EDUCATIONAL PROCESS IN THE SYSTEM OF DISTANCE EDUCATION

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The aim of the modern educational system is not only to provide a student with as much knowledge as possible; it is also to teach the learners to get knowledge themselves. It is necessary to use more intensive educational technologies one of which is represented by the distance education (DE).

The problem of DE appears to be especially important for Russia with its vast territory, uneven population density and location of university centers. However, implementing DE without methodical training can lead to discrediting it as a form of education. Absence of unified concept, lack of practical experience can often lead to controversial approach to this form of education: from putting means and methods of transmission of educational information to its absolute form, to the idea of creation of virtual educational institution, etc.

The difference of DE from traditional form is remoteness of a teacher, absence of face-to-face contact in the process of education. In this respect traditional form of education will always have an advantage, no matter how perfect the technical aspect of information communication would be.

However, introducing computer-based technologies gives a chance to move to a different level of transmitting information. Distant form of education based on new ITs may substantially add to the full-time education and in some cases, improve its quality.

There exist several ways of DE usage:

- as an additional support of the main course (here DE technologies receive subsidiary role),
- as a basis for self-education (in this case students get and master ready-made electronic educational products independently, for example — multimedia courses),
- as a constant educational technology. In this case a group of students is formed in a peripheral center which works under the supervision of a tutor or coordinator who controls the educational process, fulfillment of home assignment, and helps the learners in the process of mastering the course.

This last variant of using DE technologies has served as a basis for the activity of Peripheral Centers of Distance Education (PCDE) of Tomsk State University created in Nowokuzneck and Prokopiewsk. The Centre in Nowokuzneck is oriented on pre-university training for school students of the 10-11th grades in 10 subjects in 3 trends — humanitarian, natural science and physic-mathematical.

A branch of the Department of Physics of TSU, where the training is based on DE technologies, is operating on the basis of a training center in Prokopievsk. Fundamental courses in physics and mathematics, lasting for several terms, extensive laboratory practice have required direct contact with teachers up to the moment. The use of the latest technologies which make up the base of DE makes it possible to achieve the quality of fulltime educational system.

Two-year experience of PCDE allows distinguishing certain peculiarities in organization of educational process based on distance education.

Characteristics of organization of educational process

An educational process is preceded by projecting, developing theoretical conceptions and **thorough planning**. Pedagogical assessment of efficiency of every step of projecting and creation of the DE system is needed. Therefore it is the contents of the courses and educational services that should be given more attention, not implementing the technologies.

An academic curriculum in DE is close to an individual one as they both presuppose asynchrony and modularity of training. Curriculum does not restrict a student to certain forms of learning activity, but it defines strict deadlines for fulfilling control tasks. The educational process allows a teacher and a student to use educational technologies with no respect to timing, according to the most comfortable schedule.

The educational process in a peripheral center includes both classes conducted by the teachers who come to the center and work in computer classes. Visiting sessions are necessary because of several reasons:

- firstly, face-to-face contact between students and a teacher facilitates further remote work;
- secondly, normally a peripheral center does not have its own teachers who could perform as advisers. In case PCDE is created in a university center, for instance, in a university-member of the Association, this problem can be solved by interaction of both universities.

Working in class takes about 60% of study hours, but, with the methodical basis expanded, gradual replacement of the visiting sessions by DE technology takes place.

Computer class activities take from 40 to 60% of study hours. Hence, compulsory computer literacy of the students is necessary. They should be able to work with a certain editor program, have the skills of using keyboard, know how to run a program, create text files. Besides, the learners should be ready to work in the Internet, to use e-mail, CD-ROM. Such training does not require much time, but its absence can dramatically decrease motivation to independent work and affect the quality of the results. That is why PCDE should provide introductory courses in computer literacy and Internet literacy that start before the main program.

One of the advantages of distance education is an opportunity to involve into the educational process a large number of students living in different areas. However in this case the degree of the feedback and the activity of the learners can be about the same as in a crowded lecture hall. Correct methodical structure of the material is a key to success. Handing over some of the functions to PC gives a chance to increase the number of students.

Educational process in DE includes all the main forms of the traditional organization of educational process. However, some functions are fulfilled by computers:

- lectures are partly realized with the help of MMK,
- practical lessons are partly replaced by training simulators ,
- formalized monitoring can be carried out with the help of testing systems or control works, sent by e-mail.

Tuition is more difficult to organize: a teacher cannot be replaced, but online technologies can help him or her. Net technologies can be used for final control tests, but face-to-face contact is more preferable.

As for **self-study**, its increasing role is one of the major characteristics of DE. DE takes students away from the traditional class-lesson system, as they study most part of material without a teacher. It requires from them more independency and good time management skills. The significance of personal motivation increases as well as the degree of freedom and choice of the subjects and the profoundness of studying them. Senior school students who have just stepped on the way of self-identification and choice of profession, and students who have already made this choice, are perfect objects for DE.

This peculiarity is also a major difficulty for the students. Having got used to constant guidance of a teacher in class, they often cannot assess the tasks, are not always able to read them till the end, do not see the tips of the menu which can help them to fulfill the task, which results in such technical questions as: *How should this task be done? What should be done to the text? How should I solve this problem? e*tc.

The problem can be solved by means of developing clear directions and refusing complex tasks that can distract students' attention. A teacher takes the responsibility of not only being an adviser in a certain subject, but also of helping to create individual educational direction, evaluating the profoundness of the necessary knowledge and outlining the range of its sources.

Independence in acquiring knowledge should not be passive. On the opposite, the students should be involved in active informational activity. Within the course of such training students should be able to acquire and apply knowledge, search and find necessary means and sources of information, be able to work with this information.

Organizing individual and group independent activity within DE system presupposes, like in

fulltime education, the use of the **latest teaching technologies**. First of all it is project work, working in a team, research and problem solving methods. This should help to reveal the inner resources of every student and simultaneously to facilitate the formation of social qualities of a personality (ability to work in a team, performing different social roles, helping each other in mutual activities, solving difficult problems together).

Distance education, though individualized inherently, should not exclude opportunities to communicate with a teacher and other students, cooperation in different kinds of informative and creative activities. Problems of socializing appear to be urgent in DE.

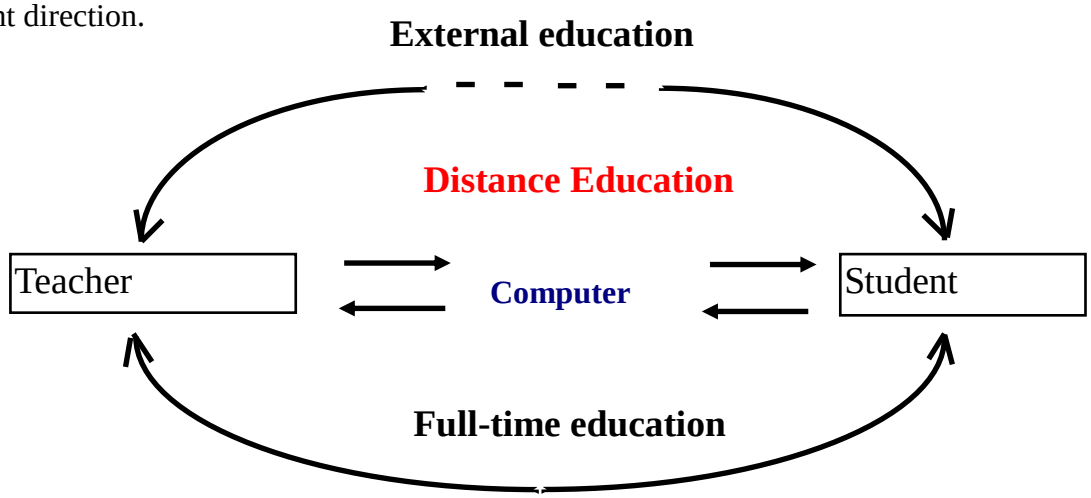
Each model of DE should provide flexible combination:

1 - independent informative activity of students using various sources of information, education materials specially developed for this course,

2 - operative and systematic interaction with the teacher, consultant-coordinator of the project,

3 - group work as of cooperative education with other participants of the course.

DE courses should provide maximal opportunity for interaction between students and teacher via computer, feedback between the students and the material and opportunity for group education. They should ensure effective feedback so that the students could be sure that they move in the right direction.



DE, despite the obviously limited personal contact, creates the conditions for constant communication between students and a teacher via e-mail. The most effective form here is online and offline consultations.

The time of contact between a teacher and a student in DE should not be restricted. Every student can connect to the server offline at the time comfortable for him. Most importantly, the tests should be sent to the adviser on time. This ensures comfortable opportunity to work in friendly home conditions. Asynchrony helps to avoid overlaps with classes of fulltime form and work overload. Time limits are constricted only to online technologies, which help to communicate

live (Chat, Audio Conferencing, and Video Conferencing).

Opportunities to control informative activities of a student in distance education are increasing. Teachers can perform regular and topical control tests and self-control of the students is also available due to the multimedia technologies. Rapid feedback can be integrated in the text of the material as well as the potential to address directly to the teacher or adviser. Delayed final control from the teacher or adviser can be organized in the form of tests, essays, creative works, problem solving and final test.

Remoteness from the teacher has a special effect on students' condition — it helps them to feel at ease. Considering this an element of a game can be included in the process, for instance, students may be allowed to act under imaginary names. This can help to overcome the fear of mistakes and resolves some commutative problems. It is especially appropriate if the aim of the lesson is not quality assessment, but modeling a study situation where students’self-study is most important.

Characteristics of methodical support

When organizing a study process in the system of DE the problem of information infrastructure support is important [2, 186-187]. Where and how should the information be located, what kind of structure and composition should it have? While organizing an educational process one should take into consideration the peculiarities of its methodical support. Nowadays computer firmware makes it possible to create hypertext, multimedia and hypermedia materials that give a complete understanding of the information under study and facilitate implementation of feedback from students [3, 105-110].

Internet resources can be used as a peculiar training tool. We only need to teach students to find necessary information fast enough and formulate the request.

However, we need to take into account the specifics of work with computer when creating a system of IT support for distance education. It means that students develop fatigue, eyesight overstrain etc. This requires thorough preparation of the materials considering human eye's perception of certain colors, accurate choice of fonts and reasonable combination of different forms of educational activities.

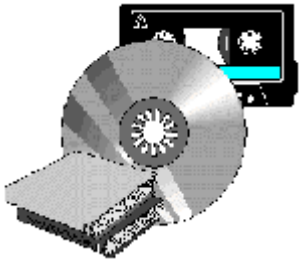
With the help of the complex of educational programs that use multimedia devices, the larger part can be passed to computers. It is multimedia courses that present the methodical basis for distance education. However, the fundamental character of the courses presumes the presentation of great part of information in printed version. This problem can be sold by creating libraries in the peripheral center or by digitalizing the information.

Methodical bases of distance education are:

- multimedia courses,
- video materials,
- audio materials,
- training simulators,
- Internet resources,
- printed text materials.

The most important component of the educational process in distance education is, as it has already been mentioned, multimedia course which is a complex of information on different media. The basis of this multimedia component is a textbook on CD. Other compulsory components include printed text materials, manuals, audio and video cassettes, manual for CD.

Multimedia course includes:



- a multimedia textbook,
- printed text materials,
- manuals,
- audio materials,
- video materials,
- manual for CD.

A multimedia textbook allows students not only to get acquainted with the theoretical material, but also the sources, illustrations, helps to carry out training simulator exercises and self-control. Material is organized on the basis of hypertext structure which makes search of information easier. The most difficult moments are provided with voice commentaries of the author. Game components can also be present here facilitating the understanding of the material. Multimedia course represents means of complex influence on the learner by matching conceptual, illustrational, training simulators and control parts. The structure and user's interface of the course should provide effective assistance for mastering the material [1,185-186].

The most labor intensive part for a teacher during PC-textbook creation is ensuring a friendly interface that will stimulate a student to further education. General structure and the interface of the textbook should provide assistance in theoretical material or in problem solving by analyzing common mistakes and tips. This demands an ability to foresee future situations that can happen during student's work with PC-textbook from the author.

It is essential to emphasize that a computer course designed for distance education is author's course by its definition. It is author's guidelines that ensure high quality of distance education. Though separate components of the computer course may be used as independent teaching modules by other teachers and for self-study, the maximal effect can be achieved only by

interaction with the author.

As the experience of the branch of the Department of Physics of TSU in Prokopiewsk shows, especial difficulty in the educational process in remote training centers is laboratory practice. Specially developed laboratory simulators which allow tracking important regularities, having modeled physical processes, should be used to organize laboratory practice. In such case a computer often performs the function of experimental facility and the design of the work, i.e. theoretical basis, unit sheets, graphical presentation of the results are carried out individually by each student. This allows not only studying physical phenomenon at a profound level, but also learning how to prepare a scientific report correctly, submitting the results of your work in the right way.

Laboratory simulators make it possible to digitalize already existing laboratory works and to develop completely new ones with such regularities, experimental fulfillment of which is not possible within the framework of student laboratory practical work.

Thus, we shall define the peculiarities of organizing an educational process in distance education. They are the following:

- greater emphasis on self-study;
- compulsory computer literacy of learners;
- opportunity to act in the name of an imaginary hero which facilitates the communication;
- relative freedom in choosing time and place for studies;
- high level of interactivity, provided by the multimedia means;
- necessity of systematic control of understanding and ways of informative activity.

To increase in the effectiveness of the educational process in distance education we need to develop forms of distance communication, use new educational technologies, activate informative motivation of the students and broaden their activities with the use of distance education. Success of distance education is to a high degree connected with how the psychological, pedagogical and medical aspects are followed, how distinctly the educational process is organized.

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