

## USE OF REMOTE TECHNOLOGIES IN TEACHING COMPUTER SCIENCE

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### ABSTRACT

Each university or educational institution tries to create its own virtual information learning environment and provide education through it, based on modern technologies to manage its educational process. This is distance learning. There are several technologies of distance education and methods of their organization, and we will focus on them in this article.

**Keywords:** computer, distance learning, education system, audio, video electronic data, interactive technologies, internet

Each university or educational institution tries to create its own virtual information learning environment and provide education through it, based on modern technologies to manage its educational process. This is distance learning.

There are several technologies of distance education and methods of their organization, which are widely used in the establishment and development of the distance education system. These technologies can be conditionally divided into four groups.

**Audio (sound)** - audio educational tools include interactive technologies such as telephony, audio conferencing and short-wave radio.

**Video** - video teaching aids can include fixed static images (slides), animation (moving) images (films, videocassettes) and animation images combined with real-time audio conferencing capabilities. It should be mentioned that the animated image transmitted together with the real-time audio conference can be a one-way or two-way video image, or else a one-way or two-way audio conference.

**Printed handouts** - such materials include textbooks, subject guides, training programs, lecture notes, and separate supplementary documents.

**Electronic data** - the term "data" refers to such data that can be transferred to another computer or computers. That is why the term electronic information is used here. Today, many computers

are connected to the global Internet network, to a corporate network (Intranet) built in a certain direction or industry. This allows distance learning on a large scale.

There are two common ways of organizing distance learning, which are more effective than others. These are distance learning methods based on videoconference technology and distance learning methods based on WEB technology on the Internet/Intranet network.

It is also correct to call the distance education system built on the basis of videoconference technology as synchronous distance education. Because of this, the learning process takes place in real time for both the teacher and the student. There are several ways to organize this form of distance learning, which differ mainly depending on the type of communication channel used for video conferencing. Today, two types of communication channels are mainly used for video conference communication. These are ISDN and Internet channels. Special devices are used for the process of videoconference communication, which, in addition to sending audio, video, and other multimedia capabilities through communication channels. As mentioned above, in such a teaching method, there is a need to synchronize the educational process bilaterally - both by the teacher and the students. That is, the participation of the teacher and students is required on both sides at the same time during the teaching process. In some cases, such a requirement causes inconvenience, especially if the teacher and students are geographically inconvenient (there is a considerable time difference between them). But real-time communication and information exchange increases the effectiveness of the distance learning process. It should also be mentioned that the method of distance education based on videoconference technology requires a high-quality channel and special devices, so it is one of the methods that require a little more money financially than other methods of distance education.

Distance learning method based on WEB technology in the Internet/Intranet network is a very cheap, simple and asynchronous method of distance learning. Today's advances in Internet/Intranet technologies allow the transmission of pre-prepared audio information, video images and other multimedia applications over the network. The main feature of this distance learning method is its asynchrony. Students participate in the learning process by referring to the distance learning platform, which is designed to organize the distance learning process through the Internet/Intranet network. In this case, they can turn to the distance learning platform at a place and time convenient for them. Unlike distance education method based on videoconference technology, the teacher and students using this method are not required to participate in the distance education process at the same time, the students receive educational materials (electronic lecture texts, videos etc.) can revise and learn even if there is no teacher on the other end. In this case, how is communication and question-and-answer between the teacher and the student, which is the main element of the educational process, carried out in this method of distance learning? - a question may arise. The communication between the teacher and the student includes e-mail exchange, the use of bulletin boards and forums, Chat (Chat applications allow real-time exchange of information in the form of text) through the use of applications and voice mail. In addition, Internet/Intranet technologies today allow the transmission of various multimedia applications through the network, which in turn increases the effectiveness of distance education (virtual laboratories, interactive test programs).

Despite the fact that the used technology plays a key role in the establishment of distance education and its transmission, teachers participating in distance education should focus not

on the technology of information transfer, but on the result of education. The first steps towards the organization of an effective distance learning process include determining the requirements of students, choosing the content of educational materials, and determining the existing boundaries of the educational process for the teacher. It is worth mentioning that these actions are performed before choosing the technology that organizes the educational process.

In the development of electronic educational materials intended for distance education, the main meaning of the lecture does not change in most cases, but in the delivery and presentation of materials, they are constantly updated, using new technologies and methods (educational materials virtual appearance) and it is required to allocate a separate time for this.

In order to increase the efficiency of the educational process, the distance education system should be such that its users can learn to use distance education tools effectively in a short period of time and should not face any inconvenience in the distance education methodology during the education process. The distance education system should be organized in such a way that the main effort and attention is directed to the students' interest in learning, and at the same time, this system meets the requirements of the teaching style and content.

The use of effective means of communication in the process of distance education allows the teacher to determine the needs and wishes of students as a result of mutual communication and adapt to them. At the same time, this has a positive effect on the content of educational materials.

The process of developing electronic learning materials has a structural appearance, which requires systematic planning, development, adaptation to the needs of students and the demand for learning materials. The model of development of electronic educational materials consists of the following steps that are sequentially repeated.

**Planning** - at this stage, the requirements for educational materials are determined, the possible audience is analyzed, and goals are set.

**Development** - at this stage, a plan for creating electronic educational material is drawn up, existing materials are reviewed, and electronic educational material is developed based on them.

**Evaluation** is a stage in which the primary requirements, the results resulting from them, the goals and tasks are revised to confirm once again that the selected teaching strategy was chosen correctly. At this stage, it is necessary to develop a strategy for evaluating the educational material. One such strategy could be a list of questions after each lecture. Students write answers to them and express their opinions on the educational material. Then the results of the evaluation strategy are summarized and analyzed.

Technology	Description
Audio-video information carriers (printed handouts, audio-, videocassettes)	Communication interactivity is low. Before using, the exact number of students should be known. The number of students depends on the cost of using the technology.
Distance learning based on WEB technology (e-mail, bulletin board, etc.)	Medium interactivity. Widespread infrastructure. It's cheap to set up. The scope of use is wide.
Real-time video conferencing over the Internet/Intranet	High level of interactivity. Widespread infrastructure. It's cheap to set up.
Video conference through ISDN channels	High level of interactivity. Requires at least 3 ISDN channels. It is expensive to organize compared to the quality .
Video conferencing through dedicated digital satellite channels	High level of interactivity. High quality image transmission. Compared to video conferencing through analog satellite channels, the price is 2 times cheaper. Organization is expensive.
Video conferencing through dedicated analog satellite channels	High level of interactivity. Maximum high-quality image transmission with minimal technological image and sound interceptions. Organization is expensive.

**Revision and modification** – This stage is where the plans are revised based on the results of the analysis, and then it moves to the planning stage.

Below is a description of distance learning methods implemented as a result of the above-mentioned technologies and their variations.

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