The Use Of Electronic Educational Resources In Education For Sustainable Development

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Abstract: The present time is characterized by a tense ecological situation on our planet. This situation is associated with pollution of the natural environment, depletion of natural resources. In addition, it is also associated with outbreaks of epidemics, including COVID-19. All these problems threaten the existence of life on Earth. It is mandatory to have this knowledge and understanding of the importance of education for sustainable development at all stages of environmental education from school to higher education. This will make it possible to form an eco-friendly person as a carrier of ecological culture. She will be able to independently influence the ecological situation in her locality and the world as a whole. In this regard, education for sustainable development among students of pedagogical universities is becoming a priority in pedagogical theory and practice. The article provides an analysis of environmental content courses located on the platforms "Open Education", Coursera, Stepik.

.1 INTRODUCTION

Humanity has entered a world of complex interdependencies and global environmental problems. The rapid and increasing human intervention in natural communities has caused a real threat to the existence of the environment around us. This greatly exacerbates environmental problems.

The growing modern environmental problems are caused by the influence of human activity on the surrounding world. The influence is so limited to such an extent that human intervention in nature can no longer be chaotic and limitless. This intervention should be regulated. Otherwise civilization will face the threat of an ecological catastrophe.

The solution of environmental problems depends to a great extent on the formation of education for sustainable development. Whereby is based primarily on environmental education and the education of students. It gives knowledge of the laws of nature and an understanding of the interrelationship of natural phenomena. In addition, it allows you to be able to anticipate and assess the consequences of interference in the natural course of various environmental and technological processes (Krayneva S. V., Shefer O. R., Lebedeva T. N.).

2 MATERIALS AND METHODS

The undesirable consequences of the spontaneous unfolding of global processes and problems require their change in order to turn the vector of global development onto the trajectory of progressive development. Or, as it turned out more than two decades ago, on the trajectory of sustainable

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development as a new type of development capable of preserving civilization and the biosphere. (Ilyin I.V., Ursul A.D., Ursul T.A., Andreev A.I.).

Education for sustainable development, both in an individual country and in the world, is based on environmental education in higher education. It is interdisciplinary in nature and is included in the content of many subjects: environmental management, economic geography, natural science, valeology, human physiology, chemistry, physics, etc. Therefore, it is necessary to maximize the coverage of various environmental aspects in classroom and extracurricular classes of all natural science disciplines (Brindley J. E., Walti C., Blaschke L. M.).

Based on the opinion of Z. A. Magomedov and U. G. Aliyeva (Magamedov Z.A., Alieva U.G.,), we can conclude that sometimes many natural science disciplines are analyzed from the position of the root cause of the pathology of the ecological balance in nature. And they are interpreted as the result of absolutely all environmental disasters in the surrounding area. It is clear that the culprit of the existing environmental problems are not the natural sciences themselves. How many are their application in human activity and obtaining results. For example, conducting various tests, using nuclear and hydrogen bombs, etc. (Sharlanova, V.).

This determines the need to prepare an ecologically qualified personality of a modern teacher (Budhai S. S., Williams M.). As a transmitter of information to the younger generation. Therefore, the study of environmental issues should be an integral part of natural science disciplines at the university. Unfortunately, the time allocated to the study of natural sciences in all areas of training at universities has sharply decreased over the past decade. Independent work requires the use of additional modern educational and scientific information in any university discipline. This is somewhat difficult in the context of distance learning related to anti epidemic measures against COVID-19. Since there is no possibility of using the offline library fund of the university.

The legislative framework provides for a change in the state of the organization of the learning process. This is based on information technology. In accordance with the Federal Law "On Education in the Russian Federation", federal state educational standards and the prospects set out in the Education Strategy until 2030, each educational institution must provide students with access to an electronic library system. This system contains fundamental, educational, popular science, methodological literature. And also provide access to electronic educational resources. This allows all participants of the educational process to refer to the regulatory information of the organization of the educational process at the university, news, documents regulating the educational process in specific disciplines and practices of the curriculum (Shefer O.R., Lebedeva T.N., Bespal I.I., Nosova L.S., Bochkareva O.N.).

Thus, the formation of education for sustainable development among students is underway. It occurs during the study of issues submitted for independent work, during the development of natural science disciplines. It is possible in the current conditions when using electronic educational resources (EER).

Today, online education continues to expand every year (Oyeleke, Olugbenga, Oluwayemi, & Sunday). It is important here that the training and content of such courses is based on the basic principles of constructive pedagogy, combining the use of different methods and forms of training: from individual to group work. Mastering research methods can be quite a difficult task for students who are familiar with this learning process for the first time through online courses.

The availability of new and exciting emerging learning technologies (Pacansky-Brock), present an opportunity for teacher educators to provide student-centered personalized feedback in online courses.

The availability of modern interactive learning technologies (Pacansky-Brock), which require active work from the student, provides an opportunity for online course developers (teachers) to provide personalized feedback focused on students.

Although the organization of online group work is difficult due to its asynchronous characteristics and lack of physical presence. Each participant in the training must have sufficient knowledge, skills and ways of mastering information technologies that allow several users to interact with each other (Chang B., Kang H.; Epp C. D., Phirangee K., Hewitt J.).

As an example of EER, consider massive open online courses (MOOCs). These include Stepik, Coursera, EdX, Udacity, FutureLearn, Khan Academy, Udemy, Lectionary, the National Platform "Open Education", etc.

We adopt as a basis the classification of MOOCs according to various criteria proposed by N. V. Grechushkina, N. A. Zhokina (Grechushkina N.V., Zhokina N.A.). In our research, we tested the educational platforms Stepik, Coursera, the National Platform "Open Education" in terms of identifying descriptive, qualitative and quantitative characteristics of the platforms on which educational and scientific information of environmental content is located. Descriptive characteristics allow you to evaluate the use of the software product, the information presented on it (authors, course scope, goals, objectives, competencies, target audience, rating, etc.).

Qualitative characteristics are an assessment of usability properties (factors of simplicity and ease of use or use). They reflect the amount of physical and mental effort that users spend to achieve their goal. We propose to include: profitability (a metric for measuring the effectiveness of an online course, with which you can determine the number of registered (and paid) students who completed the course), satisfaction indices (evaluation of any user interaction with course materials from the consumer's point of view) and user loyalty (user evaluation of the course as a whole).

The quantitative characteristics include: the number of video lectures and their duration (min), the number and level of complexity of 2D objects (static, animated illustrations), the number and level of complexity of 3D objects (static, animated). As well as the number of screencasts (video recording from the screen), the number and level of complexity of simulators /simulators /etc., the number of interactive demonstration materials (mental maps, time tapes, interactive geographical maps (Google maps), etc.), the number of educational communication tools (forum, chat, social network community, etc.) and etc

3 RESEARCH RESULTS

As part of our study, respondents were asked to conduct a qualitative and quantitative analysis of MOOCs. The study of which is aimed at the formation of ecological culture, located on the platforms: "Open Education", Coursera, Stepik (Tab.1). The respondents were students of the Faculty of Primary School Teacher Training and the Faculty of Mathematics, Physics, Computer Science of the South Ural State Pedagogical University. A total of 107 people took part in the study.

Table 1: Evaluation analysis in points (from 0 to 5) of environmental content courses located on the platforms: "Open Education", Coursera, Stepik.

No	Criteria	Platforms		
		Stepik	Coursera	Open Education
4	The possibility of using environmental information in the professional field	5	4	5
5	Ease of navigation in the course	4	5	5
6	Ease of working with the course interface	5	5	5
7	Accessibility of the presentation of the material in the course	4	5	4
8	The ability to download course materials (manuals, presentations, etc.)	4	5	5
9	Content of quasi-professional tasks	4	3	5
10	Quality and complexity of control blocks in the course	4	4	5

The data obtained show that the largest number of courses are presented on the Stepik site (19), which is 50% of the total number of all courses on the analyzed sites. These courses are aimed not only at the student audience, but also cover school education and post-secondary education, which allows you to obtain additional competencies in professional activities. 32% of the total number of courses at 3 sites is presented on the national platform "Open Education" (12 courses) and only 18% – on the Coursera site.

As a result of the analysis of the courses, all respondents agreed that modern online courses on ecology have a homogeneous structure, divided into separate modules. Each module includes theoretical and practical material, tasks for independent work, diagnostics of educational achievements.

The results of our survey show that the majority of respondents (88%) highly appreciated the convenience of navigation and working in a course on sustainable development on all analyzed platforms. This suggests that the developers of online courses are striving to improve the quality parameters of their developments. If online courses do not have these characteristics, then the rating of this course will be low, and, consequently, this will affect the visit to this resource. We can conclude that it is often the rating and feedback of the course participants that influences the choice of the course by students.

Thus, mass open online courses implement one of the main directions of education for sustainable development: improving access to high-quality basic education. They can be used as a high-quality information resource within the framework of additional education in awareness of the importance of the concept of sustainable development. And also to expand and deepen individual concepts, sections of the course "Ecology" or interdisciplinary environmental knowledge. They contain professional and interesting material, both on general environmental issues and on certain narrow sections, they contain blocks for controlling the development of information. The course programs themselves are ergonomic, easy to use with an intuitive interface for work.

4 CONCLUSION

The role of the use of electronic educational resources in teaching is increasing. The use of modern distance learning platforms in self-preparation creates a new social reality. It forms on the basis of the interest of sustainable development of society and nature and ecological education of the person of the future as a carrier of ecological culture. It also helps people to make a choice in favor of a lifestyle that allows them to prevent the depletion of natural resources and observe the principles of social equality and justice in communicating with others.

Most of the online courses reviewed provide valuable, designed with a wide variety of material in the free access. It is necessary to use these tools to diversify the learning process. They make it possible to arouse the interest of students and demonstrate to them in practice the broad possibilities of basic education. They also take into account the need to ensure sustainability, and expand it so that it covers critical thinking skills, skills in organizing and interpreting data and information, and the ability to formulate questions.

The gradual introduction of e-learning elements into the educational process is the first step towards creating a high-quality and ergonomic information and educational environment of an educational institution. It becomes an essential element in the transformation of society towards sustainable development. It acts as a means of increasing human abilities to implement their ideas about society.

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