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SPECIFIC FEATURES OF USING WEB 2.0 TECHNOLOGY
IN THE EDUCATIONAL PROCESS

Introduction. The article examines the peculiarities of implementing Web 2.0 technology into the educational process, covers the advantages of certain web-services and electronic resources. It is noted that in the conditions of the information society there is a rapid development of software and

hardware. Using services and electronic resources that support Web 2.0 technology, allows to diversify the educational process, make it more qualitative and interactive.

The purpose of the article is to reveal specific features and benefits of online services and Web 2.0 electronic resources for organizing the educational process of a higher school.

Results. It has been found that capabilities of Web 2.0 make it possible to create a modern educational environment, provide mixed and distance learning, and ensure creative application of acquired knowledge. This can be achieved thanks to various online services and electronic resources, which can be divided into several groups. It has been exposed that Web 2.0 technology is considered to be more a social innovation than a technological one. This is due to the possibility of creating thematic communities. It has also been revealed that virtual social networks, Google Classroom, Internet-blog, webinars, etc. are used to organize educational activities and communication between students and the teacher. It has been discovered that today's youth often stay in the virtual space of social networks, communicate, do educational tasks, etc. With that in view, there have been established the conditions that affect the effectiveness of the application of Web 2.0 technology in the educational process.

Originality. The possibilities of virtual social networks, Google Classroom, Internet-blog, webinars and other services to organize the educational process in higher education have been identified.

Conclusion. The implementation of Web 2.0 online resources and services allows to diversify the educational process, make it more interactive and interesting. The possibilities of Web 2.0 allow users to learn, exchange multimedia, increase social and informational competences. Working with Web 2.0 technology does not require special computer skills. The authors consider the usage of Web 3.0 technology in the educational process to be a promising direction of research.

Keywords*: institution of higher education; educational process; Web 2.0; students; communication; online services; electronic resources.*

Formulation of the problem. The modern information society is characterized by evolutionary processes at the hardware (the appearance of laptops, smartphones, various digital gadgets), software (the appearance of various electronic resources and software tools) and communication levels (the appearance of new data transmission and protection protocols, the wireless networks Bluetooth, WiFi, 4G, 5G etc.). All these changes make it possible to quickly search for information using the Internet, store and process large volume of data using Data Science, Big Data, introduce artificial intelligence into equipment, production, everyday life, etc.

Now the Internet is one of the main sources of information used by the whole world. With the help of appropriate resources, users in the virtual space can work, relax, exchange information and multimedia, and communicate freely at a distance. Most of these possibilities are based on the use of Web 2.0 technology. Today, at the same time, we are observing the emergence of various forms of educational activity, which are based on the use of information and communication technologies (ICT). Distance and mixed learning, mass open online courses, mobile learning, etc. are actively used in the educational process. These resources are also based on the use of Web 2.0 technology, which makes them more interactive and person-oriented.

Analysis of relevant research. Advances of Web 2.0 technology in the educational process are highlighted in the scientific studies by G. Tkachuk, M. Menyakina, Yu. Mishakina, V. Vlasova, A. Maslyuk and others. Possibilities of Web 3.0 technology for organizing the educational process were considered in the works by V. Grigorovich. Among the foreign scientists, who explored the influence of Web 2.0 to the quality of the educational process, there were J. Cabero-Almenara, J. Meza-Cano (Mexico), A. Habibi, A. Mukminin, R. Pratama (Indonesia) and others. The detailed analysis of Web 2.0 tools that are used for training was done by M. Bower.

The influence of virtual social networks on the development of educational achievements of students and pupils was studied by A. Yatsyshin, O. Shcherbakov, A. Shcherbina and other scientists. The use of educational web resources for the training of future specialists is investigated in the works by G. Tkachuk (virtual thematic groups), T. Hodovaniuk, T. Makhometa, M. Medvedieva (virtual boards, QR codes), Yu. Korneiko, T. Yermakova (Google Classroom) and other.

The development of educational resources and Web-services should be carried out with the help of appropriate programming languages, constructors, frameworks, etc. In this context, tools for the development of sites for remote training with support for Web 2.0 technology were analyzed in the work by I. Saloid.

At the same time, new services and electronic resources, which are constantly improved in accordance with modern conditions, appear every year. Therefore, it is necessary to repeat the content analysis of the advantages of Web 2.0 services.

The goal of the research: to highlight the opportunities of Web 2.0 technology; to identify the benefits of Web 2.0 services and electronic resources, including virtual social media, for organizing the educational process of high school.

Results. Nowadays, information and communication technologies are the main media of entering the global information space, where large volumes of information on various topics are located. Thanks to this, ICT are rapidly developing and integrated into various spheres of human activity, including education. Their advantages over other educational technologies are flexibility, rapid updating of educational content, focus on the student's personality, mass and internationalization. Thanks to information technologies, the educational process can be made more interactive, investigative and differentiated [1], to expand the possibilities of presenting educational material, to increase the motivation of learning and cognitive interest [2], we can ensure a deeper understanding of the educational material [3], quickly process information, presented in various formats, etc.

The advantages and spread of the network learning paradigm (online education) mostly depends on the emergence of new Internet standards, including Web 2.0 technology. The capabilities of Web 2.0 make it possible to create a modern learning environment with high-quality educational content, support for innovative learning, formal and informal education, practical and creative application of acquired knowledge, the possibility of forming thematic communities, etc. [4]. Thanks to the emergence of second-generation Internet services, it was possible to provide the opportunity for many users to work together on information presented in various formats. And their combination with immersive technologies [5] provides students with the opportunity to immerse themselves into the learning environment as much as possible and acquire the necessary competencies. In our opinion, Web 2.0 technology, augmented and virtual reality technologies allow approaching the study of a certain problem from different sides, to model any phenomenon, to investigate its properties theoretically or practically.

Today, there exist a huge number of electronic resources, web services and software that support Web 2.0 technology that are used to organize the educational process of higher and secondary schools. As noted in works [6], students perceive these tools as means of autonomous and more active learning. On the other hand, teachers use Web 2.0 for technological enrichment of the educational environment. In this context, M. Bower distinguishes the following groups of Web 2.0 services: multimodal production tools, video tools, audio tools, image based tools, text based tools, synchronous collaboration tools, social networking systems, assessment tools, 3D modeling tools, timeline tools, data analysis tools, knowledge organization & sharing, website creation tools, digital storytelling tools [7].

From the point of view of educational activities, thanks to Web 2.0 technology users can effectively use personal or group messages, share various documents, create notes, bookmarks, join thematic groups, hold online meetings, create or distribute the latest news [8], to communicate informally with each other to solve educational tasks, etc. At the same time, learning with the help of Web 2.0 takes place according to other principles than in traditional learning. Thus, the hierarchy of relationships changes during the organization of the educational process. This is explained by the fact that the exchange of knowledge takes place in several directions at once: teacher-student, student-student, student-teacher. At the same time, the task of the teacher is not to present educational material, but to organize the activities of students in the educational and informational space. As a result, it is possible to state compliance with the principle of cooperation and the principle of equality of participants in the educational process [9].

Web 2.0 technology can be considered more a social innovation than a technological one. Web 2.0 services are rightly called social services, as they allow to create thematic communities, where significant attention is paid to cooperation and communication between users that solve just one problem. For example, in the study of H. Tkachuk, attention is paid to such a network society that has formed among future Computer Science teacher [10].

Usually, the formation of thematic groups, the implementation of educational tasks and the exchange of information takes place with the help of virtual social networks that provide interpersonal interaction and communication at a distance. It is known that the most famous social networks have millions of registered users who communicate with each other, work, relax, form public opinion, etc. They are widely used in the educational process, which is confirmed with the investiga-

tions of various scientists. At the same time, multimedia communication in social networks occurs due to the exchange of video and audio recordings, the use of interactive applications [1], emojis, etc.

The educational effect of using social networks provides the following benefits:
– enrichment of information culture, development of critical thinking;
– development of social competence in the conditions of the information society;
– exchange of information and multimedia for solving the educational tasks;
– wide possibilities for group implementation of the educational tasks;
– use of institutional memory;
– use of social networks as an archive of useful educational information;
– possibility of communication among thematic social groups and improvement of professional competence;
– the opportunity to be aware of the latest news in the world, state, etc;
– wide possibilities for communication and finding the like-minded people.

We found that a significant number of students (51,4%) visit social networks 2-4 times a day. At the same time, 35.5% of recipients stay there permanently. To our opinion, this trend can only increase over time, as the Internet occupies more and more spheres of influence and becomes one of the main sources of information. The conducted research also showed that the most frequently used social networks in the Ukrainian-speaking region are Instagram (83.1%) and Facebook (28.0%) [11]. We consider this combination quite effective from the point of view of study and recreation.

The media content of Instagram is more oriented towards promotion and advertising, and Facebook is a more academic social network where you can get up-to-date information from official sources. Of course, for this you need to subscribe to the relevant thematic groups, including closed ones.

It should be noted that social networks provide opportunities for communication between users of different continents, nationalities and languages. Therefore, it is important to have the ability to intercultural communication, the willingness to communicate and master new ways of verbal and non-verbal communication. In this context, it is important to develop intercultural competence as the ability to understand and respect the peculiarities of different cultures in the process of constructive interaction and communication [12].

Various services with support for Web 2.0 technology are used quite widely in the educational process. The most popular services are Google services for work with e-mail, documents and spreadsheets, text translation, calendar. In addition, it is appropriate to use educational blogs [13], YouTube video hosting, Google Classroom virtual class, Office 365 suite of applications, virtual whiteboards and interactive educational games [14]. Moreover, the designated services are easy to integrate to high and secondary school.

One of the common web services that has proven itself well in the educational process is Google Classroom. It provides wide opportunities for mastering academic disciplines and communication in an online format. The advantages of this platform include the possibility of creating several courses, saving information about users (students), differentiating tasks within the course, creating your own graphic design of the course, providing prompt feedback between the teacher and students, integration with other popular Google services (Google Drive, Calendar, Gmail, Google Forms, etc.) [3].

Such a well-known service as a personal Internet blog allows to get the following advantages:
– to place posts in chronological order and to monitor the process of communication between teachers and students [7];
– to organize consultations to get ready for control measures and to obtain additional knowledge;
– to ensure a high level of interaction between participants of the educational process [13];
– to create several sections in accordance with the topic, post your own lecture notes to prepare for classes, provide reflection and analysis of your own thoughts on a certain topic, etc.

Services with support for Web 2.0 technology open wide opportunities for teachers who have minimal knowledge in the field of informatics. Moreover, Internet services allow you not only to search for the necessary educational information, but also to perform activities related to the creation of your own textual, graphic and multimedia objects [13]. Thanks to the variety of multimedia content and periodic updates of educational content, it is possible to create a personal digital learning environment without much effort.

From the pedagogical point of view, we can highlight the following possibilities of Web 2.0 services:

– use of open, free, cost-free electronic resources;

– accumulation of materials (documents, media files, tables and etc.), which can be used for further research work;

– independent creation and updating of the educational content;

– increasing the information culture of teachers and students;

– possibility of modeling the educational situations and observation of user activity in the process of their solving.

Today we have experimental confirmation of the effectiveness of using the Web 2.0 services in the educational process. In the research [4] teachers of the natural sciences, as well as students from three universities in Indonesia, have shown a strong interest in the Web 2.0 services in the field of education. The students of Mexico also confirmed their positive attitude to learning with the Web 2.0, moreover, the services positively contributed to the learning methodology, educational motivation, the degree of interactivity in communication and learning [6]. Of course, similar investigations were done in Ukraine.

The use of online services and social networks is especially relevant when it is often impossible to hold classroom classes in the conditions of a coronavirus infection and hostilities on the territory of Ukraine. A complex combination of traditional education and modern distance learning technologies, including the use of Web 2.0, is called mixed education. In this case, various electronic resources and services can be used here. These are learning management systems (LMS), such as Moodle, massive open online courses (Prometeus, EdEra, Coursera), software tools for video conferencing (Zoom, Skype, Google Meet) and instant messaging (Viber, Telegram) [15], electronic textbooks, and so on.

During the organization of the educational process, webinars have proven themselves well as an alternative form of educational activity in conditions of mixed and distance learning. Among their functional peculiarities, N. Kononets includes holding of audio and video conferences, exchange of instant messages and files using built-in chats, demonstration of educational content (presentations, computer or smartphone screen, etc.), organization of various tests and surveys, discussion of thematic issues with the help of virtual laboratories [16], etc.

From a technological point of view, Web 2.0 functionality is achieved through the use of several modern technologies, frameworks and programming languages. An example can be the text markup language XML and the programming language JavaScript, which are now quite popular. The main advantages of the JavaScript programming language are the creation of interactive web pages, speed of work and high performance, simplicity and convenience [17]. Extensible Markup Language (XML) is used to create documents that will be used in the Internet. The combination of these tools made it possible to create a new approach to building web pages, which was called AJAX (Asynchronous JavaScript and XML). In addition, modern web applications are not possible without CSS style sheets, which are used to define the appearance of a page. However, it is not necessary for the teacher to know the relevant technologies and tools, because there are many ready-made online resources and constructors.

It should be noted that for the effective use of Web 2.0 tools in the educational process, various factors and conditions must be taken into account:

– appropriate methods of using services and resources that have been formed [4];

– teachers must have technological and didactic knowledge regarding the use of relevant Web 2.0 resources and services [6];

– students should be motivated to use modern technologies;

– teachers and students must have appropriate digital gadgets and access to the Internet;

– teachers and students must have a developed digital competence at least at a minimal level, etc.

Most of these tasks are successfully performed due to the implementation of state programs for informatization of education, pedagogical activities of innovative teachers, who prove the effectiveness of Web 2.0 services and resources by their own example. The fact that the youth itself cannot do without a digital device, social networks and electronic services is significant. Therefore, if a student is shown an educational resource or an online service with an interesting graphical interface that allows him to gain knowledge in an integrative mode or check their mastering in real time, he will be happy to work with it. Our own experience has

shown the effectiveness of such useful resources as Kahoot!, Padlet, Mentimeter, etc.

Besides, it should be added that at the same time only Web 2.0 technologies are widely used for the educational purposes. However, there is a tendency to use the perspective technology Web 3.0 (Semantic Web), as it is based on the current Blockchain technology. Web 3.0 services are expected to process information better than humans, taking into account their needs and requests. In a general sense, the Semantic Web consists of semantic technologies acting as a superstructure on the Web and social networks that provide human-machine interaction. Such type of network can be established for person-oriented learning and formation [18].

Conclusions. The conducted theoretical content analysis provides a possibility to make a conclusion about the further use of Web 2.0 services in the educational activities of a higher school. In a lesson with using the Web 2.0 services students communicate, learn, develop teamwork skills and improve social and IT-competences.

Various services and electronic resources, including educational ones, virtual social networks, etc., are based on the use of Web 2.0 technology. Joint work in various services and virtual social networks does not require significant effort or special training in computer science. Most of the activities are reduced to copying, editing and creating text documents, spreadsheets, diagrams, media files, and other digital objects. However, for the effective use of services and electronic resources there must be developed appropriate methods, digital gadgets and an access to the Internet; moreover, the participants of the educational process must have at least a minimum level of information literacy.

Web 2.0 technology at the software level is supported by several modern technologies and programming languages, including XML, JavaScript, AJAX, CSS. At the same time, at the user level, knowledge of these technologies is not required, as they are built into modern services and electronic resources by default.

Internet technologies, in particular Web 2.0, are gradually evolving towards intelligence, self-organization, joint processing and generation of knowledge, the use of Blockchain. Resources based on Web 3.0 technology are already beginning to appear. Therefore, in the future we plan to investigate the possibilities of Web 3.0 technology for their use in the educational process of a higher school.

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ОСОБЛИВОСТІ ВИКОРИСТАННЯ ТЕХНОЛОГІЇ WEB 2.0 В ОСВІТНЬОМУ ПРОЦЕСІ

Анотація. У статті розглядаються особливості впровадження технології Web 2.0 в освітній процес, висвітлюються переваги окремих веб-сервісів та електронних ресурсів.

Зазначається, що в умовах інформаційного суспільства відбувається стрімкий розвиток програмних та апаратних засобів. Використання сервісів та електронних ресурсів, які підтримують технологію Web 2.0., дозволяють урізноманітнити навчальний процес, зробити його якіснішим та більш інтерактивним.

Мета статті полягає у висвітленні особливостей та переваг онлайн сервісів та електронних ресурсів Web 2.0 для організації освітнього процесу вищої школи.

Виявлено, що можливості Web 2.0 дозволяють створити сучасне навчальне середовище, забезпечити змішане та дистанційне навчання, творче застосування набутих знань. Це досягається завдяки різноманітним онлайн сервісам та електронним ресурсам, які можна поділити на декілька груп.

З'ясовано, що технологія Web 2.0 вважається радше соціальним нововведенням, ніж технологічним. Це пов'язано з можливістю створення тематичних співтовариств.

Виявлено, що для організації навчальної діяльності та спілкування між студентами та викладачем використовується віртуальні соціальні мережі, Google Classroom, вебінари та ін. З'ясовано, що сучасна молодь досить часто перебуває у віртуальному просторі соціальних мереж, спілкується, виконує навчальні завдання тощо.

Визначено умови, які впливають на ефективність застосування технології Web 2.0 в навчальному процесі.

Виявлено можливості віртуальних соціальних мереж, Google Classroom, Internet-блогів, вебінарів та інших сервісів для організації освітнього процесу у вищій школі.

Висновки. Впровадження онлайн ресурсів та сервісів Web 2.0 дозволяє урізноманітнити освітній про-

цес, зробити його більш інтерактивним та цікавим. Можливості Web 2.0 дозволяють користувачам навчатися, обмінюватися мультимедіа, підвищити соціальну та інформаційну компетентності. Робота з технологією Web 2.0 не потребує спеціальних навичок роботи за комп'ютером.

Перспективним напрямом досліджень автори вважають використання в освітньому процесі технології Web 3.0.

Ключові слова: *заклад вищої освіти; освітній процес; Web 2.0; студенти; спілкування; онлайн сервіси; електронні ресурси.*