Computer-based information system in education

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Abstract:

Computer-based information systems in education are structured systems that rely on computer hardware and software technology to collect, process, store and distribute didactical resources. Didactical resources include sets of documents for planning, programing and realization educational process. It, also, includes software based on principles of artificial intelligence to collect information, measure success and evaluate teacher's and student's work.   Information system is employed to support decision making and control in an organization. Information systems is also used to analyze problems, visualize complex subjects, and create new technologies. Input, processing, and output are the three activities in an information system that produce the information an organization needs. Electronical Web-based classroom is an evident example how much modern technical devices can help in intensifying, rationalization and generally speaking in better teaching conduction. It is specially important when teaching material is programmed; use of teaching aids and basic pupils activity is also programmed and synchronized with the relevant contents; in the teaching process successive solving of given tasks and feedback information are provided; maximum efficiency and attractiveness of frontal and other forms of work ase achieved; there is constant communication teacher-pupil-teacher; possibility of teaching indi vidualization is made as well as independent pupil's work and his advancement at his own speed. Educational software should be well prepared carefully, considering pupil's abilities, teacher's capabilities and school surrounding.

Key-Words Information system, artificial intelligence, educational *software, technology*

1. Introduction

One of the main tools of the Information Society is information technology. They can radically change the life of every human activity. Creating a strategy for development and use of information technology in all areas of life activity of man constitutes one of the key issues of strategic planning at both national and global level. The pace and directions of change are now determined not only by computer science, telecommunications capabilities and software tools,

but the people, their needs, problems, and readiness for change. In this connection it must be stressed the topicality of computerization of the educational sphere as a key resource of the society. The process involves the use of informatics education opportunities of modern information technology, computer science methods and tools for the realization of the idea of training development, intensification of all levels of teaching and educational process, increase its efficiency and quality, the preparation of the coming generations to live under conditions of informatization of society. Satisfying these requirements will result in a fundamentally new information culture, which implies the existence of skills appropriate use of a set of information technologies in their business activity.

In order to orient freely in information streams, contemporary profile of any expert should know how to receive, process and use information through computers, telecommunications and other means of information technology. In this way, the question of mastering modern information and telecommunication technologies and their use is becoming one of the basic components of professional training of each professional, including specialists in the field of education. All this requires the development and introduction of teaching at universities and institutes of education programs and professional-oriented programming and pedagogical resources and courses aimed at the adoption of the necessary knowledge and to acquire personal experience in their application in the professional, education and sports activities.

2. Composing parts of information system

Computer-based information systems in education are structured systems that rely on computer hardware and software technology to collect, process, store and distribute didactical resources. Didactical resources include sets of documents for planning, programing and realization educational process. It, also, includes software based on principles of artificial intelligence to collect information, measure success and evaluate teacher's and student's work. Information system is employed to support decision making and control in an organization. Information systems is also used to

analyze problems, visualize complex subjects, and create new technologies. Input, processing, and output are the three activities in an information system that produce the information an organization needs. An information system contains information about an organization and its surrounding environment. Three basic activities—input, processing, and output—produce the information organizations need. Feedback is output returned to appropriate people or activities in the organization to evaluate and refine the input. . [3] It is especially sensitive in education because of different opinions about the quality in educational process. That's why we need several experts to moderate software based on artificial intelligence to measure output and refine input.
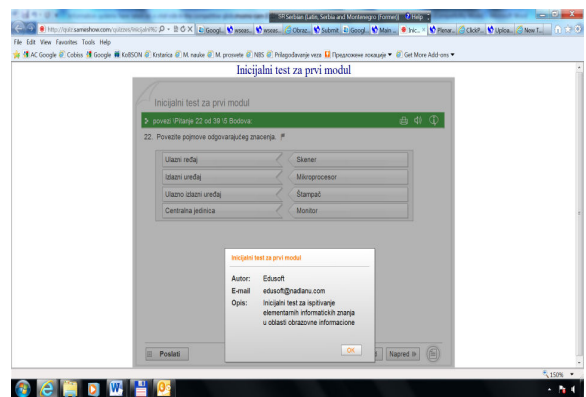

Fig 1. Feedback in on-line evaluation

From a business perspective, an information system is an important instrument for creating value for the organization because it can lead to better management decisions, more efficient business processes, and higher firm profitability.

Fig 2. Instruments for action research

Every business has an information value chain in which raw information is acquired and systematically transformed through various stages that add value to that information . Managers in schools and faculties should be well prepared to recognize priorities, competitively oriented teachers, leaders and barriers. In our software we prepared more than 300 documents for small action researches in order to identify next steps in changes. We made software with several types of instruments suitable for action and empirical research. There are a lot of Web based software for teachers in this area.

Fig. 3 Video clips for physical education

Action research is largely based on qualitative factors. Paradigm of action research is less scientific explanation, a more pedagogical and methodological understanding of the phenomenon that is the subject of research. That does not mean that action research does not strive for the quantitative facts. They tend to rely on quantitative and qualitative facts simultaneously. . [5] Action research differs from other types of methodological research and the fact that the researchers considered all the participants of activities which is the subject of research. All of them together (with the organizers, initiators, professional researchers, etc.). The research team. immediate action artists (researchers) even have a key role in the assessment exceeded the stages of research, the proposed new directions of research, as well as in the conclusion of all research and evaluation. In the teaching of certain subjects, including the teaching of physical education can be successfully prepared and implemented an action (activity) investigations, or,

as some of them due to the active involvement of teachers in all phases of research activity figuratively referred to as teacher research. The implementation of these trials, compared to the classical, is flexible (elastic), and the project research is more open and unfinished. Action research are also organized to provide, other than a professional researcher, and each teacher and colleague, to be actively engaged in the research process, from selection (identification) and the formulation of the problem (cases) research, project development, data collection and processing, to interpretation (the analysis and evaluation) the results of research and their application in the direct teaching work. At the same time, action (activity) and promote the research include, if it has reasons to change the course of the research process itself research.

Fig. 4 Video clips for teaching geograpgy

Thus, for example, professional researchers and educators (teachers directly organized and carried out educational work and do some research tasks: construct informal measuring instruments, applied them in the research, collect data from their students, etc..)
Teachers can use plans, didactical materials, pictures, movies for all classes according rhe program. These materials are located in WEB portal and could be saved on DVD, USB disk etc.

3. Electronic classroom in technology rich surrounding

We shall point out to essential parts of electronic classroom and their pedagogical function as much

as it is studied so far with us and worldwide, because in this work we are primarily interested in what modern educational technology means in the organization and conducting of teaching.Teacher's desk has all necessary electronic devices which make possible managing of teaching process, turning on programmes, teaching aids, measuring time in which some parts of the programme are realized, giving tasks to pupils, measuring time they use for solving the tasks, scoring replies, individual contacts with pupils, following and evaluation of pupils work, recording programme and pupils reactions, turning off programme and automatic carrying out and. following of the complete work. Teacher can, for instance, looking at platens, which are designating pupils seats at command desk, always know how many pupils have given correct replies to a certain question, how many of them understand definite information, he can see who knows and who does not know it. He can communicate with a pupil, not disturbing others, give him feedback information, i.e. encouragements via screen and via lighting plate at pupils seats. [4]

Fig. 5. Multifunctional classroom

We have already indicated that electronic classroom makes possible automatic functioning of the complete system, from giving information to evaluating of what pupil has achieved during his work. Now we are going to show, briefly, functioning of electronic classrooms of the kind that are usually used in today's teaching, starting from turning on the command device. „When it is turned on, it sends „orders" to audio visual aids for their work. Audio visual aids send information to display

and loudspeaker. Pupils percept information from display and loudspeaker. They receive information and give information about their knowledge and understanding through responder. Their replies come to command device for further processing. In this way one circle of communications is realized. Then process of encouragement is continued realizing again two way communication. Command device sends feedback information to display, loudspeaker: or plastic panel of the seat. [1] Pupils, receive feedback information, are being motivated for further work and give their replies to the command device. In that way constants communication between „teacher" and pupils is carried out with constant encouragement of their learning. Electronical classroom is an evident example how much modern technical devices can help in intensifying, rationalization and generally speaking in better teaching conduction. It is specially important here that teaching material is programmed; use of teaching aids and basic pupils activity is also programmed and synchronized with the relevant contents; in the teaching process successive solving of given tasks and feedback information ave provided; maximum efficiency and attractiveness of frontal and other forms of work ase achieved; there is constant communication teacher-pupil-teacher; possibility of teaching indi visualization is made as well as independent pupil's work and his advancement at his own speed; evident intensity of pupils activity in teaching is realized, conditions for his bigger contribution to teaching and his development; faster and more qualitative informing of pupils in various fields of teaching curriculum are provided, and therewith acquiring of knoweldge is fastened; more possibility is given to teacher to study teaching material, pupils, modern achievements in pedagogy and to introduce innovations in organization and conducting of educational work faster and more successfully. [3] Electronic classroom offers possibilities for carrying out traditional, semiprogrammed and programmed teaching, for testing and making conditions for research work. By use of electronic classroom better conditions for maximal visuality in teaching are made, rational usage of resources, time, staff, permanent testing and verification of pupils knowledge, naturally, electronic classroom for programmed learning contributes more to solving the above mentioned

problems in case its advantages have been used to a maximum, if it is strongly connected with other aspects of organization and carrying out teaching and if its programme work is adjusted to needs and interests of young people to a maximum. [4]

New information technology training include: program-methodical providing students didactic material of new type, the existence of modern technical equipment (computerized unit, training system based on computer technology, multimedia projects, Internet connections, etc..), The distribution of cognitive functions of management activities between teachers, students and computers. All this requires new approaches to professional and pedagogical training of students. First during training educational activities, students must be aware of the benefits of modern information technology. That is why they need: Bank of didactic content and qualified teachers who can create such content, and apply them in the learning process. Second, in the professional and educational preparation necessary to ask such a task whose solution in which students can gain an idea of the main directions of ICT in teaching and training process, to create programming and pedagogical resources and use them for mastering the knowledge and skills from the cycle of general professional disciplines. They deserve the attention of the structure and features of testing and multimedia teaching programs. Check your knowledge and skills is an important part of the teaching process: specifically to its results can be estimated effectiveness of training. [5]

In addition, the electronic edition feature new didactic functions, such as functions of individualization, interactivity and adaptability. Multimedia learning systems must not only preserve the advantages of traditional textbooks, but also more fully realize the possibilities of modern information technology.

Such features are:

- A visual representation of objects and processes that are not accessible by direct observation (eg, the display performance of the sports movement in different positions);
- Simultaneously display multiple athletes when performing movements of the same techniques to

analyze performance and errors made by a variety of athletes;
- Show processes carried out in a very short (view pictures one after another) or longer (the choice of internal image) time period;
- Computer modeling of sports competitions, the various movements and teaching and training process;
- Audio commentary textbook authors, leading experts, coaches, judges and athletes;
- Organizing the contextual help links (hypertext);
- Quickly perform complex statistical, biochemical and other calculations with the presentation of results in numerical and graphical form;
- Operational test and self-checking of knowledge and skills in performing the exercises and tests by the student;
- Automatic collection of statistics on the work of the electronic textbook;
- The possibility of actualization - operational (as opposed to traditional textbooks) to change the contents of electronic textbooks

Multimedia systems are interactive, allowing individualization of the training process and automatic recording of results, providing the possibility of significant increase in the quality of learning and skills.[6] Practice has shown that application of such a program in conjunction with the existing teaching technologies increases the level of knowledge and skills, as well as activity level and motivation due to personal oriented nature of student learning. Multimedia systems designed for electronic textbooks and teaching in the field of physical culture and sports in recent years appear and apply the teaching and training process of various higher education institutions

4. Conclusion

Automation of information and methodological support of educational process organization and management of educational institution and sports organizations is a major problem. Automated bank and database of scientific and educational information works based on local and telecommunications networks, today became one of the most important indicators of contemporary educational institutions and sports organizations. Therefore, development of mechanisms for managing the system of vocational education and

sports and recreational work based on the use of automated data blocks of scientific and educational information, information and methodological content, as well as telecommunication networks, involves creating an information management environment education and teaching and training process of teaching institutions and sports organizations. Mass production and use of computers, development of telecommunications, robotics and microelectronics, caused less interest for production, programming and use of electronic classrooms and that is considered as understandable By automating the process of information and methodological support of educational process organization and management of educational institution and sports organizations (institutions system) means maintaining a certain level of comfort activities of employees in education, physical education and sport based on the application of ICT in education and training process, and in the process of conducting business, performing professional duties of teachers, coaches and administration

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