The Overview of Media Resources in the Educational Process

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Educational media resources are becoming increasingly popular. This actualizes the issues of identifying their role and significance in the educational process, typology, and classification of resources. The methodological basis of this study is an interdisciplinary approach. Based on a review of the literature, the constituent and functional components of an open digital educational environment are identified. The effects arising in the process of informatization of the educational environment are analyzed. It is proved that a new generation of educational media resources is formed as a result of the evolution of traditional learning management systems and their convergence with the principles of open education. This paper describes applications and online services designed to enrich the intellectual potential of participants in the educational process. The authors' classification of educational media resources is presented in the study. The following characteristics were selected as the defining features for the classification of educational media resources: the technical form of resources, level of user training, user group, type of ownership, type of content, distribution technology, nature of user interaction, specifics. The main functions of an open multimedia educational environment are highlighted, which include compatibility and integration, personalization, analytics, collaboration, accessibility, and universal design. The opportunities for media resources in ensuring the continuity of modern education are revealed. General recommendations on the use of new media in the pedagogical process are given.

Keywords: Media resources, educational process, digitalization, information environment, intellectual potential, open education.

The modern media environment acts as a system of conditions for a person to solve a wide range of tasks. The media have a great influence on education; they motivate students to debate and analyze and also help to develop reading, to listen and writing skills through various activities. A person learns the world using the media, understanding it deeper in different aspects.

The classical sociological theory considers the institution of the media as an agent of the secondary socialization of an individual. Technological progress has significantly increased the number of tools that play the role of media in the modern world while expanding the functional component of the institution itself. Accordingly, the question arises about the role of new media in the educational process. However, at present, there is a certain contradiction between the student's natural need for media education and his/her alienation from the use of media resources in the educational process and everyday life, which plays a negative role from the point of view of media education (Maksimenko, 2011).

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The processes of informatization of education in recent years have been associated with digitalization. Various types of e-learning are becoming more widespread; a new generation of learning tools – Digital Learning Resources (DLR) is being formed. It is known that information processes are designed to contribute to the modernization of all spheres and systems of vital activity of society. They make fundamentally different requirements for the subjects of activity and their professional competencies. Consequently, appropriate changes in training are needed. The solution to the problems of informatization of education is defined as one of the most important strategic tasks. Therefore, in the context of globalization, the problem of informatization of the educational environment has become not only theoretically relevant but also practically in demand.

The world of media involves a special culture, which includes a culture of information transfer and a culture of its perception, while at the same time acting as a system of levels of personality development, able to read, analyze, evaluate media texts, engage in media creativity, learn new knowledge through media, etc. It must be understood that the media environment today is developing based on a whole range of technologies (primarily the Internet and television, which transform society) (Yessenbekova, 2018a, 2018b). The massive introduction of e-learning, distance learning technologies, including educational media resources, are the main trends in the development of modern education. Media resources help teachers make the learning process visual. Visualization allows students to improve their thinking and observation skills, while it also fosters the development of imagination. Using various types of media resources, it is possible to improve the understanding of comprehensive information, thereby simplifying the learning process. An important contribution is made by social media, which allowed users to produce media content. It should be recognized that today, there is no way to avoid the influence of the media; they are an integral part of public life.

These circumstances predetermined the purpose of this study, which is to justify the role of the media and media resources in the development of a humanistic model of education. The related task involves assessing the effectiveness of the use of digital media resources in the educational space and their classification. As one can see, the evaluation and classification criteria are disclosed in the parameters of compatibility, integration, personalization, and cooperation.

Literature Review

Informatization of the educational environment is a broad concept. First of all, the authors mean the informatization of the educational process, the active use of appropriate technologies and equipment (Noskova et al., 2016). This direction involves the active development of modern information infrastructure, the development of high information culture of all subjects of the educational process, the introduction of information management systems. The construction of effective management mechanisms for the organization of innovative activities of teachers seems today one of the most urgent problems of modernization of the education system (Ignateva et al., 2016). The orientation of the educational process largely depends on the teacher, immersing students in the information space and providing the necessary tools for a critical understanding of texts, images, stereotypes of behavior, situations, etc., as broadcast by the media. Shikhnabieva (2018) notes that smarter technologies in education can support the construction of an individual training course and provide interactive support.

In the conditions of cooperation, pedagogical communication in the information environment is changing (Monakhov, 2015). The tasks of pedagogical support of independent work of students using information educational environments are being actualized (Andreev et al., 2010). A new type of resource that supports collaboration in the educational information environment is communication resources. This type of resource can also include educational interaction products accumulated on network communication services

(Patarakin, 2002). They allow combining the efforts of subjects of the educational environment belonging to different educational groups or communities. The acquisition and accumulation of knowledge that occur as part of everyday communication are usually referred to as informal education (Litvina & Omelchenko, 2013).

Among the studies of media in the educational aspect, several areas can be distinguished: digital inequality (Conner & Slattery, 2014; Garces-Voisenat, 2016); the impact of new media on the development of individuals and their socialization (Goldman et al., 2008); factors of successful learning using information technology (Sun et al., 2008; Wu et al., 2010; Verhagen et al., 2012; Alcalde & Nagel, 2016; Aldieri et al., 2017); digital competency building (Nasah et al., 2010), the opportunities of using information and communication technologies (Èirjevskis, 2016; Oganisjana et al., 2018; Benešová & Hušek, 2019), etc. The most noticeable effect of the application of information technology is manifested in increasing the information saturation of the educational environment (Andreev et al., 2002; Robert, 2012) and its impact on other aspects of life, such as economic growth (Sam, 2018; KaŸmierczyk, 2012; Matei & Savulescu, 2012). The effect of openness of the scientific and educational environment is manifested in the expansion of the spectrum of external scientific and educational relations (McCarty et al., 2006; Marshall, 2018). It should be noted that the ideas of openness of the scientific and educational environment are a global trend.

Research by Kashina et al. (2018) is devoted to the creation and use of media resources, the requirements for their quality and methodological features of the application in the educational process. They believe that open media resources should be used in the educational process as additional educational materials, illustrative materials and materials for organizing the student's independent work. Vatunsky (2018) notes that educational media resources provide innovative tools to ensure a more comfortable and productive educational process (Vatunskii, 2018). The orientation of students to the use of high-quality available information resources contributes to the formation of students' competencies associated with learning in an extended information space throughout life (Grebennikova & Nikitina, 2014). It allows students at a higher level to form the skills necessary for solving educational, and, in the future, professional tasks (critical assessment of the content, the ability to choose the main thing and isolate the structure of information, apply information in accordance with the problem being solved). Richard Mayer is one of the founders of the Cognitive Theory of Multimedia Learning (CTML), according to which the process of obtaining deep knowledge is perceived as a form of construction (design) of learning. The cognitive theory is actively used in education in various disciplines (Litau, 2018). The most important principles of multimedia design are as follows (Moreno & Mayer, 1999): when visual and verbal information should be presented sequentially, the effect of order arises and intensifies if training materials are presented in a specific order of verbal and nonverbal materials.

Interaction in an open scientific information environment is important for both teachers and students (Noskova et al., 2016). Scientific and pedagogical activity is carried out in the context of global competition (Azumah et al., 2017), which is an incentive for continuous improvement of competencies. On the other hand, in the open scientific and information environment, students get the opportunity to act in quasi-professional conditions and then enter a network professional community to fully utilize its resources.

Information on media resources should contain innovative guidelines that are necessary for the subjects of the educational process. Brown (2017), Dobbin (2016), and others who work on the theoretical and practical support of open education recently are speaking about a more modern generation of educational resources, which they call Next Generation of Digital Learning Environment (NGDLE). NGDLE is conceived as a kind of ecosystem – a learning environment consisting of tools and components that meet common standards. Goodrum et al. (2019) indicate this means new standards for user interaction with training tools that provide the integration of training applications and tools. According

to Dudchak and Bataeva (2019), online technologies allow a student to independently build a training schedule and duration of the study. Open online media resources contribute to the multiple joint uses of tools of various educational environments, the dissemination of best practices, knowledge, and technologies.

Despite criticism of the openness of education, most researchers agree that the media do a great job of informing (Willets, 1998). Meantime, Lyashenko (2014) notes some negative consequences of informatization of education, such as manipulation, refusal of critical thinking, and loss of personality.

A generalization of the presented features of the modern educational environment forms several provisions (Grigoryeva & Nelunova, 2013). Firstly, multimedia training programs are personality-oriented, integrative, and they implement the principle of situationally. Secondly, the types and forms of the presentation of information reveal a wide range of technologies and implement the principle of openness of open self-organizing systems. Thirdly, multimedia learning as a novelty is innovative. Innovative learning stimulates changes in the social environment in general and in education in particular.

In Chumakova and Daineko (2015), digital educational resources are classified into simple and complex. According to their content, they are divided into information sources and information tools. Here is a list of some types of electronic resources (Arskii et al., 1996): scanned images of prints and manuscripts; electronic analogs of print media; text files; hypertext files; databases; audio/video and multimedia products. Currently, there is no single approach to the classification of digital educational media resources, and the available options are continuously being improved.

As one can see, the classification of media resources in education is not exhaustive. A variety of types of electronic resources denotes the task of clarifying their composition and identifying their types by the functional purpose.

Methodology

The methodological framework of the research is an interdisciplinary approach implemented using the principles of objectivity, historicism, and system centeredness. In the study, the methods of theoretical analysis and generalization were applied. Generalization also serves as a technique to make classification (to establish classification attributes and stages within the hierarchical method), comparative analysis (to discover commonality) and identification (to find identity and relevance).

The factual basis of the study includes academic works on the use of media resources in the learning process and their classification. Using comparative analysis, the research specifies the classification attributes that are most relevant to electronic media resources.

Results

Educational media resources can be classified according to various criteria, including the type of resources, the specifics of the audience, the subject-related educational field, etc. For the classification of educational media resources, one could use the classification applied to the educational literature, but the most rational classification seems to be based on a specific defining attribute.

In the state standard (GOST R 52657-2006, 2006), some 12 features of the classification of electronic educational resources have been identified, however, given the development of information technology, which entails the modernization of media resources, it is proposed to expand this classification with new criteria (Table 1). The following characteristics were selected as the defining features for classifying educational media resources: the technical form of resources, level of user training, user group, type of ownership, type of content, distribution technology, nature of user interaction, specifics.

Table 1. Classification of media resources in the educational environment

Feature	Type of media resources	Characteristic
1. Technical form of resources	1.1. Non-technical	Elements that belong to this category of educational media resources, as a rule, include board, pictures, photos, posters, newspapers, magazines, etc.
	1.2. Technical	Elements of this category, as a rule, include TV, telephone, projector, multimedia laboratory, etc.
2. Level of user training	2.1. Basic training	This type of resource contains textbooks, teaching aids, teaching, and methodological guidelines, lecture material, workshops that allow one to prepare for the exam/passing exam and learn the basics of the subject in various disciplines
	2.2. Additional training	This type of resource can be used to write academic papers, and it contains scientific articles, monographs. An example of a resource of this type can be an electronic library of scientific publications
3. User group	3.1. Educational media resources for schoolchildren	These resources contain teaching and information materials for preparing for exams, examples, and demo versions of exam papers, answers, etc.
	3.2. For students	This type of resource may contain materials for choosing a profession, training video courses and video lectures, scientific and educational articles, lecture notes, reference and information materials, etc.
	3.3. For teachers	This category of resources may contain the legal basis of education, methodological developments for teachers, tools (software) to support educational activities and the organization of the educational process, etc.
4. Type of ownership	4.1. Open	This category of resources includes federal and regional educational resources, conferences, forums, contests, competitions, digital libraries, dictionaries, etc. Their use is free
	4.2. Closed	An example of this type of resource is the information portals of higher education institutions. Their use is carried out only with permission
	4.3. Combined	Access to individual parts or the entire system is free but in demo mode
5. Type of content	5.1. E-data	This type of resource contains electronic data – numeric, symbolic, images, audio recordings, etc.
	5.2. Software	This type of resource contains software (system, applied, service, and interactive multimedia online services)
6. Distribution technology	6.1. Local e-periodicals	This category of resources is accessed through the local network of the educational institution
	6.2. Network	This category of educational media resources is accessed via the Internet
	6.3. Combined	Resources can be distributed both within the educational institution (for example, the electronic library of the educational institution) and via the Internet
7. Nature of user interaction	7.1. Fully determined	This type of resource differs in the sequence and form of presentation of educational material.
	7.2. Non-determined	Interactive educational resources
8. Specifics	8.1. Purpose	The following can be singled out as the target purpose of media resources: acquisition of relevant electronic publications, attraction of Internet resources that are in the public access, subscription to electronic scientific products, etc.
	8.2. Update frequency	Educational media resources can be updated daily, weekly, monthly, etc.
	8.3. Legal status	This category may include federal and regional media resources.

The lack of a universally recognized typology of educational media resources necessitates their systematization. Therefore, the following attempt at their typology is proposed: (i) Search engines; (ii) Forums; (iii) Information portals; (iv) Dictionaries, encyclopedias and electronic translators; (v) Electronic consultation; (vi) Testing at certification authorities, online training; (vii) Archives, repositories and digital libraries; (viii) Educational complexes; (ix) Distance education systems. The following is a description of these resources.

A search engine is a website that allows one to search for information on the Internet. The main criteria for the quality of a search engine are relevance, completeness of the database, and accounting for the morphology of the language. A forum is presented as a special environment for organizing communication between website visitors. Information portals cover many topics. Typical is the appearance of a portal around a search engine.

Currently, social networks for scientists and practical teachers have gained popularity, for example, Academia.edu (academia.edu), Asianavenue (www.researchgate.net), EARN (International Education and Resource Network, http://iearn.org), ResearcherID (www.researcherid.com), the Federal portal "Russian Education" (http://www.edu.ru), etc.

To explore the opportunities of open education, it is advisable to consider the practice of some electronic educational resources – information media. The following can be outlined as common open education systems: Open Educational Resources (https://www.oercommons.org/) – a web environment that provides access to educational materials (online courses, textbooks) that are used to support access to knowledge in various fields, the system provides an opportunity for communication with teachers around the world; Coursera (http://www.coursera.org) – a platform of online courses with video lectures, assignments and discussion on forums from teachers of leading universities; Academic Earth (http://academicearth.org) – a collection of online courses.

Electronic encyclopedias are pages with texts and graphic materials of a classic encyclopedic nature. Examples of electronic encyclopedias are the World of Encyclopedias (http://www.encyclopedia.ru/cat/megaonline); All-In-One Universal Reference Encyclopedia (http://www.sci.aha.ru/ALL); the Russian Encyclopedic Biographical Dictionary (http://www.rulex.ru/), etc. Examples of thematic digital libraries in Russia are the Moshkov Library (http://www.lib.ru) – one of the first and most popular Russian-language electronic libraries; the Aldebaran (https://aldebaran.ru); TarraNova archive (http://tarranova.lib.ru/about.htm); e-library scientific electronic library (https://elibrary.ru), which provides references, annotations and full texts of more than 29 million scientific papers and publications, including electronic versions of more than 5,600 Russian scientific and technical journals, of which more than 4,800 journals are in open access.

Educational complexes are positioned, most often, as electronic textbooks. The effectiveness of training is enhanced by the use of footage, interactive dialogue with the students, automated control of learning material, etc. Electronic consultations provide fulltime access to training resources. As a rule, consultations are provided upon request in the online mode via a chat or e-mail.

For lifelong education, a significant number of online courses and video lectures have been developed, accessed through repositories, which include, for example, the World Lecture Project international educational network (http://world-lecture-project.org); virtual education portal My Education Key (http://www.myeducationkey.com). The world's leading universities have their online platforms: edX web resource (https://www.edx.org), founded by the Harvard University and the Massachusetts Institute of Technology, the Princeton University Media Center (https://mediacentral.princeton.edu); audiovisual educational resources of the Massachusetts Institute of Technology (https://ocw.mit.edu/courses/audio-video-courses), etc.

Such electronic resources as testing and certification centers, electronic thematic libraries, distance education systems are common. With the help of online training, time is significantly saved, and the educational process improves. Training, as a rule, is carried out using special tools. Distance learning systems are technology based on the principles of open learning, having several advantages over other forms of learning. The most popular distance solutions on the market are iSpring Learn, Mirapolis LMS, ShareKnowledge, Teachbase, WebTutor, Docebo, Unicraft, e.Queue, eTutoriumLMS.

A significant part of the information that is produced and exists in electronic form goes to libraries. Libraries are becoming producers of their electronic information resources; in addition to publishing, the practice of libraries begins to include the replication of various information products and information resources on various media.

Discussion

Building an environment of open education has the goal of satisfying the information and educational needs of users. Users are visitors who receive information and reference services; readers of the electronic library; trainees; purchasers of educational products; researchers (Lobachev, 2004). Only consumers of educational services are listed here. Also, the system includes two more categories of users that provide educational services – teachers and technicians.

Currently, all participants in the process of educational and scientific communication support open access to educational media resources (Fig. 1). At the same time, it is worth noting that not all representatives of the community support the open access policy, pointing to the threat of intellectual property, the risk of reducing the quality of academic work, and the educational process. One of the problems that, on the whole, is caused by the spread and increase in the availability of the global network is the excess of information flows and their mass availability. This is especially true for the education system for the following reasons. Firstly, the amount of educational information available online may cast doubt on the need for a higher education institution in its classical form. Secondly, there is a high probability of information glut, low-quality information, false information, and even misinformation of the students, which not only reduces academic performance but also creates potential risks for further professional activity.
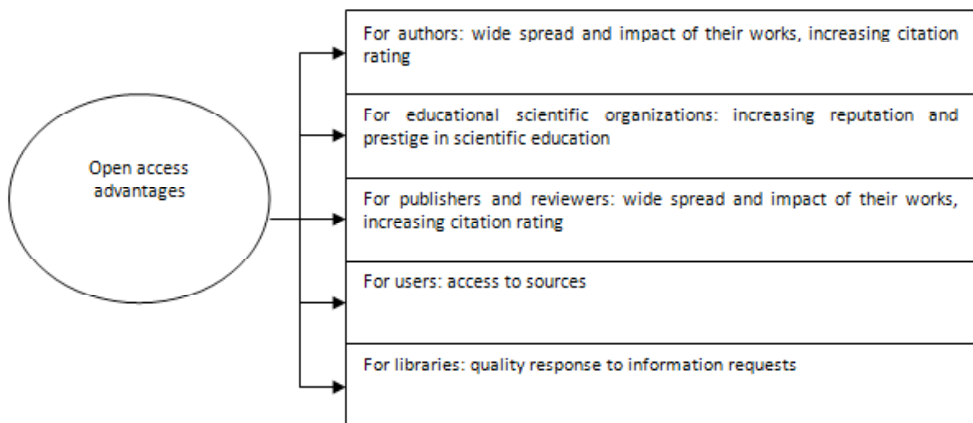

Figure 1. Advantages of using open access for various groups of participants in the process of educational and scientific communication

The review made it possible to conclude that the use of media resources in education must be built based on three key methodological mechanisms:

(i) A combination of implicit and explicit goals of working with media resources – natural and focused assimilation of experience using such resources.

(ii) Problematic navigation of students working with media resources: media resources provide users with simple, vibrant, emotionally colored, breathtaking images of reality; simple ready-made recipes that do not require critical analysis or thinking. In such a situation, the problem lies in the problematic interaction with media resources. Problematic tasks can be aimed at developing the ability of students to analyze, critically interpret and create media texts; identify the sources of media texts, their political, social, commercial and/or cultural interests, their context; interpret media texts and values distributed by the media; select appropriate media to create and distribute their own media texts (Kubey, 1997).

(iii) Self-design of a student as a responsible user of media resources. To solve this problem, the self-designing technology of personality is effective.

Modern conditions ensure the formation of an effective digital educational environment based on a number of principles that must be observed in the design of media resources of open education (Mayer, 2009): consistency principle; alarm principle; redundancy principle; spatial adjacency principle; temporary adjacency principle; segmentation principle; preliminary preparation principle; modality principle; multimedia principle; principles of personalization, voice and image. Such a policy supports the development of media resources integrated into training programs. All this is important for the functioning of a digital educational environment.

Conclusion

The issues of development and use of educational media resources are extremely relevant. A review of the literature showed that in practice, a new generation of educational resources is beginning to spread that form a digital learning environment. This was the result of the evolution of traditional learning management systems and their convergence with the principles of open education. The process is accompanied by a clear advantage of open digital educational resources over traditional ones.

Recognizing the leading role of new media in comparison with traditional ones in terms of popularity, it is impossible to ignore the trend of their growing penetration and impact on the education system. On the one hand, there are negative forms of the impact of new media on the learning process. On the other hand, new media, when used correctly, have significant value through the ability to introduce and implement interactive teaching methods, and the availability of data and information.

A variety of types of electronic resources denotes the task of clarifying their composition and identifying the types by the functional purpose. Educational media resources can be classified according to various criteria. In the study, the following characteristics were selected as the defining characteristics for the classification of educational media resources: technical form of resources, level of user training, user group, type of ownership, type of content, distribution technology, nature of user interaction, specifics.

Thus, the evolution in education is caused by the technological changes that are global. Consequently, digitalization processes gradually cover the entire educational space. Now there is another wave of renewal of educational resources and world experience that emphasizes the need to create a new generation of teaching aids that will be integrated into the classical model of education.

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