NOVATEUR PUBLICATIONS
JournalNX- A Multidisciplinary Peer Reviewed Journal
ISSN No: 2581 - 4230
VOLUME 6, ISSUE 5, May -2020

METHODS OF FORMING STUDENTS NATURAL SCIENCE LITERACY IN CHEMISTRY LESSONS

RAZAKOV GULOMJON
Doctoral student of the TSPU
Named after Nizami

ABSTRACT:

In recent years, the Uzbek education system, as in the whole world is undergoing major changes, the new responsible approach is the need of continuous self-education for young people in secondary schools, mastering new information technologies, ability to cooperate and work in groups. These changes require some revision of both the content of training and approaches to identifying its effectiveness.

KEYWORDS: PISA, knowledge and skills, information, subjects of the natural science

INTRODUCTION:

These changes in education are reflected in the program of the international study PISA (program for International Student Assessment), the main purpose of which is to assess the readiness of students aged 15 to participate actively in society, i.e. their functional literacy. In the PISA 2000-2003 study [2] natural science literacy refers to "the ability to use natural science knowledge to identify problems in real situations that can be investigated and solved using scientific methods, to draw conclusions based on observations and experiments. These conclusions are necessary for understanding the world around us and the changes that human activity makes in it, and for making appropriate decisions."

Thus, the degree of development of students ' skills to use knowledge in situations close to real ones is revealed. In the future, such skills will contribute to the active participation of school graduates in the life of society, help them acquire new knowledge.

METHODS:

Performing the tasks of this research, students had to demonstrate: the ability to describe, explain and predict natural science phenomena; the ability to interpret scientific arguments and conclusions that they can meet in the media; understanding of research methods, identifying issues and problems that can be solve using scientific methods.

One of the characteristics of tasks for assessing natural science literacy is situations in which various problems are revealed. The situations offered to students in the tasks were related to everyday life of people, health preservation, use of natural science knowledge for the development of technology, and environmental problems.

Analyzing the results of the study, the specialists of the Center for quality assessment of education the leadership of G. S. Kovaleva identified significant shortcomings in the ability students to apply the knowledge and skills obtained at school in the context of life situations [2]. Based on a detailed analysis of the results, it was concluded that in the practice of teaching students do not meet the tasks:

- containing a large amount of text information, as well as information presented in the form of tables, diagrams, graphs, drawings, diagrams;

* compiled on the material of different subject areas, for the correct implementation of which it is necessary to integrate a variety of knowledge, use General academic skills, select and use appropriate ways of thinking, analysis, justification, communication, etc.;

• in which it is not clear which area of knowledge to turn to in order to determine the course of action or find the information necessary to pose and solve the problem;

• requiring additional information (including beyond the scope of the situation described in the task text) or, on the contrary, containing redundant information and «extra data»;

* Complex or structured, consisting of several interrelated questions: each question tests the mastery of a particular knowledge or skill, and a group of questions – some of their totality. According to the developers, this approach reflects the complexity of the real world to a greater extent and reduces the time spent on introducing students to the problem under consideration.

RESULTS:

As a result, the following characteristics of these tasks were identified:

• The condition is implicit and contains information that is not required to answer the question;

• The condition contains a lot of unnecessary details, but at the same time some of the necessary information is missing. In some cases, this information may be contained in the question;

• The necessary information is presented in different formats (text, graphs, tables, reference books, personal knowledge);

• The necessary information is set not in the logic of referring it to a specific subject (educational or scientific), but in the logic of a specific life situation (the condition is taken from life, not from a textbook);

• The shape of the response is not specified (or is specified in an implicit form).

These features show significant differences between such tasks and those that our students are used to solving in the classroom. And the most important difference is that their solutions do not fit into the framework of the usual algorithms.

To solve the problem in the PISA study, you need to apply (and therefore own them) the following General academic skills:

* differentiate, isolate the desired information;

* Search for information in different places: in the text of the question, based on your own knowledge or experience;

* highlight the actual question and additional information in the task, re-structure the question, and change its form;

* select the information needed to make a decision;

* dispose of the selected information to get a response;

* convert the issue to a relatively standard format;

* develop an action plan to find a solution;

• Constantly monitor the results of the program (constantly checking the progress of actions);

* keep the question in memory as a criterion for the correctness of the program;

* When performing actions, understand what is being obtained, discard unnecessary results, and check them;

* restore question-result relationships and convert the result to an answer;

* develop the response design and layout;

* consider the targeting of the issue.

These General academic skills are developed when learning to solve creative tasks [3, 4]. Creative tasks are rarely used in school practice. They require a fairly high qualification of the teacher and additional training time. However, we believe it is possible to gradually introduce elements of such tasks into everyday practice.

It is important to develop such training and control tasks, their typology, and develop methods for their use in chemistry lessons in primary school.

If you ask different people what the human body is made of, you will most likely get different answers. Some answers will use biological terms that refer to internal organs, bones, and so on. In others, it is possible to talk about such small "details" as proteins, fats, carbohydrates, and nucleic acids. Chemists are likely to immediately think of atoms and molecules, i.e. chemical elements and their compounds. All chemists know that the human body is not a mixture of chemical elements, but a mixture of chemical compounds, many of which are very complex.

The elements that make up the compounds that make up the human body can be divided into three types.

Macro elements (basic elements), they account for 2-60% of the total number of atoms of the entire organism; they include, for example, carbon and hydrogen (table 1).

Macronutrients in the human body

Proportion of atoms %

Oxygen 25,9

Carbon 11.0

Hydrogen 59.4

Nitrogen 2.39

Trace elements, their proportion are 0.01-1%, for example, calcium or phosphorus (table 2).

Microelements in the human body

Proportion of atoms %

Calcium 0,22

Sulfur is 0.13

Phosphorus 0.13

Potassium 0.04

Chlorine is 0,03

Sodium 0.03

Magnesium 0.01

Data on the elemental composition of the human body is presented in the form of text and tables. This is not always the best way to provide information. A chart, such as a sector chart or a column chart, may be more convenient.

Task 1:

a) Using the data in table 1, draw a sector diagram of the ratio of four macronutrients in the human body. The fifth sector will reflect the share of all trace elements.

b) Build a diagram in the form of columns.

C) Which way of presenting information is more visual and convenient for comparing data?

d) Perform a similar task using the data in table 2.

e) Give one reason why these methods of submitting information are not successful for comparing the generalized data in table 1 and table 2.

CONCLUSION:

Continuous self-education requires the ability to work with various sources of information (text and non-text). By performing the proposed task, students do not just get actual knowledge, but by presenting it in various ways, they learn to perceive non-textual information, evaluate it adequately, and choose methods for presenting their own knowledge in subsequent educational activities.

As the experience of pedagogical activity shows, a student can know the essence of the issue, but is not able to share his knowledge with others, i.e. his communicative competence is not formed. On the one hand, it is well known that a deep understanding of a subject is formed when you can talk about a very complex subject in a language that is accessible to your interlocutor. On the other hand, the conditions of the problem are set vaguely: when solving the problem, the student has to rely on their life experience, attract knowledge obtained in other subjects of the natural science cycle, make assumptions and accept or reject them.

The experience of using such tasks in chemistry lessons in the 8th grade shows that

the tasks considered and similar to them contribute to the formation of student's natural science literacy.

REFERENCES:

1) Component of the state standard of General secondary education. M: 2004, 487 p.
2) A new look at literacy. The results of the international study PISA 2000. Moscow: Logos, 2004, 296 p.
3) Orzhekovsky P. A., Davydov V. N., Titov N. A. Experimental creative tasks in inorganic chemistry. Moscow: 1999, 48 p.
4) Orzhekovsky P. A., Davydov V. N., Titov N. A., Bogomolova N. V. Creativity of students in practical classes in chemistry. Moscow: 1999, 152 p.