

Methods of advancing education in the interests of sustainable development

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Abstract

The essence and basic principles of the concept of sustainable development, features of its adaptation to domestic social and economic conditions are considered in work. Emphasis is placed on the certainty of sustainable development as the only possible way to solve environmental problems on a global scale. Education is one of the critical goals of sustainable development and a means to achieve it. In getting an education, people must learn to meet their own needs without compromising the needs of future generations. Fulfilling modern education tasks to form individuals capable of acting within the sustainable development strategy is possible subject to its radical renewal and modernization. Today it is not enough to learn the «old», the «famous», to reproduce the «experience of generations». Education must prepare the individual for new challenges, for the future. So – to be anticipatory and prognostic. The purpose of advancing education for sustainable development should be the development of highly educated, creative individuals capable of constantly updating professional knowledge; introduction of modern pedagogical technologies that allow increasing the adaptation of graduates to the perspective needs of the labor market. The main principles of advancing education are as follows: integrativity, variability, regionalization, creativity, acmeology, fundamentalization, continuity, rationality. Advancing education, taking into account its purpose, should be based on methods aimed at stimulating the cognitive activity of the learner, the development of mental abilities, skills, and needs of self-learning. Such practices include problem-based learning, interactive, developmental, and the project method.

Keywords: problem-based learning, interactive methods, developmental learning, project method.

Методи випереджаючої освіти в інтересах сталого розвитку

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Анотація

У роботі розглянуто сутність та основні засади концепції сталого розвитку, особливості її адаптації до вітчизняних суспільно-економічних умов. Наголошується на безальтернативності сталого розвитку, як єдиного можливого шляху розв'язання екологічних проблем планетарного масштабу. Освіта є однією з важливих цілей сталого розвитку, водночас засобом його досягнення. Саме в процесі здобуття освіти люди мають навчитись задовольняти власні потреби не ставлячи під загрозу потреби наступних поколінь. Виконання сучасною освітою завдань з формування особистостей, здатних діяти в межах стратегії сталого розвитку можливе за умови її кардинального оновлення та модернізації. Сьогодні недостатньо навчатись «старому», «відомому», репродуктивно передавати «досвід поколінь». Сучасна освіта має випереджальний та прогностичний характер. Метою випереджаючої освіти для сталого розвитку є розвиток високоосвічених, творчих особистостей, здатних до постійного оновлення професійних знань; впровадження сучасних педагогічних технологій, що дозволяють збільшити адаптацію випускників до перспективних потреб ринку праці. Основними принципами випереджаючої освіти є такі: інтегративність, варіативність, регіоналізація, креативність, акмеологічність, фундаменталізація, безперервність, раціональність. Випереджаюча освіта, з урахуванням свого призначення, має базуватись на методах, що спрямовані збудження пізнавальної активності того, хто навчається, розвиток розумових здібностей особистості, навичок та потреби самонавчання. До таких методів відносять проблемне навчання, інтерактивні методи, розвивальне навчання та метод проектів.

Ключові слова: проблемне навчання, інтерактивні методи, розвивальне навчання, метод проектів.

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Introduction

The time of birth of the term «sustainable development» in its modern sense is considered 1987. It was then that the phrase «sustainable development» was voiced in the report «Our Common Future» by the International Commission on Environment and Development (1987). However, the ideological predecessors of «sustainable development» can be considered the concept of «noosphere» of our compatriot VI Vernadsky (Grinyov, 2017; Zebro, 2017), reports of the Club of Rome (in particular, «The Limits to Growth» (Meadows et al., 2004).

The concept of sustainable development is a kind of «anti-crisis plan», the emergence of which is due to the awareness of leading scientists, politicians that the existing model of development (economic, political, etc.) of humanity began to threaten the very existence of humanity on Earth. Furthermore, the «cult of mindless consumption» encouraged by large corporations, the desire of the latter to make extra profits at any cost (including through predatory use of the environment), waste clutter, unnatural disasters, have virtually exhausted natural resources for self-recovery.

The central postulate of the concept of sustainable development is the statement that sustainable development should meet today's social needs but not jeopardize the ability of our descendants to meet their own needs (Lyashuk, 2020; Haustova & Omarov, 2018; Zagorsky & Borschuk, 2020).

On September 30, 2019, the Decree of the President of Ukraine, «On the Sustainable Development Goals of Ukraine until 2030» (2019) was signed. According to the Presidential Decree, the UN-proclaimed global goals of sustainable development until 2030 (2015) and the results of their adaptation to the specifics of Ukraine's development, set out in the National Report «Sustainable Development Goals: Ukraine» (2017) are supported. The 17 goals set out in the Decree of the President of Ukraine «are guidelines for developing draft forecast and program documents, draft regulations to ensure the balance of economic, social and environmental dimensions of sustainable development of Ukraine.»

Indeed, a unique role in implementing the concept of sustainable development is given to education, which should be the foundation for the harmonious development of economic, social spheres and the natural environment (Kovaleva, 2007). At the same time, building a system of quality education and ensuring broad access to it is one of the 17 goals of sustainable development. Thus, the development of the educational sphere, bringing it to a qualitatively new level, is one of the results and means of achieving sustainable development.

Various aspects of sustainable development are covered in the works of foreign authors L. R.

Brown (2003), J. Dixon (2003). The research of domestic scientists is devoted to the problem of reforming education in the interests of sustainable development (Levkivsky, 2007; Karpan, 2012; Root, 2018). Fundamental principles of education in the context of sustainable development were developed by A. Azizov and Akinshina (2009), G. Nepeina (2009), O. Khmelevskaya (2018). Peculiarities of the implementation of the principles of sustainable development in school education were studied by O. Pometun (2015), A. Mruz et al. (2020). The main goals of education in the interests of sustainable development were considered by L. Agranovich (2017), L. Bazavlutska (2018), A. Subetto (2010). Methodological aspects of advancing education are covered in the study of O. Vysotska (2012), O. Komarova (2011), A. Ursula (2012).

However, the issue of implementing the concept of advancing education in the interests of sustainable development in higher education remains insufficiently developed.

The article aims to analyze the main trends of sustainable development in Ukraine, generalize modern research on the implementation of the concept of «advancing education» in the interests of sustainable development, and identify effective methods of «advancing education» in higher education.

Methods and Materials

In order to solve the tasks set in our work, we have grown the following research methods: analysis of scientific and pedagogical sources on the research problem; generalization of advanced pedagogical experience in the field of advancing education in the interests of sustainable development.

Research

In researching the theoretical and methodological foundations of advancing education for sustainable development, O. Vysotska (2015) states that there are four models of education in Ukrainian society. Such models, according to the researcher, are:

- the model of «advanced education», which uses innovative educational technologies aimed at restructuring the educational sphere in the interests of sustainable development;
- the model of «catching up education», which implements the principles, content, forms, and methods of education, which are not yet sufficiently implemented in Ukraine, but are already actively used in leading countries;
- the model of «inhibitory education», i.e., education based on the already irrelevant needs and demands of society, the use of outdated pedagogical technologies;
- a model of «imitative education», which only monkeys belonging to the «advanced» or «catching up» models of education by unsystematically copying certain elements of the latter.

We follow the approach according to which advancing education should be the foundation of the sustainable development of society. The concept of advancing education is based on the idea that education should not meet the current requirements of society but the requirements that will be put forward in the future.

Thus, the level of participants in the production process must exceed the level of development of production itself. Thus, education should drive production and not just ensure its functioning (Novikov, 2002).

Achieving this goal implies a reorientation of the domestic education system to the long-term needs of socio-economic development. Considering the main trends in economic development, improving the quality of education, forming in students understanding the need and motivation to constantly update their knowledge (Komarova, 2011).

Note that the analysis of modern research on the problem of advancing education shows the existence of different interpretations of the term «advanced education» (Kitaygorodsky, 2007). Within the first approach, the term «advanced learning» is used. Implement «advanced learning» by presenting the general basics of the program material earlier than required by the standard plan. This construction of the educational process provides the teacher with more opportunities for a differentiated and individual approach to students and promotes more in-depth study of educational material.

According to another approach, «advanced» is the professional training of employees, which occurs in connection with the planned reorganization, reorganization, reduction of enterprises, organizations, or their structural units. In this case, the purpose of «advanced training» is to retrain employees, gain a more competitive and demand in labor market specialty. It is true that such measures positively affect the moral and psychological climate in the workforce, reducing social tensions in society.

We share the position of the approach representatives, according to which advancing education is considered future-oriented, on the conditions of professional activity in which the specialist must act after graduation and shortly.

Thus, the goals of advanced advancing for sustainable development should be the development of highly educated, creative individuals (rather than narrow specialists) capable of updating professional knowledge; introduction of modern pedagogical technologies that allow increasing the adaptation of graduates to the long-term needs of the labor market (Komarova, 2011).

The main principles that determine the requirements for the content, forms, and methods of advancing education according to researchers (Ainutdinova, 2010; Komarova, 2011) are the following:

- integrativity in the broadest sense, means the integration of educational institutions with production and research units, forms and methods, didactic concepts, disciplines, theory, and practice;
- variability, i.e. instantaneous response to social and economic changes, which is expressed in the constant updating of forms, methods, and content of education;
- regionalization, which means the orientation of educational institutions to the long-term development needs of a particular region and labor market;
- creativity, which determines the focus of the didactic process on the development of personality, capable of creative rather than reproductive or algorithmic activities, solving problems in conditions of uncertainty, generating new ideas;
- acmeological, which consists in building an individual trajectory of development of the learner, purposeful influence on the inclinations and abilities of the individual, stimulating the subjectivity of the student;
- fundamentalization, which implies the deepening of general scientific, general and professional training as the foundation of general and professional culture of the specialist;
- continuity of «lifelong learning», i.e. the formation of students' motivation for continuous professional self-improvement, the desire to update knowledge and skills;
- rationality, which means the ability to make decisions and act on the basis of appropriate logical norms in the process of achieving goals.

Indeed, the implementation of the concept of advancing education and the practical implementation of the above principles determines the use of appropriate pedagogical technologies, forms, and teaching methods.

Advancing education, taking into account its purpose, should be based on methods aimed at stimulating the cognitive activity of the learner, the development of mental abilities, skills, and needs of self-learning (Komarova, 2011).

Such methods include problem-based learning, interactive methods, developmental learning, and project method (Ainutdinova, 2010; Komarova, 2011; Nikolaev, 2015).

Unlike traditional, problem-based learning is not based on the message of the finished material; the student must acquire knowledge and skills to solve educational problems.

One of the first recorded variants of such training in history is the Socratic conversation. First, Socrates tried to question the interlocutor's knowledge to prove that the latter can not be considered knowledge, and since then, he knows

nothing. Then the great Greek used the inductive method: students moved on to concepts and their definitions from individual ideas. Finally, with the help of guiding questions in individual phenomena, highlighted the essential, derived a general concept, essence, and features, this is because the purpose of the teacher, thus, is to help the thought that is already in the student's mind to be born, hence the comparison of the teacher's art with the skill of midwifery (Yavorskaya, 2004). Recognizing the correctness of the great philosopher, we consider Socratic conversation appropriate in advanced education. After all, the main purpose of a Socratic conversation is not to obtain «ready» knowledge. Instead, it aims not to develop independent, analytical, and dialectical thinking but to gain scientific research experience.

The Socratic conversation was further developed in a heuristic conversation (dialogue). The heuristic conversation takes place in asking the teacher a series of interrelated questions, each of which stems from each other, to answer which students must gain current knowledge and experience. Each of the questions seems to be a little independent problem, but together they lead to the solution of the main problem posed by the teacher.

The use of heuristic dialogue adds to the educational process features of scientific research and contributes to its participants' psychological emancipation. Heuristic dialogue also allows deepening previously acquired knowledge to reconcile it with many close or even alternative points of view to integrate connections and relationships between individual subjects into a holistic system. Many possible solutions are built and tested during the heuristic dialogue in situations that do not provide an unambiguous and definitive answer.

The application of heuristic dialogue in the educational process allows the formation of a specific algorithm with successive stages. The task of the motivational stage is to update the student's existing knowledge to encourage him to develop new information. The content of the information stage is the direct acquaintance of the learner with the new information, which allows it to serve as a basis for its assessment and construction of its new knowledge. The communication phase involves the exchange of views on the issues under study. The teacher needs to participate in this process as an equal partner (not a leader or observer), who is very interested in communication. The optimal organization of heuristic dialogue involves the emergence of a problematic situation in the dialogical communication of learners. Solving such problems is more motivated and meaningful for students than setting the problem from the outside – the teacher. The teacher's function in such communication is to coordinate the actions of students, to direct the dialogue in the plane of the problem under discussion. The final is the reflexive stage, during which there is an introspection of

cognitive activity on the way to new knowledge and the results obtained in its process.

Other problem-solving methods that best meet the objectives of advancing education are the case-study method or the situation-specific analysis method. Learning is done by solving specific (usually professionally-oriented) tasks (cases). Then, students should thoroughly analyze the case and suggest the best solution by working together.

There are two leading schools of case study, Harvard and Manchester. Harvard University is considered a pioneer in applying the case method in higher education. The difference between the schools is, in particular, that Harvard Schools insist that in the process of solving the case, students must find the only best solution. From the point of view of the representatives of the Manchester school, students should offer several options for solving the case. Harvard cases tend to be larger (20-25 pages), often added to 10 pages of illustrations. The cases of Manchester school representatives are usually almost twice as small (Ridkodubskaya, 2017).

Especially valuable in the context of advancing education is that in solving cases is the formation of students' skills of independent problem solving; gain experience in the practical application of theoretical knowledge; the emotional sphere of the personality is activated.

Among other teaching methods that are most characteristic of advancing education «are called interactive methods. For a long time, the term «active teaching methods» was used in pedagogy. These included teaching methods aimed at enhancing the cognitive activity of students, which are transformed from objects into subjects of study.

Interactive methods can be considered as further development of activity, the main emphasis is shifted to effective interaction, dialogue between teacher and student (Tomashevskaya, 2017; Vyshkivskaya & Shikirinskaya, (2021). According to such approaches, interactive methods of advancing education include (Komarova, 2011) training, role, and business games.

An important place in the implementation of advancing education is occupied by the technology of developmental learning, which is aimed at developing independent analytical thinking, creative and adaptive abilities. The rapid development of information technology leads to the leveling of education based on memorizing concepts. Skills acquired in the process of professional training also quickly become obsolete. We need a specialist who understands the essence of phenomena, their relationships, can observe, analyze, identify patterns and draw conclusions. Only such a foundation provides prospects to compete with the growing capabilities of artificial intelligence, helps to learn new technologies, processes, and devices.

It is advisable to use the project method in the interests of advanced education. According

to S.O. Sysoeva (2002), in the project activities, students learn to adapt to the rapidly changing living conditions of post-industrial society.

Students' implementation of educational projects provides opportunities for independent creative work, which is organically combined with group work. In our opinion, the most significant advantage of project-based learning is its significant potential for transferring students' theoretical knowledge into practice. In addition, the project method has a pronounced pragmatic and applied focus on achieving a specific result; contributes to the formation of cognitive motivation of learners.

Project training demonstrates high efficiency when working with interdisciplinary material. After all, the knowledge and skills necessary for the project are acquired during the study of various subjects. In a sense, project implementation may even run counter to the principle of objectivity. Therefore, we must ensure that project activities complement the traditional subject design of the educational process. Project-based learning should integrate and link competencies formed during the study of different subjects.

Discussion and Conclusion

Today, the need for immediate transformation of some spheres of life has become more urgent than ever before. After all, the lack of such a transformation threatens humanity's very existence. Almost the only alternative is the Concept of Sustainable Development, which is currently being implemented by the world community. However, our country also does not stand aside. One of the essential steps in this process is implementing advancing education in sustainable development. The purpose of advancing education in sustainable development is to prevent negative processes occurring in the economic, environmental, and social spheres; formation of a socially active, environmentally responsible, and knowledgeable personality; prepared for life in a significantly changing world.

Advancing education in the interests of sustainable development should be based on the principles of integrativity, variability, regionalization, creativity, acmeology, fundamentalization, continuity, and rationality.

Given the objectives and purpose of advanced education as its primary methods, we note problem-based learning, interactive methods, developmental learning, and the project method.

We consider the development of methodological support for advancing education to be a promising area of further research, considering the direction of training and specialty of the specialist.

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