Effective methods of improving the quality of education in biology lessons through computer technology

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Abstract. Improvement of school biological education is required at all levels of its organization. At the same time, the introduction of modern computer technologies into the learning process is of particular importance. One of the most natural and productive ways of introducing them into the educational system of the school is to directly link the learning process with the improvement of the content, methods and forms of teaching, orienting the entire program towards solving generally significant pedagogical problems. The article discusses the features of the use of modern computer technologies as one of the ways to increase the interest of schoolchildren in biology. The results of experimental work carried out on the basis of secondary school №5 of the Nizhnekamsk region of the Republic of Tatarstan are presented. Based on the results of the analysis, conclusions were drawn about the effectiveness of the use of computer technologies in the educational process of the school.

1 Introduction

One of the most important areas of modernization of the modern school is informatization. Currently, various authors point to the possibility and importance of using computer technology in teaching Natural Sciences, specialized conferences are being organized dedicated to the problems of computerization of Education [1-6]. The use of multimedia tools in teaching is considered the most promising, since multimedia allows you to use all information transmission channels in the learning process, maximizing all types of memory.

But it should be borne in mind that computerization of the teaching of biology is a rather complex scientific, methodological and organizational problem. His decision requires a revision of the content of training and its educational and methodological base in accordance with the trend of forming an open information society, as well as the preparation of teachers for work in a new educational setting. Get a number of pedagogy

Thus, the relevance of this research is determined by the need to resolve the conflict between the need to create effective methodological approaches using computer technologies in the teaching of biology and the fact that most biology teachers and Methodists are not ready to use such technologies.

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In the era of modern development, such an important issue is such as the preparation of the growing younger generation for life in an information society. And in this, of course, it is important to form an Information Culture in each person. The fact that human civilization is stepping into an informed society assumes that the training of biology teachers to conduct professional activities in an automated information educational environment will be studied as an urgent problem. As a result of informatization of the educational sphere, it is necessary that each teacher and student have an unlimited source of information. Analytical processing of information makes it possible to use it in its place and enhances the activities of participants in the pedagogical process.

The extensive research carried out in the field of informatization of the educational sphere, as well as the experience of the use of information technologies in the higher education system, shows that the content, style, tools, form of education and methods of control of educational programs of higher educational institutions acquire new didactic conditions and acquire a new structure, form, performance, volume of work With this in mind, the use of interactive technologies for assessing students ' knowledge in the context of informatization of Education puts them to gain their professional training by activating their cognitive activity. For many years, the problem of gaining professional training of future teachers has been in the spotlight of many scientists and specialists in the field of Education. In recent years, the scientific research of a number of scientists has been studied in connection with the general theory of pedagogical education. However, in biology classes, the possibilities of organizing the assessment of student knowledge on the basis of interactive technologies have not been studied as a separate research object. Therefore, contradictions began to appear in pedagogical practice. It is a contradiction that the development of cognitive activity in teachers of future biology, the use of modern technologies for preparing for professional activities in a fast-paced information and communication educational environment is the non-existence of the system. The use of interactive technologies for assessing student knowledge in biology classes provides the following in accordance with the requirements for informatization of the higher education system: - individual orientation of teaching; - achieve interactive acquisition of the database in accordance with scientific and professional requirements; - develop students 'intellectual and creative abilities; - gain students' aspirations for independent educational activities, mutual knowledge sharing and cooperation; - gain motivation of student activities using modern capabilities of interactive technologies; - create an information environment of assessment of students ' knowledge through an automated system; - reduce timek. In accordance with the requirements of 190 higher education, students need to independently develop assessment tools, methods, types and forms. The choice of methods of knowledge control is in accordance with the purpose, content of the assessment and the possibilities, resources of the educational institution to use this method. Examination of complex theoretical questions is carried out mainly in the manner of an individual survey (seminar, colloquium). Frontal oral survey is planned in the study of educational materials rich in a large, but uncomplicated content. Knowledge acquisition control:-traditional or innovation (rating, Portfolio, keys-scale, essay, etc.k.) can be; − individual, Group; − written, oral, in the form of the use of software tools or the protection of creative work, etc.k. From the traditional forms of knowledge control: interview, colloquial, test (zachyot), examination (by fields, by module, final state attestation), test, control work, report (practice report, student report on research, etc.k.), coursework, graduation qualification work are common.

For example, monitoring is one of the modern tools, which includes a system for assessing the results of knowledge acquisition; Rating technology of knowledge assessment provides for independent work the forms and difficulties of knowledge control, objectivity of criteria for assessing individual types of work; final certification provides opportunities for determining the degree of formation of competencies in accordance with the content of

State Examinations It should be noted that ensuring the reliability and objectivity of the control of knowledge acquisition is important in solving the problem of improving the quality of mastering knowledge related to science and in obtaining the level of training of graduates for professional activities in accordance with the requirements of the labor market.

In traditional forms, types and styles of control, it will be mainly focused on controlling the acquisition of knowledge and will not always serve to modernize and transfer the control of the formation of competencies provided for by state qualification requirements. Control innovation technologies and assessment tools include: Portfolio, keys-technologies, situational assignments, imitation training, small-project, computer simulation, staging, performance of course projects in groups, collaborative and role-playing games (1, 4 pp.). At the modern stage, the task of control is directed to the readiness of students to carry out educational activities in accordance with the level of management of educational activities, personal abilities. The developmental and educational function is directed to the personal characteristics of students and the specificity of the sphere of further professional activity. Specificity of control in terms of a new competency approach: - classification of competencies: universal. metapredmetli and private, subject-specific; - professional need, for example, an increase in the potential of employers; - monitoring the formation of competencies; - subjective, personal need of each student; - communication with educational technologies; - openness, transparency of consumers of educational products and the educational process;-conditions of self-control and transportation, the formation of "exit" boundaries from the audience space are important in assessing competencies. This innovation control is carried out through statistical and dynamic assessment and leads to changes in student readiness.

The purpose of the study was to study the features of the use of computer technology in biology classes at a Secondary Secondary Secondary Secondary Secondary School as an effective means of improving the quality of learning. Computer Technology (Computer science) is the common name for technologies responsible for the storage, transmission, processing and recovery of data through computers and related scientific field [1]. Computer technology develops programmable educational ideas, opens up new, yet unexplored technological options related to the unique capabilities of modern computers and telecommunications. Computer teaching technologist.

Computer technology has its own goals, methods and means of implementation. Their summary is as follows. The purpose of information technology is to create an information resource of a high-quality information product that meets the requirements of the consumer. Information technology methods are methods of data processing and transmission.

Information technology tools-mathematical, software, information, technical, etc. in such identification of goals, methods and Means, Information (Computer) Technology (ICT) is understood as a whole technical system that provides for the targeted construction, transmission, storage and presentation of an information product (information, ideas, knowledge) and corresponds to the laws of the social environment [2].

- The computer can be used in the study of science at all stages of the lesson, namely:

- in explaining the new material (color pictures, photos, diagrams, graphics, tables, slideshows, video segments, animation short, etc.

The purpose of the program was to improve the quality of teaching science through the use of ICT in biology classes, to ensure the optimal formation and development of the personality of the student.

Within the framework of the pedagogical experiment, classes were held on the topics "animal" and "birds". The Act, i.e. multimedia presentations (Power Point), was held using interactive authoring games, authoring videos. Thanks to computer technology, educational materials were presented in a bright and interesting way in the form of various storage

tools: illustration, computer animation, slides, texts, videos, along with the teacher's explanations.

As a criterion for the effectiveness of the use of ICT, the activities of subjects evaluated under the five-point system were demonstrated. At the detection stage of the experiment, control sections of knowledge in the form of test assignments were carried out in control and experimental classes. The purpose of the control department is the topic of "vertebrates", which was previously studied.

Following the initial control cross section, the following results were obtained: academic performance in the experimental and control classes was 80.0%, respectively. However, the high level of knowledge in the experimental class showed 30.0% of students, 20.0% in the control class; the average level of knowledge in the experimental class was 20.0%, and 30.0% in the control class. According to the test results, 30.0% of students received satisfactory grades, both in the experimental and control class. 20.0% of students in both grades failed to complete the assignment. Thus, analyzing the results, it can be noted that students have the opportunity to increase academic performance on this topic, but there is no motivation and interest in biology.

2 The main part

In the second (formative) stage of the study, classes were held in an experimental class, in which we used ICT at different stages of the lesson: at the stage of studying new material, at the stage of combining the studied material.

Thus, comparing the results of the control departments (before and after the experiment), we came to the conclusion that students in the experimental class fully and efficiently master the educational material when using ICT. Their performance level rose to 100.0% compared to the control class, where this indicator remained the same as the indicator at the detection stage, indicating the effectiveness of the use of computer technology in the teaching of biology.
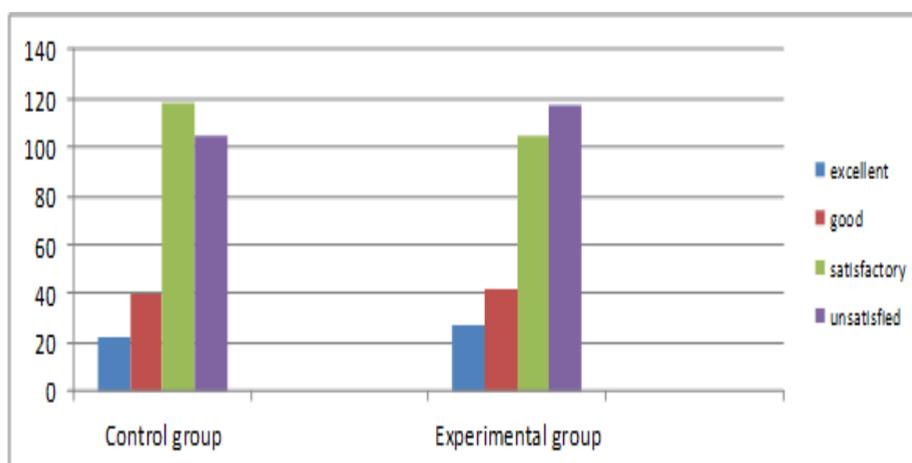

Fig. 1. The results of the study.

Having considered the essence and variety of modern computer technologies, describing the features of their use in the teaching of biology, we came to the conclusion that the use of a computer allows you to increase the possibilities of teaching this discipline, optimize

the motivational and visual parameters of the educational material, provide a qualitatively new level of Education.

The use of computer technology in biology classes helps to develop the personality of students.

The results of the study are visible in the fig. 1.

3 Conclusion

So, the results of the experiment showed that if you constantly use innovative computer technologies in the school biology course, then the achievement and quality of students will be ensured.

From the above, it can be noted that in the conditions of current economic and social changes, the need to pay special attention to family education is growing, and the responsibility of parents is growing in solving this problem. This means for a creative approach raising children in the family, achieving the formation of positive qualities in children, parents their children and children should be well aware of their duties and responsibilities to their parents.

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