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FACTORS FACILITATING THE DEVELOPMENT OF NATURAL SCIENCE COMPETENCIES THROUGH ARTIFICIAL INTELLIGENCE

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Abstract

This article focuses on the development of science, the rapid growth of production, the improvement of teaching based on artificial intelligence, the correct formation of a holistic picture of the world in the minds of school students during the educational process and finding correct solutions, and ensuring the close interconnection of fundamental knowledge with practice by improving the process of teaching natural sciences to school students based on a competency-based approach through artificial intelligence tools.

Keywords: Competence, international, development, natural sciences, educational programs, general education, improvement, artificial intelligence, efficiency, quality education, scientific research, theoretical, practical activity, knowledge, skills, abilities.

Introduction

The correspondence of educational material to the level of modern science includes its approach, the state of the academic subject, the use of leading scientific ideas and theories, the disclosure of methods of cognition in biology and its laws, the introduction of main conceptual systems (biological processes), their adaptation to the educational process, the reliability of selected materials,

and the need to develop teaching natural sciences based on a competency-based approach through artificial intelligence.

An important condition for implementing these principles is the consistency of knowledge. It is characterized by the following:

highlighting fundamental knowledge and skills in educational material and establishing relationships between them;

developing learning activities based on artificial intelligence;

concentrating knowledge around leading ideas;

revealing the content from the point of view of the most general theories and laws;

subordinating it to course theories and concepts;

distributing biological laws as important system-forming connections of concepts.

At this point, specific processes are subordinated to the scientific consistency of the educational material. The leading role of theory in teaching is expressed in bringing it closer to the beginning of training courses, strengthening the ideological and theoretical level of content, and in explanation, generalization, and prediction. The process of developing competence ensures the consistent development of the most important competencies throughout the entire learning activity.

This process involves improving and deepening the teaching of natural sciences in general education based on a competency-based approach through artificial intelligence, establishing and restructuring their relationships in discovering new knowledge. Accordingly, when moving from one theoretical level of content to another, it is necessary to reconsider concepts, generalize and systematize them, and establish conceptual relationships. Individual concepts are included in more general theoretical knowledge systems. The process of developing concepts also implies increasing the complexity of their forms of expression. Along with

competence, the interrelated development and generalization of appropriate methods of activity are ensured.

Teaching natural sciences based on a competency-based approach includes selecting educational material taking into account age and psychological characteristics of mastering it. According to this process, the complexity of educational material gradually increases. In one part of the lesson, competencies of theoretical questions, their assimilation, and application become more complex. Therefore, it предусматривает teaching based on artificial intelligence in general education.

Analysis and Results

It is necessary to highlight the main facts. In forming necessary concepts in biology (usually cells, tissues—oxygen, organ, organism, organ systems, etc.), auxiliary, temporary elements also require frequent changes in accordance with modern requirements.

In teaching natural sciences in general education based on a competency-based approach, without the organizational and guiding role of theory, without theoretical generalization, it is impossible to explain the essence of studied objects and phenomena, to form the required knowledge, and to provide a scientific understanding of the world. Establishing the relationship between theory and facts is an important factor in implementing the scientific principle in teaching. Increasing the theoretical level of a topic is associated with a reduction in facts. In ensuring the optimal ratio of theory, it is important that the number of facts for studying each main issue is minimal but sufficient to understand its essence.

Based on these principles, it is required to improve the content of teaching natural sciences based on a competency-based approach through artificial intelligence.

Increasing students' interest in natural sciences can serve as a basis for the emergence of qualified specialists in the future and for the development of science and technology in our country. At present, interest in applying innovative educational technologies in the educational process is increasing.

The active use of innovative pedagogical technologies in the educational process, increasing the effectiveness of education based on artificial intelligence tools, analyzing and implementing them in practice are among the important tasks of today.

Increasing students' scope of thinking, consciousness, and worldview, and transforming them from passive listeners into active participants is extremely important. In this process, the teacher should act as a facilitator in the lesson, while students should become active participants. The predominance of innovative activity in this process brings multifaceted effectiveness. In the educational process, more attention should be paid to the comprehensive development of the student's personality.

Students' attitudes toward learning and their intellectual potential are formed during this period. Lessons organized on the basis of artificial intelligence should correspond to the needs of learners in terms of organizational methods and teaching techniques. Such lessons are closer to the psychology of learners. Achieving the goal by stimulating students' interest in mastering educational materials is motivation, which represents the internal convergence between teachers.

It is the theoretical level of professional skills formed on the basis of adaptive skills and creativity in a particular field. Mastery is art, mastery is inquiry, mastery is the ability to apply innovative educational technologies, mastery is the teacher's ability to organize his or her activity on a scientific basis and to engage in self-education. Ability exists in all people, but not equally; it may be high,

medium, or low. For successful work, every teacher must possess pedagogical mastery. A teacher with pedagogical mastery achieves great results through effort. Ability emerges and develops in the process of activity.

For effective work in vocational guidance of students, the educational institution should, on the one hand, take into account students' personal interests and abilities, their right to self-determination, and their socio-economic relevance. To implement this work, new conditions appropriate to our time are being created to meet the characteristics of the internal educational environment.

General education schools in our country are being improved within a modern system. Therefore, they are being equipped with modern equipment for practical and laboratory classes in natural sciences.

Based on social, economic, and scientific-technical conditions, it requires the development of effective educational activity. One of the optimal methods of teaching biology based on a competency-based approach is to improve the process of conducting laboratory classes related to biological knowledge.

In teaching natural sciences in general education based on a competency-based approach through artificial intelligence tools, attention should be paid to the following:

to consider any object of natural knowledge as a dialectical unity of its true idea, laws of functioning and development, opposing tendencies, properties, and interrelations;

to improve natural sciences through artificial intelligence tools;

to improve the specific features of biological thinking and the dynamic and statistical laws of science;

he essential feature of the style of thinking is mastering the most important theoretical materials studied by the student.

Developing learning and cognitive activity is aimed at performing actions such as working at the required pace, reading, writing, calculating, drawing, preparing for educational activities, using necessary teaching methods, memorizing, grouping material semantically, and focusing on key points.

It is also aimed at developing perseverance, achieving set goals, developing cognitive skills, increasing the ability to act independently, acquiring knowledge, improving activity, implementing it, and developing self-control. At this point, the process of developing cognitive skills and receiving knowledge in a ready-made form is understood.

Teaching natural sciences based on a competency-based approach is not only about providing theoretical knowledge to students, but also about forming the ability to apply acquired knowledge in real-life situations, and this approach is important on the basis of artificial intelligence.

In a competency-based approach, the student:

does not limit themselves to memorizing knowledge;

learns to apply it in practice;

acquires skills of independent thinking and problem-solving.

The main purpose of teaching natural sciences based on a competency-based approach:

to form knowledge about nature and living organisms;

to develop ecological culture;

to explain a healthy lifestyle;

to teach the application of biological knowledge in everyday life.

Advantages of the competency-based approach:

students learn independent thinking;

knowledge is connected with practice;

interest and activity increase;

life skills are formed.

As a result, the student acquires biology not only as a subject, but as knowledge necessary for life. Factors for improving the teaching of natural sciences based on a competency-based approach through artificial intelligence:

increases students' natural-scientific literacy based on artificial intelligence;

develops independent thinking and research skills;

forms a healthy lifestyle based on artificial intelligence;

increases efficiency in biology lessons;

natural-scientific competence develops in students;

students acquire scientific thinking;

guides students toward independent research.

The organizational and methodological aspect of teaching biology to school students based on a competency-based approach consists of designing a curriculum that connects ideas from various fields. Such teaching encourages students to think deeply and understand the interconnection of all things in the world. Teaching based on a competency-based approach is characterized by its focus on increasing students' thinking abilities. This helps them solve problems and understand complex concepts.

Also, in studying the problem of forming a scientific worldview in school students, it has been found that learning science and scientific knowledge based on a competency-based approach manifests in students the unity of the material world, that is, the interconnection of nature, society, and its cognition, as well as the development of interrelations between sciences, and the increasing importance of information tools, which is reflected in the achievements of the educational process.

Accordingly, in improving the scientific worldview of students based on a competency-based approach, attention should be paid to environmental

protection, preservation of nature and humans, rational use of natural resources, and issues of cleanliness. These issues should be included in curricula, educational programs, lesson content, and work plans.

Today, knowledge and skills alone are not sufficient. Rather, self-confidence, the ability to make decisions, teamwork skills, focus on clear goals, the ability to identify problems, and the ability to search for solutions independently or collaboratively are very important. In this process, students must learn to take responsibility for the results of their actions.

Currently, the demands arising from the development of science and major changes in production are setting new tasks for school education. The problems of teaching and educating school students in biology based on a competency-based approach are becoming increasingly relevant both theoretically and practically from the perspective of modern social demands [6].

In this process, the education system is aimed at establishing a high level of scientific foundations, developing thinking, understanding and perceiving the world holistically, correctly interpreting events and phenomena occurring in the surrounding environment, and educating young people who can comprehend their essence.

The deep mastery of the foundations of subjects recommended as academic disciplines in educational institutions helps to form a broad worldview in students. Teachers should pay attention to providing education based on a competency-based approach and ensuring that acquired scientific knowledge can be applied in practice [7].

It should be noted that organizing the educational process in a consistent, continuous, systematic manner and based on a clear social goal, as well as relying on the unity of all existing factors in teaching natural sciences based on a competency-based approach, is a guarantee of achieving the intended goal.

A worldview in an individual is formed as a result of the consistent, systematic, continuous, and purposefully organized educational process, its improvement based on artificial intelligence, active participation in social relations within this context, and continuous self-education [2].

Conclusion

This requires equipping students with educational materials of practical significance, numerous facts, value-based concepts, and natural knowledge. Teaching students natural knowledge based on a competency-based approach has certain advantages, such as strengthening acquired knowledge through its integration into practical activities, creating favorable conditions for students' independent thinking and deep understanding of material reality, and forming artistic-aesthetic and natural-scientific worldviews.

Improving the teaching of natural knowledge to school students based on a competency-based approach through artificial intelligence plays an important role in ensuring their thorough mastery of the foundations of natural, social, and humanitarian sciences. The moral and ethical image of an individual, life approaches, and worldview reflect the essence of values and ethical principles that are of priority importance for them [6].

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