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National-Scientific Vocational Adaptive Teaching on the Example of Vocational School and Academic Lyceum (On the Example of Chemistry Course)

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Annotation: This article focuses on the role of science-based professionally-oriented adaptive teaching (in the example of a chemistry course) in the association, use, and mastery of technology-based lessons in the vocational guidance phase of secondary schools and academic lyceums. The effectiveness of the training conducted in this way was studied.

Keywords: adaptive teaching, chemistry, human health, integration, educational technology

The specialization of chemistry education in the world makes it necessary for a high school graduate to make a responsible choice - preliminary self-determination about the specialization of their activities. In this regard, the continuation of specialized training in grades 10-11 and academic lyceums - a system of pedagogical, psychological, informational, and organizational support that helps students to determine their professional self-determination at the end of general secondary education - in higher specialization classes, vocational schools The organization of the direction becomes a topical issue.

The study of the quality of education in terms of vocational guidance of students at the stage of vocational guidance in the category of natural sciences in secondary schools and academic lyceums in the country shows a growing gap between the socially necessary vocational guidance and the current level of training. To overcome the above-mentioned gap, the subject of "Chemistry", one of the natural sciences, was used as an experimental field in the development of adaptive teaching technology for the natural-scientific profession in the vocational guidance phase of secondary school.

LITERATURE ANALYSIS AND METHODOLOGY

The criterion for the quality of general education also sets its requirements for science teachers in the classrooms of adolescents. According to NV Kuzmina, "The professionalism of

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primary school teachers is to diagnose students' interests, tendencies, abilities with the help of their teaching aids, to help them in their initial professional self-determination, to help them choose a profession that best suits their creative potential."

Because adolescents feel a strong need for self-knowledge, the educator's professionalism must be exercised in his or her self-seeking: propensity to think theoretically - then focus on teaching 'technologically' in higher education classes to choose a higher education institution; if the tendency to practical thinking and practical activity prevails, it is advisable to realize the creative potential of the profession without delay, because early professional self-determination leads to successful self-realization of creative potential Implementation of goal-oriented career-oriented adaptive activities to define, represents a path that creates the conditions for them to assert themselves and express themselves as individuals. Based on the functional model of the educational process in AS Granitskaya, he introduced a functional model of communicative management of the educational process in natural-science professionally-oriented adaptive learning technology. According to Z.D. Zhukovskaya's research, "control, which is an integral part of almost all other methods of intensification of the educational process, is the main, system-forming factor" and is the basic concept of system-control activity of the teacher. Many scholars, including D.I. Feldstein's Theory of Adolescent Developmental Psychology, J.J. Locke, has developed new forms and methods of adaptive teaching of chemistry abroad and improved the science-based teaching, including the solution of the problem of career-oriented teaching in the vocational guidance stage of secondary school. , J.J.Russo, Dj. Dewey The ecological theory of improving the quality of training of educational specialists, a valuable approach to the content of educational information and information technology, the theory of design of pedagogical technologies have made a great contribution.

DISCUSSION AND RESULTS

The search, development, and implementation of effective technologies for science-oriented vocational training in the vocational guidance phase of secondary school, which provides a creative adaptive transition of graduates from the general education system to the system of chemistry education, highlighted the relevance of this research.

Expresses the following goals of modern chemical education:

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to acquaint students with the versatility and uniqueness of substances and chemical phenomena, their importance in nature and human life;

formation of a system of chemical concepts in their interaction with each other;

introduction to methods of knowledge of nature common to the natural sciences;

formation and development of interest in chemistry and its capabilities in certain areas;

formation of skills of safe work with chemicals necessary in daily life;

fostering a valuable attitude to nature, human health;

develop the ability to critically assimilate and modify the information obtained, and on this basis to conclude situations related to the use of substances.

The main components of the scientific content of chemistry education are distinguished, which are based on two basic concepts: matter and chemical reaction.

In this regard, it is important to choose the right educational technology, theoretical justification, and construction in such a way that the "evil" is not in chemistry itself, but in people who do not understand the laws of nature and therefore do not take into account the natural cycle of chemical elements. they must be able to explain that

A necessary element of the subject-subject concept of education is a system of incentive scores for the evaluation of learning activities in conjunction with the advanced principles of pedagogical management. The main principles of pedagogical management are pedagogical competence consultation; standardization of working conditions; fast, reliable (objective), complete, accurate, and continuous identification; discipline; fair treatment of students; rewarding for high efficiency and timely completion of tasks (with the use of spiritual means to strengthen motivation for points and (or) education); the presence in teachers and students of well-developed standard guidelines known to them, strict adherence to them, which contributes to the objectivity of the mutual control of the subjects of the educational process; allows students to predict in advance the objective assessments they will receive.

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All lessons in science-professionally oriented adaptive teaching technology include business games, discussions, workshops, etc. held in the form of.

Buffer system (based on chemical-biological integration)

For our body to function normally, the pH of our blood must be in the range of 7.35-7.45. If the pH is below 7.35, the blood is acidic and a diagnosis of “alkoloz" is made. If the pH is higher than 7.45, the blood becomes alkaline and a diagnosis of “alcoholism” is made. The role of CO2 in the blood is important in maintaining the normal pH of the blood.

CO2 reacts with water to form carbonic acid. It is a weak acid that forms a hydro carbonate anion and a hydrogen cation as a result of partial dissociation into ions. The resulting reaction is reversed and the system is in equilibrium.

$CO_2 (r) + H_2O (c) = H_2CO_3$;

$H_2CO_3 = HCO_3^- + H^+$

This system is a buffer system.

Q1: Carbon dioxide dissolves in the water in the blood and reacts under the influence of certain enzymes in the body to form a weak carbonic acid. Where does CO2 come from in the blood?

Evaluation criteria.

Competence: This question is aimed at assessing the competence of students to explain events scientifically.

Context: human health

Context level: national

To complete this task, students must be familiar with the process of respiration and metabolism in biology. They need to know that biochemical processes take place in cells as a result of the breakdown of fats, proteins, and carbohydrates in the human body and that carbon dioxide formed as a result of their oxidation passes from the cell to the capillaries and then into the blood.

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The correct answers can be as follows:

It is formed by the oxidation of glucose.

The final oxidation product of the food consumed.

Due to the presence of carbon in fats, it oxidizes in the presence of oxygen to form SO2. Along with ATF, water and CO2 are formed in the cell.

If there is no answer or the following and other answers are given, (0) points.

CO2 is naturally present in the blood.

O2 enters the body through the air.

It is formed by the interaction of carbon, which is formed by the decomposition of water and carbohydrates in the cell

- Obtained from the decomposition of carbonate salts

- Carbon is present in the blood and is formed by oxidation under the influence of oxygen.

Question: The concentration of hydrogen ions in the blood, i.e. the pH value, can change under the influence of substances released during metabolism in the body. However, as a result of the dissolution of carbon dioxide in the blood into water, which turns into carbonic acid and forms a buffer system, the environment of the blood is maintained at a normal level.

As the acidity of the blood increases, the body begins to produce large amounts of CO2 Conversely, when the alkalinity of the blood increases, the body needs large amounts of CO2.

According to the Le Chatelet principle, express by reaction how changes in the concentration of hydrogen ions in the blood affect the equilibrium system. Use an arrow to indicate in which direction the chemical equilibrium is shifting.

1 ._____

2. _____

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Competence: This task is aimed at assessing students' competence in the scientific interpretation of data and evidence.

Context: human health

Context level: national

Evaluation criteria.

CO2 interacts more with water, causing the equilibrium to shift to the right.

If students explain only one side of the balance shift, the answer is partially acceptable.

If students explain both sides of the balance shift, the answer is fully accepted.

Question 2

Determine how accurate the following information is. Mark (+) in the “right” or “wrong” box for each idea. №

That's right

Wrong

1.An increase in the amount of CO2 in the air in an unventilated room increases the acidity of the blood.

2.As a result of vomiting or gastric lavage through the probe, the stomach loses large amounts of acid. As a result, a person suffers from "alkoloz" ,ie an increase in the acidity of the blood.

3.In the treatment of "alkoloz" caused by metabolic disorders, a solution of NaHCO3 is injected into the blood.

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4.Patients with alcoholism, ie depletion of hydrogen ions in the blood, are advised to breathe again in a closed paper bag.

5.The CO2 formed in the cells is completely excreted through the respiratory organs and has no significance for the body.

Evaluation criteria

Competence: This task focuses on assessing students' competence in the scientific interpretation of data and evidence.

Context: human health

Context level: national

1 Students must be fully aware of the above information to complete this task.

"Alcoloz is" - an increase in blood acidity, "alcoholism" - a decrease in blood acidity, and what methods can be used to treat and eliminate them. On this basis, they must correctly analyze the data in the table and answer "yes" or "no".

Each correct answer is given 1 point.

Meaningful analysis of the results of qualitative monitoring of the application of science-oriented adaptive teaching technology (in the example of a chemistry course) in the vocational orientation stage of secondary school developed in the study. low level, the level of development of information culture was low, the type of polytechnic-practical thinking was not sufficiently developed, as a result, such students could not choose the professional stage of education correctly.

In contrast, the students of the two experimental groups observed a steady increase in motivation for environmental-chemical education and, accordingly, a sufficiently high level of success and quality of independently acquired knowledge. There is a significant growth of the ecological-chemical information culture, which is formed every year, which depends on the correct creative choice of the next direction of education (according to abilities and tendencies) at the end of the vocational orientation stage.At the stage of vocational guidance of secondary

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schools and academic lyceums developed questions, test assignments to assess the effectiveness of the technology of adaptive teaching (for example, a chemistry course), acquired knowledge, skills, and abilities.

At the experimental stage of our research work, the results of pedagogical experiments were statistically analyzed and summarized. To determine the reliability of the results obtained from pedagogical experience, to show the effectiveness of the proposed method, the method ch2 - Pearson criterion was used.

1-picture

Oral survey results

1.Control group 68,5%

2 experimental group 69,4%

Result of test

1.Control group 61%

2.experimental group 63,0%

2-picture

Oral survey results

1.Control group 63,0 %

2 experimental group 76 %

Result of test

1.Control group 61%

2. experimental group 75%

Figura 1.performance indecators in cantrol and experimental groups before experimental testing

Figure 2.Performance indicators in control and experimental groups after experimental testing.

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The diagram shows that the average mastery of students in the experimental groups was 14% higher than in the control groups. This demonstrates the effectiveness of the experimental work performed.

CONCLUSION

Qualitative monitoring technology for the development of students' cognitive abilities and the use of natural science-oriented adaptive learning technologies (for example, chemistry course) in the vocational guidance phase.showed that. The level of motivation, learning activities and creative independence of students in the study of natural sciences and ecology has increased significantly, which has led to the formation of information and environmental culture and a conscious desire to enter the system of continuing vocational education.

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