Gulnara Abdullaeyvna Shakhmurova
Tashkent state pedagogical university named after Nizami
professor, doctor of biological sciences,
head of the department of "Zoology and anatomy",
Uzbekistan

Dilrabo Umidovna Asomidinova
Tashkent state pedagogical university named after Nizami
1st year master
Uzbekistan

FORMATION OF ECOLOGICAL WORLDVIEW THROUGH COMPUTER AND MOBILE GAMING TECHNOLOGIES

Abstract: *The paper provides a brief theoretical justification and demonstrates the possibilities of using informational gaming technologies in shaping an ecological worldview through computer and mobile gaming technologies at various stages of the general education system. It defines ecological thinking and discusses the issues of ecological education in the context of the modern media space. The paper also presents a theoretical overview of some mobile and computer applications and their practical use tailored to the age and individual characteristics of learners.*

Key words: *Ecological worldview, ecological education, game, information technologies, personality development, mobile and computer gaming technologies.*

Language: *English*

Introduction

UDC: 372.857

The relevance of this article largely corresponds to the demands of our time. Environmental education is one of the most important factors in shaping a fully developed, harmonious personality oriented towards the preservation and multiplication of the world's natural wealth, the rational use of the natural resources of one's own country, and even the formation of national and racial tolerance within civil society. Today, the development of an ecological worldview is at the forefront of many educational systems in developed countries around the world. In our countries, environmental education is often seen as a separate discipline, and various methods, forms of organizing educational activities,

and teaching techniques related to it are still poorly developed and justified in the system of education.

One of the problematic areas in shaping an ecological worldview is the use of information technologies in the educational process, the transition from academic learning to the digital dimension [1,3,8]. In modern conditions of constant digital noise and contamination of the media space, educators often have to compete for the students' attention with various media objects that pollute their minds. Mobile and computer games, which are often considered by most educators as the main enemies of the educational and upbringing process, can actually be used as a powerful means of educational influence on students by selecting and combining scientific content, theoretical justification of gaming material, pedagogical foundations of education, and didactics of the process, together with the vividness and

colorfulness of the gaming process. This research is dedicated to addressing this issue, with a focus on mobile and computer gaming technologies in the educational process and their role in environmental education at different stages of the educational process [5,7,9,11].

The goal of this work is to examine the use of mobile and computer gaming technologies in the context of shaping an ecological worldview.

Today, there are many approaches to defining the concept of an ecological worldview. For instance, contemporary educators in the field of pedagogical ecology, V.V. Lisnichenko and N.B. Lisnichenko, provide the following definition of an ecological worldview: *"An ecological worldview is a set of views, evaluations, and principles that determine a person's overall perception of their place in the surrounding world. It also includes life positions, behavioral programs, and actions in the social and natural environment, which enable maintaining the natural balance in the 'human-society-nature' system."* [6] On the other hand, Academician D.K. Belyaev defines an ecological worldview more concisely as a persistent belief and aspiration to preserve and understand our impact on nature [2]. N.G. Vasiliev, on the other hand, asserts that the concept of an ecological worldview includes *"a combination of scientific and everyday knowledge about the relationship between society and nature, ethical, aesthetic, and value orientations of a given subject, that is, specifically subjectivized features of ecological consciousness, reflecting the socio-environmental environment and the specific natural conditions of the subject's spiritual and practical exploration of nature."* [13].

However, based on the specifics of the subject of ecology, we can derive our own definition of the concept of an ecological worldview: An ecological worldview is the awareness of one's place and significance in the natural system of the environment. This approach to definition is the most objective for a simple reason – often, humans are considered as the highest level of nature's evolution, somehow detached from it. However, as we all know, humans are just a part of nature, and not necessarily the highest part. As the renowned biologist Charles Darwin defined, dominance in an environment does not belong to the perfect or the strongest species, but to the one most adaptable to a specific niche [4]. Thus, we come to realize that the preservation of nature and biodiversity is not just for the sake of nature itself, but for the survival of our own species. When viewed from this perspective, we arrive at the main problem in ecology – its incorrect understanding and interpretation, which is related to the inadequacy of our environmental education.

Currently, the majority of environmental education in the general education system is provided through subjects like natural sciences and biology, including both in-class and extracurricular activities [10,12]. Despite the extensive study of this issue and the availability of a vast amount of literature on the topic, many methods and techniques for fostering ecological thinking are rarely used in general educational practice, and there are many factors influencing their utilization. One such factor is the lack of necessary conditions for extracurricular activities, such as the absence of a schoolyard for conducting ecological experiments with students, the lack of a zoological and botanical corner, and the inability to observe the natural environment due to the urban layout of the surrounding area.

One method to overcome this problem may be the use of ICT (Information and Communication Technology) in the process of nurturing an ecological worldview. This includes virtual excursions, 3-D models studied both during and outside of class, the construction of such models based on knowledge of the principles of biological systems, the use of interactive ecological educational presentations, and ecological assignments, among many other methods and techniques. In addition to addressing the above-mentioned issue, computer and mobile technologies also solve the problem of providing diversity in teaching methods, especially in the rapidly evolving field of ecology. Furthermore, these technologies are notable for their vividness, clarity, and accessibility to many modern students, especially those in primary and secondary schools.

One of the distinctive and rarely explored forms of using mobile and computer technologies in the educational sphere is mobile and computer games. These games combine the advantages of gaming as a form of learning and student development, together with the benefits of operational electronic systems. Of course, such a form of material presentation should not and cannot be the primary foundation of the didactic and educational process. However, it can certainly be used as a reinforcing factor, an activator, a means of uniting a group around a common (including ecological) task, as a way to present additional material in a readily accessible format, or as a means to address the problem of a lack of objects for student research.

Games of this kind can be conventionally divided into two broad groups:
- Contextually educational games;
- Purposefully educational games.

In this system, contextually educational games include many existing computer and mobile games and applications that do not have a direct context or an obvious ecological focus but incorporate elements of ecology. For example, various nature simulators that allow a child to immerse themselves in the natural habitat of different animals fall into this category. Such games are particularly popular among elementary school students and those in the first stage of secondary education. However, it is essential to emphasize that before recommending a game as a

supplementary or all-encompassing educational tool, educators must carefully examine the game. Over time, many of these games may transition from a scientifically grounded mechanism to purely recreational gameplay. For instance, games in which a mouse can kill a cat, snake, or badger, and spiders are often larger than mice, prioritize the colorful nature of the gameplay over scientific accuracy.

On the other hand, exemplary games like Plague Inc., which can serve as a visual aid for examining the ecological aspects of the spread of various diseases or understanding the challenges in combating disease spread, allow students to take on the role of the head of the WHO (World Health Organization) and may prompt a reconsideration of their attitude towards recommended sanitary measures. Additionally, there are numerous games that reflect the current ecological state and the uneven struggle of ecologists against the consequences of environmental pollution.

However, as mentioned earlier, games of this type can only be used as a supplement to the educational process and should be accompanied by some didactic task. For example, using the disease simulator mentioned earlier, students can be tasked with writing an essay on the importance of preserving personal health for the safety of society as a whole or on the nature of the rapid spread of certain pathogens within populations due to poor ecological conditions.

A special and highly significant group of computer and mobile games and applications are specialized or didactic games. Currently, there are very few such games available for public use, and most of them are still in the testing and implementation phase in general educational practice. However, some developers are directly targeting the educational audience. For example, Mozaik3D app by Mozaik Education offers over a thousand different 3D gaming models, including those related to ecology and biology, as well as history, physics, chemistry, and various other school subjects. In the same category, games designed for individual purposes can also be included. For instance, a teacher can unite students from the entire school in a single ecosystem by developing an interactive mobile gaming application. For every "ecologically responsible" action, a student earns points for their group or class, and the teacher monitors compliance by analyzing photos and videos of students' work submitted through the app. An distinguishing feature of such an application could be an open database system, an electronic library, and various mini-applications for entertaining students in their free time.

In conclusion, despite the limited research and material availability regarding computer and mobile gaming methods for nurturing an ecological worldview in open access, a talented educator, by delving into the depths of the internet, can find a sufficient number of applications and games that position themselves as teacher's assistants. However, for the same purpose, contextual learning can be used, which, as practical experience shows, can often be even more effective in terms of education. After all, we not only influence our environment but, to a greater extent, what surrounds us influences us.

References:

1. Apatova, N.V. (1994). *Information technologies in school education*. Moscow.
2. Belyaev, D.K. (1986). *Meet the requirement of time.* Questions of Philosophy - 1986, pp.98-108.
3. (2017). C*ontinuous environmental education: problems, experience, prospects:* Materials of the All-Russian scientific and practical conference, (p.277). Tomsk: Hang Glider.
4. Darwin, C. (1991). *The origin of species by natural selection or the preservation of favorable races in the struggle for life. Translation from the sixth edition* (London, 1872). Executive editor Academician A. L. Takhtadzhyan, St. Petersburg "Science", 1991 - [URL] Retrieved from http://charles-darwin.narod.ru/origin-content.html
5. Abdullaeyvna, S. G., & Sergeevna, K. N. (2022). An education of ecological culture of students in the conditions of professional training. *East European Scientific Journal*, 2022, №. 1-2 (77), pp. 11-15.
6. Kartashova, N. S., Shakhmurova, G. A., & Khalitova, R. A. (2021). *Conducting interactive excursions in the process of methodological training of biology teachers*. Collection of articles of the XV International Scientific and Practical Conference. Volume Part 1. Rostov-on-Don, 2021- 2021, pp.372-375.
7. Lisnichenko, V.V., & Lisnichenko, N.B. (2015). *Fundamentals of pedagogical ecology*. (p.95). Severodvinsk: OJSC Severodvinsk City Printing House.
8. Sabiryanova, Yu. Yu. (2021). The use of computer games in the environmental education

of preschool children. Text: direct. *Bioeconomics and ecobiopolitics*. 2016. No. 1 (2), pp.121-124. https://moluch.ru/th/7/archive/26/1171/

9. Shakhmurova, G. A., & Egamberdieva, L. N. (2021). The Use Of Digital Gaming Technologies In Solving The Problems Of Environmental Education. *International Journal of Progressive Sciences and Technologies (IJPSAT)*. 2021. Vol. 26 No. 1, pp. 558-561. DOI: http://dx.doi.org/10.52155/ijpsat.v26.1

10. Shakhmurova, G.A., Egamberdieva, L.N., & Akhmedkhodzhaeva, N.A. (2015). *The use of information technology in the learning process of biology.* Innovation in Education: Search and Solutions. Collection of materials of the II-nd international scientific-practical conference. National Academy of Education named after I. Altynsarin, Astana, November 20, 2015, pp. 576-578.

11. Shakhmurova, G.A., Rakhmatov, U.E., & Saitjanova, U.S. (2021). A complex of entertaining tasks and exercises on biology is one of the means of enhancing the cognitive activity of students. *Asia life sciences. The Asian International Journal of Life Sciences* 2021. Volume 30, № 1 & 2. 87-97. http://reja.tdpu.uz/shaxsiyreja/views/article/files/3547/08-5.%20

12. Sukhorukova, O.E. (2021). *Formation of the ecological worldview of schoolchildren*. Materials of the V International Student Scientific Conference "Student Scientific Forum" Retrieved from https://scienceforum.ru/2013/article/201300870

13. Tevs, D.P., Podkovyrova, V. N., Apolskikh, E. I., & Afonina, M.V. (2006). *The use of modern information and communication technologies in the educational process: educational manual* / Authors and compilers:- Barnaul: BSPU.

14. Vasiliev, N.G. (1985). *Ecological consciousness: genesis and essence.* Dr. Diss, (p.23). Irkutsk.