



DOI: 10.54919/physics/56.2024.28pgc4

Pedagogical management to improve environmental education in the context of sustainable development

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Abstract

Relevance. The relevance of the study in this research is based on the problems of severe ecological imbalance in the world, which has caused the necessity to update environmental education in the conditions of sustainable development of the educational process in higher education.

Purpose. The purpose of this study is to develop a teaching management model for successful eco-oriented learning in higher education students.

Methodology. The leading method for investigating this problem is testing using the Sh. Schwartz "Schwartz Values Survey" to investigate personal values based on the identification of essential components of society and personality, considering various problems through existing self-assessments and behavioural traits.

Results. The study provides a model of teaching management for the successful teaching of various disciplines within the framework of ecologically-oriented education of higher education students, based on which the teachers themselves should have developed a culture of ecological conservation and a model of analysis of any action with its impact on the field of ecology and with the methodological prerequisites for considering practical examples of ecological conservation at all levels of various disciplines.

Conclusions. The established model of teaching management of ecologically-oriented education of higher education students allows to establish conditions of sustainable development for development of high ecological culture with value

Suggested Citation:

Sandibekova A, Dlimbetova G, Abenova S, Kainbaeva L, Akimish D. Pedagogical management to improve environmental education in the context of sustainable development. *Sci Herald Uzhhorod Univ Ser Phys.* 2024;(56):284-292. DOI: 10.54919/physics/56.2024.28pgc4

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norms of careful attitude to the environment and all levels of nature, to understand on the deep cognitive-activational level the model of ecological conservation in practice in any of their future activities, both personal and professional, which will allow them to conduct any activity within the framework of ecological and environmental restoration and conservation, which is of practical relevance to the education system and the welfare of society.

Keywords: ecological conservation method, teaching system, moral values, eco-oriented education.

Introduction

Education at the current stage should be modified based on the relevance of necessary approaches dictated by what is happening in the world and, at the moment, one of the major values is environmental values to restore and further preserve the ecology on the planet, and the entire ecological balance, given the recent trends in the world regarding natural disasters, cataclysms that endanger the life of humanity, which at this stage has already taken many lives at all levels of the biosphere, including people [1]. Nature is actively responding to climate change and its obvious imbalance and is increasingly causing the emergence of various natural phenomena that are destructive and result in social and global disasters, significantly worsening the health and quality of life in many countries and regions [2]. Current climate-changing trends are even more life-threatening and the rate at which these processes are proceeding is alarming, and with annual fires around the world destroying or have now destroyed more than half the planet's forests, habitats for ecological balance, and natural habitats for wildlife, ecological destruction is on the verge of global disaster, which has already caused the extinction of many wildlife inhabitants and the near extinction of the animal world in general, compared to the statistics of past centuries, and has also significantly influenced human life, given that its level of health has become very low, and the term ecological diseases have come into use, to which most diseases of the modern world have come to refer, due to their development from the etiological cause of the ecological problems [3].

Thus, the existing eco-oriented education at this stage acquires one of the main functions and an essential component in modern education, which should be introduced at all levels of all disciplines studied to develop in students a culture of eco-sustainability based on the inherent interconnection of a set of personal and professional qualities of a person and such a system under consideration is observed as a connection between the living environment in conditions of ecological culture and the education system, in which the learner becomes the result of a multi-level, dynamic process, reflecting a symptom complex of various manifestations from behavioural to skill-based reactions, attributes and traits within the framework of eco-sustainability [4]. Notably, that learners are influenced by the teaching staff, on whom the correct perception of the problem in question depends, the personal example of the teacher himself is also essential, which for the learner is frequently a model of further behaviour and a factor of trust in what the teacher is trying to present, and thus through a combination of many factors the learner largely becomes a reflection of the teacher's perception model and acquires his world-view fundamentals, and it is especially crucial for teachers themselves to have an ecological culture, which is a prerequisite for the success of their future work [5].

The improvement of eco-oriented education should have its own sustainable and successful development to introduce its benefits into all spheres of life to support sustainable development in society [6].

Materials and Methods

This study was conducted using the method of diagnostic testing according to the Sh. Schwartz's "Schwartz value survey" examines the personal values of the researched based on the definition of what is happening in society, its important components and personal self-realisation, considering the existing various problem situations in life with the manifestation of themselves as individuals through the available self-objectives and the features of their behaviour, based on personal priorities and values. The method described allows identifying the level of value motivation and, based on the values identified, their relationship with respect for nature, ecology and life.

The Schwartz test has two parts, in which the respondent has to assess their attitudes towards each of the 57 values presented, allowing them to determine their aspirations and beliefs based on internal values, which together influence behavioural and emotional responses, from which the respondent essentially prefers to act and conclude, which in turn will influence people around them and the world around them through their domestic, personal and professional life activities. The level of sincerity in the answers is compared according to the answers in the second part of the test, which presents about 40 descriptions with 10 basic types of values, allowing establishing an in-depth description of the person based on their motivations on the level of world perception and holistic attitude towards it with the prediction of possible activities within the framework of beneficial influence on the world, life, both human and surrounding world for restoration and conservation of ecology, natural balance. This test identifies the relationship between parameters such as attitudes towards one's power and factors regarding safety and favourable attitudes towards people and the world around, which one will consider on the way to reaching one's purposes, both at the level of personal pleasure and life stimulation to provide it with the most emotional colouring, and determining personal traits such as understanding and patience, and awareness of personal protection of the welfare of all people and nature, and the ability to expend personal energy for this purpose, and level of control over one's behaviour within the framework of not harming others in general, with consideration given to, and representatives of, the surrounding world, plant and animal life.

So when the conditions described above were performed, ready-made keys were used to calculate the diagnostic test data, which made it possible to determine the level of value motivation considering personal stimulation, pleasure, achievement, kindness, safety, comfort, traditions and when calculating the overall

research results, a standard method of mathematical counting and graphical representation of the results was used.

The teaching experiment was conducted at the L.N. Gumilyov Eurasian National University in the Republic of Kazakhstan. The diagnostic test was conducted among 94 3rd and 4th-year university students, aged from 20 to 26. The study of this issue was conducted in three stages, and the first stage involved a theoretical analysis of the existing scientific, research and methodological literature on the establishment of teaching management for the sustainable development of environmental education, and identified the issue, purpose, research methods and work plan. In the second stage, respondents were tested to identify the parameters that influence the success of environmental education, and experimental work was conducted to analyse the results and conclude. A third phase, which refined the conclusions and systematised the results, allowed concluding this work.

Results

Based on an analytically systematic approach, a detailed analysis of the data obtained on the test results of the chosen method for students studying in various specialties in higher education, considering the personality indicators of the respondents at the level of values, was conducted and based on their regular motivations, an analysis of their personality traits and features was assessed according to a set of their psychological qualities influencing social, natural, social relations, intellectual, behavioural and emotional features according to the area of their influence on eco-oriented education as part of successful development with the application, to which specific criteria and parameters of the teaching system will be required to organise knowledge for the ecological culture establishment, which in fact is one of the essential components of the ecologically-oriented education taught based on the main significant methodological bases of teaching, officially prescribed at the level of educational concepts [7]. Special attention has been paid to this aspect, as a developed environmental culture is one of the main indicators that will guide and coordinate actions and behavioural reactions both as an individual and as a future professional in their professional career towards all things in life and the world.

The professional path of any specialist can have various events and purposes, and the professional activity itself is a very multi-dimensional and multi-level system, and the result of the action, in which the features of personal qualities, properties, special, systemic reproduction of personal emotions and associations that motivate a person to activity about the outside world in general, and the knowledge of personality should be based on a detailed analysis of its values, personal aspirations, ideas about the future, and be considered as a set of unique, distinctive, highly individual qualities that constitute the inner world of a person with an established worldview [8]. Notably, that the worldview is established immediately after birth by the example a person observes and based on the conditions a person lives in. Therefore, the emphasis on nurturing a respectful attitude towards nature and ecology should start at an early age, be in parallel with upbringing with the rest of the necessary components, and appear in

all the information field a person comes into contact with, beginning from the level of toys, videos and many other things, but everything, and it should have an image of ecological conservation and respect for all living things, which are essentially the main components of ecological balance, and already in further education these parameters should be reinforced and deepened in each discipline studied, using all the examples and objectives encountered by the learner [9].

The training at a higher school will already enable, based on the established ecological conservation world perception and behaviour, to continue training in the field of vital ecological conservation parameters in teaching any professional knowledge to develop specialists of high professional level with actions within the profession to restore and conserve natural factors concerning the entire living world, including both the plant and animal worlds and other components of the biosphere to maintain an ecological norm of balance on the planet, on which the welfare of human life itself, and life in general, is now particularly depending [10]. Therefore, the analysis of the results of work on this eco-oriented basis in education, as the main line along with health promotion, included the analysis of all components of the content features fully covering the multifaceted aspects of the personality of the researcher, and these components in interaction reveal the organisation of the process of educational management establishment, and the organisation of teaching including methodological prerequisites, and parameters of the teacher, which will be reflected in the analysis of the results of work on this eco-oriented basis in education, as the main line along with health promotion, in the following.

The result of the study under consideration is understood as a developed model of teaching management for the successful organisation of eco-oriented education in the conditions of successful development within the framework of conducting classes at all levels in the conditions of ecological culture establishment. Thus, this research work with the established described model was implemented in the educational process in several stages, which included the definition of value criteria in the study subjects reflecting in their motivational and action processes at the level of life activity and towards future professional work, teaching observation and clarification of the necessary in the respondents and the final statistical processing of the obtained results. The following stage was the development and implementation of a successful teaching management model for eco-oriented education in higher education for its subsequent implementation in the field of practical education.

The study covered 94 students, and the results indicated that the value motivations towards respecting nature have a very low score, given that the results indicate that most students think about personal welfare, independent of the price of health, ecology and the welfare of those around them, and the natural world in general. Thus, the following value orientations were identified in the studied students: Power (62; 66%), personal ambition (67; 71%), devotion to traditions raised in the family (91; 97%), the ability to restrain their desires when they factor in harming others (24; 25.5%), personal pleasure realisation (85; 90.4%), stimulation facts of feeling their life (52; 55%),

independence (67; 71%), kindness (28; 30%), the safety of their life to others and the world around them (24; 25.5%), as can be seen in Figure 1.

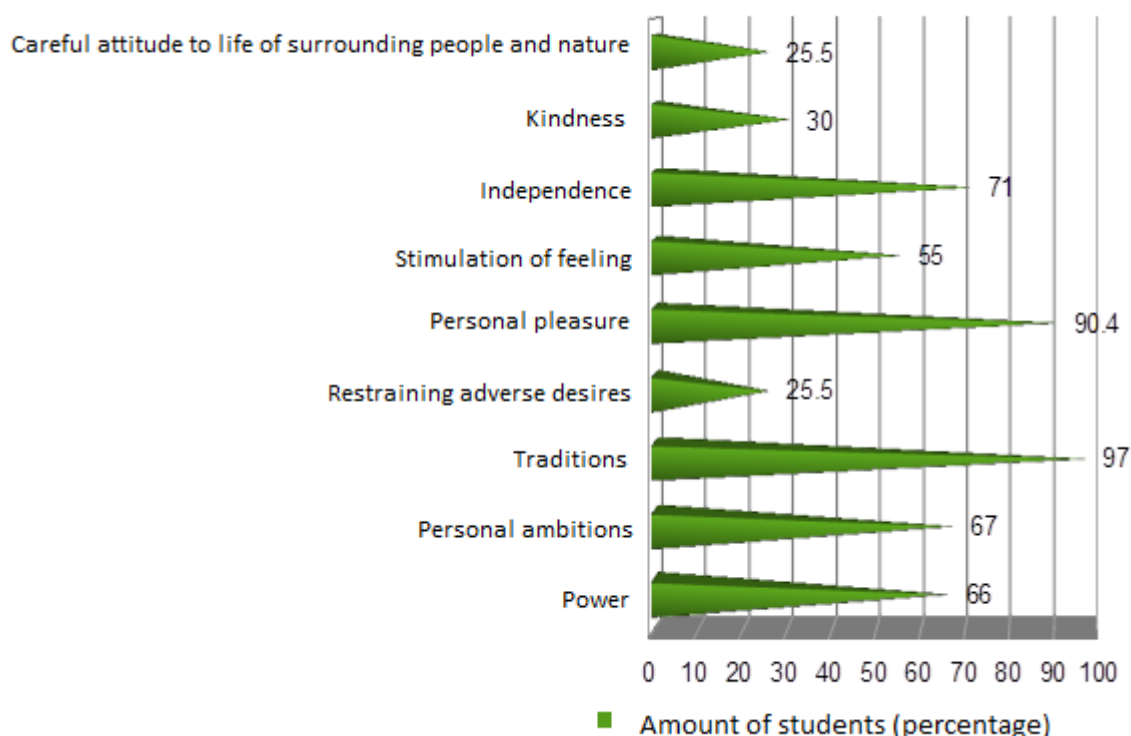
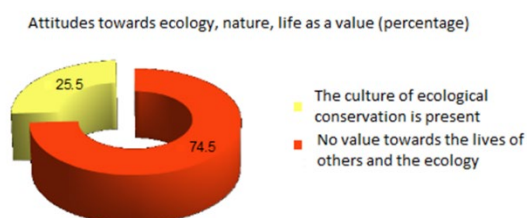


Figure 1. Distribution of students according to the presence of values in their lives after survey analysis

Analysis of the data allowed saying that the majority of respondents do not possess qualities that would be oriented towards environmental conservation, most of them prefer to satisfy their interests, need stimulating facts that arouse in them the emotions of the urgency of life and strive for power. Only less than 1/3 of those surveyed understand the significance of ecological conservation and respect for the lives of others and can restrain their emotions and desires if their realisation would cause harm to the environment or people. Figure 2 describes the establishment of attitudes towards ecological conservation and restoration in the world, which indicates that most students (74.5%) lack even the prerequisites of this at the level of ecological conservation worldview.



Based on the obtained data, the research conditions were implemented to develop a model for successful teaching management of eco-oriented education in various disciplines for higher education, which required

methodological development of the data obtained in the course of the study. A step-by-step analysis of the results allowed identifying the main components of this process and identifying the main ones based on the establishment of a culture of environmental conservation among students, which is the main objective of environmental education that educates students to respect nature and understand the significance of ecology, to have active behaviour for its preservation and restoration, and considering the essential values necessary to develop a culture of ecological stewardship, establishing through the teaching and learning process a form of understanding of the ecology model and the ecosystem itself, that everything in the world is interconnected and ecological balance depends on the welfare of each component in the biosphere, which includes humans and all-natural factors, flora and fauna, with the understanding that any human action can impact on the welfare of an ecosystem.

Considering all details of the research and the mentioned above, the model of teaching management of eco-oriented teaching of students of higher schools with the development of value orientations on careful attitude to life of surrounding people and nature considering all representatives of fauna, including value-motivational, cognitive-informational and modelling of constructive eco-cognitive professional activity based on which future specialists will have the level of ecological culture, has been developed, which allows the future specialist in any field to establish a high culture of aesthetic perception of the world and life in general for future favourable

interaction within both personal and professional activities for the development of the welfare of society. Thus, the parameters were defined and a model of teaching management was developed for the successful teaching of various disciplines within the framework of eco-oriented education of higher education students, based on which the teachers themselves should have an established culture of eco-saving by leading by example, and during the training analyse everything that exists within the framework of ecological restoration and respect for nature with the model of analysis of any action, and its impact on the field of ecology and methodological preconditions for consideration.

Then, in the control phase of the study, the data was identified within the dynamics, considering the results obtained in the re-testing of students after the testing of this learning system in practice, which identified an improved trend of understanding the significance of ecological restoration and conservation, and the significance of aligning one's life with a careful, conserved attitude towards the natural life of the surrounding world to support the ecological balance on the planet. The retesting identified that the parameters of the ability to restrain one's desires to the detriment of others and the world increased to 87% (82), understanding of the significance of respect for the environment increased to 94.6% (89), as indicated in Figure 3.

Dynamics of attitudes towards ecology, nature, life as a value (in percentages)

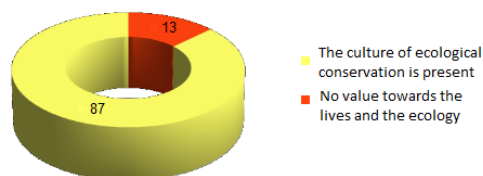


Figure 3. Students' distribution based on the dynamics of the study in the control phase of the experiment

In addition, teaching observation and a survey identified that the majority of students decided to rethink their lives and were willing to learn about the possibility of their professional activities within the framework of eco-sustainability (100%), which makes the developed model of teaching management successful in the context of sustainable development (Figure 4).

Attitudes towards ecological conservation education (percentage)

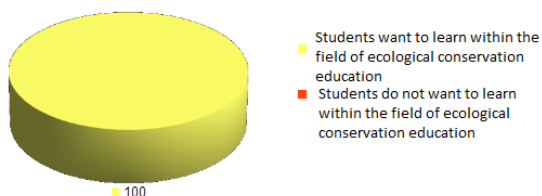


Figure 4. Students' attitudes towards environmental education in the control phase of the experiment

This study ensured its accuracy as the features and data parameters of the test and the developed aspects of the teaching management model were compared correctly in

the study, and the analysis of the results made it possible to determine that the developed model can successfully improve the teaching and learning process in higher education.

Discussion

Modern education has several criteria that are essential to consider when developing new methodological and educational programmes, and one of its conditions is a factor in its successful development [11]. In turn, the significance of the introduction into the sphere of practical education no longer raises doubts about the area of environmental orientation, which is vital for the preservation of life, including humanity, given the natural disasters, the number of which is currently increasing at a great rate and leads to the destruction of life on many levels, and greatly degrade the quality of human life destroying their homes, cultural sites, natural assets, significantly reducing social activity, and subsistence of people, which is explained by the environmental deterioration of the planet and the disruption of the ecological balance caused by the professional activities of many areas of people, as confirmed and repeatedly stated before and now by scientists and researchers all over the world [12; 13].

Thus, it logically follows the necessity of official and compulsory introduction of the eco-oriented education into the environment of practical teaching and educational activities at all levels, and compulsory in high schools about sustainable development for education and training personnel with an ecological culture, who would focus their activities on the development of the natural environment of fauna and nature, which are obligatory parameters for restoration of ecology, and reviewing, and establish new products of engineering and technological progress, both through scientific research and discoveries, and further with their impact on the production of new facilities that would consider the impact factors of general and private production on the natural components, such as air, water and many others, and produce everything necessary for a high-quality and prosperous human life at a high ecological level with parameters designed to restore and preserve nature, and the ecosystem in general with the support of a natural and healthy ecological balance in the biosphere [14-16].

Sustainable development has several principles, such as purpose-oriented, dynamic, holistic, and is environmentally-oriented education that corresponds to these principles, as preservation of the environment is initially a purpose at the worldwide level of all states, which is defined at the level of laws [17-18]. Ecologically-oriented education can only be conducted in the context of a holistic presentation of knowledge, allowing the understanding of all the interconnections that exist in the world to support the ecosystem at its natural health level, because only this health parameter allows speaking about the norm of all the relationships that support a harmonious balance with the construction of a long-term health path, as it is the support and preservation of natural and harmonious parameters that allow health to be preserved, and any intervention from outside introduces something else into it that somehow disrupts this balance, and over time this is exacerbated and elements of disharmony and disturbance

begin to emerge, which is reflected in the deterioration of ecology, and gradually only gets worse as time passes again, and already reflected more obviously, as can be observed at the moment based on a catastrophic ecology that does not allow for the smooth flow of life, due to the increasing occurrence of natural cataclysms, which are already unforeseeable and of enormous destructive proportions [19; 20].

Thus, the implementation of eco-centred education is of central significance and covers all the necessary parameters, while teaching management refers to the teacher's system of teaching organisation, which includes both their training and the orientation in which they teach knowledge, methods and techniques of teaching that are designed to increase the success and efficiency of students' cognitive development and their acquisition of skills and competencies that they can successfully apply [21; 22].

The model developed implies that, initially, the teacher has an established culture of eco-sustainability and understands the significance of presenting any information within the framework of a constructive, respectful attitude towards nature and ecology, and life in general, teaching and explaining the significance of conservation behaviour towards their health, and towards the lives of others, society and the surrounding world, flora and fauna, which are among the most essential natural environments for supporting the ecology in general. Thus, any teacher has to convey the significance of such eco-saving behaviour by their example and establish conditions on the level of theory or practice of eco-saving either by presenting the subject or by conducting a practical lesson [23; 24].

The following crucial stage in the implementation of the education in question is the analysis of already existing methods and knowledge within the various subjects in all fields of study to identify their impact on ecology and the ecological balance in the world and such analysis should be detailed and consider already introduced and studied knowledge in connection with the level of catalysts, and natural phenomena, and other existing factors, and proceed from the attitude towards the norm, the ideal health of nature, in other words, ecology, and leave only those data that correspond to this high level and parameters [25; 26]. At the same time, it is necessary to study scientific and practical achievements at the world level, which may not yet be officially published and put into practice, but they exist and have a level of environmental orientation within the restoration and preservation of the planet's ecology, and when such environmental-oriented technologies are identified, they should be introduced into the practical education for their study, so that in future students as future specialists could use them in practice to improve and restore the ecological balance, and their implementation in teaching will allow, at any level of teaching, the establishment of models for practical examples of production and eco-sustainable professional activity, and people's livelihoods [27-29].

This model should also include the area of scientific research, which in any sphere should conduct its research only to restore and preserve health and nature, its ecological balance, and the fields and results of research should have a profound sense of preservation of ecological balance in the norm, and most significantly with consideration of remote preconditions, and consequences

for life on the planet in the framework of ecological conservation and their activities should be designed to improve life in general, people, nature, representatives of the flora, and fauna, that will re-establish conditions for the restoration of ecology and such action must be established at absolutely all levels and in all areas of professional spheres and spheres of life activities, where it is essential to observe the conditions for the preservation of the natural health of nature, ecology and all members, living objects of the biosphere [30; 31]. The approach under consideration in the teaching management system makes it possible to say that a field of education with an ecologically-oriented approach will be established, which will train young professionals and allow, within the framework of retraining and improvement of professional high-skilled knowledge, these ecological values to be presented, also to existing professionals in various fields, so that they can reconfigure their professional activities, and implement technologies and facilities at the ecological conservation level into practical production and livelihoods at the working, and administrative, levels [32; 33].

All of the above will establish conditions for the restoration of nature and ensure the prosperity of the welfare of society and, thus, the implemented model of teaching management, which will allow at all levels of education to implement changes with the condition of their eco-orientation will establish conditions to ensure that students develop a culture of psychological eco-saving, which has the most significant value in the modern world to restore the ecosystem, and its associated parameters [34; 35].

Thus, the developed model of teaching management within the framework of ecologically-oriented education proved to be at a high level within the study of various subjects and disciplines in higher education and can be used in practice to develop a valuable motivation for the restoration and preservation of ecology and to acquire practical skills in this field during the teaching and learning process at the level of practical education.

Conclusions

It has been established that the introduction of eco-oriented education will solve the problem of training personnel for the development and implementation of new technologies in various spheres of life, professional production, and other works to establish conditions for the restoration and preservation of ecology, and ecological balance in the world, which is essential for the development of prosperous life in general. The developed teaching management model, which allows establishing conditions for educational work in all fields of education in the field of teaching knowledge and teaching practical skills and abilities in various disciplines and subjects with the application of eco-oriented teaching, including students of higher schools, where teachers themselves should initially have developed culture of eco-sustainability, and establish by example in the teaching process any condition using the model of analysis of any action of the pupils within the framework of their life or professional activity regarding the impact of the result obtained on the sphere of ecology in its holistic representation, and understanding as a single world planet with multiple natural factors based on, as the

nearest one, and distant ones on the ecological balance of consequences, considering the future time dimension in which the following generations are to live, who must inherit the ecology at the level of its restoration to improve their future lives, the methodological prerequisites for the consideration of practical examples of eco-saving at all levels of various disciplines in any of the examples, which in general will allow students to develop an environmental culture to establish in the future their careful attitude towards the environment, nature, understand at a deep cognitive-activational level the model of eco-saving, and understand the significance of applying it in practice in any of their future activities, which will enable them to conduct any process of life within the framework of ecological and environmental restoration and conservation, which is of

practical relevance to the education system and the welfare of society.

The materials in this study are useful for educators, teachers, methodologists and other educators and can be applied in practice, which will contribute to solving the significant objectives of education and ecological restoration.

Acknowledgements

None.

Conflict of Interest

None.

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Педагогічний менеджмент у вдосконаленні екологічної освіти в умовах сталого розвитку

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Анотація

Актуальність. Актуальність дослідження у цій статті зумовлена проблемами серйозного порушення екологічного балансу у світі, що призвело до необхідності актуалізації екологічної освіти в умовах сталого розвитку навчально-виховного процесу у вищій освіті.

Мета. Мета статті полягає у формуванні моделі педагогічного менеджменту успішного екологічно орієнтованого навчання у студентів вищих навчальних закладів.

Методологія. Провідним методом для дослідження цієї проблеми є тестування за методом Ш. Шварца «Ціннісний опитувальник Шварца» для дослідження особистісних цінностей виходячи з визначення важливих складових суспільства та особистості з урахуванням різних проблем за рахунок наявних самозадач та особливостей поведінки.

Результати. У дослідженні запропоновано модель педагогічного менеджменту для успішного викладання різних дисциплін у рамках екологічно орієнтованої освіти студентів вищих навчальних закладів, на основі якої у самих викладачів має бути вироблена культура збереження довкілля та модель аналізу будь-яких дій з їх впливом на сферу екології та з методологічними передумовами для розгляду практичних прикладів екологічного збереження на всіх рівнях різних дисциплін.

Висновки. Створена модель педагогічного менеджменту еколого-орієнтованої освіти студентів вищих навчальних закладів дозволяє створити умови сталого розвитку для формування високої екологічної культури з ціннісними нормами бережливого ставлення до навколишнього середовища та всіх рівнів природи, усвідомити на глибинному пізнавально-активаційному рівні модель екологічного збереження на практиці в будь-якій їхній майбутній діяльності, як особистій, так і професійній, яка дозволить їм вести будь-яку діяльність у рамках екологічного відновлення та збереження, що має практичне значення для системи освіти та добробуту суспільства.

Ключові слова: метод екологозбереження, педагогічна система, моральні цінності, екологоорієнтована освіта.