

FORMATION OF THE INTELLECTUAL AND PROGNOSTIC POTENTIAL OF STUDENTS IN GRADES 7-9 IN CHEMISTRY LESSONS

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Annotation. This article highlights information about the formation of the intellectual and predictive potential of their students in chemistry lessons. When organizing lessons, several effective approaches and technologies for the development of intellectual abilities, general abilities of students, and creative abilities were considered.

Keywords. Ability, forecast, creative activity, development of intellectual capabilities, general abilities, analytical thinking, creative thinking, synthesizing skills.

INTRODUCTION

Today, one of the urgent issues in the field of education is to contribute to the economic and social development of the society by developing the informational, creative and flexible potential of the individual. In this regard, the importance of quality education is increasing. The development of students' intellectual abilities is especially important in teaching chemistry at school.

The development of intellectual abilities is an important aspect of the overall development of a person. It is an integral process of teaching chemistry aimed at increasing the system of chemical knowledge, intellectual skills, thinking style, leading to a qualitative change in cognitive competence, allowing students to successfully solve professional and life problems. [1].

LITERATURE ANALYSIS AND METHODOLOGY

used in psychological and pedagogical literature, and they are often analyzed together with abilities. These concepts represent a person's ability to acquire knowledge, solve problems, think creatively, and adapt to changing circumstances.

refers to a person's ability to solve problems, adapt to new situations, acquire knowledge and use his experience. Psychological research shows that there are different types of intelligence, for example, general intelligence and special intelligence in different fields (mathematical, linguistic, creative, etc.). The

development of intelligence depends on many factors, including genetic factors, environment, education and experience.

Intellectual abilities include the expression of intelligence through abilities such as problem solving, knowledge processing, and logical reasoning. These capabilities measure a person's thinking process and its various characteristics [2].

Intellectual capacity encompasses many qualities, such as analytical thinking, creative thinking, and synthesis skills.

General abilities are the main indicators of intelligence, which provide a common basis for all intellectual activities. An example of this is general intelligence, which represents a general level of ability to acquire knowledge and solve problems.

Special abilities are abilities of the mind that are specific to a certain field or type of activity. For example, mathematical abilities, linguistic abilities, musical abilities, etc. Special abilities are necessary for a person to achieve high results in specific areas.

S. I. Ojegov, the concept of "opportunity" is considered from three points of view: opportunity - appropriateness, acceptance of something; opportunity-favorable conditions, availability of conditions; opportunity - something that can be developed and serve as a source, basis for development. The philosophical interpretation of the concept of "possibility" is expressed in two necessary, objectively existing stages of development of any object, event - "possibility" and "reality". A possibility is something that does not yet exist at this time, but due to the influence of the laws of development of this subject, it can become a reality. According to S. L. Rubinstein, the intellectual development of a person is determined by the range of new opportunities that are opened by the realization of existing opportunities. According to academician U. Z. Zubaydov, the intellectual capabilities of a person are one of the main sources that form the basis of a self-sufficient, enterprising, productive life [3].

A forecast is a probable judgment based on scientific research about the future state of an event. There are two types of forecasting: natural-scientific forecasting and social forecasting. They are distinguished from each other by their characters. For example, the use of natural-scientific forecast in order to accelerate or prevent the occurrence of the predicted event is limited. Such forecasts include meteorological, hydrological, geological (on lithosphere phenomena), biological (for example, on

animal and plant diseases), medical-biological (on human diseases), scientific-technical, cosmological, physicochemical forecasts. The information obtained from social forecasts is so widely used in purposeful activities that people can unknowingly accelerate the occurrence of the predicted event by their actions. Such forecasts include forecasts of the general development of science and technology, social forecasts, economic forecasts, psychological forecasts, political forecasts and others. Forecasts also differ in their purpose. Some forecasts are made in order to determine the consequences of existing trends [4].

When analyzing the process of developing students' intellectual abilities in chemistry classes, the following main aspects are taken into account:

be used to develop intellectual abilities in chemistry education. These methods help to develop students' analytical thinking, problem solving and creative approaches. For example, experiential learning, project-based learning, and problem-based methods can be effective in this process.

2. Psychological-pedagogical theories: Leading psychological-pedagogical theories play an important role in the analysis of students' intellectual development. For example, Vygotsky's sociocultural theory or Piaget's theory of cognitive development can help students better understand the processes of learning and logical thinking.

It is necessary to analyze the functional and didactic significance of the development of intellectual abilities in the teaching of chemistry. Scientific knowledge and practical skills of students are interconnected, and successful organization of this process is required.

4. Contingent analysis: By analyzing the student contingent, the reasons for the low level of intellectual abilities in chemistry can be determined. These reasons may include factors such as insufficient support from teachers, the effectiveness of teaching methods, and the level of motivation of students.

5. Methods of solving problems: Various methods should be offered to overcome the shortcomings in the development of intellectual abilities of students. These methods include modernization of educational methods, improvement of professional qualifications of teachers, and expansion of the use of new technologies in the educational process.

DISCUSSION AND RESULTS

Intellectual and creative games stimulate the development of students' educational interests, contribute to the development of their intellectual and creative abilities, give children the opportunity to assert themselves through the game and realize themselves in the intellectual and creative sphere, reduce the lack of communication. helps to fill. Intellectual and creative games can be used not only in extracurricular and extracurricular activities, but also in classes (learning new material, repeating previous ones, monitoring student knowledge, etc.) [5].

For example, in the 7th grade, when the topic "The role and tasks of chemistry in our life" is taught to students, it is clear that the tasks of chemistry are very wide and important, that it plays a big role in our daily life, in industry, medicine, ecology and many other fields. is keyed. Students will be asked questions about the topic. Questions about the role of chemistry in our life can be formulated as follows. These questions will help you explore how chemistry plays a role in different fields:

1. What is the role of chemistry in the production of medicines?
2. What is the role of chemistry in cosmetics and cleaning products?
3. How does chemistry help in the production of nutrients and vitamins?
4. How does chemistry help in the production of new materials and plastics?
5. How does chemistry help in food preservation and conservation?

students' chemistry classes are enriched with additional materials and deeper study of the subject, for example, "Acids. It is possible to develop intellectual and creative abilities by conducting an extracurricular activity "Travel to the world of acids" on the topic "Synthetic and natural acids". A series of questions will be asked on the topic:

1. Which acid eats glass?
2. What acids are included in Tsarsho vodka?
3. What kind of acid is in gastric juice?
4. What kind of acid is added to give a sour taste to drinks?
5. What substance is there in mineral water and volcanic gases?
6. What acids are there in acid rain?

, it is important to develop students' creative abilities in studying chemistry. For example, in the 8th grade, from the topic "Introductory chemical concepts and laws", it is necessary to develop the ability to predict chemical concepts and laws in students, to increase their advanced thinking skills and to teach scientific methods. This process allows students to apply chemical laws and concepts to practical problems, predicting and analyzing results. Below are the approaches and methods used to develop students' ability to predict chemical concepts and laws:

Matter and its types: Explain to students the different forms of matter, such as elements, compounds, and mixtures.

Teaching types of reactions, reaction equations and their different methods.

Chemical Laws: Explanation of Avogadro's Law, Boyle's Law, Law of Equivalents etc. with practical examples. For example, measuring the volume of a gas. Modeling the effect of gases on temperature, pressure and volume.

of students' ability to analyze and predict results in laboratory experiments.

students' basic chemical concepts and the ability to predict laws will help them improve their scientific thinking skills. This process is carried out through practical training, laboratory experiments and real-life examples. By assessing students' ability to apply basic concepts and laws, they can deepen their knowledge and develop their practical skills.

In order to predict and prevent the corrosion of metals, it is necessary to determine their interaction with the environment and under what conditions they corrode faster when studying the topic "Corrosion of metals" for students of the 9th grade of chemistry. It is also important to analyze data on corrosion resistance of materials, protective measures and types of corrosion. This process will help students to analyze the corrosion of metals and provide practical advice on how to prevent it.

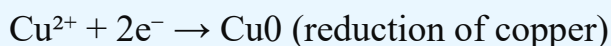
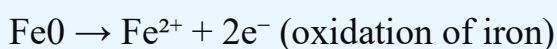
is a chemical or electrochemical process that occurs when metals and their alloys interact with the environment, resulting in changes in the composition and structure of the metal. Corrosion causes many practical problems, so it is important to anticipate and prevent them.

Students will begin to predict the concept of corrosion. Concepts are formed in different variants. Corrosion is the change of metal as a result of chemical or

electrochemical processes. This process often involves oxidation or melting of the metal. When metals interact with air and water, they corrode. Oxidation of metals, for example, oxidation of iron, that is, rusting of iron standing in moist air. Iron reacts with water and air to form iron oxide (rust).

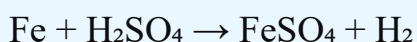


Corrosion in a galvanic cell, for example: Galvanic corrosion due to the reactivity of one metal to another. For example, galvanic corrosion can occur between an alloy of iron and copper or between aluminum and copper.



An example of chemical corrosion is the reaction of metal with acids and bases.

Reaction of iron and sulfuric acid:



Forecasting, assessment of environmental conditions: for example, the corrosion of iron depends on the humidity level and air content in the place of installation.

Prognosis: high humidity and oxidizing atmosphere lead to faster rusting of iron.

Forecasting requires acquisition and analysis of humidity and temperature data.

When choosing structural materials, for example, using stainless steel or aluminum instead of iron reduces the risk of corrosion. Corrosion resistance of materials is analyzed. Coating metals with protective paints or coatings can help prevent corrosion. To prevent corrosion, paints and coatings are selected according to different conditions.

to the students, their creative abilities are formed.

Galvanic corrosion occurs between aluminum and copper. Aluminum corrodes faster because it is a more active metal than copper.

Prevention: Applying insulating coatings between aluminum and copper reduces the possibility of galvanic corrosion.

studying chemistry, developing their interest in science is one of the main tasks that a teacher should solve in a modern school. Even DI Mendeleev emphasized that there is no education without emotions. Development is the process of achieving a

previously unachieved result. Development as an irreversible, directed and natural change of material and ideal objects resulting in their new qualitative state. Various approaches to understanding cognitive interest have been developed in pedagogical practice. Approaches are used in order to increase cognitive interest and make the educational process effective. Learning materials and activities tailored to students' interests and needs are provided to increase students' motivation. Also, this approach considers interest as a variable and dynamic state [6].

Cognitive interest is manifested in cognitive activity, in a clearly chosen direction to academic subjects, in valuable motivation, in which cognitive motives occupy the main place. It is characterized by the progressive movement of cognitive activity associated with the active search for information of interest to the student. The formation and development of cognitive interest in students takes place using various forms and methods of education. For this purpose, tasks that activate students' cognitive activity, individual, group, frontal tasks, didactic games, problem solving and, of course, chemical experiments can be used.

It is possible to propose the composition of the sinkway method as individual tasks that form students' interest in the subject. The name of the method may come from the English words "synthesis" and "analysis", but the term refers more to a special approach used in chemistry. This method can be used to discover new chemical elements and compounds, to study their properties. Cinquain is a semi-formal form used in chemistry or other fields to briefly express a concept or idea. It usually has 5 lines, each line consists of a certain number of words. Zinc can be very useful in chemistry to represent chemical elements, compounds or other concepts. Here are some examples of the Sinkwain method:

1. Acid (Acid): Name: Acid; Description: Aggressive, hot; Property: Proton donor; Example: Sulfuric acid (H_2SO_4); Similar to: Acid, hard, oxidizing
2. Hydrogen (Hydrogen): Name: Hydrogen; Description: Light, colorless; Feature: Simplest item; Example: H_2 ; Similar to: Gas, commonly used, flammable

show how the Sinkwein method can be used in chemistry. It helps to provide concise and clear information about each element or compound, which improves knowledge and facilitates understanding. In chemistry, the zinc-wein method is a method used in

the study and understanding of chemical elements. It mainly helps to study the structural properties of chemical elements and to better understand their interactions.

CONCLUSION

use new technologies and methods to develop students' creative abilities in chemistry classes. Modern educational methods help to activate students and express themselves freely in the learning process. Several effective approaches and technologies can be considered for the development of creative abilities in chemistry classes: interactive educational platforms and innovative technologies activate students [7].

Making chemistry lessons more effective and interesting will help develop students' creative abilities. It creates opportunities to develop active and creative cooperation between teachers and students, to make the educational process more successful.

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