

The Role of Computer Technologies in Learning Process

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Abstract--*The article analyses basic concepts related to the connection of modern education with the information technologies and deals with the role of computer technology in the educational process.*

Today it is quite possible to trace some trends that are beginning to show up in the field of CT development. First of all, this is due to the emergence of the so-called information learning environments and virtual educational spaces, which are built according to the “student - intermediary - teacher” system, where modern IT tools act as an intermediary. New forms of organization of educational information appear which are characterized by non-linear structuring of educational material, which, in turn, allows the student to choose an individual learning path. Thus, the study and analysis of special literature on the role of CT, the development of students' information competence, shows that education as a basic social institution, which determines to a greater extent the prospects for Russia's progress, can normally exist and effectively develop, and remain a modern knowledge industry as a leading cultural value only subject to the use of constantly updated IT - an important component of the information technology environment of each educational institution, their system of integration into all types and forms of the educational process.

Key words--*Education; information Technology; new information technologies; computer technologies.*

I. INTRODUCTION

An important means of intensifying and improving academic work should be the computerization of instruction. The task of didactics in this connection is to determine and ensure the conditions under which such intensification is really achieved.

At the first stage, the computer acts as the subject of educational activity, during which knowledge about the operation of the machine is acquired, programming languages are learned, operator skills are learned. At the second stage, this subject is already transformed into a means of solving educational or professional problems, into an instrument of human activity (Burkovskaya M.A., (2002).

A computer is not just a technical device; it involves appropriate software. The solution of this problem is associated with overcoming difficulties due to the fact that one part of the task, computer design and production, is

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performed by an engineer, and the other is a teacher who must find a reasonable didactic justification between the logic of the computer and the deployment of living human learning activities. At present, the latter is still sacrificed to machine logic, because in order to successfully work with a computer, one must, as proponents of universal computerization point out, possess algorithmic thinking.

Another difficulty is that any tool used in the educational process is only one of the equal components of the didactic system along with its other links: goals, content, forms, methods, activities of the teacher and student. All these links are interconnected and a change in one of them causes a change in all the others. Just as new content requires new forms of organization, so a new tool involves the reorientation of all other components of the didactic system. Therefore, the installation in a class or university classroom of a computer or display is not the end of computerization, but its beginning, the beginning of the system restructuring of the entire learning technology.

First of all, the activity of the subjects of education is being transformed — the teacher and student, teacher and student. They have to build fundamentally new relationships, master new forms of activity in connection with a change in the means of academic work and specific restructuring and content. And this, and not the mastery of computer literacy by teachers and students or the saturation of classes with teaching equipment, is the main difficulty in computerizing education.

Three main forms are distinguished in which a computer can be used when performing training functions: as a simulator; as a tutor, performing certain functions for the teacher, and the machine can perform them better than a person; as a device simulating certain subject situations. Computer capabilities are also widely used in such a function, non-specific with respect to learning, as carrying out cumbersome calculations or in calculator mode.

The conclusion drawn by researchers in those countries where the experience of computerization has been accumulated, primarily in the developed countries of the West, is that real achievements in this field do not give reason to believe that the use of computers will fundamentally change the traditional learning system for the better. You can't just integrate a computer into the usual educational process and hope that it will bring about a revolution in education. It is necessary to change the very concept of the educational process, in which the computer fits in organically as a new, powerful learning tool.

The problem of computer training, as shown above, is not limited to the mass production of computers and their integration into the existing educational process. A change in the teaching tool, as well as a change in any link in the didactic system, inevitably leads to a restructuring of that entire system. The use of computer technology expands the capabilities of a person, however, it is only a tool, an instrument for solving problems, and its application should not turn into an end in itself, fashion or formal event (Plotnikova I.A. 2000).

The very possibility of computerization of the educational process arises when the functions performed by a person can be formalized and adequately reproduced using technical means. Therefore, before starting to design the educational process, the teacher must determine the relationship between the automated and non-automated parts. According to some literary sources, the automated mode in terms of the volume of educational material can reach 30% of the content. This data can help you choose the sequence of computerization of subjects. Naturally, first of all, it will affect those of them who use a strict logical-mathematical apparatus, the content of which can be formalized

(Burkovskaya M.A., 2002). Unformalized components need to be deployed in some other, non-algorithmic manner, which requires the teacher, teacher of appropriate pedagogical skills.

Computerization of training does not mean a simple addition of a new tool to an existing educational process. It is necessary to design a new educational process based on modern psycho-pedagogical theory. And this task is more complicated than preparing programs in existing academic subjects. The fate of computerization will ultimately depend on a pedagogically and psychologically sound restructuring of the entire educational process.

Assessment of performance associated with certification is only an insignificant part of pedagogical practice. In the future, the importance of the computer will increase in the procedure for assessing the knowledge and skills of students and the effective use of such information by the teacher. In all likelihood, this will primarily be associated with centralized initiatives that will determine the participation in the process of replenishing banks of test questions and tasks, that is, in the development and preparation of exam papers and diagnostic tools. Third, the most important type of computer use from the point of view of learning objectives will provide the opportunity to obtain individual information about the pace and level of assimilation of the materials studied by each individual student. Thanks to this processing of communication, teachers and students will be able to more consciously control the process of assimilation.

The individual work of students has a serious impact on the student's self-esteem, the possibilities of his advancement in the material being studied, the idea of the learner that the teacher develops, as well as the form and content of the educational work offered to students. Thanks to this, computer-assisted feedback on the learning situation is extremely useful for both each individual student and teacher. However, the performance of such a function does not exhaust the capabilities of computers. Computing systems in practice provide the teacher with access to test procedures, the purpose of which is to diagnose the dynamics of assimilation, and not retrospective control, which is carried out at the end of the topic or part of the work the recommendation that the machine is intended to give the user regarding what tasks he needs to consistently perform depends on the specific answers or answer options received by her. To provide such functions, a series of very complex programs are needed.

This is not to say that programs of the mentioned type do not exist. Most of the programs that can act as a means of controlling the assimilation processes are some structural constructs that are free of specific content. In order to use such software packages in a given situation, they need to be supplemented with details of a certain subject content. This means that under no circumstances can these programs be edited by one teacher and only for their own needs: they require joint efforts and substantial assistance from the outside.

At its most extreme, computer-assisted learning becomes computer-controlled learning. In the latter case, the figure of the teacher can be perceived as something redundant. In fact, the opposite is true: the teacher gets much more freedom for the educational process itself, without being distracted by organizational tasks.

The use of control and diagnostic software packages has a lot of indirect positive effects, completely unrelated to the assessment itself. The number of points received for the answer may indicate this series of tasks that need to be completed at the next stage - information is important not only for the one who works, but for those who have observed the work. The teacher is provided not only with a short list of details of future work, but also with information regarding what was done at the previous stage. This allows the teacher to relatively quickly select the appropriate materials and

take care of the tools for the next lesson. Thus, what is considered to be a means of assessment on the basis can significantly enrich the sources of increasing the process efficiency?

Currently, such systems are used in a certain range of situations and are based on the use of tasks, information with a specific educational content, the solution of which is achieved on the basis of trial and error. An automated bank of tasks (tasks, questions) belongs to the category of similar systems for the development of which various properties of computers are important.

An important aspect of the preparatory work that will be carried out by teachers and non-teachers, while compiling examination or control tests with given characteristics, is the ability to use the source material from the questions bank. In the past, such tests were almost entirely based on “multiple choice” questions and were traditional in nature. Now, for similar purposes, optionally textual information and equally optionally familiar forms can be used. Perhaps the main limitation will be the ability to print tasks that are in demand from the task bank. A test question and the correct answer are saved in the computer's memory. Information regarding the test task and the answers of all those who solved it provide the educator with preliminary knowledge regarding the nature of the requirements: what skills are tested with this task, the difficulty level and significance of the correct answers or distractions.

At the same time, the preparation of test material is nothing more than the beginning of the work, since the evaluation points themselves carry very significant information about the amount of assimilation and the need for correction. In addition, information about a particular test question in the task bank cannot be considered sufficiently complete until it receives the latest data on the results of decisions.

Significant advantages of using a computer for data analysis. Having direct access to the machine provides the student with quick feedback. In this case, the teacher and the student receive comprehensive diagnostic information without any additional burden on the teacher associated with the assessment, monitoring and analysis of the work performed. Finally, thanks to the computer, it is possible to obtain an accurate registration of the entire test execution process, which can either be attached to existing information about an individual student or the whole class, or, if desired, saved for further comparison and analysis.

In the simplest case, such information will take the form of an assessment, the amount of points for solving a specific task or series of tasks. You can make up a slightly more complex program that accepts user responses. In this case, the package, comparing the information received with that which comes from the teacher or is contained in the previous answers, provides the teacher and student with valuable information from the point of view of training. This information will indicate the strengths and weaknesses of the student, will help to choose the right direction for further work. If he worked with a general program, she will send it to the teacher for advice, more specific programs will offer to refer to the corresponding tasks or pages of the textbook.

In addition to the listed features, the computer allows you to purposefully group questions and tasks into one test battery and, accordingly, receive pre-structured information. So, one series of tasks or questions may relate to checking the level of formation of a particular skill or ability or mastering a part of the curriculum in some subject,

another one - identifying the amount of actual knowledge in a particular field. The machine will easily compile a list of identified causes leading to errors or lags in each specific subject area (Williams R., 1998).

Practice shows that a computer with good reason can be considered an integral part of the educational process. It can acquire considerable importance as a means of assessing the knowledge and skills of students, and in addition, as a measure of the effectiveness of chosen learning strategies. Today everyone understands that assessment is an integral part of the assimilation process, and not just something that characterizes or satisfies. That is why the potential for adequate use of a computer in the educational process for diagnostic purposes is very significant.

II. CONCLUSION

The conclusion drawn by researchers in those countries where the experience of computerization has been accumulated, primarily in the developed countries of the West, is that real achievements in this field do not give reason to believe that the use of computers will fundamentally change the traditional learning system for the better. You can't just integrate a computer into the usual educational process and hope that it will bring about a revolution in education. It is necessary to change the very concept of the educational process, into which the computer fits organically as a new, powerful means of training and monitoring the knowledge, skills of students.

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