Chapter 36: Promotion of enlightenment, informing and staff training*, 60. Retrieved 04 January 2021 from: <http://www.prometeus.nsc.ru/koptyug/ideas/unrio92/index.ssi>
- Kutyrev, V. A. (2012). *Mortido time*. Aleteya.
- Liseev, I. K. (ed.) (2018). *Philosophy of socio-natural interaction in the age of convergent technologies: Collective monograph*. Nestor-History.
- Moiseev, N. N. (2012). *Works of N. N. Moiseev on the issues of modern education*. MNEPU Academy.
- Popkova, N. V. (2017). The ecology of education as a part of the ecology of culture. *Pedagogy and enlightenment*, 1, 57-65.
- Trifankov, Y., & Dergachev, K. A. (2016). Brief Review of the Modern Development of the World and Life in the Works of Scientists of Bryansk Philosophical School of Social-Technogenic World Development. *SHS Web of Conferences 2015*, (28). <http://doi.org/10.1051/shsconf/20162801151>
- United Nations Conference on Sustainable Development "Rio+20". (2011). Retrieved 27 November 2011 from: <https://web.archive.org/web/20120730170520/http://www.un.org/ru/ecosoc/about/uncsd-rio.shtml>
- Vernadsky, V. I. (2004). *Biosphere and noosphere*. Iris Press.
- Yurchik, V. (2006). Constantly stable life. *Globalistics: International interdisciplinary encyclopedic dictionary*, 707-709.