PEDAGOGICAL PROJECT OF ELECTRONIC EDUCATIONAL-METHODICAL COMPLEX AND ITS APPLICATION IN EDUCATIONAL PROCESS

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Abstract. Development of education as an important sphere of human activity, ensuring the formation of intellectual potential of society, is one of the priority tasks of the state policy of the Republic of Uzbekistan. Qualitatively new step in the modernization of the educational system is introduction in educational process of information and communication technologies (ICT) covering all aspects of activity of educational institution. In this connection the problem of creating multimedia resources and their introduction into the system of continuing education is relevant and socially important task and development of electronic educational-methodical complexes will help to improve the quality of education and level of training specialists for all sectors of the socio-economic structure of our state. This article provides an analysis and systematization the experience of development and implementation of electronic educational-methodical complex in the process of school education, practical steps, aimed at improving the efficiency of potential developers when creating multimedia resources, describes software products for general secondary schools, developed in the framework of research projects.

Keywords: electronic resource (ER), electronic educational-methodical complex (EEMC), information technology (IT), interactive equipment (IE), multimedia teaching materials (MTM), training process

Introduction.
Being a specular reflection of processes happening in society, the school can't exist without use of IT today. Modern school pupils have absolutely other, than in former years, psycho-type. The generation which grew on mobile phones and computers demands continuous visual stimulation, fast dynamic educational process.

IE – the latest tutorial uniting in itself all advantages of modern computer technologies. IE not only corresponds to a way of perception of information of generation of modern school pupils, but also allows the teacher to create a success situation for any pupil, irrespective of his knowledge and abilities.

Using IE gives new possibilities to the educational process:
Interactivity – interaction between the teacher, learner and digital learning resources. Every action or reaction of the participants reflected on the screen, is available for consideration, awareness and discussion all participants in the educational process.

Multimedia representation of objects and processes of traditional text description in combination with other media: photos, video, graphics, animations, sound... Multimedia projector (interactive whiteboard, or other similar console) displays the multimedia to a qualitatively new level, including in the process of perception is not one person (as in the case of the learner's work with a personal computer), and the whole team of students that is more convenient and appropriate for the subsequent process of discussion and collaboration.

Communicativeness – possibility of direct communication of participants of educational process, efficiency of dialogue of each participant, control over a condition of process.

Classes using IE gives the teacher a number of advantages:
– Enhanced training effect. You can control any computer presentation, use sound, images, schemes, diagrams, to run animations, videos, which favors a better perception of information by students.
– Significantly increase opportunities for construction and project lesson, because all of these resources the teacher has the opportunity to have attached to IE.
– On average 30 percent increase in the density lesson, mainly due to more rational organization of work of the teacher. Pre-prepared information with a good project can appear at the right time in a convenient mode. The time saved can be used for repetition and consolidation of material.

– New features of management of educational process. The teacher can monitor the learning situation and adjust it. The permanent visual contact with the class can positively influence the rhythm of work.

– The possibility of application of group learning methods (work in small groups, General discussion, combined work). For example, using an electronic pen, you can quickly and clearly show the information or acceptance of the work to the whole class and make notes during the presentation, highlight, delete, add fragments.

– The ability to assess learners' knowledge in all academic class allows you to organize competent feedback “student – teacher”.

– The lesson esthetics changes. The IE tools work for appeal of a lesson.

In preparation is not necessary to use an interactive white board, you need to have on your computer the same software, so you can choose and simulate the necessary materials to the lesson on any computer.

– The ability of the teacher to create quick and simple amendments to existing methodological material directly into the lesson, during the explanation of the material, adapting it to the specific audience, the specific objectives of the lesson.

– Convenient storage and cataloging of materials (all materials, including attachments, are saved in a single file). You can apply your previously created presentation without any change or rework them, using IE.

– The ability to replicate the lesson. All conducted during the class information can be saved for later viewing and analysis. The teacher could replicate and spread all of the lesson materials (attachments), the structure of the lesson or script of the lesson, a video lesson.

– The possibility of including materials in e-learning children, including children with disabilities. Obviously, with the full integration of IE in education, the creation of a single database methodology and demonstration materials for teaching, teachers have more free time.

The use of interactive white boards gives learners several advantages:

– Increases learners' interest in learning. Modern children are the children of screen information. The information is perceived better.

– Increases training effect (the use of sound, static visualization, animation, video, etc. is conducive to the rapid perception of information by learners).

– Activates independent, creative, search activities of learners. Through a variety of visualization and interactivity, the whole class is involved in active work, acute perception, and increased concentration.

– An opportunity for students to participate in group discussions, making discussion more interesting.

– Ability to conduct itself/inter-help knowledge allows learners to consolidate the knowledge immediately after carrying out Supervisory activities.

– May change the aesthetic aspect of the lesson. Tools Board work on the attractiveness of the lesson. For example, work with an electronic pen does not require working with chalk and duster, which eliminates at least the dust and dirt.

– Able to view the video of the lesson (as needed all the information that appeared on the Board during the lesson can be saved).

– Learners have the opportunity not only to learn the lesson on an individual basis, but also to report on assignments that affect the quality of education. Working with IE requires no special skills or knowledge of the programmer, so you can make notes or draw on the Board the necessary information can even primary school pupil.

– The ability to perform teamwork, to solve the overall task set by the teacher.

– The study materials in distance mode learners, who for one reason or another missed the class in school, including children with disabilities.

In addition, our constantly growing base of interactive e-learning lessons contains theoretical questions, test tasks, questions for control of knowledge that are available for learners, if they wanted to repeat/reinforce the skills or expressed a desire to perform additional tasks.

Along with the benefits of using interactive white boards revealed a number of negative things:

– The cost of the equipment (white board, projector and computer) is large enough.

– High time costs in searching for and preparing materials.
– Insufficient number of illustrations in certain subjects.
– In the device boards are not always considered wireless technologies.
– The image being transmitted to the surface of the interactive white board, can be closed by a person standing near the Board.
– When using portable boards at each transfer to a new place Board you must calibrate (set up).
– Using the advanced features of interactive white boards may result in displaying incorrect information.
– When allowed remote access to the interactive white board some users may project unwanted information (message or image).
– A limited number of pupils which can work simultaneously on the Board.

We offered ways of overcoming of the negative moments in using an interactive board.

– Ways of overcoming of the negative factor consisting in high cost of the equipment (a board, a projector, the computer), lie in the field of a choice of an interactive board. According to "The state national program of developing general secondary school for 2004-2009", schools of Uzbekistan already have computers and projectors in the arsenal. Besides, schools started being provided with this equipment centrally at the state level.

– The second negative factor – much time expenditure by search and preparation of materials; insufficient amount of illustrative material in certain subjects; display on the screen of incorrect information; transfer on the screen of undesirable information at remote access to an interactive board – is explained by the low level of computer literacy at teachers. We suggest passing training on special training of the teacher to work with an interactive board or independent acquaintance of the teacher with the methodical instructions which are built in the software of an interactive board for the user.

– The third negative factor – the shadow closing the image on a surface of an interactive board – is overcome by installation of a projector on a ceiling or over a board.

– The fourth negative factor – absence of wireless technologies; need for continuous calibration of an interactive board; the limited number of learners who can work at the same time at a board, – is overcome due to promptly developing technologies (new models of boards have no the listed shortcomings any more).

Traditional technical training is divided into audio (tape, radio), screen (overhead projector, overhead projector, transparency projector) and screen–sound (projector, TV, VCR). IE combines the functionality of all these technical devices. But IWB is more: it combines the functions of a computer with a video projector, and tactile-interactive user functions (teachers, learners).

Method

EEMC include the modern electronic equipment for training and a database in electronic form (documentation, educational and methodical resources, software products including created by teachers independently and electronic versions of printing resources).

Research work on development of EEMC was carried out step by step to the period from 2000 to 2013.

At the first phase (2000-2003) psychological researches on determination of the prevailing style of perception of information by learners and studying of literature on a research problem that allowed to create theoretical bases of research work were carried out, there were definite purposes and research problems, the hypothesis is formulated, the condition of development and deployment in teaching and educational process of ET in the conditions of modern general secondary education was analyzed, the experiment technique was developed.

In the second phase (2003–2004) on the basis of experimental schools №254, №289, №290, №292 and №293 of Tashkent city, №1, №5 and №18 of Dzhizak region was held pedagogical experiment, which consists in the confirmation identified in the theoretical study of pedagogical conditions of creation of the ET (for example, mathematics for VI class) and test the technology with the implementation of ET in the educational process.

In the third phase (2004–2006) in 2005–2006 academic year by decree of the Ministry of Public Education of Republic of Uzbekistan has carried out experimental work on approbation ET for schools (on computer science and computer engineering to 8th, 9th grade, math for 5 class, Russian language and literature for classes with state language of instruction for class 9, the basics of economic studies for 8th and 9th classes, physics for classes 6-9, geography for classes 5 and 6 on hard media (CD-RW and hard drive))

At the fourth phase (2007-2008) the analysis of the advanced foreign technologies on development of electronic resources of educational appointment, studying of sociological, psychological and pedagogical
literature on a research subject, specification of basic objects of research was made. In 2008 at republican competition on the best textbook and educational literature of year the software product "Matematika, 6-sinf. Electron darslig" (Certificate No. DGU 01053) was awarded the diploma of the III degree.

At the fifth phase (2009-2014):

2009 – the School Concept of the friendly attitude towards the child is developed (the project of Children's fund at the UN "Unicef");

2009-2010 – researches on "Project of monitoring system and quality management of education" project UzSRIPS;

2009-2011 – created "Electronic system of monitoring the progress on discipline" (patent № DGU 02371), an electronic interactive board "SensBox" and the experimental software for it, are developed multimedia educational book (MEB) Fizika. 6 class (Certificate №. DGU 02200) and "English-8" (the Certificate №. DGU 02199), and also a multimedia lesson of the subject "Sound Phenomena" on the basis of standard programs of training; the developed scientific and technical product including an interactive board of "SensBox" and MEB was shown at the international exhibitions in Tashkent in 2009, 2010 and 2011 (in 2011 it is noted by the diploma for the best innovative project and the certificate for the best innovative idea); the analysis of results of approbation is carried out and requirements to statement of the equipment in pilot production for equipment of pilot educational institutions are developed;

2012-2013 – the program cover for development educational and methodical resources" is created "(Patent №. DGU 02704); the program of the course "Using an Interactive Board at general secondary school" for training of teachers-trainers is developed; by decree of №. 138 of Ministry of Public Education of Republic of Uzbekistan of April 26, 2012 in the Center of developing of multimedia general education programs the first courses for implementing of training in methods of interactive pedagogics for of system of public education institutions teachers-trainers are conducted; the electronic manual of "Physics" corresponding to the updated training program for VI class and nature study. MEB for 4 class (patents №. DGU 02905 and №. DGU 02906) is developed, experiment and systematization of the received material is made;

2013-2014 – continued an experiment using EEMC, supplemented by software products developed geography (patent № DGU 02907), geometry (patent № DGU 02908), physics (patents № DGU 02909 and No. 02910 DGU), literature (patent № DGU 02911).

In addition, in order to share experiences and promote innovative technologies in the system of education in the capital schools held seminars and trainings among teachers. To them, we introduced learners to the technical characteristics of new equipment. Listeners had the opportunity in practice to evaluate the performance of multimedia equipment of different manufacturers. Teachers appreciated the didactic potential of electronic interactive whiteboard "SensBox".

The basic theoretical principles of the study and the results of the experiment were reported and discussed at the meetings and methodological seminars in Uzbek research institute of pedagogical sciences named Kari Niyazi, at scientific conferences and in publications in the Republics of Uzbekistan, Kazakhstan, Turkmenistan, Ukraine, Belarus, the Republic of Korea, Russian Federation, Mongolia, China, Bulgaria, France, Spain, UK, USA and other countries.

The introduction of EEMC teaching practice in school education has the following sequence:

Development and improvement of software products on educational disciplines of school education.

1. Development, approbation and the statement, in accordance with the established procedure, techniques of training in work with IE and programs of development MEB: a) teachers-trainers; b) subject teachers.

2. Transfer of software products on educational disciplines of the general secondary education in the Center of development of multimedia general education programs at Ministry of Public Education of Republic of Uzbekistan for further introduction in system of school education.

3. Development and the statement in Ministry of Public Education of Republic of Uzbekistan of the standard of training and procedure of award to teachers-trainers of the diploma of the specialist in training of teachers in work with IE.

4. Development and the statement in the Ministry of public education of the Republic of Uzbekistan of the standard of training and procedure of award to teachers of the certificate on the right of work with IE.

5. Equipment of institutes of professional development of workers of public education with IE according to amount of educational disciplines.
6. Ensuring training of the diploma educational disciplines teachers-trainers for regional institutes of professional development and pedagogical higher education institutions.

7. Equipment the institutes of professional development and pedagogical higher education institutions with IE.

8. Ensuring training of teachers in work with IE with issue of the corresponding certificate.

9. Equipment the schools in which collectives there are certified teachers, IE.

10. Ensuring continuous service of IE on places.

Strengthening the material–technical base and equipment of schools with modern educational equipment requires new approaches to the development of the educational process.

As the primary changes in the activities of teachers in the conditions of information society are as follows:
– complexity activities for the development of training resources;
– need of special skills and methods of development of educational resources;
– strengthening of requirements to quality of training materials;
– increase of a role of the teacher in the process of self-education;
– strengthening of function of support of learners, possibility of feedback of the teacher with learners.

In connection with the foregoing, we believe that tactically more useful to give the teacher such multimedia tools, with which he could be himself without a lot of time creating author training resources.

We have developed versatile software for developing educational resources (Certificate № DGU 02704) to create the instructional framework each teacher who is familiar with computers at the level of the average user.

The program consists of two parts:
1. Some teachers (creation of ER in different subjects and test jobs on these subjects with the ability to assess learners' knowledge);

2. Function learner (learning and self-education for teacher-created lessons and knowledge check). To change the language in the "Language" menu you can select: state, Russian or English. The program works in two modes – local and network.

Using this cover program can be created a self-developing database ER model that enables the user (teacher, lecturer) independently develop (forming) the authorized learning lessons, constantly improving in an interactive process of user interaction with the learners. The use of software will contribute to the productivity and quality of work for future author’s multimedia teaching resources and the technology of use of a program shell will provide targeted self-training teachers to create their own ER.

Special software designed to automate the monitoring of academic performance on academic discipline, documenting the quality of mastering of knowledge by learners, statistical analysis and reporting on the results of mastering of educational material in educational institutions on the basis of the local network. The program provided a convenient interface. Detailed information on a single learner and the whole group of users is stored in a separate block and is accessible with the account access category. You may add courses, edit the list of users, self-control training. Given application for search of information, monitoring activity and feedback from the teacher.

Discussion

In recent decades there has been a significant increase in the volume and complexity of educational materials in general education subjects taught in schools. In schools there is a shortage of teaching staff. These factors have a negative impact on the quality of training learners, in this connection the great attention is given to progressive methods of learning using EEMC, more adapted to the goals and conditions of learning.

Use of MEB gives the chance visually to represent the studied or investigated objects: in geometry, drawing, physics, chemistry, biology – practically in any school discipline; at the organization of leisure, the developing games; at development of evident and figurative, evident and effective, intuitive, creative types of thinking.

MEB, of course, cannot and should not replace teachers in the classroom. But using the MEB can actually make the job of the teacher, freeing him from the functions that the teacher almost cannot fulfill, namely, throughout the course of the subject, at each stage, immediately after learning the material to control
the outcome. The teacher will have more opportunities to perform tasks that only a human teacher and in which no media can't replace.

MEB – a universal learning tool (in addition to the printed textbook) which can be used with success at lessons and out of occupations. Thus he fits into a framework of traditional training with broad application of all tutorials. MEB can promote active inclusion of the pupil in educational process, maintain interest, and promote understanding and storing of a training material.

As a result of the comparative analysis of opportunities of a number of MEB and traditional printing textbooks the general and distinctive characteristics were revealed.

Results of the analysis show evidence of advantage of MEB:
- providing feedback in the process of training (the organization of contextual helps, links);
- increase of presentation of educational process (the computer models representing objects and processes in dynamics);
- greater mobility (MEB can be sent freely on a network or to transfer on any digital carrier);
- compactness;
- search of necessary information from any part of MEB by means of hyper / media–note (it is possible to find any word in the text or its fragment by the word, the phrase, the name, the author that is difficult during the work with the usual book);
- providing an individualization of educational process (speed, sequence, possibility of control of fonts and flowers under the tastes and requirements etc.);
- expeditious self–checking of knowledge of the user in performing by it of exercises and tests;
- modeling of the studied processes or the phenomena;
- copying and printing texts and illustrations;
- other opportunities.

In the traditional model of schooling interpreter of knowledge is the teacher. When training on the basis of EEMC role as a leading participant of the educational process is transferred to the learner and important function of the teacher becomes tutor support.

Ideally EEMC includes computer equipment, IE, and program and methodical complex on subject disciplines at all grade levels. Tested us EEMC consists of a computer, "SensBox" with special software adapted to the needs of school education, and MEB on school subjects. EEMC at school can develop due to the recharging of electronic design creatively working teachers. MEB included in the program and methodical complex, consistent with approved curriculum and state educational standards. Possibilities of EEMC are huge, and its use on occupations allows: to make a material statement evident and available; to make active cognitive interest of pupils on occupation; to provide the differentiated and individual approach to training; to increase a share of independent work of pupils in educational process; to realize the didactic principle of the theory and practice in training; to provide learning efficiency due to increase of density of educational occupation and due to simultaneous attraction at once of several channels of submission of information; to create effective system of monitoring of knowledge of learners, etc. MEB in a complex with IE have advantages in comparison with habitual text representation of knowledge as, using alternative channels of submission of information; do a way to knowledge richer and more natural.

At schools of Uzbekistan approbation of MEB developed in UzSEIPS is carried out. In research experimental work captured learners of the corresponding classes, teachers–subject teachers, programmers, psychologists. In control classes were given in the traditional textbook without use of EEMC, in experimental classes – with use of EEMC on MEB developed by us for general secondary schools.

Results of the conducted survey on readiness of experimental classes teachers to carrying out occupations with use of EEMC at a diagnostic stage showed that teachers have no personal experience with IE, and some teachers use in the work of e–book, MEB, Internet resources and other types of digital tutorials.

Revealed a low level of preparedness of the teachers of experimental classes to conduct studies using the EEMC was overcome by conducting training with the teachers-experimenters and a series of training seminars. Were attracted teachers of computer science to enhance consulting activities with the teachers for work with multimedia equipment. At the seminars the teachers were introduced to the structure of the MEB content and the method of application of EEMC.

During the experiment the following tasks were solved:
1. To check we have identified in the theoretical study of pedagogical conditions of creation MEB.
2. Check out the technology implementation opportunities EEMC in the educational process: a) to check experimentally identified forms of organization learning through the use of EEMC, b) to verify experimentally the combination of methods and techniques of work of teachers and learners in the learning process with the use of EEMC, c) to check the assimilation by learners of the program of the selected subject discipline in the learning process, d) to identify the role of the teacher in organizing learning using EEMC.

During testing, we have confirmed experimentally pedagogical conditions identified in the theoretical study. Also during the experiment was studied the role of the teacher in organizing learning using EEMC. The General result of the experiment was the recognition EEMC teachers and learners as a powerful and essential means of learning in modern school.

After the instruction and training of teachers and experimental classes in order to explore teachers' preparedness to teach the classes in a MEB, we again conducted a survey on the previously developed issues with the inclusion of several additional questions to determine their level of preparedness to conduct studies using the EEMC. Comparative analysis of the results obtained in the diagnostic phase, and after training workshops and experimental practice has shown that the introduction of EEMC in the educational process is necessary, the level of knowledge on the use of IE, as well as the basics of creating a MEB significantly increased, which will help teachers in their future teaching. Teachers of experimental classes were formed a creative approach to the development of multimedia lessons, teachers made specific suggestions for improvement of experimental MEB.

Results of the diagnosing experiment show that the level of readiness of teachers to carrying out occupations with use of MEB is insufficiently high, in this regard carrying out the trainings at the level of institutes of professional development of pedagogical personnel is necessary.

Use of EEMC in educational process promotes the best assimilation of information due to increase of interest and a positive emotional background, and also involvement of all bodies of perception of information, considerably reducing training time.

In the process of the stating experiment the role of the teacher during the work with EEMC consisting in its the leading, coordinating and advising functions is defined.

Teachers appreciated the convenience of the interface, the ability to create solid copies of the MEB and copies on external storage media. In this technique, the main information is shipped on the CD–ROM that provides low cost, educational information system provides relevant update training information on the network.

Introduction of EEMC in educational process changes a traditional view of education, does possible improvement of strategy of selection of the contents, the methods and organizational forms of education corresponding to problems of development of the identity of the learner in the conditions of informatization of society, focused on development of intellectual potential of the personality on formation of abilities independently to acquire knowledge, to carry out information and educational, experimental and research and other types of independent activity.

We came to a conclusion that at creation it is necessary to realize the following indicators of quality determined by us on the basis of requirements to MEB in EEMC:

– the general indicators of quality characterizing the level of maturity of EEMC: flexibility, correctness, reliability, convenience of application, efficiency;

– functional indicators of quality.

1) the pedagogical: didactic (scientific character, a practicality, availability, adaptability, existence of independent and active nature of training, durability of assimilation of results of training, interactivity), methodical (the accounting of an originality and features of a subject, the accounting of specifics of the corresponding science, realization of modern methods of information processing), ergonomic (the accounting of age and specific features of pupils, ensuring increase of level of motivation of training, the temporary modes of studies, the organization of dialogue, color characteristics, alphanumeric symbolic and signs, spatial placement of information on the screen);

2) esthetic (compliance of esthetic registration to a functional purpose of ER; compliance of color to purpose of ER and to ergonomic requirements, orderliness and expressiveness of the graphic and graphic ER elements);

– indicators of quality of the maintenance of ER (compliance of ER to the state educational standards and the training program, compliance of the subjects MEB to a number of hours in the curriculum, ensuring inter-
subject communication, compliance to age and degree of knowledge of pupils, communication of the material
ER with practice, the phenomena and events of world around, sufficiency of exercises, tasks and practical
exercises for assimilation of subjects, training of learners in independent work, clarity of a statement of the
contents, availability of additional materials to the main contents);
– the indicators characterizing the interface (system of the menu, window type of the interface, context-
dependent system of the help, support of the "mouse" manipulator or "stylus").

The practitioner of use of EEMC in educational institutions more than 5 academic years allow to draw the
following conclusions.

The main criteria of efficiency of application of EEMC – the modern equipment and software products –
are:
– simplicity of installation and setup;
– laconicism of the interface, simplicity of navigation, absence of excess managing directors of elements;
– obligatory existence of an interactive operating mode, that is instant reaction to any actions of the user;
– existence of system of the help and search;
– rather small volume of text material;
– use of multimedia;
– organization of control of knowledge;
– choice of level of complexity of material;
– possibility of modification by the tutor of the theoretical block and block of control;
– lack of restrictions on number of users.

ER effective if there are: interactivity; almost instant feedback; the ability to quickly find required
information; demonstration examples and models; control of knowledge.

The MEB is an effective means of using ER for training purposes, allowing attendees to choose the ways
and means of studying material in accordance with the existing level of knowledge, generated by and inherent
psychological features.

MEB needs:
– to comply with the curriculum and common requirement of educational-methodical editions;
– have a capacity in excess to the contents of the existing textbooks on circuit-based and sufficient to
achieve the educational-methodical purposes;
– to contain visual features that contribute to the achievement of educational-methodical purposes, i.e., to
the maximum extent possible to use the multimedia features of the computer;
– developed based on the perception of material from the screen and the network boot (metered modules,
the structuring of material for obligatory and optionality with its corresponding visual highlighting,
hyperlinks, etc.);
– contain links to different sections of the textbook and, if necessary, and external web sources and
resources;
– contain regulatory elements and testing with the possibility of self-knowledge and self-assessment by
the learner the degree of mastering of a material;
– provide feedback and training students for further improvement of the textbook;
– to have a simple interface, accessible to users of any level of computer literacy.

Results of experiment showed that nature of formation of key competences of learners considerably
changed in experimental classes in relation to control as a result of their training with use of EEMC.

Specially developed tests and animation exercise machines practical works, optimum combination of
various ways of giving of a training material and complex use verbal and nonverbal (graphics, color, the
sound alarm system) means of multimedia, nonlinearity of information structures, the organization of
independent educational activity promoted increase of motivation of training due to increase of level of
emotional perception of information and had positive impact on completeness, durability and sensibleness
of knowledge at learners on subjects.

Having defined results of experimental work in experimental and control classes and having compared
them, we can draw a conclusion that in experimental classes the level of assimilation of knowledge and
abilities on subject disciplines at pupils, thanks to training with use of EEMC, is much higher, than in control
classes where training took place traditionally.

Statistical calculations allow to draw the following conclusions:
– results of the made experiment are positive;
– EEMC developed by us allows acquiring material better, than only the traditional textbook;
– training of subject disciplines on the basis of MEB can be recommended as good addition to printing textbooks.

The comparative and comparative analysis of results of the stating and forming stages proves efficiency of the offered EEMC.

Summary

The value of modern IT is that they give learners access to nontraditional sources of information, enhance the efficiency of independent work, creating entirely new possibilities for creativity, regaining and consolidation of intellectual skills, allows to implement a fundamentally new forms and methods of training with application of means of conceptual and mathematical modeling of phenomena and processes. Simulation training promotes visual representation of the studied object and to increase interest in this form of teaching and learning processes in the dynamics of deeper learning.

The main strategic goals and objectives of implementing IT and multimedia resources can be formed as follows:
– the creation of open self-developing EEMC, which include software products, appliances and equipment (IT, computer complex, multimedia resources) and special pedagogical methods of teaching;
– the formation of subject teachers with necessary competencies to acquire basic knowledge of IT functions (interactive projector, interactive whiteboard or interactive console) and methods of its use in the educational process;
– project and manufacture of special equipment, mining tools for learning management of educational process, interactive methods of training, creation of databases and software providing wide development and implementation of information and network technologies in teaching practices in general secondary schools, academic lyceums, and teacher training colleges:
– creation of necessary programs and training materials for refresher courses of the pedagogical personnel with the involvement of a wide range of specialists, teachers-experimentalists;
– development of special software, transforming the methods of teaching general and special disciplines in language for the general secondary and secondary special professional education.

The introduction of EEMC in the educational process will contribute to improving the quality of teaching and educational work corresponding to the requirements of modern progressive methods, techniques and technologies of training with the view everyone equal access to high quality education, providing the education-minded, able to practically apply the knowledge gained, the graduates of educational institutions.

References


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