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MONITORING AND RESEARCH ON IMPROVING THE QUALITY OF KNOWLEDGE OF HIGH SCHOOL STUDENTS IN GENERAL EDUCATION SCHOOLS

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Abstract

this article examines issues of monitoring and research aimed at improving the quality of knowledge for high school students. Ensuring the effectiveness of approaches to improving the quality and monitoring of student knowledge assessment in the process of using information and communication technologies in secondary schools creates the necessary conditions for ensuring the process of training secondary school students through information technologies. The implementation of the obtained results into practice allows for an assessment of the quality of school graduates' knowledge in the field of information technology. The developed model of the pedagogical consulting system and the didactic conditions for organizing knowledge quality monitoring allow for an increase in the level of knowledge of secondary school graduates.

Keywords

secondary education, education system, school, teacher, student, learning, evaluation, testing, information, technology, monitoring.

In recent years, increasing attention has been paid in Russia, as well as in many other countries of the global community, to the issue of informatization of education, which is considered one of the most important strategic problems in the development of civilization. It implies the process of equipping the education sector with the development of modern information technologies and the methodology and practice of their optimal use.

Informatization of education supports the integrative tendencies of the process of understanding scientific fields and their regularities by realizing the potential of information technology tools. It is a process of intellectualizing the activities of

educators and learners. It combines the advantages of individualization and differentiation in education, thus ensuring pedagogical effectiveness.

It is widely recognized that information components should dominate in the education system of the future, since the education system not only provides the necessary knowledge about the new information environment of society but also forms a new worldview. This worldview is based on understanding the decisive role of information processes in natural phenomena and human society.

Today, it is necessary to revise the goals of education and redirect them in a completely new way toward the challenges of the information civilization. At present, our educational system already has a sufficient number of original developments—specialized teaching, control, and teaching-control programs. However, the integration of information technologies into education may require serious research efforts, as the success of creating these tools and using them effectively in the educational process depends on such studies [2].

The concept of modernizing education and addressing the issues of reforming it should prioritize informatization of education as a key direction for improving the quality of education. To achieve this, it is essential to develop new information technologies, improve the qualifications of educators, and create an industry for producing electronic educational products. Particularly relevant is the development of issues related to the use of information technologies in managing the quality of education. In our research, organizing the monitoring of high school students' knowledge quality in general secondary schools through the use of infocommunication technologies is of significant importance.

Scientific research related to the problem of monitoring the quality of students' knowledge in general education schools through the use of information and communication technologies [3] focuses on the following areas:

- Developing efficient, modern systems for providing fast, transparent, and comprehensive information to participants in the educational process, aimed at improving students' knowledge quality;
- Presenting the importance of infocommunication technologies in integrating knowledge from different academic disciplines and their role in the educational process;
- Meeting the growing demand for information among students and forming sufficient information culture among teachers to work with modern information-pedagogical resources.

The necessity of addressing these issues increases the practical relevance of the research. Solving this problem is the primary goal of our study. The object of the research is the internal monitoring of education quality among high school students

in general secondary schools [4]. The subject of the research is the management of high school students' knowledge quality during the use of infocommunication technologies.

The management of knowledge quality among high school students through the use of information and communication technologies improves in the following cases:

- Analyzing the needs of participants in the educational process for information and consulting services, classifying the developed normative-legal and methodological documents for professional education, developing and implementing an information-consulting system for general secondary schools based on a pedagogically supported information exchange scheme;
- Identifying the criteria and indicators of education quality for secondary school graduates, and based on those, creating a monitoring system for assessing education quality;
- Monitoring the quality of knowledge of high school students in general education schools based on selected criteria and indicators during the use of information and communication technologies.

In accordance with the aim, object, and subject of the research, the following tasks were addressed:

- Identifying the main directions of using modern information and communication technologies in secondary education schools;
- Defining the pedagogical conditions for applying infocommunication technologies in the school learning environment;
- Developing criteria and indicators for knowledge quality;
- Developing a methodology for conducting monitoring of students' knowledge quality during the use of infocommunication technologies in secondary schools, and determining the didactic conditions;
- Examining the concept of "consulting," identifying the specific features of a pedagogical consulting system, and formulating its core content.

To solve the set tasks, the following research methods were applied: studying and analyzing psychological-pedagogical and scientific-methodological literature related to the research problem, as well as electronic resources; generalization and specification; systematization; surveys (questionnaires, interviews, conversations); assessments (self-assessment, expert evaluation); analysis of pedagogical activity results, and control stages [4].

Scientific Novelty of the Research:

- A methodology for monitoring the quality of students' knowledge during the use of infocommunication technologies in secondary schools has been developed;

• An information-consulting system has been presented and implemented, based on a set of interconnected elements (information flows, information-analytical services) aimed at collecting, analyzing, and transmitting information and providing consulting services. This system is designed to enhance the quality of training for users of the information-consulting base and future specialists—graduates of general education schools;

• Didactic requirements for organizing the monitoring of students' knowledge quality during the use of infocommunication technologies in secondary schools have been developed.

Theoretical Significance of the Research:

• Clarification of the meanings of the terms: pedagogical consulting, information-consulting system, information technologies, and pedagogical monitoring;

• Defining the theoretical and methodological foundations for improving the quality of students' knowledge through the formation of information culture among secondary school students;

• Clarifying the essence and main components of the information-consulting system, and its role in improving the knowledge quality of school graduates;

• Justifying the stages of monitoring the quality of students' knowledge during the use of infocommunication technologies in secondary schools.

• Identifying the prospects of using monitoring in the process of assessing students' knowledge when applying infocommunication technologies in secondary schools.

The following provisions are put forward for defense:

• A knowledge quality monitoring system has been developed that ensures the evaluation of the training quality of secondary school students based on criteria and indicators, the level of information exchange, and teaching quality, as well as the effectiveness of the corresponding information-consulting system;

• In the context of innovative changes in secondary schools, the management of the pedagogical process is a complex, multi-stage process. Its foundation is a systemic approach that involves defining the goals and criteria of educational activity and systematizing them so that the projected system aligns as closely as possible with those goals and criteria;

• During the process of using infocommunication technologies, controlling the quality of secondary school students' knowledge requires: Organizational-pedagogical measures (developing a culture of intellectual work, the ability to plan one's own activities, and the skill to critically link a work plan with real actions); Psychological-pedagogical measures (establishing psychological mechanisms of

interaction between students and information technology instructors in the educational process); Technological operations and procedures (defining the functions to be performed by computers and selecting verifiable and diagnosable methods for their implementation);

• The monitoring of knowledge quality during the use of infocommunication technologies in secondary schools should be a systematic, comprehensive process consisting of four stages: preparatory, main, analytical, and evaluative.

In the process of developing and utilizing information technologies, the education system can play a special role as the primary source of highly qualified, intellectually advanced personnel and as a strong foundation for both fundamental and applied scientific research [5]. In schools, various software packages are successfully used—ranging from basic tools for working with text, spreadsheets, and preparing computer presentations to more complex and sometimes highly specialized applications (such as programming, database management systems, symbolic computation, and mathematics).

Several key factors have led to increased interest in the capabilities of information technologies for evaluating education quality. These include the rise in the number of students involved in new forms of education, the implementation of test systems in secondary schools [6], and the widespread introduction of numerous certification cycles within the school education system.

Various functional approaches may be used to assess educational and cognitive activity outcomes—for example, diagnostic and summative approaches. Experienced teachers understand how incorporating new elements into teaching can diversify the learning process and enhance students' cognitive motivation. To address issues related to the structure of control systems, assessment strategies, and the methods used for evaluation, it is necessary to analyze what type of instruction is being implemented in each specific case. For instance, the control principles suitable for repetitive instruction may not be appropriate for exploratory instruction.

To achieve this, schools must establish a monitoring system that continuously tracks the course of the educational process. This system should identify interim outcomes, determine the influencing factors, and enable decision-making and implementation of measures to regulate and correct the educational process [7].

Monitoring student learning outcomes is one of the most complex challenges in the system of managing the quality of students' knowledge. The main tools of this activity are illustrated in the following diagram.

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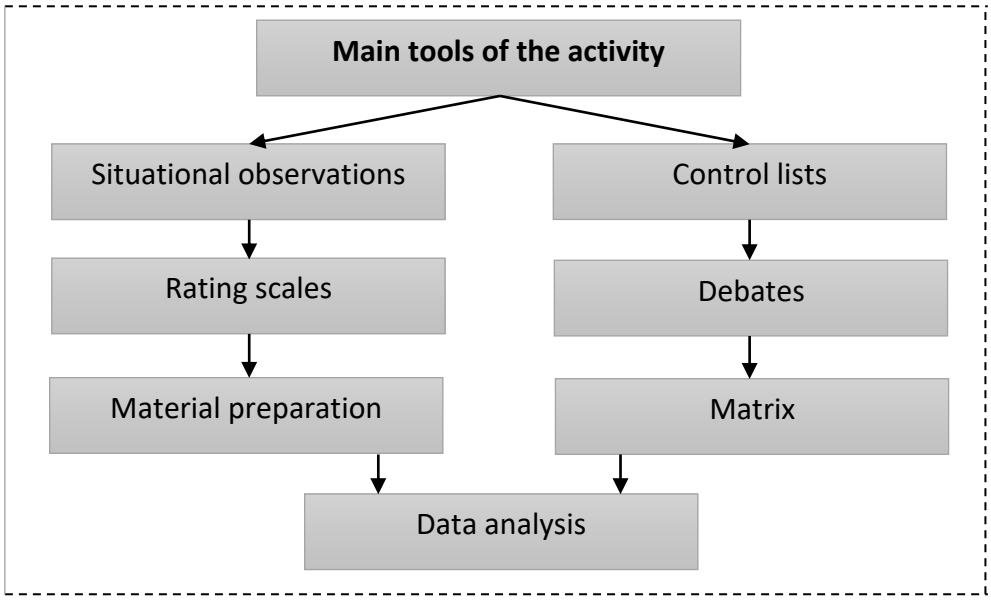

Figure 1. Diagram of the main tools of the activity.

High-performance monitoring systems may consider alternative and additional methods of assessment (e.g., a combination of oral and written tests, official rating scores, interviews, and direct observation methods).

The theoretical foundations of the elements of monitoring and improving the quality of students' knowledge outlined above suggest the primary direction: Thus, by using information and communication technologies in secondary schools, we can change the organizational and pedagogical conditions in which the educational activity takes place, leading to a positive pedagogical transformation.

CONCLUSION

In conclusion, the issues of monitoring and researching the improvement of the quality of knowledge of high school students were examined. In this case, the quality of preparation of high school students in the process of using information and communication technologies improves in the following cases:

• Analyzing the needs of the participants in the educational process for information and consulting services, classifying the regulatory, legal, and methodological documents of the developed professional education, and developing and implementing an information-consulting system based on the information exchange scheme in secondary schools and its pedagogical support;

• Considering the multi-component structure of the school, the quality criteria and indicators for preparing school graduates are established, and a monitoring system for educational quality is created based on these;

• In secondary schools, monitoring is carried out on the effectiveness of the process of preparing students to use information and communication technologies based on the selected criteria and quality indicators for preparation.

The process of improving the quality of students' knowledge and monitoring in the use of information and communication technologies in secondary schools involves several stages that replace one another sequentially. For example, planning, preparation, implementation, result analysis, and decision-making.

The status of the issue of information provision in secondary schools allows us to determine the level of development of the research topic by various scientists and practitioners.

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