

To the question of the use of electronic educational resources for preparation of future physics teachers

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Abstract: Currently the special attention in the course of training is paid to electronic educational resources. Logically coordinated materials of studied disciplines sated with information usually contain in electronic educational resources. Therefore in this direction it is necessary to use reasonably a wide arsenal of opportunities of computer technologies. Electronic educational resources are capable to add "experimental" part of a physic course and to increase efficiency of the lessons considerably. Improvement of professional training of the future specialists - physicists on the basis of electronic educational resources is done by supply of educational process with training materials. The aim of this research is to analyze the scientific-practical bases of improvement of professional training of future specialists - physicists at the University, to identify the extent of its theoretical and practical elaboration on the basis of experimental verification and analysis of the comparison of the experimental and control groups of students from «Physics» Department, Natural Sciences Faculty of Ahmet Yasawi International Kazakh-Turkish university, according to 5B011000 - Physics and 5B060400-Physics; to prove requirement and necessity, to improve the professional training of the future specialists - physicists, to develop the electronic educational resources, to improve the training of future physicists.

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1. Introduction

In the conditions of informatization of education the requirements to professional training of future specialists – physicists are increasing, functions of the teacher who has to master computer literacy became complicated. Work skills with the computer equipment makes a basis of the teacher computer literacy which is the ability to work purposefully with information and to use it for receiving, processing and transferring computer information technology and modern technical means and methods.

Currently the special attention in the course of training is paid to electronic educational resources. Logically coordinated materials of studied disciplines sated with information usually contain in electronic educational resources. Therefore in this direction it is necessary to use reasonably a wide arsenal of opportunities of computer technologies [1].

The Electronic Educational Resources (EER) is training materials and used for their reproduction electronic devices. It is possible to distinguish the following electronic educational resources: a) textographics (the material of the textbook is represented on the computer screen, instead of on a paper; if it is possible there is no need to print it); b) hypertext (textographics with navigation in the text); c) these are the resources entirely consisting of a

visual or sound fragment; d) multimedia electronic resources (in our opinion they are one of the most perspective in the course of formation of resources, electronic textbooks and virtual laboratory complexes) [2].

Electronic educational resources are capable to add "experimental" part of a course of physics and to increase efficiency of lessons considerably [3,4].

The problem of improvement of professional training of the future specialists – physicists, updating of the contents and technology of training is a constant object of active research and theoretical understanding.

When improving professional training of the future specialists – physicists the use of information technologies takes an important role on the one hand, and on the other- effective technology and its applications in the course of training [5].

And it defined the solution of contradictions between the creation, use and theory of electronic educational resources, the solution of requirement of innovative technologies and their practical problem in the course of professional training of students, especially training of the future specialists – physicists to electronic educational resources and formation of their skills in practice.

Nowadays formation of preparation of future teachers is an actual problem and considered by many scientists.

Preparation is an initial condition of any carried-out action. Researchers also proved and pay attention that the beginning of any new business can't instantly reach good results [6].

By V.A.Slastenin the definition of the pedagogical problems solution is the following ways of achievement of high extent of preparation: professional-and-pedagogical qualification and skill, and also a great attention to knowledge, distinction between qualification and skill, quickly and consciously created transition of action to creativity.

As well as we presented the rules which are professional indicators of the personality of a future teacher:

- personal character of a future teacher;
- requirements to psychological-pedagogical preparation of the teacher;
- structure and volume of a special preparation;
- methodical contents in the specialty.

"Work of the teacher will be considered successful if the main personal character of the teacher coincides with the nature of professional action".

M.N.Dyachenko in his works considered such professional-and-indicative elements of preparation of formation of higher education institutions graduates– future teachers, as a general characteristic of a future teacher, the main object of professional activity, following the direction of a future teacher, readiness for training in the general knowledge and developing thinking, existence of a special diligence and ability [7].

In our research under the contents "improvement of professional training of future specialists – physicists" we understand its correspondence of personal, cognitive and methodical concepts to the market society, innovative, physics-and-technology knowledge and qualification, information-and-technological skills, and the ways of development of scientific-theoretical bases.

To analyze the scientific-practical bases of improvement of professional training of the future specialists - physicists at the University, to identify the extent of its theoretical and practical elaboration on the basis of experimental verification and analysis of the comparison of the experimental and control groups of students from «Physics» Department, Natural Sciences Faculty of Ahmet Yasawi International Kazakh-Turkish university, according to 5B011000 - Physics and 5B060400-Physics; to prove requirement and necessity, to improve the professional training of the future specialists -

physicists, to develop the electronic educational resources, to improve the training of future physicists.

2. Method

The general scientific: analytical (the analysis of scientific literature on psychology, pedagogics, physics on the researched subject; the analysis of school books on training in physics); the pedagogical: supervision and material generalization on professional training of future specialists – physicists; questioning and testing; experimental methods: carrying out experimental training, pedagogical experiment, processing of mathematical and statistical data.

The created electronic school book allows you easily find the information you need, return to the material, gives an opportunity to more fully explore the material, which makes a school book attractive, affordable, and this in turn has a positive effect on the learner. The contents of the material set out with the use of animation easy and accessible, clear. Text material is equipped with: illustrations, tables, and graphic examples, facilitate the perception of the material, tests for the control of knowledge of students at the section. The results of the research can be used in training the future teachers of physics in the quality of material when teaching of the following disciplines: «Mechanics» of course «Physics», «Methods of teaching physics».

3. Results

To scientific-practically prove the usage of electronic educational resources in improvement of professional training of future specialists - the physicists proved in the principles of scientific character, problematical character of training, presentation, consciousness, independence and activation of activity, systematicness and sequence.

Improvement of professional training of the future specialists - physicists on the basis of electronic educational resources is realized by supply of educational process with training materials [8].

When creating electronic textbooks we were guided by the following principles:

1. Principle of scientific character. To provide the content of a training material with scientific reliable information – expresses the need of taking into account the last scientific achievements. The process of assimilation of a training material via the electronic textbook has to be created according to modern ways of scientific knowledge (experiment, comparison, control, abstraction, generalization, specification, analog, induction and deduction, analysis and synthesis, modeling methods), and also to the mathematical and system analysis. For example, Newton and Kepler's laws, space speeds, etc.

2. Principle of problem training. To train in case of educational-cognitive actions importance. By

search of solutions for problem situations the students' thinking ability develops actively. It is more favorable to fulfill such didactic requirements with the help of electronic textbooks. For example, numerical values of inertial and gravitational masses we analyze by means of problem questions.

3. Principle of illustrativeness expresses the need of formation at students of notions and concepts on the basis of all sensual perceptions of the studied objects and their models. In the electronic textbook execution of the illustrativeness requirement has to be provided at a new and high level. Use of multimedia elements covers all channels of information perception of the person.

4. Principle of interactivity, activation, organization of independent work. As the electronic textbook (ET) is intended first of all for independent work, the trainee has to approach to it consciously.

5. Principle of systematicness and sequence. Electronic forms have to allow easily and conveniently systematize all material of the textbook and arrange it in sequence of convenience for studying. For example, the law of momentum conservation of movement demands systemacy [9].

In addition to the above-mentioned pedagogical principles you should master the following special didactic conditions connected with the use of modern information and telecommunication technologies (on a basis of Internet materials):

1. Adaptation condition. To adapt the electronic textbook according to personal opportunities of a student. This is adapting of knowledge in the course of training on psychological features of the student.

2. Interactivity condition in training. In the course of training there has to be a connection between the student and the electronic textbook. ET has to provide interactive dialogue or feedback. The main condition of the organization of interactive dialogue is feedback availability with the student using the electronic textbook.

3. Computer visual condition. Comparative analysis of modern means of information display (computers, multimedia projectors, virtual means, software), qualities of the electronic book.

4. Condition of development of intellectual potential. To form different types of thinking by means of ET (algorithmic, visual image, reflexive, theoretical), ability to make the correct decision in difficult situations and qualification of information processing.

5. Condition of structurally functional connection. To specify all necessary training materials of ET.

6. Condition of providing continuity of a didactic cycle of training [10].

When creating the electronic textbook the main task is to increase knowledge level of students on the section of physics "Mechanics", and as ensuring quality of studying separate topics of discipline that in great degree can be promoted by the use of information and communication technologies.

The electronic textbook developed by us includes the following parts: introduction, contents, help, authors, literature.

The structure of the created electronic textbook allows to be easily guided in its sections. By consideration of the textbook structure we begin work with the main page. It includes two directions: "Introduction" and "Contents (which are divided into five sections and topics)".

The created electronic textbook allows easily find the necessary information, come back to the previous material, gives the chance to study the material much fully that makes the school book attractive, available and in turn it well influences on the trainee. The material contents are stated with animation application easily, well and clearly. The text material is supplied with: drawings, tables, the visual examples facilitating perception of the material, tests to control students' knowledge on the previous section [11].

Results of the research can be used at professional training of future teachers of physics as a material when training the following disciplines: "Mechanics" of the course "Physics", "Technique of Teaching Physics".

In stating experiment the indicators and criteria of components mastering by students were defined, test tasks were prepared, the assessment technique was revealed, the system of didactic tools was made, electronic options of checked knowledge of physics course were chosen [12]. The electronic textbook on "Mechanic" section was developed. The animation Macromedia Flash MX program was chosen.

As a result of the carried-out methods at the last stage of experimental work the levels of development of professional training improvement of future specialists – physicists to use of electronic educational resources (table 1) were defined.

In the final stage of experiment significant increase level of development of improvement of professional training of future specialists – physicists to use of electronic educational resources cleared up. If during the determining experiment – 46,69% of experimental group students showed low level, but at the end of experiment low level was showed by 10,09% of students; at the beginning the average level was showed – 32,87%, at the end – 38,29%; at the beginning the sufficient level was showed by 17,44% of students, at the end their number reached – 39,90%;

at the beginning none of students showed high level, at the end their number increased by 11,72% (Figure 1).

Table 1. Levels of development of improvement of professional training of future specialists – physicists to use of electronic educational resources (%) (The Experimental Group (EG) – 210, the Control Group (CG) – 190)

Development stages	High		Sufficient		Average		Low	
	EG	CG	EG	CG	EG	CG	EG	CG
Beginning			7,44	0,56	2,87	6,15	9,69	3,29
End	1,72	,5	9,90	0,89	8,29	8,65	0,09	6,96

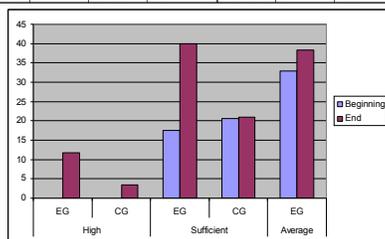


Figure 1. Levels of development of improvement of professional training of future specialists – physicists to use of electronic educational resources (%) (The Experimental Group (EG) – 210, the Control Group (CG) – 190)

As a result of a tangible growth of level of preparation of students in experimental group in comparison with the control group, and also absence of students showed low level, it is possible to say that it is the result of assimilation of "Mechanics" course. So, the results of pedagogical experiment proved correctness of our initial hypothesis.

In summary we state the fact that the analysis of experimental work shows that the use of electronic educational resources in the course of professional training has the huge importance and promotes improvement of professional training of future specialists - physicists.

Scientific-and-practical research will be continued by us, and according to our work we draw a conclusion about the importance and topicality of issues of using electronic educational resources in improvement of professional training of future experts in the field of physics, modernization of educational process, updating of the content of process of preparation which accordingly influence on the

change in professional training of future specialists - physicists.

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