

CHARACTERISTICS, ADVANTAGES AND DISADVANTAGES OF CLOUD TECHNOLOGIES IN THE PROCESS OF TEACHING BIOLOGY

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Abstract:

This article describes the use of information technologies in HEIs, the computerization of education, the importance of using Internet technologies in the process of independent study, the features, advantages and disadvantages of cloud technologies.

Keywords: Information technologies, Internet technologies, cloud technologies.

ХАРАКТЕРИСТИКИ, ПРЕИМУЩЕСТВА И НЕДОСТАТКИ ОБЛАЧНЫХ ТЕХНОЛОГИЙ В ПРОЦЕССЕ ОБУЧЕНИЯ БИОЛОГИИ

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Аннотация: В данной статье рассказывается об использовании информационных технологий в вузах, компьютеризации образования, важности использования интернет-технологий в процессе самостоятельной учебы, особенностях, преимуществах и недостатках облачных технологий.

Ключевые слова: информационные технологии, интернет-технологии, облачные технологии.

БИОЛОГИЯНИ ЎҚИТИШ ЖАРАЁНИДА БУЛУТЛИ ТЕХНОЛОГИЯЛАРНИНГ ХУСУСИЯТЛАРИ, АФЗАЛЛИКЛАРИ ВА КАМЧИЛИКЛАРИ

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Аннотация: Ушбу мақолада ОТМ да ахборот технологияларидан фойдаланиш, таълимни компютерлаштириш, мустақил ўқиш жараёнида интернет технологияларини қўллашнинг аҳамияти, булутли технологияларнинг хусусиятлари, афзалликлари ва камчиликлари ҳақида баён қилинган.

Калит сўзлар: Ахборот технологиялари, интернет технологиялари, булутли технологиялар.

INTRODUCTION

In our country, every year, the opportunities of higher education institutions to improve the educational process and train professional personnel, to implement new approaches to the development of independent educational activities of students by introducing various didactic teaching tools are increasing.

No. PF-4947 of the President of the Republic of Uzbekistan dated February 7, 2017 "On the Strategy of Actions for the further development of the Republic of Uzbekistan", No. PF-5349 dated February 19, 2018 "On measures to further improve the field of information technologies and communications", No. PF-5349, 2019 Decree No. PF-5847 of October 8 "On approval of the concept of development of the higher education system of the Republic of Uzbekistan until 2030" and No. 824 of the Cabinet of Ministers of December 31, 2020 "On measures to improve the system related to the organization of the educational process in higher education institutions" The decision and other legal-regulatory documents focus on digitization of the educational process, development of IT competence of teachers, improvement of students' training and independent education based on information and Internet technologies.

Issues such as the problems, status and directions of information technology development, the possibilities of their application in educational systems, and the formation of ICT competence are being widely discussed in the scientific community. Problems of introducing ICT into the educational process M.M. Abdurazzakov, V.P. Bepalko, A.G. Gein, S.G. Grigorev, V.V. Grinshkun, A.A. Kuznetsov, I.V. Robert, T.K. Selevko, O.I. It is widely covered in the works of Shilova and others.

Leading scientists in the field of education information (M.M. Abdurazzokov, A.A. Andreev, S.A. Beshenkov, Ya.A. Vagramenko, I.E. Vostroknutov, S.G. Grigorev, A.R. Esayan, S. D. Karakozov, A.A. Kuznetsov, K.K. Kolin, M.P. Lapchik, Z.F. Mazur, V.M. Monakhov, I.V. Robert, N.I. Rijova and others) it is emphasized the need for a goal-oriented organizational process of providing the educational field with the theory, technology and practice of using information and communication technologies in teaching.

E.K. Gerasimova, N. Yu. Goncharova, SV. Zenkina, A.A. Kuznetsov, O.L. Mnatsakanyan, M.M. Nimatulaev, G.M. Nurmukhamedov E.D. Patarakin, M.A. Surkhaev, M.V. Fedoseeva and other scientists were involved.

Although some approaches of theoretical and practical importance have been put forward in the above-mentioned studies on the use of electronic tools in education, the possibilities of using mobile and network educational technologies, and the improvement of teaching methods, the features, advantages and disadvantages of cloud technologies and their use in

the organization of independent education of students in pedagogical higher education institutions not enough studies have been conducted on the methodology.

MAIN PART:

Today, it is difficult to imagine modern society without advanced technologies, and our life without computers. As a symbol of our age, the Internet is gradually surrounding us and even entering our psyche. In the near future, we will not be able to imagine our life without cloud technologies.

The reason we say this is that cloud technologies are the next step in the computerization process. That is, now we will get rid of the need to download and install programs on a computer, tablet or phone. Because all our comfort is created on the basis of cloud technologies through the Internet. Such technologies are the innovative internet technologies that are rapidly entering the state administration, business, science, education, in short, all aspects of our life in the next period.

In this process, information processing technologies, computer resources and capabilities are provided to the user through the Internet service. Government bodies, large and small companies, stock exchanges and trades, health history of diseases, all information of citizens, details of various events in our lives around us, all information is located in the "clouds" and can be used quickly anywhere on the globe. . [10;3]

Cloud computing technology is the most effective way to organize an educational system through the Internet. Cloud technology, consisting of distributed data storage and processing systems, allows to organize an online distance education system consisting of a large number of educational materials at the same time, to organize all educational activities on a single platform.

Cloud resources can be effectively used in education in order to have the opportunity to rationally organize the learning process of the students in a similar way to the organization of the work of the employees of the organization. Examples of the use of cloud technology in education include personal offices, electronic diaries and journals for students, professors and others. Cloud technology makes it possible to organize access to various social software using all the advantages of information technology, which can serve as a platform for organizing mobile learning. Therefore, the use of cloud technology allows to reduce the costs of the study process, to create study materials, to provide access to them, and to increase the quality of study at the expense of rapid change of study plans.[5;714]

The characteristics of cloud systems can be divided into three important classes:

- main;
- technological;
- economic.

Main features:

Elasticity - this property refers to the ability to measure. It should be noted that in addition to the dynamic increase in the number of used resources, the ability to reduce the allocated computing power is also required. It is this feature that gives cloud systems a number of economic advantages over classical information systems.

Fault tolerance - Providing a high level of fault tolerance requires additional resources. Virtualization in cloud systems can largely get rid of it.

Ensuring the specified quality of service is not only ensuring that the services are at a high level, but also includes other important features: response time to user actions, execution of published work, etc. Dynamics - the time with which the IT system can respond to changing educational needs - is now becoming a very important parameter. Technological features:

Virtualization - the use of virtualization systems makes it possible to perform the basic requirements for cloud systems in abstraction from physical equipment. At the same time, the maintenance of the system is not only simplified, but also the stability of the infrastructure is increased. In addition, the use of virtualization provides elastic expansion for cloud systems. Storage management - As cloud systems are often distributed, the task of effectively managing data access is critical. In addition to ensuring compatibility, access speed and the increase in the amount of data stored must also be considered.

Security - Ensuring the security of cloud systems is the most important task in organizing and working with cloud systems today. Currently, there is no ready-made solution for data security, and everyone solves this problem in their own way.

Software APIs for cloud applications - the availability of standardized software interfaces for the interaction of applications and cloud systems allows developers to initially create cloud applications using all the advantages of cloud infrastructure.

Metrics of resources consumed and services provided are critical to managing and automating a number of cloud infrastructure functions.

Economic characteristics:

The economic aspects of the implementation of cloud systems, as stated by European experts, are already well known:

- payment only for used resources;
- decrease in property value;
- High profitability of investments;
- transferring part of the capital costs to the operating system;
- Environmental aspects of modern IT technologies [6;85].

The benefits of cloud storage and services include:

- the ability to work on any document almost anywhere and on any device;
- organization of general access to data and subsequent synchronization for several users who are located absolutely anywhere and can use different devices;
- unlimited space for data;

- ease of data transfer;
- keep copies of important information;
- users of cloud services pay for the space they actually use, not for renting a server where all resources are not used;
- The user does not need to deal with the purchase, support and maintenance of the data storage infrastructure, as a result, the presented documents are placed correctly;
- All data backup and storage procedures are performed by the cloud center provider, which does not involve the student in this process [7;43-44]

However, in addition to positive reviews, the concept of cloud storage is also criticized.

Disadvantages of cloud storage and services include:

- when using a cloud service, all data is located on foreign servers and access to it is carried out through third-party programs, as a result, the user depends on the company that provides the storage service;
- with the widespread use of this technology, problems with the formation of uncontrolled data may arise if the data left by the user remains for years or cannot change any part of it;
- due to the significant increase in the number of users of services using cloud computing, the cost of errors and data dissemination is increasing;
- The security of the IT infrastructure can be affected by cloud storage tools:
- company employees can share (steal) confidential information;
- Data on-line data storage systems can be one of the methods of rapid distribution of malicious programs in corporate networks;
- using online information, you may lose confidential information;
- accounts in cloud services may be compromised, resulting in the loss or leakage of confidential information;
- in conflicting situations related to data in cloud systems, it is not clear what legal documents to refer to[8;112].

CONCLUSION

Cloud technologies can be used in pedagogic educational institutions to organize individual and group teaching forms and independent education of students in the classroom and outside the classroom. In addition, if using interactive electronic whiteboards or multimedia projectors in the auditorium of a higher education institution, the use of cloud technologies in the educational process can be considered as a certain part of the collaborative work of teachers and students. This form of training motivates students, it is possible to ensure and strengthen their effective learning by the learner through interesting presentation of educational material, use of unlimited literature and visual presentation of information [11;98].

Thus, by explaining the features, advantages and disadvantages of cloud technologies, developing a methodical system based on cloud technologies aimed at teaching "Biology Teaching Methodology" in higher educational institutions, it is possible to be sure that the independent education of students in the classroom and outside the classroom will be improved, and the efficiency in mastering the science will be high.

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