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DIGITAL CONTENT IN FORMING THE STUDENTS' ECOLOGICAL WORLDVIEW

ABSTRACT

This chapter examines the theoretical and methodological foundations for the use of digital content in shaping the environmental worldview of learners in the context of the digital transformation of the educational environment. The essence of an ecological worldview is defined as an integrative personal formation that combines ecological knowledge, value orientations, beliefs and models of responsible behaviour in interaction with the environment. The role of digital content and interactive educational resources as an effective tool for increasing motivation, stimulating cognitive activity and enhancing the practical focus of environmental education is substantiated.

The current experience of foreign and Ukrainian researchers regarding the creation and implementation of digital content in the educational process has been analysed. Approaches, principles, methods and pedagogical conditions for the development of digital environmental content have been outlined, taking into account the needs of modern learners and the specifics of the digital educational environment.

Based on the results of a survey of Ukrainian students, the study identifies the characteristics of their perception of digital learning materials, their interest in interactive and game-based forms of presenting environmental information, as well as the uneven implementation of digital environmental content in the educational process. The need to create high-quality methodological, organisational and informational support for the effective use of digital resources in shaping young people's environmental outlook is emphasised.

A methodological framework has been developed for the use of multimedia resources in the process of shaping students' environmental outlook, which involves the use of educational programmes, multimedia presentations, video and audio conferences, assessment technologies and digital interactive resources. It has been demonstrated that the use of multimedia technologies contributes to improving the quality of the educational process, the effective acquisition of knowledge and the development of environmentally responsible behaviour among students. The need to develop the digital competence of teachers and students has been identified as a key prerequisite for the successful implementation of digital environmental education practices.

KEYWORDS

Digital content, environmental awareness, environmental education, digital technologies, multimedia resources, interactive learning, digitalisation of education, environmental literacy, educational process.

2.1 THEORETICAL PRINCIPLES OF USING DIGITAL CONTENT IN FORMING THE STUDENTS' ECOLOGICAL WORLDVIEW

DIGITAL CONTENT IN THE EDUCATIONAL PROCESS

We will begin the analysis of the theoretical principles of using digital content in forming the ecological worldview of education seekers with the terminological and categorical apparatus and a review of the current regulatory documents regulating the specified process in the field of education.

Thus, the Law of Ukraine "On Digital Content and Digital Services" associates the term "*digital content*" with data created and provided in digital form. "Digital content includes, in particular, computer programs, applications, video files, audio files, music files, digital games and electronic books" [1].

The Law of Ukraine "On Copyright and Related Rights" identifies the term "*digital content (electronic (digital) information)*" with any information or data in electronic (digital) form, i.e. objects of copyright and/or related rights, with the possibility of storage and/or distribution in one or more files (parts of files), entries in a database on storage devices of computers, servers, etc. on the Internet [2].

Electronic educational resources for educational subjects (integrated courses) in accordance with the current Regulation on the distance form of obtaining complete general secondary education are called "learning resources on digital media of any type or placed in information and communication systems, which are reproduced using electronic technical means and can be used in the educational process when studying individual educational subjects (integrated courses)" [3].

Let us detail the terminological and categorical apparatus in terms of individual types of digital content. Thus, the Law of Ukraine "On Copyright and Related Rights" interprets such an important term for our study as "*computer program*", which is identified with words, numbers, codes, diagrams, symbols or other formats, which together are a set of instructions, reading which is carried out using a computer (desktop computer, laptop, smartphone, game console, smart TV, etc.), putting into action occurs in order to achieve a certain goal or result, in particular, the creation of an operating system, application programs, expressed in source or object codes [2].

In the Recommendations on ensuring the legality of the use of computer programs in the activities of business entities, issued by the Ministry of Economy, Environment and Agriculture of Ukraine, the phrase "*computer program*" is used in the meaning of "a set of instructions in the form of words, numbers, codes, schemes, symbols or in any other form, expressed in a form readable by a computer, which put it into action to achieve a certain goal or result (this concept includes both an operating system and an application program, expressed in source or object code)" [4].

Digital applications, according to the definition established in digital pedagogy, are identified with a type of specialized software, the work with which is associated with portable devices, for example, smartphones or smart watches, and the solution of problem-oriented tasks [5].

The Law of Ukraine "On Copyright and Related Rights" contains the term "*audiovisual work*", which is interpreted as a sequence of episodes or frames with or without sound, which are connected by a holistic creative idea with the accessibility of perception through appropriate technical means on a certain type of

screen (cinema, television screen, etc.), which enables the transmission of a sequence of frames to form a moving image [2].

The Regulation on Electronic Educational Resources offers an explanation of another important term "*digital games*" as an electronic educational gaming resource with a combination of cognitive and developmental functions, holistic theoretical material and competency tasks on the subject presented in a game form [6].

The Regulation on Electronic Educational Resources details the concept of "*electronic books*" and provides its interpretation through a number of definitions, such as: an *electronic manual*, which is identified with an electronic educational publication to supplement or partially (completely) replace a textbook; an *electronic textbook* is an electronic educational publication with a systematic presentation of educational material in accordance with the educational program, the presence of digital objects of various formats, ensuring interactive interaction; an *electronic workshop* is an electronic educational publication with a set of practical tasks and/or exercises in a certain educational subject, discipline for the formation of competencies with the presence of interactive elements; an *electronic laboratory workshop* is an electronic practical publication with tasks of practical content, models of natural and/or artificial objects, processes and phenomena using computer visualization tools [6].

General requirements for digital content are its functionality; safety; reliability of operation; user-friendliness; cross-platform; compliance with the basis of implementing the principles of the digital development state policy; compliance with the legislation of Ukraine on copyright protection; compliance with international standards (Experience API, etc.) [6].

The technologies used when using digital content are developmental, project-based, blended, differentiated, programmed, modular learning, information and communication (digital) technologies to ensure the implementation of the educational process in educational institutions.

Substantiating the essence of distance and blended learning as a means of implementing the individual trajectory of a teacher's professional growth, a team of scientists led by I. Vorotnikova identified the formulation of an educational goal as a system-forming component of the methodological system, on which the teacher's subsequent actions will depend for selecting the content of the lesson, teaching methods, forms of organizing students' educational activities, and learning tools to achieve specific learning outcomes. This is what makes the situation of using "digital technologies for the sake of digital technologies" impossible, and therefore the presence of digital skills among students without proper mastery of the educational material of the lesson, during which these skills are actively used.

Scientists suggest that in the process of planning lessons using digital content, questions should be asked about the ways to achieve the planned learning outcomes with its help, the effectiveness of using this tool, the absence of a shift in the focus of students' attention towards mastering this digital resource, the level of effectiveness of achieving the educational goal with or without a digital tool (resource). Therefore, the main criteria for selecting digital tools, according to the authors, are "correspondence to the educational goal of the lesson and the accessibility of the specified learning outcomes; ease of use for all participants in the educational process; availability of the digital tool for use (free or a symbolic fee for use); the ability to work with the digital tool using mobile devices" [7].

In the context of using digital content in professional educational and cognitive activities, scientists actualize the role of the process of continuous professional development of a pedagogical worker, which involves the implementation of the possibility of simultaneous work with the tool by several users; ensuring the security of users' information and a safe process of working with the digital tool; skills in selecting digital educational resources for use in the educational process; predicting the achievement of specific learning outcomes using digital tools; using digital technologies depending on the educational goal of the lesson and the choice of content, methods, forms and means for its effective implementation [7].

Instructive and methodological recommendations for the introduction and use of artificial intelligence technologies in secondary education institutions are, in our opinion, an important regulatory document that regulates the responsible, ethical and effective use of AI systems in secondary education institutions. The *AI literacy of participants in the educational process* is being updated, identified with understanding the fundamental principles of responsible use of AI systems, mastery of the skills of identifying the fact of using AI, understanding its limitations and threats as consequences of irresponsible use [8].

In this context, we consider it appropriate to present recommendations for teaching students subjects, partnership interaction with participants in the educational process, participation in the organization of a safe and healthy educational environment, management of the educational process, and continuous professional development.

Thus, recommendations for teaching students subjects (integrated courses) contain the following proposals: integration of AI into the preparation and conduct of lessons through preparation for lessons (structure, content, didactic materials, creative, innovative tasks, original physical education minutes, quizzes, quests, interactive tasks, video content scenarios, etc.); obstacles of education seekers (academic, cognitive, behavioral, emotional, organizational, special), expected learning outcomes; conducting lessons using independent, paired, group work of students with AI, project/research activities, etc.); development of key competencies and cross-cutting skills (critical thinking, development of prompts, detection of fakes, AI intervention in work results, correctness of the neural network response); formation of individual educational trajectories, personalized educational content (differentiation, personalization, adaptation to the individual needs of each education seeker); positive support to promote motivation growth based on results prediction; socio-emotional support of the lesson.

A separate block of recommendations provides suggestions for organizing extracurricular activities in educational institutions, namely: creating programs/event scenarios, conducting competitions, competitions-defenses of scientific and research works of the Academy of Sciences, the use of AI in the work of circles); finding and developing thematic selections for independent work of education seekers; implementing STEM training, robotics, etc.

Recommendations for the participation of AI in organizing a safe and healthy educational environment deserve attention. This, in particular, concerns supporting inclusivity and individual needs of education seekers, i.e. speech recognition systems for students with hearing impairments and speech disorders; non-verbal communication with education seekers with autism spectrum disorder (ASD) and other difficulties. The use of adaptive and assistive technologies to create an inclusive environment is enabled: individual chatbots for consulting students with special educational needs; use of art therapy practices

with the help of AI systems (relaxation therapeutic music compositions, coloring books, art compositions); self-study tools for self-paced learning through the use of instructional cards; game-based learning with the development of critical thinking, creativity and problem-solving skills.

The developed recommendations for managing the educational process are significant, as they are related to monitoring and analyzing the progress of education seekers through the use of automated assessment, producing control materials for homework (tasks, tests, etc.), checking and assessing student knowledge (results, essays, tests, reviews, feedback); creating individual educational trajectories (AI Tutor programs); providing feedback from education seekers (chatbots for communication); collecting and analyzing data on the success of education seekers to identify problems and provide necessary assistance to them; identifying risks and opportunities for each participant in the educational process in order to help achieve success; evaluating, monitoring and forecasting the educational process individually for each education seeker through conducting individual consultations, creating individual curricula)[8].

ECOLOGICAL WORLDVIEW: ESSENCE, CONTENT, ROLE IN THE FORMATION OF EDUCATION SEEKERS' PERSONALITY

The essence of the ecological worldview, its content and role in the formation of education seekers' personality have been studied from various aspects in the scientific works of scientists.

Let's start with the classical definition of the concept of "*worldview*", presented in the Encyclopedia of Education, edited by V. Kremen. The indicated lexeme is identified with a system of views on the objective world and the place of human in it, on the attitude of human to the surrounding reality and him/herself, as well as the basic life positions of people, their beliefs, ideals, principles of cognition and activity, and value orientations determined by these views. As a reflection of the world and the value attitude towards it, the worldview also plays a certain regulatory role, acts as a methodology for building a general scientific picture of the world [9].

In the context of our study, we consider it appropriate to quote the famous Ukrainian scientist V. Vernadsky: "We do not know science, and, accordingly, a scientific worldview, outside the simultaneous existence of other spheres of human activity... All these aspects of the human soul are necessary for its development. They are the nutrient medium from which it draws vital forces, the atmosphere, in which educational activity takes place" [10].

The issue of the peculiarities of the formation of a person's worldview position was investigated by a team of authors led by T. Okushko. According to the authors, worldview is the highest and most generalized level of a person's relationship with the world, a regulator of behavior and activity, a kind of integrative integrity of knowledge and values, reason and feeling, intellect and actions, critical doubt and conscious conviction, the core of the personality structure with the direction of the process of awareness of the surrounding reality and the role of a guide in practical and transformative activity, a holistic system of a person's views on the world and his/her place in it [11].

Azerbaijani scientist Sh. Mikayilov carried out a philosophical analysis of the ecological worldview. The author claims that modern science considers the way of people life not only from the point of view of satisfying their material needs, but also from the point of view of moral and psychological requirements, and at this time it gives priority to the moral superiority of human. The need for a humane attitude towards nature should follow from the fact that the process of increasing natural resources is getting stronger every year. The attitude towards nature and its resources requires expanding the boundaries of moral relations. A society that determines the development of the individual takes into account all the factors of human formation. All the foundations of a humane attitude towards nature are included here. In connection with the development of society as a specific type of social relations, a person's attitude towards nature is also reflected in the daily concrete activities of all members of society. The ecological basis of a humane attitude requires an approach to the issue from an ethical and moral point of view, the formation of an ecological worldview. The object of a humane attitude is the subject's attitude towards nature use. For this reason, the scientist noted that the new path of development of environmental research should be based on the norms of moral values. It is legitimate to understand the ecological worldview as a worldview through the prism of the relationship between human and his/her environment [12].

S. Homonets, S. Chorniy, Ya. Bilyk, K. Lesnyak-Mochuk, N. Chorniy, L. Fedonyuk analyzed the environmental education of youth on the basis of the strategy of sustainable development and in the context of the ecological worldview. They see the fundamental trends in the development of environmental education and upbringing of modern youth in the creation of a single space focused on the integration of knowledge and skills on the sustainable development of society in the understanding of human and nature. The role of environmental education, according to the authors, is to cover a wide range of human qualities and characteristics, principles and norms, ecological and humanistic worldview and world perception, preparation for production, public and cultural activities [13].

For her part, O. Groshovenko revealed a worldview and ecological approach to the content of natural education in the first-level school. The researcher claims that the modern model of natural education fulfills the task of ensuring the harmonious development of the personality of the student, fostering a value-based attitude towards the natural and social environment, towards oneself. The problem of forming worldview and ecological values and finding the optimal model of natural education involves the integration of axiological, activity, creative, innovative approaches.

According to the author, *an ecological worldview* is a system of interconnected components: a generalized set of ecological views, knowledge, values, spirituality, beliefs, practical guidelines related to the individual's understanding of the unity and indivisibility of natural and social existence, "the place of a person in it together with life positions corresponding to nature, programs and other components of behavior, which in the complex form an ecologically oriented life position in him/her, encourage him/her to active environmental protection work" [14]. The applied content of an ecological worldview is realized through the influence on the norms of behavior and attitude to reality, the way of perceiving the environment. The author identifies the formation of an ecological worldview with a complex and long-term process aimed at mastering the system of ecological knowledge, developing the spiritual abilities of education seekers' personality through a combination of social and family influence, value assessment, stable motivation,

willful efforts in the attitude towards nature, its ecological problems through a positive emotional background, the formation of principles and positions, and appropriate behavior in the process of solving ecological and environmental protection problems [14].

N. Dushechkina highlighted the features of the students' ecological worldview formation in higher education institutions, based on the ecocentric paradigm as the basis for harmonizing the interaction of human and nature. The essential features of the ecocentric paradigm of the ecological worldview are associated with the recognition of the equal ecological value of all living beings, the perception of the Earth as a common home for all living beings, the justification of the ecological approach to understanding the environment as a system of natural and cultural-historical relations, the promotion of environmentally acceptable technologies, the recognition of the law of nature, self-government, local control, understanding the unity of the environment and sustainable development, the awareness of the advantages of qualitative development over quantitative increase, the affirmation of the diversity (variability) of the content, forms and methods of education, their systematicity and continuity, the stimulation of mutual assistance and cooperation [15].

The main features of the ecocentric paradigm of the ecological worldview in the process of environmental education are established by the author as comprehensive development of the personality based on the theory of developmental learning, based on cooperation and respect for learner's personality, the use of problem-based learning and research technologies, various styles and methods of teaching and learning, the growth of the role of informal learning of ethical values. In addition, the main features of the ecocentric paradigm of the ecological worldview in the process of environmental education are identified with the study of the interrelationship of debatable issues at the local, national and global levels, the analysis of political and economic problems, the correlation of the issues studied with the problems of one's own selection and responsibility; conditional freedom from established principles and prescriptions, self-government, self-development, self-control, self-support of the individual; ensuring the stability and sustainability of the natural environment; formation of a broad ethically oriented view of environmental problems [15].

N. Dushechkina identified the students' *ecological worldview* with a generalized indicator of the effectiveness of environmental education and upbringing, an integral quality of the personality, a complex of ecological values, internal motivation, views, beliefs, reactions of a nature-oriented kind, understanding of the value of nature, a conscious ability to use ecological knowledge, skills, and abilities to solve environmental problems [15]. The formation of the students' ecological worldview, in the author's opinion, is a holistic integrative process of gradually involving students in educational activities to ensure the development of their views, value orientations, and beliefs regarding the harmonization of relations with nature, taking into account the need to solve modern environmental problems in future activities [15].

L. Korobchuk detailed career guidance aspects and investigated the problem of forming an ecological worldview as a component of training future environmental specialists [16]. The scientist, in particular, focused on the integration of formal and informal environmental education, upbringing and legislative coercion for the formation of a new ecological worldview of education seekers as future citizens. She believes that the foundations of a scientific ecological worldview are laid when young people acquire environmental knowledge. According to the author, the worldview orientation of environmental education is associated with a holistic vision of the subject of ecology at each stage of training, which involves deepening the

picture of biological reality from stage to stage; concentration of the essence of leading concepts and theories related to the awareness of the picture of the world and the choice of methodology; reflection of worldview intentions and research in the science of life, enrichment of the course with material for developing generalizations and skills of assessment, orientation in situations of alternative choice [16].

O. Pashchenko identifies the concept of "ecological worldview" with a form of self-awareness, self-termination of a person in the world, "which is based on ecological competence, awareness of the vital necessity to harmonize one's own needs with the need to preserve the natural environment and careful handling of natural resources. Ecological worldview is a form of spiritual and practical mastery of the world by a person, which provides for the organic unity of a meaningful view of the world, scientifically based beliefs about the laws of development of nature and society, lifestyle, system of socio-political relations, which determine an active nature-safe and nature-conserving life position of the individual" [17].

The scientist substantiated the pedagogical conditions for the formation of an ecological worldview in a children's association, which is identified with the content and technological support for the formation of an ecological worldview of adolescents; self-organization as a formative mechanism for a children's association; creating a system for training adults to work with adolescents in a children's association; supporting children's social initiatives [17].

The peculiarities of the process of forming an ecological and evolutionary worldview in students of a specialized school were considered by L. Rybalko [18]. The author characterized different types of worldviews (ecological, noospheric, synergistic) and scientifically substantiated the relevance and need for the formation of an ecological and evolutionary worldview in students as an evolving system of "principles, views, knowledge, values, assessments, beliefs, practical guidelines that determine a person's holistic understanding of the unity of natural and social existence, their coevolution, that regulate a person's attitude to environmental problems and their solutions, form an active environmental position, encourage environmental protection activities and maintain the stability of the development of the biosphere" [18]. The presence of an ecological-evolutionary worldview involves solving environmental problems of society and nature, demonstrating not destructive, but creative behavior that contributes to the development of the biosphere, awareness of the need for the interconnection of humanity and nature, recognition of objective ecological and evolutionary connections and interdependencies. The ecological-evolutionary worldview consists of world impression, world perception and world understanding as its levels [18].

A team of scientists (B. Rokhman, O. Savchuk, A. Sinitsyna, S. Bilous) in their study focused on the ecological worldview formation in the conditions of martial law and ecocide challenges. The relevance of the aforementioned process is due to large-scale military operations, which bring a number of ecological disasters not only to the territory of Ukraine, but also spread far beyond its borders. The authors see the philosophical understanding of ways out of the modern ecological crisis in the inclusion of the ecological concept in philosophical concepts and an anthropologically oriented paradigm guided by personalism. The ecologization of the worldview at the present stage involves focusing more attention on the current problems of coexistence of human, society and the environment, while it is not necessary to create a philosophically grounded model for solving the ecological crisis and overcoming unambiguously negative phenomena, such as ecocide. The ecological worldview itself, as the highest characteristic of a person, which arises as

a result of his/her adaptation to the surrounding world and constitutes a system of knowledge about the place of human in relation to nature, becomes an internal plan of human actions, based on values, beliefs, convictions, ideas, judgments and manifested in the active actions of the subject [19].

S. Sovhira in the dissertation research identifies the process of forming the ecological worldview of future teachers with a multifaceted, complex, contradictory, gradual process of continuous, active theoretical and practical activity related to the acquisition of ecological knowledge, the development of student's spiritual abilities through a combination of social and family influence, value assessment, stable motivation, willful efforts in the attitude towards environmental problems against a positive emotional background, the formation of beliefs and appropriate behavior in solving pedagogical, ecological and environmental protection problems [20].

Based on the above research, we will formulate the author's definitions of key concepts.

The students' ecological worldview, in our opinion, is an integrative personal formation reflecting a system of scientific ecological knowledge, value orientations, beliefs, emotional-value attitudes and behavioral models to determine the conscious and responsible attitude of students to nature, society and their own activities in the environment.

The formation of the students' ecological worldview is identified with a purposeful, systematic and pedagogically organized process designed to ensure the creation of a holistic system of environmental knowledge, values, beliefs, emotional-evaluative attitudes and behavioral models in students to ensure a conscious, responsible and activity-oriented attitude to the environment.

DIGITAL CONTENT IN THE FORMATION OF THE STUDENTS' ECOLOGICAL WORLDVIEW: FOREIGN AND UKRAINIAN DIMENSIONS

In the next part of the work, we will integrate the use of digital content in the educational process during the formation of the ecological worldview in students. We will focus on the analysis of global and Ukrainian experience.

Foreign practice of using digital content is longer, and therefore presented in more detail in scientific research.

Thus, a specialist from the University of North Malaysia K. Abdullah analyzed how TikTok, Instagram, YouTube influence the environmental thinking of young people. Short videos with a clear eco-message where young bloggers popularize environmental ideas turned out to be effective; students demonstrate a higher level of environmental identity when the content is presented in an interactive format (*challenge, quiz, reels*); peer influence plays an important role – students are more willing to adopt eco-models of behavior from their peers than from teachers [21].

English scholars (C. Howson, M. Kingsbury) have investigated how belonging and identity formation affect the experiences of students and teachers in science, technology, engineering and mathematics (STEM) fields, especially in the context of changes caused by the COVID-19 pandemic. They analyze the barriers to belonging that students from different social and cultural backgrounds, including racial minorities, women,

people with disabilities, and others, face. They describe practices that contribute to the formation of a sense of belonging, such as active learning, interdisciplinary projects, and partnerships between students and teachers [22].

Brazilian scholars J. V. Da Silva Lima, B. dos Anjos Soares, B. Maran, M. Hyppolito, A.C.M Barbosa Reis studied the experience of emergency distance learning in university teaching and learning during the COVID-19 pandemic [19] and the adaptation of teachers and students to the aforementioned processes through the implementation of distance and blended learning [23].

Information technologies in the formation of environmental awareness of future specialists and the features of the formation of professional competencies of future teachers using computer methods and a research approach were proven by Romanian scientists B. Cioruța and M. Coman [24].

Lebanese scientist M. Hajj-Hassan, French R. Chaker and Swedish researcher A.-M. Cederqvist, using the PRISMA method, analyzed 21 articles published between 2013 and 2023 that demonstrate interest in using digital tools in environmental education to increase students' awareness of sustainability. The research shows that virtual reality tools and climate change topics are the most trending in this field of research. Furthermore, the results show a positive impact of using digital tools on students' concerns about planet sustainability [25].

Turkish scientists K. Arslan and N. Karakuş analyzed the results of environmental education using digital games based on Web 2.0 for sustainable living through an empirical study. The study data were collected using an environmental knowledge test, an environmentally responsible citizenship scale, and a digital literacy scale. The obtained data were analyzed using an appropriate analysis using a statistical program. The results of the study showed that environmental education supported by digital games is effective. It was found that the level of students' knowledge, environmental behavior, and digital literacy indicators increased. Based on the results of the study, it is recommended to use digital games to achieve better learning [26].

Romanian researchers D. Gheorghiu, L. Ștefan and M. Moțăianu analyze environmental humanities as a new interdisciplinary field of research focused on determining the impact of modern human (including cultural) activities on the environment, as well as on environmentally friendly solutions. The authors note the serious consequences of environmental damage today and for the past, in particular in the case of archaeological sites, whose research is becoming more difficult and the process of destruction is accelerating. The scientists propose a digital educational solution in the field of humanities focused on augmented reality (AR) technology. The IT application they propose aims to identify areas of environmental risk and provide detailed information on the processes of destruction, as well as the possibility of connecting with networks of specialists. As a result of the use of the specified digital tool, critical thinking focused on environmental problems will develop, providing a solution for continuous learning for environmental specialists and the public, which in turn will contribute to the protection of the environment and archaeological sites, as well as the development of sustainable activities through education and awareness-raising [27].

The relevance of implementing digital technologies, digital content in the educational process has been confirmed by a number of Ukrainian scientists. Thus, T. Bakka analyzed international approaches and modern trends in the use of digital gaming technologies in pedagogical education [29], and I. Khoroshevska

and O. Khoroshevsky analyzed digital educational games as components of multimedia educational resources [30]. V. Bilous [31] and B. Komar [32] considered the advantages and disadvantages of using mobile educational applications in modern education, and G. Skrypka detailed the issue of their use for conducting research during the study of subjects of the natural and mathematical cycle [33]. V. Kosyk, T. Khomych and Y. Khomych considered the use of mobile devices and tablets based on the Android OS in the educational process [34]. Researchers Y. Bogachkov, O. Burov, N. Dementievskaya, O. Pinchuk analyzed the role of electronic social networks as tools of the modern educational environment [35]; N. Ichanska – the optimal choice of methods for organizing Internet resources and analysis of the resources and knowledge needed by the user [36]. V. Kovalchuk analyzed the essence and role of digital technologies in the formation of education seekers' ecological culture [37]. T. Pozdnyakova and V. Tymchyna investigated the use of the Learning Apps service to create interactive didactic exercises for biology lessons [38], and V. Streltsova and L. Mironets investigated the possibilities of online resources Classtools and Wordwall to create active interaction of students in biology lessons [39]. V. Moshura investigated the features of the formation of students' environmental awareness through social media [40]. Our previous numerous studies are aimed at analyzing the information support for the formation of education seekers' environmental competence [41], the methodological basis for using digital technologies in the formation of environmental competence of education [42], the formation of environmental culture in education seekers in the context of modern education [43], the use of project technologies in the formation of environmental competence in senior students to overcome the environmental consequences of the war [44], the essence, content and effectiveness of digital pedagogy of open education [45], the theoretical substantiation of the importance of the formation of students' environmental competence for the sustainable development of ecological systems [46], the formation of environmental competence in senior students in the process of STEM education using project technologies [47].

First of all, let's analyze the use of digital content in the educational process of educational institutions.

Thus, in the analysis of the trend of using digital gaming technologies in pedagogical education, T. Bakka identifies educational games with specially designed gaming products (board, digital, simulation), which integrate cognitive content with game components in order to gain knowledge, acquire skills, develop thinking and learning motivation. Virtual simulations are considered to be modeling real or fictional situations in a digital environment for safe interaction with virtual objects, decision-making, analysis of consequences and development of practical skills due to experience close to reality [29]. The key advantages of digital gaming technologies are the motivational component, the creation of a relatively safe environment for practicing pedagogical situations, the individualization and adaptability of the educational process, the promotion of the key competencies development: communicative, managerial, creative, and the readiness to work in the conditions of digital transformation of education [29].

I. Khoroshevskaya and O. Khoroshevsky conducted a fundamental analysis of the current state of the application of digital educational games in the process of training students, proved the importance of their implementation as components of multimedia educational resources to maintain the activation and support of the process of consolidating knowledge through effective use in a game form. Based on the results of the experiment, the experience of using a multimedia educational complex with three games of different genres

within the course "Programming of multimedia tools" is described. Based on the analysis of the responses of second-year students, it was concluded that the game elements of the complex make the learning process more exciting (thanks to detective and adventure storylines), increase motivation to master the art of programming (thanks to numerous interactive tasks in various game locations), and simplify students' understanding of complex aspects of C# syntax and program construction (thanks to simple visualization of the game) [30].

V. Bilous analyzes mobile educational applications in modern education (PDAs (pocket computers), smartphones, tablets and mobile phones, i.e. autonomous compact devices that accompany people in everyday life) and associates their advantages with expanding opportunities and ensuring equal access to education, personalization of learning, instant feedback and assessment of learning outcomes, learning at any time and in any place, support for situational learning, development of continuous learning, ensuring a connection between formal and informal learning, and assistance to students with disabilities. The author focuses on the wide possibilities of using these educational tools in view of the constant growth of their possibilities and capabilities [31].

For his part, B. Komar focused on the difficulties and problems of using mobile devices for educational purposes, namely: technical (small screen size and keys on mobile devices; problems with Internet access; dependence on battery status; memory size, information security; lack of unified standards in connection with mobile platforms, device characteristics; the need to rework conventional electronic content for mobile devices; risks of losing a mobile device; social and educational problems: inability of education seekers to purchase a suitable mobile device; assessment of learning outcomes; security of educational content; rapid development of mobile technologies; conceptual differences between electronic and mobile learning; security of personal information [32].

V. Kosyk, T. Khomych and Yu. Khomych analyzed the use of mobile devices and tablets based on the Android OS in the educational process. Researchers focus on the possibility of installing Android applications from a computer or special Internet sites: application stores. This is made possible by the built-in Android Play Store (Android Market) application catalog with a variety of free and paid programs. The authors provide a number of applications related to teaching mathematics, geography, physics, biology, preparation for external independent testing (EIT), NMT (national multimedia test). In addition, they emphasize that thanks to the Android operating system, Senkatel ZnayPad tablets can be used for taking notes at lectures, managing schedules, working with electronic textbooks, conducting research and communicating with teachers and classmates via e-mail, voice and video conferences. Another advantage of mobile devices and tablets is the ability to solve the problem of individualizing learning, that is, students can study and repeat the material at their own pace, and control the degree of its assimilation [34].

A lexicographic work "Electronic social networks as tools of the modern educational environment" edited by O. Pinchuk identifies the definition of the term "electronic social network" with the symbiosis of social and technical reality for the formation of various communicative configurations (spatio-temporal, subject-subject, subject-object) with high information density of modern society and the implementation of all types of social communication (mass, interpersonal, group) at all technological levels: verbal, written, audiovisual [35]. By actualizing the role of electronic social networks, the focus is on creating an interactive

educational environment with hypertext, mobility, high speed of information exchange, the ability to control the learning process, support feedback with listeners, regular updating of information and access by users at any time convenient for them [35].

N. Ichanska considers the site to be the main working unit of the Internet and classifies their types into a business card site, a corporate site, a forum, a promotional site, a blog. The basis of all pages created on the Internet are HTML and CSS technologies, programming languages that are responsible for the logical structure of the page and its stylization. The first group includes those whose code is executed on the site visitor's computer, that is, in his/her browser. This is JavaScript and a large number of libraries written in this language. The second group includes those languages whose programs are executed on the computer where the Web server is located. This group is larger and uses PHP, Ruby, C# when developing the server part. They are executed on the server side and start working before the page loads, after submitting a request (for example, entering an address). The third group includes SQL (structured query language) and relational databases MySQL, MSSQL, etc. The third group is associated with the storage of information: personal user data, logins, passwords, various settings, a set of information that should be displayed on a particular page [36].

The next part of the study will be devoted to the theory and practice of using digital content in the formation of the students' ecological worldview.

G. Skrypka, in her study of the use of mobile applications for conducting educational research during the study of natural and mathematical cycle subjects, calls modern smartphones and tablets powerful and complex devices with a variety of circuits, boards and sensors, the use of which will help students in conducting educational research. A mobile device makes it possible to measure various environmental parameters, analyze and statistically process the results using special applications. The author divides the sensors of modern mobile devices into three categories: motion sensors (accelerometer, gyroscope), position (magnetometer, GPS, proximity sensor) and ambient conditions (light sensor), the presence of which is checked using the Sensor Kinetics program (<http://goo.gl/gTLJyC>). Most mobile devices, together with software, are advisable to use for conducting scientific and educational research in natural and mathematics lessons. With the help of motion, position, ambient conditions and dozens of programs, teachers are able to carry out the educational process qualitatively [33].

Digital technologies in the formation of education seekers' environmental culture in accordance with the goals of sustainable development were analyzed by V. Kovalchuk. The researcher substantiated that interactive models, virtual laboratories, digital maps and research platforms contribute to the development of critical and systemic thinking, environmental empathy and responsible behavior of students. Thanks to digital formats, the author claims, students are immersed in an environmental problem, since in virtual laboratories they can change the parameters of experiments and track the phasing of consequences. With the help of digital simulations of ecosystems, students understand the dynamics of natural processes. Through the use of real-time pollution maps, students form an impression of the environmental situation in the region, country, and world. Thanks to interactive models of environmental phenomena, students are able to independently investigate the consequences of human activity. In a digital environment, a student can model scenarios of its development over time in parallel with the assimilation of information about climate

change; instead of hearing about water pollution, he/she is able to observe specific indicators and analyze their dynamics. Digital technologies allow combining theory with practice, that is to evaluate changes in virtual communities in accordance with the environmental decisions made, along with studying the concept of "sustainable development". According to the author, this form of education contributes to the formation of a deep understanding of environmental processes, which contributes to the formation of competencies necessary for making environmentally sound decisions, the development of environmental competence, worldview, consciousness, responsible consumption, and active citizenship [37].

T. Pozdnyakova and V. Tymchyna investigated the practice of using the Learning Apps service to create interactive didactic exercises for biology lessons. The authors argue that the LearningApps.org web service, which is a WEB 2.0 application, was created to support learning and the teaching process using interactive exercises. The service collects interactive exercises and makes them publicly available. It is used to develop and store didactic multimedia interactive tasks: memory games, crosswords, quizzes with the choice of the correct answer, tests, crosswords, etc. The authors call the automatic creation of QR codes an indisputable advantage, which is convenient when used as an interactive tool in classes, at home, in the process of organizing quests, etc. It is important to comply with copyright, that is, the ability to grant the status of one's own development [38].

Researchers V. Streltsova and L. Mironets detail the capabilities of the online resources Classtools and Wordwall for creating active student interaction in biology lessons. The authors argue that using the Classtools resource makes it possible to create various interactive tasks for independent study of the material, its consolidation and repetition. The specified resource allows you to use the entire functionality of the games without registration, but with the preservation of the reference to it. They consider the creation of a QR code for scanning with phones to be the greatest advantage, since students use smartphones for learning due to their mobility, high-quality functionality of training programs, and a clear and convenient interface. The researchers analyze another platform – Wordwall, which is more understandable and easy to use for teachers with modified interfaces. The optimal speed of producing quizzes, questions, arcade games, anagrams, crosswords and the ability to share in Google Classroom or on social media pages make this online resource more practice-oriented. The importance of the timer function for answering questions ensures compliance with the rules of academic integrity. It is significant to implement automatic assessment of tasks, self-analysis by the student of the achieved learning outcomes, and the teacher's assessment taking into account the result of the game [39].

V. Moshura states the fact of uncritical and unsystematic assimilation of information from social media by modern teenagers, so the development of their environmental awareness is possible only under the condition of comprehensive influence. The specified influence on environmental awareness integrates traditional forms and approaches: phenological work, observations, conversations, lectures, psychological trainings. The digitalization of the educational process is associated with the actualization of modern formats: webinars, master classes, online trainings and online marathons, psychological online quests and online conferences, live broadcasts and stories on Facebook or Instagram, informational and motivational videos on YouTube, Telegram channels and the youth network TikTok, etc. Given the popularity of social media among the population, the author emphasizes the importance of using media to develop environmental

awareness: for children – cartoons with environmental content, digital role-playing games; for teenagers – social networks (Instagram, Facebook, etc.), TV series, arcade games; for adults – information sites, social networks, news sites, etc. [40].

The role of social networks in representing the results of the research was revealed by the team of authors led by S. Tolochko. Thus, in their opinion, the formation of high school students' environmental competence by means of project-research activities is impossible without the final stage, namely, the dissemination of experience and publication of the report by posting it on open access platforms, in particular websites, social media, electronic libraries, etc. In the conditions of modern digitalization, the use of information resources by posting information about the project on websites, blogs, social networks in order to attract the attention of a wide audience and disseminate experience is relevant. Special media support can be obtained through cooperation with local media for the publication of articles, interviews or reports about the project [41].

The authors of the aforementioned work, in particular L. Mironets and S. Tolochko, also studied the characteristics of online platforms for use in the process of forming education seekers' environmental competence through their features, advantages and disadvantages, in particular Google Apps Education Edition, Google Classroom, Google Meets, Teams, Moodle, Zoom, Classtools, LearningApps, Edmodo, etc. A methodology for using mobile applications with environmental content in the formation of education seekers' environmental competence was developed by determining the methods of their integration into educational and cognitive activities, location (autonomous work in a classroom or remotely); frequency of their use (prepared training course, project using mobile technologies or one-time integration into a training session in the process of working on a certain topic); creation and use of existing mobile applications; use of personal mobile devices or devices of educational institutions [42].

Scientists S. Tolochko, N. Bordyug, L. Mironets developed a methodology for using modern digital technologies in the formation of education seekers' environmental competence, features of using online resources during the formation of environmental competence through the intensive introduction of "cloud technologies" and services into the system of general secondary, extracurricular, professional pre-higher and higher education and the development of a single information space. The types and capabilities of the 28 most common online platforms with active QR codes are described, which simplifies their search and use; 10 modern mobile applications with environmental content are characterized (Plickers, Anatomy 4D, Anatomy 3D human atlas, Animal 4D+, Bacteria interactive learning VR 3D, Zoopolis, WildCraft: Animal life simulator online, Evolution Idle, Mouse simulator, Flora Incognita App, etc.). In addition to the mentioned useful applications and links, Litterati, Sortuy, Garbage 31, Trash-It, Ecolabel guide, SaveEcoBot, Air Quality Index in Kyiv, Love Food Hate Waste, It's fresh, Stock factory, Dirty Dozen, Refill, Happy cow, Eco friendly cafe, Lunchtime Legends, Forest, etc. were also analyzed [41].

Researchers A. Truten and S. Tolochko revealed the features of STEM education as an innovative direction that contributes to the formation of high school students' environmental competence. The integration of interdisciplinary approaches and practice-oriented methods in STEM education ensures the effective assimilation of environmental knowledge and the formation of a value-based attitude towards the environment. The authors analyzed modern approaches to the use of project technologies in the process of

STEM education, which act as an effective tool for the formation of environmental competence. They found that project technologies stimulate the active cognitive activity of students, develop critical thinking and contribute to the acquisition of practical skills necessary for solving environmental problems. Scientists have developed a model for the implementation of STEM projects of an environmental direction with the involvement of project technologies in secondary education institutions, which takes into account the peculiarities of the educational process and is aimed at the formation of environmental competence in high school students [47].

The analysis of the theoretical foundations of using digital content in the formation of the education seekers' ecological worldview carried out in this section confirms a certain level of development of the above. Further scientific research will be directed at publishing the results of the conducted empirical study and creating a methodology for developing digital content in the formation of the education seekers' ecological worldview.

2.2 ASSESSMENT OF VALUE ORIENTATIONS AND EDUCATIONAL PREFERENCES OF EDUCATION SEEKERS IN THE CONTEXT OF USING DIGITAL ECOLOGICAL CONTENT

The educational environment in modern conditions is undergoing active transformation, which is associated with the development and active implementation of digital technologies in all aspects of the activities of educational institutions. This process affects the features of the formation of education seekers' value orientations, worldview and behavior. The need to form an ecological worldview in children from an early age is exacerbated by global environmental challenges facing humanity, including climate change, loss of biodiversity, pollution of water resources, atmospheric air, soils, etc. It is worth noting that the natural environment of Ukraine is constantly suffering from the environmental consequences of military operations and human-made risks. Therefore, the formation of environmental values and responsible consumption among students using digital technologies is of particular importance in the context of the post-war reconstruction of Ukraine.

The formation of an ecological worldview in students is a complex process that includes cognitive (acquiring knowledge about ecosystems, natural resources, the impact of anthropogenic activity), emotional and value (development of environmental awareness, responsible attitude to nature) and behavioral (the ability to take environmental protection actions) components. The use of digital educational content in the formation of the education seekers' ecological worldview opens up new opportunities for increasing motivation, visualization of complex natural processes, personal learning and development.

The intensive personality formation occurs in children and young people aged 10–18. This is a period of development of critical thinking, formation of value orientations and the ability to reflect. They realize the global nature of environmental problems, as well as their own role in solving them.

For students, the digital environment is a source of information, a space for socialization and communication, an opportunity for self-expression. This environment directly influences the formation of their beliefs and the creation of their personality. Since students aged 10–18 are active consumers of digital

content, a study was conducted to identify their views, interests and preferences on environmental topics. The peculiarities of their perception of digital educational materials were also identified.

1975 respondents from 11 regions of Ukraine took part in the survey, including 55.9% girls and 44.1% boys. The survey was conducted in Zhytomyr, Chernihiv, Sumy, Mykolaiv, Ternopil, Odesa, Khmelnytsky, Kyiv, Kirovohrad, Poltava and Dnipropetrovsk regions. During the survey, students of the following age categories were interviewed:

- 10 to 11 years old – 219 people (11.1%);
- 12 to 13 years old – 438 people (22.2%);
- 14 to 15 years old – 589 people (29.8%);
- 16 to 17 years old – 545 people (27.6%);
- 18 years old and older – 184 people (9.3%).

The largest share of respondents (57.4%) is made up of students aged 14 to 17.

Students actively spend their time on a computer, mobile phone and other gadgets. Therefore, it is important to determine the duration of using the digital environment by students during the day. The survey results were analyzed and a high level of daily digital activity of children and youth was revealed (**Fig. 2.1**).

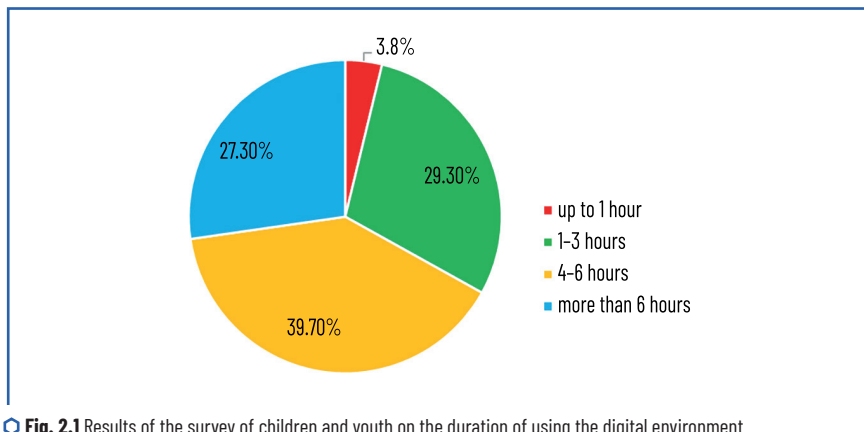


Fig. 2.1 Results of the survey of children and youth on the duration of using the digital environment during the day

67% of the respondents spend more than 4 hours in the digital environment, of which 27.3% spend more than 6 hours. Only 3.8% of the respondents use digital content up to 1 hour a day, which is the minimum level of digital activity. The results of the survey prove the significant integration of digital technologies into the daily lives of education seekers, which is due to the combination of both educational and entertainment content. Education seekers actively view social networks, various videos and games, and also use educational online platforms and video materials, electronic textbooks, manuals, etc. for learning.

A clear trend towards the prevalence of prolonged use of the digital environment by education seekers during the day, which is an integral part of their lives, has been identified. Therefore, it is necessary to

create and implement an ecological and educational digital resource for children and youth, since they are most open to its influence. Therefore, the use of digital content of an ecological orientation is an effective means of forming the ecological worldview of education seekers.

Fig. 2.2 shows the results of a survey of education seekers on the frequency of using various digital resources in everyday life.

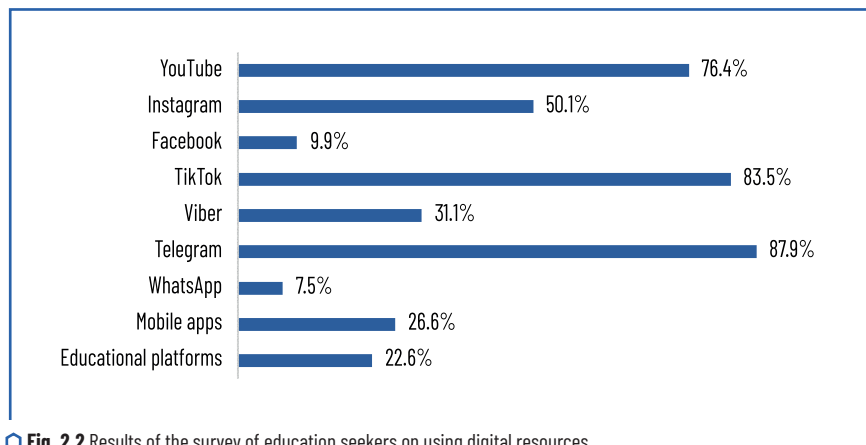


Fig. 2.2 Results of the survey of education seekers on using digital resources

It was found that 87.9% of education seekers use the Telegram messenger in everyday life, which defines it as the main channel of communication, information exchange and access to thematic communities among young people. The TikTok application also has a high level of popularity among children and young people, which was noted by 83.5% of the respondents. A feature of the TikTok application is the use of short video content with a high level of visualization and dynamism. The survey results reflect the desire of education seekers to watch short video content, so this must be taken into account when creating educational videos on environmental topics.

According to the survey results, 76.4% of the respondents use YouTube. It combines entertainment, cognitive and educational potential, and also provides access to video lectures, educational materials and popular science content. The share of mobile applications is 26.6%, while educational platforms are used by 22.6% of the respondents. This indicates the potential for expanding the implementation of educational digital content on environmental topics in the daily activities of education seekers.

When analyzing the results of the study, it was found that social networks and messengers dominate the information space of education seekers. They give priority to digital platforms that have a short video format and allow for quick exchange of messages. At the same time, the relatively lower rate of using educational platforms highlights the need to adapt environmental digital content to the formats that are most popular among the target audience, in order to increase the effectiveness of forming an ecological worldview in the conditions of digital culture.

It was determined that 74.5% of education seekers use digital gadgets for learning every day. This indicates the active integration of digital technologies into the structure of the modern educational process and confirms the transformation of the traditional learning model. 17.0% of the respondents indicated that they use digital technologies for learning several times a week, which also indicates a sufficiently high level of their educational activity in the digital space (**Fig. 2.3**).

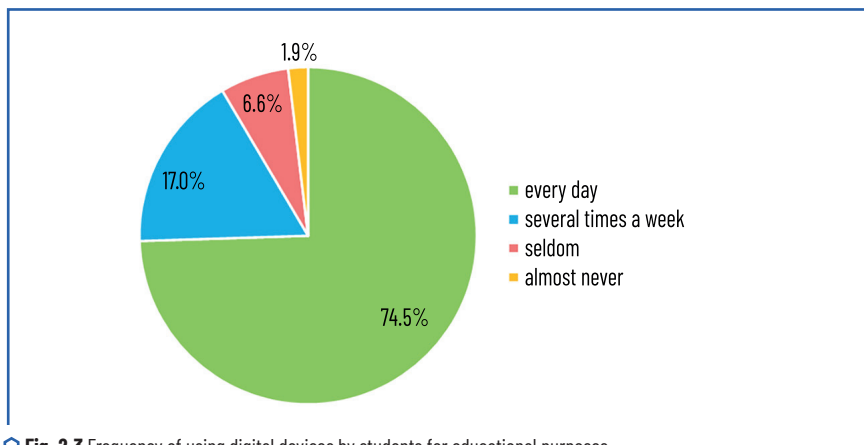


Fig. 2.3 Frequency of using digital devices by students for educational purposes

Daily use of digital devices can be associated with completing homework, searching for information, participating in online lessons, using electronic textbooks and educational platforms. The high frequency of their use creates favorable conditions for integrating digital content of an environmental focus into the educational process and increasing the effectiveness of forming an ecological worldview.

The analysis of the survey results showed that 66.0% of the respondents most often watch video material for educational purposes, which confirms the dominance of the audiovisual way of perceiving information in the modern digital generation. Video provides a combination of text, image, animation and sound, which contributes to better concentration of attention, emotional involvement and a more accessible explanation of complex phenomena, in particular environmental processes and problems (**Fig. 2.4**).

The results of the survey on using mobile applications for learning indicate a fairly high level of their integration into the educational activities of students. In particular, 58.3% of the respondents noted that they use mobile applications for learning. This indicates their significant role as a tool to support the educational process. At the same time, 18% of the respondents noted that they do not use mobile applications for educational purposes. It should be noted that 23.7% of the respondents find it difficult to answer the question posed. This indicates the lack of a clear understanding of the boundaries of educational and extracurricular use of mobile applications. For the modern digital generation, educational content is often integrated into familiar digital environments (social networks, video

platforms, messengers), which makes it difficult to distinguish between educational and entertainment activities (**Fig. 2.5**).

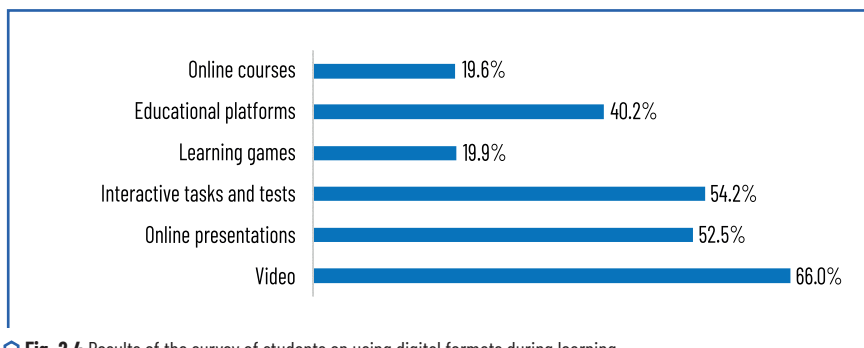


Fig. 2.4 Results of the survey of students on using digital formats during learning

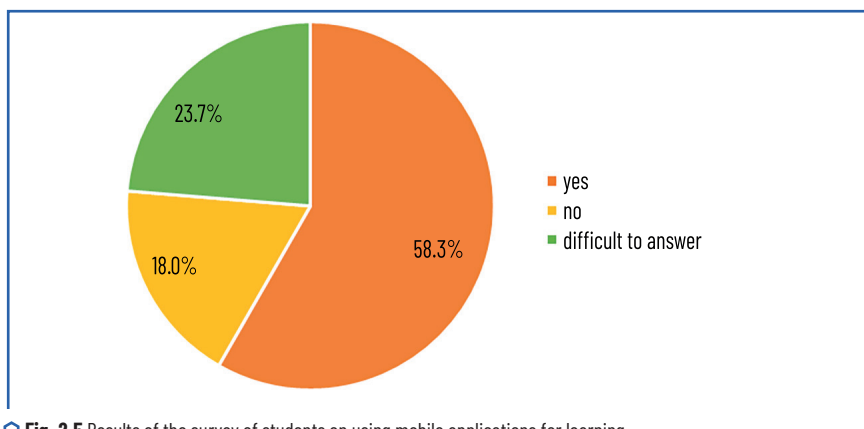


Fig. 2.5 Results of the survey of students on using mobile applications for learning

The analysis of the survey results on the frequency of viewing digital content on ecology (videos, publications on social networks, information posts, etc.)

indicates a moderate level of students' interest in the relevant topic. In particular, only 9.7% of the respondents noted that they often view environmental digital content. This indicator demonstrates the presence of a relatively small group of students with a high level of environmental and information activity (**Fig. 2.6**).

The largest number of the respondents (44.0%) sometimes view digital content on environmental topics. In most cases, this is associated with viewing educational tasks, information news related to environmental disasters, promotions, as well as recommendations on social networks, etc.

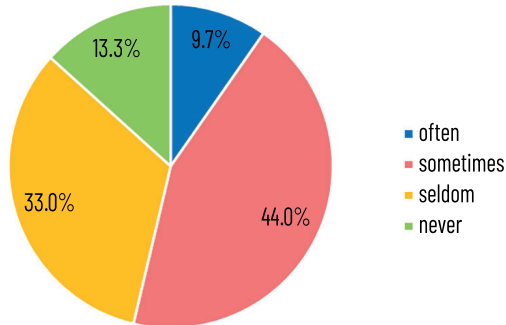


Fig. 2.6 Results of the survey of students on viewing videos, posts or other content on environmental topics on the Internet

At the same time, 33.0% of the respondents rarely view environmental digital content, which indicates insufficient integration of environmental issues into their daily information space.

It should be noted that students rarely view materials on environmental topics in their digital information environment. This highlights the need to create attractive and integrated digital environmental content that will correspond to the age category of children. Increasing the involvement of children and young people in viewing such content will be an important factor in their environmental awareness, and will also contribute to the formation of a sustainable ecological worldview in the conditions of digitalization.

During the survey, the formats of environmental digital content that are most liked by education seekers were determined (**Fig. 2.7**). It was found that the respondents like audio-visual forms of information presentation, as well as interactivity and visualization of various environmental data, the most. Video materials arouse the greatest interest in children and young people, this was noted by 72.5% of the respondents. This confirms that the main role in the structure of information preferences of modern youth is given to dynamic visual content. When creating video materials, specialists combine imagery, emotional impact and accessibility of presenting complex environmental problems. This not only increases the level of coverage of education seekers, but also contributes to a better understanding of the content of the information presented.

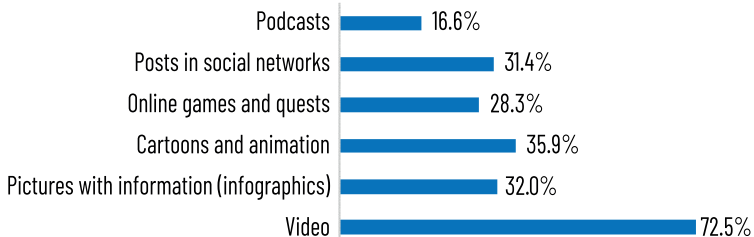


Fig. 2.7 Results of the survey of students on preferences for formats of digital content about ecology

It was also found that education seekers are significantly interested in cartoons and animations (35.9%), pictures with information and infographics (32.0%), and posts on social networks (31.4%). The survey results confirm the fact that concise, structured, and visual presentation of material dominates in everyday life and among young people. Therefore, it is necessary to adapt environmental materials to digital communication formats. Podcasts are the least attractive for education seekers, since only 16.6% of people noted this format.

Fig. 2.8 shows the results of the survey on better understanding of environmental problems by education seekers when using digital educational materials.

The majority of the respondents (72.7%) believe that digital educational materials help them better understand the essence of environmental problems, but for 6.5% of the people, they do not help in understanding environmental topics, and 20.8% of the people cannot clearly decide. The results of the study revealed positive dynamics in the use of digital materials in the formation of the education seekers' ecological worldview, as well as the high potential of the digital information environment. However, the presence of 27.3% of the respondents who are undecided or believe that digital resources do not help in understanding environmental topics highlights the need to create methodological recommendations for teachers. These recommendations should include a structured selection of digital resources, features of their use, and a methodology for forming an ecological worldview using the digital environment.

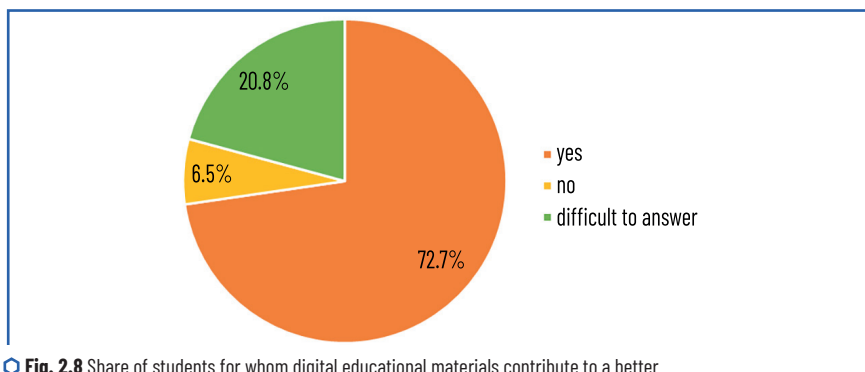


Fig. 2.8 Share of students for whom digital educational materials contribute to a better understanding of environmental problems

During the survey, the students were asked to express their opinion on the main factors that make digital environmental content attractive. The results of the survey are shown in **Fig. 2.9**. It was determined that children and young people pay the most attention to the content and practical aspects of digital environmental content. Thus, 62.3% of the people noted that interesting information about nature is crucial for them, and for 62.1% of the people – real-life examples that reflect environmental problems and ways to solve them. 55.5% of the students noted the importance of conciseness and clarity in presenting environmental material. This indicates that they best perceive a structured and accessible format for presenting the material. However, visual appeal plays a significant role in the perception of digital content. Thus, 45.8% of the respondents noted that one of the main factors in attracting attention is bright pictures and design.

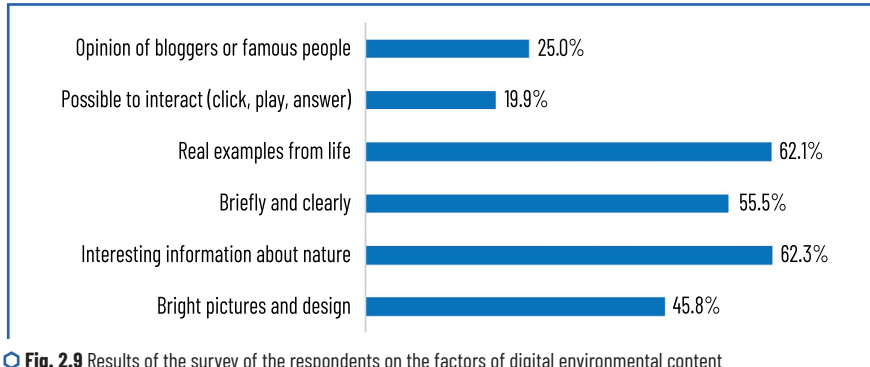


Fig. 2.9 Results of the survey of the respondents on the factors of digital environmental content attractiveness

Regarding the interactivity of the material presentation, it does not play a significant role, since 19.9% of the education seekers chose the ability to interact with the content, for example, to click, play or respond, as its attractiveness. A small proportion of the respondents (25.0%) noted that they are guided by the opinions of bloggers or famous people. The obtained survey results allow us to identify the main factors of the effectiveness of digital environmental content, namely, meaningfulness, scientificity, reliability and practical orientation, which must be taken into account when creating it.

The opinion of education seekers on the influence of digital content on their attitude towards nature and the implementation of environmental actions was studied (**Fig. 2.10**). According to the survey results, it was found that digital content has a significant impact on the formation of environmental awareness and value orientations in education seekers. Thus, 29.4% of the respondents noted that digital environmental education materials influence their attitude towards nature and environmental actions, 48.2% of the people believe that this influence is partial.

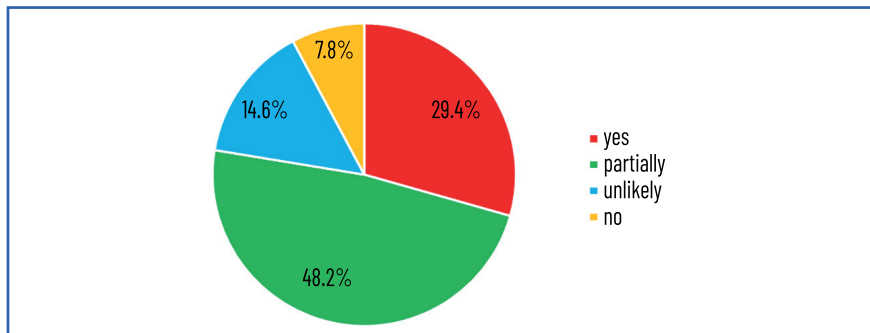


Fig. 2.10 Results of the survey of students on the impact of digital content on attitudes towards nature and environmental actions

However, 14.6% of the respondents believe that the impact of digital content on environmental awareness is unlikely, and 7.8% of the people completely deny this impact. Such results may indicate a critical attitude of students to information or insufficient integration of environmental content into their everyday lives. It was established that digital content performs an informative and motivational-behavioral function, contributing to the formation of environmental awareness, encouraging students to take environmental actions and motivating them to responsible consumption. Therefore, the systematic use of high-quality digital content on environmental topics during the educational process is advisable.

The impact of digital content on the motivation of students to take environmental activities was studied. Most respondents (64.3%) noted that digital environmental education materials motivate them to take environmental actions. This indicates a high level of emotional and value impact of digital content, which not only provides knowledge, but also encourages specific actions, namely: waste sorting, saving natural resources, participation in environmental conservation activities, etc. However, 8.9% of the people believe that digital content on environmental topics does not have a motivational impact, and 26.8% of the respondents find it difficult to answer this question. This indicates a specific uncertainty in self-assessment of their own behavior or a low level of personal involvement in environmental initiatives (**Fig. 2.11**).

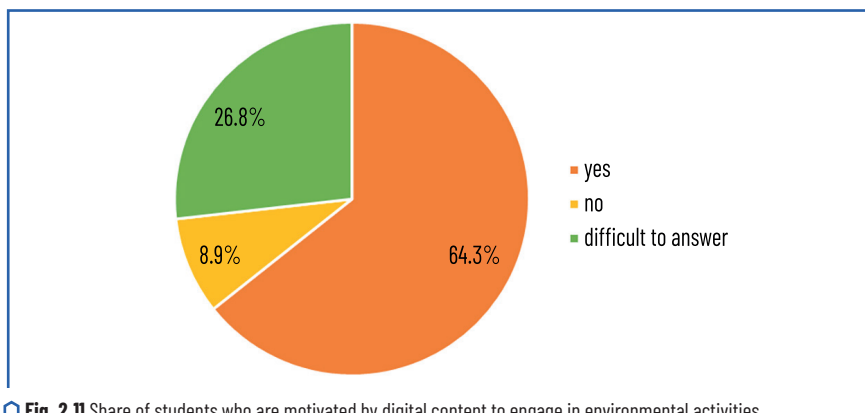


Fig. 2.11 Share of students who are motivated by digital content to engage in environmental activities

Constant viewing of digital environmental educational content can contribute to the formation of useful environmental habits. This is confirmed by the results of the survey of students (**Fig. 2.12**).

So, 20.8% of the respondents noted that they regularly implement useful environmental habits after viewing the relevant content, 60.3% – sometimes, and 13.0% – very rarely use environmental habits. Only 5.9% of the people did not find any changes in their own behavior. These results prove that digital environmental educational content is able to influence the implementation of situational environmental activities by students. In order for this activity to become regular and conscious behavior, it is necessary to carry out pedagogical influence during the educational process using digital content.

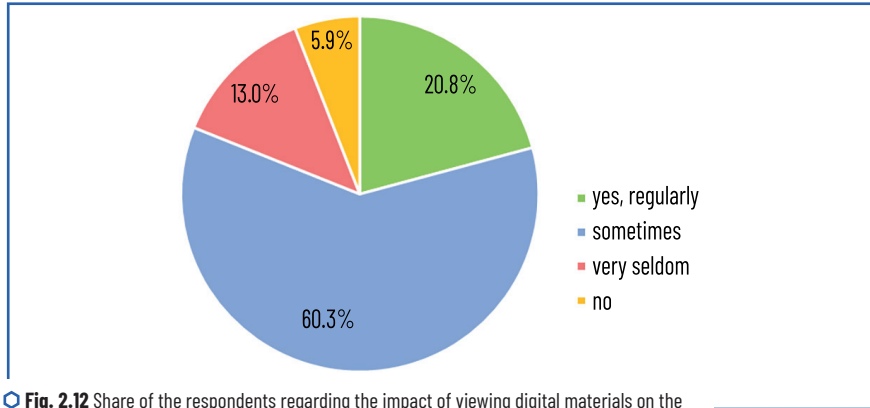


Fig. 2.12 Share of the respondents regarding the impact of viewing digital materials on the formation of useful environmental habits

Accordingly, the opinion of the students regarding the use of digital environmental educational content during the educational process was studied. Only 17.0% of the respondents systematically view digital environmental materials in lessons, while 50.3% of the people sometimes do so. This indicates the gradual introduction of digital content into educational activities. An effective process of forming environmental awareness in children and youth will be possible during pedagogical support of viewing digital content, as well as consolidating the acquired knowledge and skills in practical activities (**Fig. 2.13**).

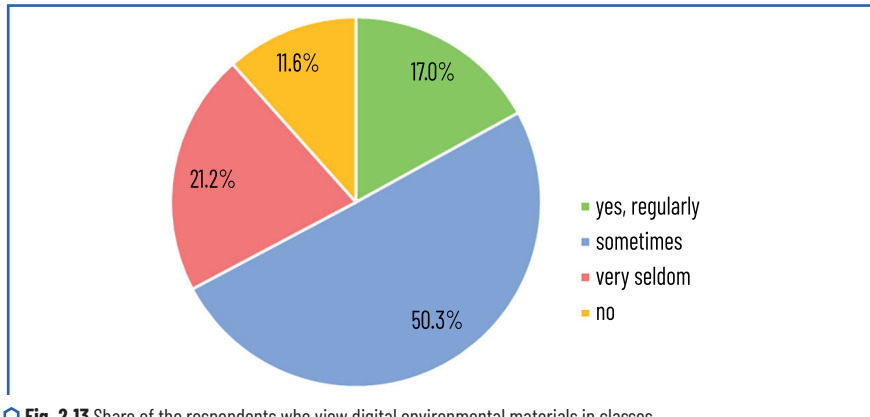


Fig. 2.13 Share of the respondents who view digital environmental materials in classes

Almost a third of the respondents (32.8%) noted that they rarely or do not use digital environmental content during lessons. This indicates the lack of a systematic approach to the implementation of digital resources in the educational process or the uneven digitalization of the educational environment

in educational institutions. Therefore, it is extremely important to create pedagogical support for the integration of digital content on environmental topics in educational institutions.

The analysis of the study results allows us to identify priority characteristics of high-quality digital content on environmental topics (**Fig. 2.14**). Students want digital content to be simple and understandable (78.1%), with reliable information (68.6%), interesting and creative (60.8%). The results of the study indicate that high-quality digital environmental content should be structured, accessible, and take into account the age characteristics of learners, as well as combine meaningful content with a creative and attractive form of information presentation. In conditions of information overload and the spread of unverified data, the reliability of digital environmental educational content is important.

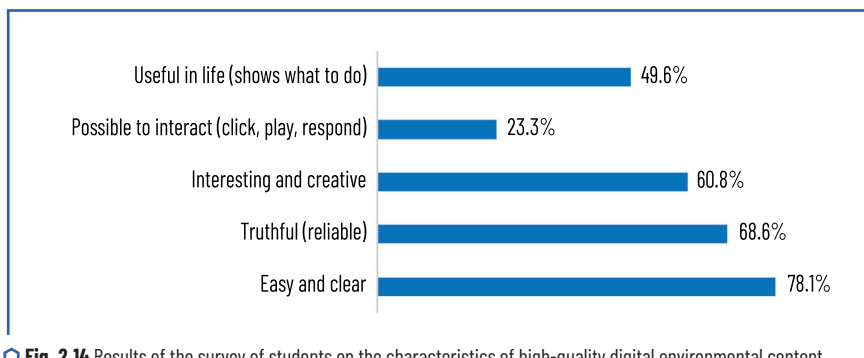


Fig. 2.14 Results of the survey of students on the characteristics of high-quality digital environmental content

As noted by 49.6% of the respondents, the practical orientation of digital content is important. Education seekers want to see specific practical examples of environmental activities and behavior in everyday life. However, only 23.3% of the people are interested in the interactivity of digital content, which indicates the importance of the content and practical orientation of the information provided. Therefore, to ensure the effective formation of an environmental worldview and responsible behavior among education seekers, it is necessary to use digital environmental content that is accessible, meaningful, reliable and practical.

During the survey, education seekers expressed their opinion on environmental topics that are relevant for viewing in the digital space (**Fig. 2.15**). After analyzing the survey results, it is possible to form a rating of environmental topics that are priorities for children and youth:

- protection of animals and plants (biodiversity) – 58.1% of the people;
- climate change and its impact on people – 56.7% of the people;
- the problem of the impact of war on the environment – 49.3% of the people;
- an ecological lifestyle – 37.9% of the people;
- garbage sorting and recycling – 37.4% of the people;
- water conservation – 36.8% of the people;
- air pollution – 35.6% of the people;
- energy saving and the use of renewable sources – 35.2%;

- the problem of plastic and its impact on people and the environment – 34.4% of the people;
- environmental problems of the community – 33.7% of the people;
- sustainable development – 33.2% of the people;
- environmental habits that everyone can change – 32% of the people;
- conscious shopping and minimalism – 25.8% of the people.

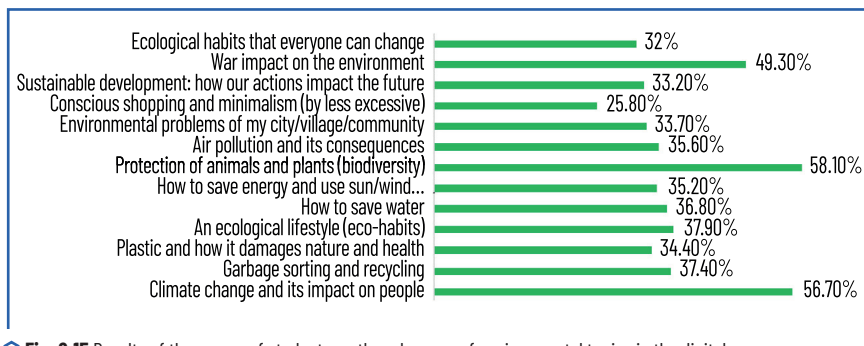


Fig. 2.15 Results of the survey of students on the relevance of environmental topics in the digital space

It should be noted that education seekers are interested in complex environmental topics that combine natural, social and ethical aspects. This is the problem of climate change, the impact of war and the preservation of biodiversity. They are also interested in environmental topics of applied importance, such as an ecological lifestyle, waste sorting, saving natural resources and others. Accordingly, when creating digital environmental educational content, it is necessary to combine the global context with specific practical actions. Such a combination will contribute to the formation of a holistic ecological worldview.

The education seekers also expressed their opinion on the formats of digital environmental educational content that are more convenient for them. It was determined that 75.5% of the respondents chose the game format of learning. The video format of digital environmental content is also popular, as evidenced by 44.2% of the people. Visualization of the material and its dynamic presentation remain relevant for modern youth. Posts on social networks (15.0% of the people), challenges (12.0%) and various images (9.4% of the people) are less interesting for education seekers. To form an ecological worldview in children and youth, it is necessary to use visual, interactive digital content with the possibility of social interaction. Education seekers will perceive it most effectively.

According to the results of the empirical data obtained, it can be stated that the introduction of digital environmental content into the educational process is uneven. Some education seekers regularly use digital resources on environmental topics during lessons, but a third of children do not have such constant experience. This indicates differences not only in the level of digitalization of educational institutions, but also in pedagogical approaches to the use of digital content. In order to overcome the discrepancies between the capabilities of the digital environment and practical application, it is necessary to create high-quality methodological, organizational and information support. Therefore, digital environmental content can

become one of the leading tools for forming an ecological worldview and responsible behavior among students, especially in the post-war reconstruction of Ukraine. But this will be possible only if digital content is adapted to the media consumption habits of children and youth, filled with scientifically based materials, and provided with systematic pedagogical support.

2.3 METHODOLOGICAL PRINCIPLES OF USING DIGITAL CONTENT IN FORMING THE ECOLOGICAL WORLDVIEW OF EDUCATION SEEKERS

The provision of modern teaching aids (software: multimedia textbooks, disks, universal encyclopedias, presentations, video, audio materials, Internet resources; equipment: personal computer, audio, video tools, multimedia projector, interactive whiteboard) ensures the quality of representation of theoretical and practical material and the effectiveness of its assimilation by education seekers. Digital technologies integrate classical visual information (text, graphics) with dynamic (speech, music, video, animation), causing a simultaneous impact on the visual and auditory senses of education seekers. The introduction of multimedia technologies in environmental education is an objective necessity of today's society. The basis for the use of multimedia technologies to form the educational space of an educational institution is the harmonious integration of various types of information. The term "multimedia" is used as an analogue of the lexeme "media" (print, photography, radio, cinema, television, video, multimedia computer systems, including the Internet). In pedagogical discourse, it is identified with a special interactive technology for working with computer graphics, text, speech, high-quality sound, static images and video through the use of technical and software tools.

The use of multimedia in the educational space is associated with the creation of computer educational and cognitive courses (E-learning), reference books (encyclopedias and collections). CBT (computer-based training) helps the user go through a series of presentations, thematic texts, illustrations using various formats for presenting information. Edutainment is appropriate in environmental education and upbringing - educational and entertainment programs used to combine education and entertainment.

The idea of media convergence as a dynamic and variable educational course, relevant in this context, is used all over the world. It transforms the educational reality and requires the use of technological skills when creating videos outside the walls of an educational institution. For example, in a situation of misunderstanding of the topic of an educational subject during listening or the absence of an education seeker in a lesson, it is advisable to use educational videos. Their duration should be up to 10 minutes, in this case time is saved, since the education seeker will spend more time on processing the material of a textbook or manual. In the process of viewing content, both visual and auditory memory are activated, so memorization of new information improves, that is the quality of educational activities and study of educational subjects in educational institutions increases. Multimedia presentations are used as digital multimedia tools here; work with personal computers and created personal folders of education seekers; integration of parallel and concentric processing of the educational program; individual approach with the use of individual educational programs, banks of multi-level tasks in classes; use of business games and projects with the systematic

use of a problem-based approach in learning. Thanks to multimedia technologies, the educational process becomes more technological and effective. Just thanks to interactivity, the use of multimedia in lessons structures and visualizes information, strengthens the motivation of students, and activates their educational and cognitive functionality both at the conscious and subconscious levels.

It is well known that the visual information channel is the most effective, so the achievements in its use in the field of education by means of multimedia are more developed. However, the creation of a rhythmic dominant for a multimedia product through the optimal selection of musical accompaniment also increases the efficiency of learning the material. Another advantage of this educational technology is the integrated interaction of the keyboard and mouse in multimedia textbooks in combination with other media. The basis is the ability to significantly develop memory through manual exercises. The new system combines individual products of individual authorial consciousness, that is, text with an image, sound series, video, etc. During the specified interaction, their independence is lost at the stage of developing the script, calculating the functionality, the results expected from the product in accordance with its intended purpose, and the multimedia product itself acquires qualities that are absent in its individual components. Nowadays, the effectiveness of multimedia in education determines the specifics of their use when solving a specific educational task, that is, learning something, developing skills to work with something.

Considering the effectiveness of multimedia in education, it is worth, however, indicating the features of its application and certain shortcomings and possible threats. Yes, it is worth understanding that the software of an educational course is a significant help in implementing the educational goal. The need for parallel use of a regular school board and monitor, as well as the integration of Power Point with the study of students' opinions, is undeniable. It is advisable to combine traditional methods and means of teaching with the use of multimedia technologies without abusing them.

As we know, multimedia technologies as a means of teaching can be used during various classes. For example, in the process of presenting theoretical educational material, it is appropriate to use presentations with different types of information: text, sound, graphic, animation. Electronic textbooks are widely used as one of the tools for independent training of students. At the stage of testing knowledge, skills and abilities, it becomes advisable to use test programs for diagnosis, consolidation and control.

In the process of selecting a multimedia tool, the teacher should take into account the characteristics of the subject, take into account the characteristics of the field of science, research methods, and its regularities. Multimedia technologies should meet the goals and objectives of environmental education and be organically implemented in the educational process. As noted earlier, multimedia teaching aids are universal and can be used at different stages of an educational lesson: when posing a problem before studying new material; in the process of explaining new material as an illustration; at the stage of consolidation and generalization of knowledge, skills, abilities; for the purpose of control. Multimedia learning technologies are a guarantee of improving the quality of education in educational institutions, they give the learning process a specific novelty, ensure the reproduction of a significant amount of material in a short time, as well as its presentation in a unique and exciting aspect, the emergence of new images in students, the detailing of vaguely formed ideas, and the deepening of acquired knowledge.

A number of countries use correspondence courses and schools with training through the transfer of educational information to students through the local computer network "Intranet" and the global "Internet". Currently, full-time, distance and blended learning are widespread in Ukrainian educational institutions, and the use of video recordings of classes in electronic repositories exceeds the number of educational films.

Undoubtedly, the use of multimedia teaching aids requires additional significant costs for the organization and implementation of the educational process, as it requires qualified maintenance, repair and provision with consumables. Given the constant updating and modification of the computer equipment market, the period of its obsolescence is steadily decreasing, which requires systematic updating. Thanks to distance learning, forms of communication associated with e-mail, video conferences, participation in the work of the Internet (conferences, forums, webinars, etc.) are updated. Therefore, the information distance environment is a means of effective interaction between participants in the educational process: students and teachers. Through the use of multimedia technologies, educational institutions become an enriching and transformative factor, one of the ways to modernize the content of education, including environmental education, in accordance with modern requirements.

The current Ukrainian society considers the formation of a new generation without outdated standards and stereotypes, individuals capable of creative thinking, independent decision-making on solving environmental problems and taking responsibility for their implementation, active participation in the life of the community, society, solving complex problems of the present day in view of inevitable climate change, identified environmental problems of the regions, significant environmental consequences of Russian armed aggression to be an important task.

To organize pedagogical work using multimedia tools, goals, tasks, the course and content of research and search work are formed, its conclusions are formulated and the results are evaluated. Taking into account the considered approaches to organizing the learning process, we will present a model of using multimedia technologies in the formation of an environmental worldview of education seekers. Learning technology is directly related to such important characteristics of learning as personalization of the educational process while maintaining its integrity through dynamic adjustment of the programs of educational subjects: biology, ecology, physics, chemistry, geography, valeology, mathematics, etc. Using multimedia learning technology, the basic principles of learning are implemented: clarity by expanding the possibilities of visualizing educational information, where reality can be created using graphics, sound, color and other multimedia tools. The user and the program are accepted instantly, that is, feedback, interaction between the user and the software system, which is characterized by the implementation of more advanced methods of virtual dialogue, for example, the ability to choose the operating mode and the content of educational materials.

In order to increase the effectiveness of multimedia technologies, it is necessary to implement the following conditions of organization and learning for the formation of an ecological worldview of students: internal openness; flexibility; adaptability; speed and compactness of learning; strengthening the needs and interest of education seekers in the rapid and high-quality acquisition of environmental knowledge, acquisition of skills and abilities, formation of competence, worldview, and consciousness. It should be noted that a systemic approach is used when creating the model, which means that all elements of the model are closely interconnected and, if at least one element changes, this will affect other elements and even the entire model (**Fig. 2.16**).

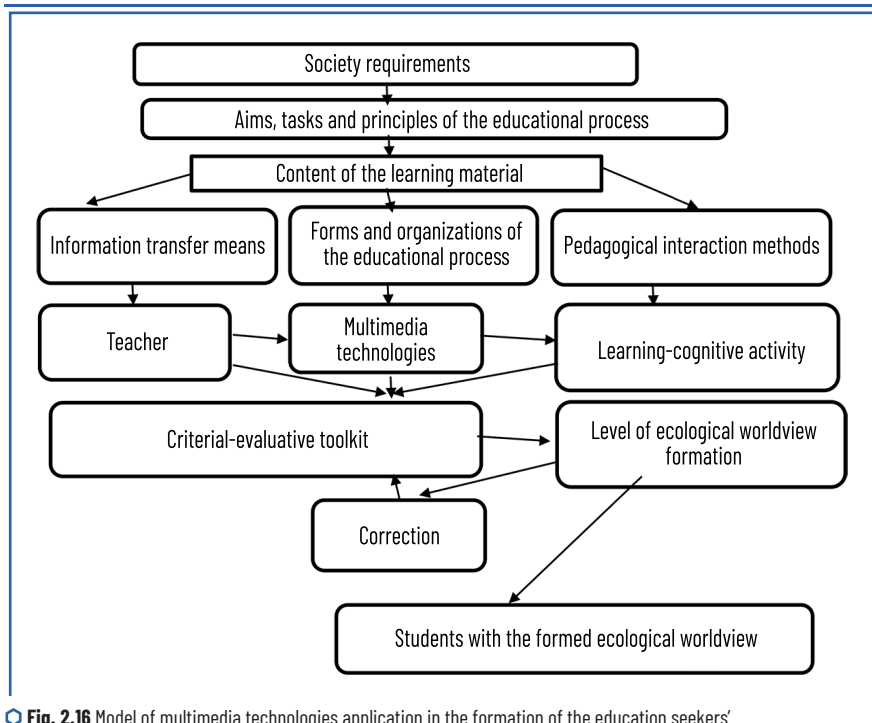


Fig. 2.16 Model of multimedia technologies application in the formation of the education seekers' ecological worldview

Methods of information transfer in work of modern graphic editors for creation of vector and animated graphics, interactive videos are favorable for the formation of stable practical skills. Creation of educational multimedia products, as well as use of modern graphic editors, form vector and animated graphics, interactive video, involvement of Macromedia Flash MX tool environment develops immediacy, creativity and design talent of education seekers, promoting the development of their ecological worldview.

The system of ecological education and upbringing contains real independent performance of each task, preparation for thematic control, implementation of final personal ecological mini-project by education seekers.

In the context of our research we will allocate four modules, which embody the technology of creation of educational multimedia products in instrumental environment Macromedia Flash MX:

- 1) creation of graphic images using tools;
- 2) variety and combination of animation methods;
- 3) Macromedia Flash software and interactive animation on the Internet;
- 4) development of an educational computer multimedia product.

The student has the opportunity to practice the techniques of creating educational multimedia projects and consolidate the skills acquired in practical classes. There is a presentation of works and a theoretical demonstration of methods for their development, a detailed analysis of the possibility of using these multimedia products in education, the creation of lapbooks, comics on environmental topics.

When integrating knowledge of the basics of computer graphics and multimedia in the process of organizing independent work, it is necessary to take into account the basic principles of personally oriented and activity approaches. With the use of the personally oriented one, the development of the student, his/her understanding of the need for self-education and self-determination, and awareness of personal responsibility for the result of learning is carried out. Acquired ecological knowledge, obtained skills and abilities, formed competencies are both the goal of learning and a way to develop the ecological worldview and consciousness of the education seeker. Thus, when performing work in small groups, the individual learning style and behavior of each student are taken into account.

The activity approach in the independent work of education seekers during the formation of their ecological worldview involves the interaction of the teacher and the student in the development of important personal qualities, the manifestation of an individual pace and style of work; modeling of future activities (using a business game); orientation to self-development (project activities and contextual learning).

Important for the development of cognitive abilities of education seekers is the form, in which the results of independent work are presented, in particular visual (demonstration of created projects/mini-projects, didactic materials, presentations, brochures, animations and visualization). The methodology for demonstrating the results of independent work theoretically and practically leads to consistency in improving students' skills and abilities, applying the acquired knowledge and solving various environmental problems. When assessing independent work, attention is focused on subject and personal results.

The subject learning result is associated with the transformation of knowledge from an implicit state into an explicit one, that is, in the form of visual forms that can be transmitted to others. The personal result in the context of our study is identified with the formed ecological worldview of education seekers. Thus, in the process of assessing the subject results of independent work of education seekers, attention is focused on the number of errors in the final tasks, while the personal results are focused on the lack of self-control, reflection and self-correction in the formation of their ecological worldview.

The formation of students' interest in the possibilities of applying the acquired knowledge, skills and abilities in their own educational and cognitive activities during the formation of their ecological worldview is ensured by means of a developed system of educational and methodological tools, in particular electronic textbooks, educational and methodological manuals, methodological recommendations, instructions, workshops, etc. The next stage of training must necessarily be leading questions for self-control.

Based on the knowledge obtained during the study of theoretical and methodological support and the performance of practical work, the block of tasks is performed by applicants independently. At this stage, practical skills are formed in working with design tools (drawing, selection and transformation tools;

principles of working with curves, filling graphic objects, contour in fill; color, layers, text and graphic images), transformation, creation of an electronic poster according to the chosen topic.

The next block of tasks is to understand the possibilities of creating basic types of animations in Macromedia Flash (frame-by-frame, simple motion animation, shape change animation, motion along a trajectory and deformation). This block selects tasks to practice skills in working with masks and paths and files with audio, video and animation.

For independent work, students may be asked to create the following types of products of their educational, cognitive and practical activities:

- an animated film, where the following is demonstrated:
 - 1) the impact of human activity on various components of the environment (forests, rivers, soils, etc.);
 - 2) rules of responsible consumption or useful environmental habits (saving natural resources, energy conservation, garbage sorting, etc.);
- a film that reflects the properties of natural resources or ecosystems (for example, comparing a clean and polluted body of water);
- a film, where the structure of natural objects is demonstrated (for example, the structure of an ecosystem, its main components and their relationships);
- presentation of the educational assignment for studying a topic of choice on ecology;
- multimedia card of participants in competitive tasks on ecology;
- educational demonstration video that explains the algorithms of ecological behavior.

The following block of tasks shows the features of working with the "Button" object and the principles and capabilities of using the ActionScript language when processing events and performing software animation.

In the specified block of tasks, skills are acquired in designing and developing didactic teaching aids, such as: educational flash videos, educational computer multimedia products in Macromedia Flash, fragments of an electronic textbook in Macromedia Flash, where interactive animations, tests, educational websites were used. This block also involves the implementation by students of a specific project, where it is planned to create a fragment of an electronic textbook on the specified topic using interactive animation.

The above-mentioned project develops in students such individual characteristics as learning and organization, which increases cognitive interest and reveals creative abilities.

At the stages of organizing work on completing tasks, the functions of the teacher and the content of students' activities are formed.

1. Preparatory-organizational and planning-prognostic stage. Examples of electronic and interactive posters on environmental topics, fragments of an electronic textbook and their creation are discussed with the teacher, the possibilities of using them when organizing the educational process, conducting a lesson on a given environmental topic with the search for the necessary information, defining the goal and task.

2. Organizational-executive stage. Formation of electronic and interactive posters, fragments of an electronic textbook on the given topic.

3. Correction-evaluation stage. Demonstration of the created complex works. Discussion and evaluation take place, where the requirements for the design of didactic materials are taken into account.

4. Final stage. The results of the work of students are summarized during the final lesson in the classroom with a multimedia board. It should be noted that in order to achieve more effective independent work of students on the creation of didactic materials within the framework of the work on creating environmental projects using Macromedia Flash tools, it is necessary to unite students in groups with a clear definition of the topic of the created works.

To improve the skills of working with drawing tools in Macromedia Flash, it is proposed to create electronic posters on environmental topics, for example, "Conservation of marine mammals", "Nature without garbage", "Water is the source of life", "Ecological Ukraine".

Next, to implement the project, you need to create an interactive didactic thematic complex with an initial image and a list of interactive posters that are part of it. Using an organized system of buttons, make a transition between them, where the ability to process the corresponding events is taken into account. The productive goal of the work is to create a fragment of an electronic textbook in Macromedia Flash using interactive animation, where test tasks are an integral part. To conduct a final lesson, it is worth using a room with a multimedia board, where students have the opportunity to present their own work results, which increases interest in studying the methods of creating and practical application of the capabilities of the Macromedia Flash MX tool environment for creating educational multimedia products with environmental content.

To understand the essence and specifics of using multimedia in the educational industry, we will conduct a SWOT analysis and analyze their advantages and disadvantages, opportunities and threats.

Let's start the analysis with the use of multimedia in the educational process, in particular with the formation of an ecological worldview, the advantages of which include interactivity, easy perception of the material, increased interest of students, their increased motivation and the ability to connect via the network.

Among the disadvantages of multimedia in the educational process, it is worth mentioning the need for access to a multimedia computer, the need for special equipment for the operation of programs, and the imperfection of the development of methods for using it in education.

The main possibilities of using multimedia in the educational process include presenting information using a combination of different human-perceived environments, the presence of several storylines in the product content, artistic design of the interface and navigation tools; the ability to transmit and present information in a clear and structured form, while maintaining flexibility and the ability to use various applications.

The threats associated with the use of multimedia in educational and cognitive activities include the possibility of reducing the effectiveness of the educational process due to permissiveness in the virtual network and reducing the efficiency of the educational process due to low competence of teachers.

The preliminary analysis of the use of multimedia in the educational process is presented in **Table 2.1**.

● **Table 2.1** SWOT- analysis of the use of multimedia in the educational process

Advantages	Weaknesses
- interactivity; - easier perception of the material; - increased interest of students; - increased motivation of students - there is a possibility of connection via the network	- the need for access to a multimedia computer; - the need for special equipment to run programs; - the imperfection of the development of the methodology for use in education
Opportunities	Threats
- presenting information using a combination of different human-perceived environments; - having multiple storylines in the product content; - artistic design of the interface and navigation tools; - the ability to transmit and present information in a clear and structured way, while maintaining flexibility; - the ability to use a variety of applications	- reduction in the effectiveness of the educational process due to permissiveness in the virtual network; - reduction in the efficiency of the educational process due to low competence of teachers

The methodological principles of using digital content in the formation of the education seekers' ecological worldview are presented through the use of multimedia on personal computers in the educational process as various developmental and learning programs, reference books and encyclopedias, graphic programs, ordinary music editors, programs for education seekers, computer games, etc. The developed methodological system for using multimedia tools in the educational field through the use of multimedia for presentations, organizing video or audio conferences and testing education seekers makes it possible to check the effectiveness of learning material on environmental topics. The need for appropriate competence in teachers for the development and effective implementation of multimedia tools in the educational process during the formation of an ecological worldview is determined. Knowledge of a personal computer and skills in working with special software for both teachers and education seekers is recognized as a necessary condition for the creation and use of multimedia tools in the educational process. The use of multimedia technologies improves the quality of presentations of educational materials and contributes to the effective assimilation of knowledge, skills, abilities and competencies by students, significantly enriches the content of the educational process, increases motivation and creates a comfortable environment for closer cooperation between participants in the educational process during the formation of an ecological worldview.

CONCLUSIONS

An analysis of the theoretical principles of the use of digital content in the formation of the students' ecological worldview, terminological and categorical apparatus and current regulatory documents regulating the specified process in the field of education has been carried out.

The ecological worldview of students is understood as an integrative personal formation that reflects a system of scientific environmental knowledge, value orientations, beliefs, emotional and value attitudes

and models of behavior that determine the conscious and responsible attitude of students to nature, society and their own activities in the environment. It is emphasized that in modern conditions, the formation of the students' ecological worldview takes place in the context of the digital transformation of education, where digital educational resources and interactive content act as an effective means of activating cognitive activity, increasing motivation and ensuring the practical orientation of environmental education.

The results of research by foreign specialists on the creation and implementation of digital content in modern educational discourse are characterized, their thorough development is confirmed taking into account the specifics of different educational systems. The relevance of the implementation of digital technologies, digital content in the educational process of Ukrainian educational institutions is confirmed by a number of Ukrainian scientists. Digital content, in accordance with current legislation, is considered as data that is created and provided in digital form. It is confirmed that digital content includes, in particular, computer programs, applications, video files, audio files, music files, digital games and e-books, etc. As a result of scientifically based analysis, approaches, principles, methods, and conditions for developing digital content for the formation of an ecological worldview among students have been developed, taking into account their theoretical and practical application.

A survey of Ukrainian students was conducted to identify their views, interests and preferences on environmental topics, as well as to identify the peculiarities of perception of digital educational materials. It was conducted by interviewing 1975 respondents, of whom 55.9% were girls and 44.1% were boys. It was found that the respondents are oriented towards interactive and game-like forms of presenting material. According to the results of the empirical data obtained, it can be stated that the introduction of digital environmental content into the educational process is uneven. Some students regularly use digital resources on environmental topics during lessons, but a third of children do not have such constant experience. This indicates differences not only in the level of digitalization of educational institutions, but also in pedagogical approaches to the use of digital content. In order to overcome the discrepancies between the capabilities of the digital environment and practical application, it is necessary to create high-quality methodological, organizational and information support. Therefore, digital environmental content can become one of the leading tools for forming an ecological worldview and responsible behavior in students, especially in the post-war reconstruction of Ukraine. But this will be possible provided that digital content is adapted to the media consumption habits of children and youth, its filling with scientifically based materials and systematic pedagogical support.

We have presented the methodological principles of using digital content in forming the students' ecological worldview through the use of multimedia in the educational process on personal computers as various developmental and learning programs, reference books and encyclopedias, graphic programs, ordinary music editors, programs for students, computer games, etc. A methodological system for using multimedia in the educational field has been developed through the use of multimedia for conducting presentations, organizing video or audio conferences and testing students, which allows you to check the effectiveness of assimilation of material on environmental topics. The need for appropriate competence among teachers for the development and effective implementation of multimedia tools in the educational process during the ecological worldview formation has been determined. Knowledge of a personal computer and skills in working with special software for both teachers and students has been recognized as a necessary condition

for the creation and use of multimedia tools in the educational process. The use of multimedia technologies improves the quality of presentations of educational materials and contributes to the effective assimilation of knowledge, skills, abilities and competencies by students, significantly enriches the content of the educational process, increases motivation and creates a comfortable environment for closer cooperation between participants in the educational process during the ecological worldview formation.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest in relation to this research, whether financial, personal, authorship or otherwise, that could affect the research and its results presented in this paper.

USE OF ARTIFICIAL INTELLIGENCE TOOLS

The authors confirm that they did not use artificial intelligence technologies in creating the submitted work.

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Manuscript has no associated data.

AUTHORS' CONTRIBUTIONS

Svitlana Tolochko: conceptualisation; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; visualisation; writing – original draft; writing – review & editing.

Nataliia Bordiug: conceptualisation; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; software; supervision; validation; visualisation; writing – original draft; writing – review & editing.

Liudmyla Mironets: formal analysis; data collection; validation; project administration.

Liudmyla Dovhopola: formal analysis; data collection; validation; project administration.

Halyna Tarasenko: formal analysis; data collection; validation; project administration.

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