

Experience of distance education implementation

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Abstract. The article substantiates the relevance of distance education development in the Russian Federation and in the world in general. The positive aspects of this type of training are also described. The article describes the experience of implementing distance education on the basis of the Moodle system in Ufa State Oil Technical University at the Department of Mechanics and Engineering Technology. The gained experience can be used when training specialists who are going to develop information technologies of automated engineering.

1 Introduction

Society is currently undergoing a fundamental transformation of the productive forces, which contributes to the formation of the information society. Information society has a huge impact on all spheres of human life, including science and education [1].

The educational environment begins to widely implement and distribute e-learning, which is the application of educational programs based on information and educational resources, information and communication technologies, technical means, with the mandatory use of information and telecommunication networks that provide the transfer of information and educational resources and organize the interaction of all participants in the educational environment.

One of the forms of electronic education is distance education, which is gaining popularity since the beginning of the twenty-first century in our country and abroad. The main advantage of this form of education is its convenience and flexibility.

Distance education is a set of technologies that provide students with the delivery of the bulk of the studied material through information technology. Distance learning is currently popular in the system of higher education. Distance education is a new form of education based on telecommunication technologies and Internet resources. Distance education is an interactive form, implementing a systematic interaction between the teacher and students, but the main emphasis is made on the independent activities of students. Distance education can be considered as a form of continuing education [2].

According to V.S. Sharov, distance education is an independent form of education of the twenty-first century and can act as an innovative component of full-time and part-time learning. It also creates a new educational information environment that promotes the

involvement of students who know what kind of knowledge, skills, and abilities they need [3].

Some researchers define distance education as a synthetic integral-humanistic form of education which is based on the use of a wide range of traditional and new information technologies and technical means used for the delivery and independent study of learning material, as well as the dialogue information exchange between teachers and students. At the same time, the learning process is not bound to the location of students and educators, to the time and the educational institution [4].

2 Problem statement

The emergence of distance education was facilitated by the progress in the field of communications, which started by the early eighties of the last century. This allowed using satellite communication and new ways of data transmission in the field of education, and thus helped to transfer training to a completely new level which makes the location of teachers and students unimportant. In these circumstances the presence of a communication network is only important.

A full course of distance education contains a list of lectures and other types of classes available to students and contributes to organizing an accessible and interesting learning process. The presence of interest in the subjects studied will contribute to good performance. A distinctive feature of a good distance education curriculum is full involvement and immersion of students in the educational process.

Under the concept of distance education we can understand suitable standard qualification development programmes and full-fledged higher education courses, implementing methods of establishing close contact between students and teachers/fellow students. This process resembles full-time education.

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3 Materials and methods

Distance education can stimulate independent thinking of students, promotes transition from the transfer of ready-made knowledge to self-management of cognitive activity, as well as activates the independent cognitive activity of students.

Distance education includes:

- joint activities in small groups;
- discussion of issues, problems, difficulties in an interactive form through chats, forums, video conferences within the whole group;
- the use of project methods, case methods, problem methods, role-playing and simulation games.

Types of training used in distance education.

1. Chat sessions are training sessions using synchronous chat technologies, which provide all participants with simultaneous access to the chat. Within the framework of many educational institutions that implement distance education there exist chat schools which organize the activities of remote teachers and students in specialized chat rooms.

2. Web-based classes include lessons, seminars, conferences, simulation games, laboratory work, workshops, other types and forms of training sessions conducted by means of telecommunications and the Internet.

3. Teleconferences are organized and conducted on the basis of e-mailing lists. Educational teleconferences are conducted to solve educational tasks.

4. Telepresence is an experimental method of distance education, organized on the basis of forming the atmosphere of presence. Students who are outside the classroom have a sense of personal presence in it.

Web-quest technology can also be used to organize independent training sessions in distance learning. Web-quest is one of the types of students' research activities, the essence of which is to find information through the pre-specified e-mail addresses on the Internet. Web-quest allows spending the time to the maximum benefit; this leads to developing the ability to critically understand information and the ability to analyze, synthesize and evaluate. Web-quests teach to use the information for practical purposes.

Researchers from San-Diego State University Bernie Dodge and Tom March are the developers of this activity, which began in 1995. Being a problem-oriented task, Web-quest acts as an effective method in obtaining new knowledge and developing cognitive skills of students [5].

Some of them can be copied to the site. It should also contain links to web-pages, necessary e-mail addresses, and chats. Here you can also find books and other materials suitable for the subject. The exact address helps to save students' time. It is necessary to bring a step-by-step process of work with specific deadlines for all stages. It is also necessary to give some explanations for information processing, concepts, cause-effect diagrams, questions. The conclusion may contain a general description of what is achieved in performing this task, describe how to use the experience in another area or for further work on this topic.

Web-quests can be short-term and long-term. Short-term work contributes to the acquisition of new knowledge and integrates this knowledge into a coherent system. Short-term web-quests can be performed in one or in up to three sessions. Long-term web-quests expand and refine concepts. Working on a long-term web-quest, a student learns to deeply analyze the knowledge gained, gets the skills to transform it and deep knowledge of the material that allows you to create your own tasks on the topic. Work on such a project can take from one week to a month (maximum two months).

The most convenient way to create web-quests is not to give out the task to individual students, but to mini-groups of students. It should be noted that there are also some projects that can be performed individually. Web-quests are dedicated to one subject and can be interdisciplinary. Such projects, as the researchers note, are the most effective.

Web-quests can be different in form. There are such types of web-quests in which it is necessary to create databases on the problem. All aspects here are prepared by students. A microcosm is created where movement is possible with the help of hyperlinks and the physical space is simulated. Students write interactive stories in such a way that at each stage you can choose one of several possible directions.

The same form of web-quest offers students to create a document that provides an analysis of a complex problem, and the student needs to decide whether he/she agrees or disagrees with the opinion of the author.

There is another form of web-quest that offers an online interview with a virtual character. Answers and questions for such an interview are developed by the students themselves, who have deeply studied this character. The interviewee can be a politician, a literary character, a famous scientist, or a fictional character, for example, an alien, etc. Work is large in this case and is better to be assigned not to individual students but to a mini-group.

To achieve maximum efficiency a web-quest should consist of an introduction, a task, a set of links, a description, an explanation, and a conclusion. The introduction sets the initial data and timing. The task should be interesting and really executable. The link sets mention the network resources that may be required for carrying out the task.

There are forms of distance education in which educational materials are sent by mail to the remote regions.

The use of distance education technologies allows us to:

- significantly reduce the cost of training because it does not require renting and maintaining premises, traveling to the venue of training students and teachers;
- successfully conduct training a large number of people at the same time;
- improve the quality of education through the use of large electronic libraries and modern tools;
- create a single or sectoral educational environment which is especially important for corporate training.

4 Results

The convenience and efficiency of distance education depend on the appropriate level of structure and organization.

An integral part of the learning process is the appropriate qualification and professionalism of teachers. Some researchers now consider it appropriate to separate the functions of a teacher and a tutor. A tutor is a new category of specialists introduced respectively for the system of distance education. Tutoring is promising although the definition of "tutoring" is not new to modern education. The beginning of tutoring as the original educational philosophy and the leading way of organizing the educational system was laid in medieval European universities in the XII-XIV centuries. "As a special pedagogical attitude and then the position, it is formed in the most famous ancient universities-cities of Great Britain: first in Oxford, later in Cambridge" [6]. The teacher, who organizes the conditions for the design and implementation of independent extracurricular work, is called a tutor. Tutoring is characterized not so much by the transfer of knowledge and technology, but by the formation of creative competencies, readiness for retraining, the ability to learn throughout life, and at the same time to choose and update the individual professional path. Tutoring became widespread in distance education. The basic principle of tutoring is manifested in the individual approach to the student and assisting him/her in the educational process management.

According to the method of interaction of the educational process participants, the kind of activity involved and the direction of the provided support, there are distinguished several types of tutoring. Tutoring can be strategic or tactical; include student tutoring, individual tutoring, group tutoring or problem situations tutoring; academic training; academic, home, private or online tutoring. The most promising type is online tutoring which is based on computer and Internet technologies and is one of the directions for developing science and society at the present time. Student tutoring is quite effective, based on the interaction between peers in the educational process.

Analyzing cognitive interests and needs of students, the tutor develops special exercises and tasks which are based on modern communication methods; thinks of ways to increase motivation. The teacher helps students to get the most benefit of their studies, supports feedback, conducts counselling, provides an opportunity for personal contact often through modern information technologies: e-mailing, computer conferences, and chats.

Counseling is the interaction between the teacher and the student, organized in a special way that solves problems and makes changes in the activities of the consulted. It can be carried out in real time or remotely. When organizing there is no traditional presentation of the material as the training function in education is replaced by counseling.

Any form of training should facilitate the organization of the learning process in the situation of

mutual respect. It is inadmissible in humanistic pedagogy to make remarks in the presence of other students and pupils. This principle is particularly effective and manifests itself in distance learning management because only in the conditions of videoconferencing participants can have the opportunity to visually observe each other. In all other cases, communication between students and teachers occurs without visual contact. Such interaction can contribute to the creation of uncomfortable situations in which some participants of the dialogue can afford to make offensive remarks, to be more relaxed than it is permissible in society. And in these circumstances the teacher needs to make additional distinctive efforts to competently extinguish the beginning conflict.

Modern development of technology allows placing almost any form and content of educational materials on the Internet. Students obtain the same unlimited access to them because students who know the ropes on the Internet have also great opportunities to engage in their own self-educational activities and learn remotely.

In the system of distance education there is a problem of controlling the acquired knowledge. This problem is very relevant for domestic and foreign distance learning systems. The emergence of the problem is associated with the specifics of communication in the information space of the Internet. Existing modern forms of networking such as e-mailing, forums and chats allow quick exchange of information messages, but there is no possibility to identify the interlocutor. The teacher cannot be absolutely sure that the given task was performed by the student independently. The problem can be solved by connecting a video camera that allows talking online.

The following factors influence the choice of control forms: duration of control activities, efficiency, availability of feedback, accessibility, compliance with the learning content, compliance with the used pedagogical technologies.

Special importance in controlling knowledge is given to who and how will evaluate the knowledge of students. There exist several forms: interactive, computer-related and communicative. The interactive form of control is organized in such a way that the student receives a teacher's response to each message sent to the teacher. When using a computer-related control form, it is assumed that tasks are issued and controlled directly by computers. Within the framework of the communicative form, communication can take place between all people involved in distance courses. Thus, the test of knowledge can involve the teacher, students, computer programs or tests, the latter are often used on the Internet to assess the knowledge of students. However, the use of tests in assessing knowledge control is not appropriate in all cases. Testing is appropriate to use when checking academic knowledge. When skills assessment is required, the tests may not be sufficiently valid.

Various forms can be used to control knowledge: oral and written. The teacher can conduct surveys for individuals or the whole group. One can also perform random or continuous tests. But when using any form, it is necessary to comply with certain requirements. If

possible, it is necessary to strive for maximum individualization of tasks and systematic monitoring. Forms and methods of control should have reasonable limits, understandable and accessible evaluative criteria. The degree of independence and creative activity of students, the time of assignment execution, the nature of students' actions can be taken as evaluative criteria.

Depending on the time of teacher's controlling students' knowledge, there are distinguished the following types of control: preliminary, periodic, selective, stagewise, and final.

The final control is provided upon completion of the work. This type of control has significant drawbacks. Since the entire amount of work is performed by the student independently, the completed task can have significant drawbacks in their volume and quality. The final control is more appropriate to use when performing short-term tasks.

To reduce the risks of the final control execution, preliminary control is used. It represents an additional test to check the student's performance of the task.

Another great advantage when testing long or complicated tasks belongs to periodic control, which provides verification in certain periods of time. However, the high frequency of control is associated with significant timing which is a disadvantage of this type of knowledge control.

Selective control can also be used. It differs with spontaneity and the lack of prior agreement on the time of holding control. Selective type of control can cause tension and increase the level of students' stress, which is undesirable; so it is recommended to limit the use of selective control.

In the case of a long-term task it is most convenient to apply stagewise control.

The level of students' preparation, as well as their levels of motivation, can vary significantly. This can greatly affect the results of implementation in turn. Any university can mark students who have a systematic backlog in the educational process, such students need to be paid special and increased attention. If the low rates are observed in the majority of the training group members, such a result may indicate miscalculations in development and organization of independent work, which should be the basis for analysis, development and adjustments.

An example of introducing distance education technologies in the educational process is the Ufa State Oil Technical University which introduced and successfully used distance learning based on the Moodle system [7].

This technology allows students who are outside the educational institution to maintain a dialogue with teachers through telecommunications. Many University teachers have been trained in the system of distance education, have documents confirming their qualification in this field and successfully use them for teaching their students. The Moodle system contains an extensive database of electronic educational and methodical complexes on the taught disciplines developed by the University teachers. The teaching materials include the following: lecture notes; educational and teaching AIDS

for conducting practical, laboratory and seminar classes; educational and teaching AIDS for conducting course work, design and graphics work, homework, and TAM (testing and assessment materials). An electronic library allows students to timely obtain theoretical knowledge in the disciplines studied. Teaching materials in the electronic library are very convenient to use because it provides students with the full texts of literature pieces and study-guides through the Internet.

Moodle access is only possible through a personal login and password which are individual for each teacher and student and prevent unauthorized access to the system for unauthorized users.

The system of distance education is not limited to the functions of the electronic library. Many University teachers have registered courses on the discipline they teach. Completing the course is a creative process. The system has a huge number of features. In addition to theoretical learning materials, it is possible to lay out creative tasks, control practices, course works, etc. Many teachers use the system of distance education to issue mandatory tasks. The system also allows monitoring the data. For these purposes, teachers use test items, testing and assessment materials, and sets of assessment tools. Students have the opportunity to send the completed task through the Internet. As the performance of test tasks is also possible in the real online mode, there is the possibility to receive comments or see the received mark.

The system is equipped with a calendar that allows teachers to regulate the performance of work on time. The teacher has a huge number of opportunities when creating test tasks [8].

It is also possible to conduct classes in the form of chats and video conferences.

Analyzing the experience, we can conclude that distance education stimulates independent thinking of students, promotes transition from the transfer of ready-made knowledge to self-management of cognitive activity, as well as activates the independent cognitive activity of students. Distance education provides a high level of accessible education. Modern information technologies allow students to act as the subjects of cognition and communication.

5 Conclusion

The opinions of authors and researchers on the introduction of distance education vary widely from very enthusiastic to quite skeptical. So D.D. Hunter believes that the most significant change in the field of educational technology is the emergence of Internet learning over the past five hundred years since the advent of printing [9].

According to V.L. Benin remote computer-related technologies are really impersonal because they lack an individual and author's approach to the transfer of knowledge [10].

The experience of implementing distance education in the educational process within Ufa State Oil Technical University leads to the conclusion that this type of

training has many positive aspects and complements the educational process. However, the replacement of the existing education system is advisable only when there are insurmountable restrictions in mobility or time.

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