

UDC 37.014.544:001.18

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**SYSTEMS APPROACH AND EDUCATION FOR SUSTAINABLE  
DEVELOPMENT**

**СИСТЕМНИЙ ПІДХІД І ОСВІТА ДЛЯ СТАЛОГО РОЗВИТКУ  
СИСТЕМНЫЙ ПОДХОД И ОБРАЗОВАНИЕ ДЛЯ УСТОЙЧИВОГО  
РАЗВИТИЯ**

***Summary.** The article is devoted to the study of systems approach in providing the education for sustainable development that enables solving the task of forming a new holistic person, with a new noospheric worldview, with a new system of values and meanings. Following the principles of systems approach makes the education for sustainable development not only fit into the evolution of the world community along a new path, but also be one of the decisive levers of the forthcoming civilizational innovation-sustainable transition.*

**Key words:** *sustainable development, education, systems approach, integrity.*

**Анотація.** *Стаття присвячена дослідженню застосування системного підходу в освіті для сталого розвитку, що дозволяє вирішити завдання формування нової цілісної особистості, з новим ноосферним світоглядом, з новою системою цінностей. Дотримуючись принципів системного підходу, освіта для сталого розвитку не лише стає складовою еволюційного розвитку світового співтовариства, але й є одним з вирішальних важелів майбутнього цивілізаційного інноваційно-сталого розвитку.*

**Ключові слова:** *сталий розвиток, освіта, системний підхід, цілісність.*

**Аннотация.** *Статья посвящена изучению системного подхода в обеспечении образования для устойчивого развития, позволяющего решить задачу формирования нового целостного человека, с новым ноосферным мировоззрением, с новой системой ценностей. Следование принципам системного подхода делает образование в интересах устойчивого развития не просто частью эволюции мирового сообщества, но и является одним из решающих рычагов предстоящего цивилизационного инновационно-устойчивого развития.*

**Ключевые слова:** *устойчивое развитие, образование, системный подход, целостность.*

**Introduction.** The future forms, paradigms and models of education will be influenced by the evolution of civilization, and education as its component should contribute to those forms of development that will most effect the strategy of human survival and conservation of the biosphere. In the area of

education, transformations will be closely linked to the evolutionary changes in the entire civilizational process and the interaction of society and nature.

Nowadays an intensive world search for new strategies and models of education of the 21<sup>st</sup> century is being carried out. Thus, the up-to-date education should meet the needs of present and future generations, set the goal of survival in the conditions of preserving the natural environment. It is supposed to be not the one ultimate model of education but the evolutionary series of models and strategies of educational processes and systems that contribute to the emergence of a new civilization that ensures the survival of humankind and the preservation of the biosphere.

The reason for increasing interest in a new vision of world education is the need to forecast and change the vector of global processes, especially globalization, in which negative trends and consequences are growing, causing aggravation of global problems. Thus, global problems concentrate mainly on the negative consequences of previous world development and exacerbate contradictions that threaten worldwide catastrophic consequences. Humankind needs to take coordinated actions to break out different global crisis, generated by global problems and negative processes. The undesirable consequences of the spontaneous development of global processes and problems require their modification according to the aim of turning the global development vector into a path of progressive development or, as it turned out more than two decades ago, the path of sustainable development as a new type of development capable of preserving civilization and the biosphere.

Effectively managing the processes of globalization and solving global and other problems with the help of a modern yet unformed global consciousness and modern conservative-lagging education is not just ineffective, but even fundamentally impossible. Education rejects from active participation in the search for optimal solutions in the emerging anti-crisis global activities and does not contribute to the survival of humankind. The worldwide transition

to the sustainable development of civilization and its co-evolutionary interaction with nature has begun to raise the question of changes in all forms and directions of social activity, including education.

**Education for sustainable development.** One of the new and most important models of world education is linked to the strategy of sustainable development, to which humanity is already beginning to move in the 21<sup>st</sup> century, according to United Nations decisions. The main features of the new model of the civilizational development of the 3<sup>rd</sup> millennium and its most important subsystem – education, should be formed in the coming decades. Sustainable development is not just one of the new problems, but the problem, the solution of which determines the future of all humankind. This is a completely new development model of the entire world community, which is on the path of its survival and solving global problems of humankind.

There exists hundreds of definitions of the notion “sustainable development”, but among the most frequently quoted is one given in the “Report of the World Commission on Environment and Development: Our Common Future”, according to which sustainable development is the development that “meets the needs of the present without compromising the ability of future generations to meet their own needs” [1, p. 16].

As for the education for sustainable development, UNESCO defines it as a concept that “empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity” [2].

The main idea of education is the idea of development. Any growth or development, as John Dewey notes, should create conditions for further development [3]. Therefore, the main goal of education is the formation of a person capable of self-development and striving for the continuous personal development. Therefore, in modern conditions, the education system should become a system of continuous education that reproduces in each person the

best features of national and world culture and positively develops them, shaping each person's mindset for continuous development throughout life and creating conditions for such development – the principle of continuous education. Only continuous education can ensure the preservation of the internal and external integrity of a person, his/her sustainable development, and as a consequence, the sustainable development of humankind in harmony with the nature of which it is a part.

**Systems approach in sustainable development.** The implementation of sustainable development requires special management, the correct formation and implementation of which is impossible without the use of a system approach. Therefore, it makes sense to study not just sustainable development, but the system of sustainable development and the sustainable development management system as well. Moreover, if we want to penetrate deeply into the essence of the problem of sustainable development and manage this development, to find the right directions for its solution, it is necessary first of all to try to determine the goals of this development, because the goal is the main backbone factor, and its basic system properties.

The overall goal of the system of sustainable development should be the formation of such a direction, such a path and development rates that would enable humankind to exist on Earth without global catastrophes and with acceptable quality without losing human in man indefinitely.

Since we do not really know the possible consequences of human influence on the future and achieving the goal of sustainable development of all anthropogenic factors, it would be more correct to strive to preserve the habitat in an unchanged form in which humanity already existed for a long time of its evolution, and with which it represented until recently a single whole, integrity.

The system is an integral set of elements. Integrity gives the aggregate system, superadditive properties, the main one of which is the possibility of using the system for its intended purpose. The higher the integrity, the higher the

effect of using the system to the destination. However, on the other hand, the higher the current integrity, the more difficult it is to implement a system change in the future. Therefore, we can assume that, given the prospect of further development, there is always some optimal current integrity of the system. Managing the development of the system means managing its integrity.

As for the notion of integrity in relation to system of education, its internal unity is usually associated. However, the true inner unity is impossible without the unity of the system with the external environment, without resorting to the external environment and the function that the system performs in it and in whose name it was created. You can create an internally unified system that performs well in the external environment, but this function can be aimed at destroying the external environment, there are plenty of such examples in history. Therefore, system of education should have both an internal unity between its elements – internal integrity, and an external unity with the environment, the element of which the system exists – external integrity. The unity of the system with the environment is characterized by its dynamic equilibrium and is ensured by both internal and external integrity.

Retribution for integrity is the mandatory coordination of the goals and interests of system elements with a common goal, a certain loss of freedom of elements, the emergence of new restrictions and additional responsibilities for the elements. The overall goal of the system must be understood and accepted by all its elements, in spite of the fact that in the process of moving towards it, they must partially give up their interests.

Evolutionary changes in nature go from simple to complex, which allows us to conclude that the main development arrangement is integration, through which the integrity of existing systems increases and new systems are created. The main task in integrity management is to accurately determine the moment of integration, when all the conditions have matured and the system and private interests are properly taken into account. Too early or too late integration is

fraught with deterioration in the quality of the system functioning, the possibility of changing the movement direction.

But all the measures to ensure sustainable development will be useless if one of the main components does not include solving the task of forming on a massive scale a new holistic person, with a new noospheric worldview, a new system of values and meanings.

The most important role in the formation of such a person belongs to education, which is a mean of human development, a mean of familiarizing it with culture and social experience, with the method and essence of socialization through all institutions. Education is the mapping of the desired prototypes of the individual (knowledge, meanings, values, competencies, etc.) into the psyche of the learners, introducing into their living programs the basic elements of culture.

**Conclusions.** Science and education, which are already integrating into a single advanced scientific and educational process, will change the evolutionary path of social development in the direction of its survival, preservation and further permanent progress. For a future sustainable civilization, a new model of education is needed that could meet the corresponding needs of present and future generations of earthlings and of all humankind in the conditions of conservation of the biosphere. The main contours of the new model of social development and its most important subsystem – education should be formed in the coming decades and to have a success they should follow the principles of systems approach. As a result, education for sustainable development will not only fit into the evolution of the world community along a new path, but will also prove to be one of the decisive levers of the forthcoming civilizational innovation-sustainable transition. In its turn, as one of the most important spheres of social activity, education will also go on its own path of sustainable development in accordance with the basic principles of sustainable development transformations.

## **References**

1. Our Common Future: Report of the World Commission on Environment and Development. United Nations. – 300 p. URL: <http://www.un-documents.net/our-common-future.pdf>
2. Education for Sustainable Development. UNESCO. URL: <https://en.unesco.org/themes/education-sustainable-development>
3. Dewey, John (1916). Democracy and Education: An Introduction to the Philosophy of Education. New York: Macmillan. URL: <https://archive.org/stream/democracyandedu00dewegoog#page/n6/mode/2up>