

Die Bedeutung des Einsatzes der Methode „Intellect Map“ zur Verbesserung des Chemieunterrichts

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Zusammenfassung: Der Artikel löst so wichtige Aufgaben im Chemieunterricht, wie den Schülern komplexes chemisches Wissen auf einfache Weise unter Verwendung moderner Unterrichtstechnologien, einschließlich der „Intellect-Map“-Methode, zu erklären, die Fähigkeit zu entwickeln, das erworbene Wissen in der Praxis anzuwenden und dadurch zu erhöhen Interesse am Fach Chemie in allgemein bildenden Schulen.

Schlüsselwörter: Leistung, Chemie, Kooperatives Lernen, Individualisieren, Instruieren, Lernpaket, Lehren, Wissen, Erklären.

The importance of using the Intellect Map method to improve chemistry education

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Abstract: The article solves such important tasks in teaching chemistry as explaining complex chemical knowledge to students in a simple way using modern teaching technologies, including the “Intellect- map” method, developing the ability to apply the knowledge gained in practice and thereby increase their interest in the subject of chemistry in general secondary schools.

Keywords: Achievement, Chemistry, Cooperative Learning, Individualized, Instruction, Learning Activity Package, teaching, knowledge, explaining.

At a time of renewal and development in various spheres of our life, society is putting high demands on school graduates to find their place in the future life, that is, to have scientific knowledge from various subjects, to implement existing knowledge in practice in familiar and unfamiliar situations, to be able to solve life problems through their own knowledge and creative thinking and others. To ensure that graduates have the potential to meet such high standards, it is necessary to organize quality lessons in general secondary schools, which provide basic knowledge in all subjects, to ensure the effective use of modern teaching methods by our teachers and they will have to enrich their skills and abilities, direct their activities to the development of creative thinking, diligence, creativity of the pupil.

If a pupil does not develop creativity, research, diligence, logical thinking in school, he/she will do only existing activities in the future, that pupil will not have the

ability such as to innovate, apply new approaches to their field, to invent, which, of course, has a negative impact on the country's development.

Chemistry is one of the experimental sciences. The theory without practice is nothing. As long as the pupil tries himself as a researcher, he will be able to master the material to the maximum. Effective and appropriate use of innovative teaching methods in the classroom helps to make the lesson interesting and understandable for pupils.

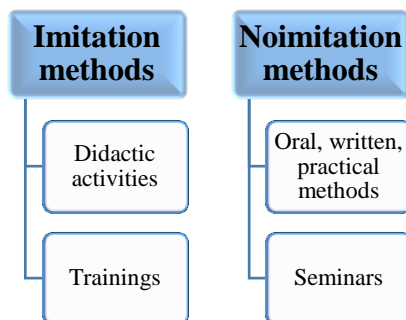


Figure 1. Educational methods

Taking into the needs of society account, the teacher should be able to use interesting and colorful methods in chemistry lessons and extracurricular activities, be in constant creative research in order to nurture a pupil, who is self-aware, able to take full advantage of computer technology in a modern information environment, able to work effectively, collaborate with the class team, and adequately assess their own strengths and weaknesses. Chemistry teachers should set the following goals:

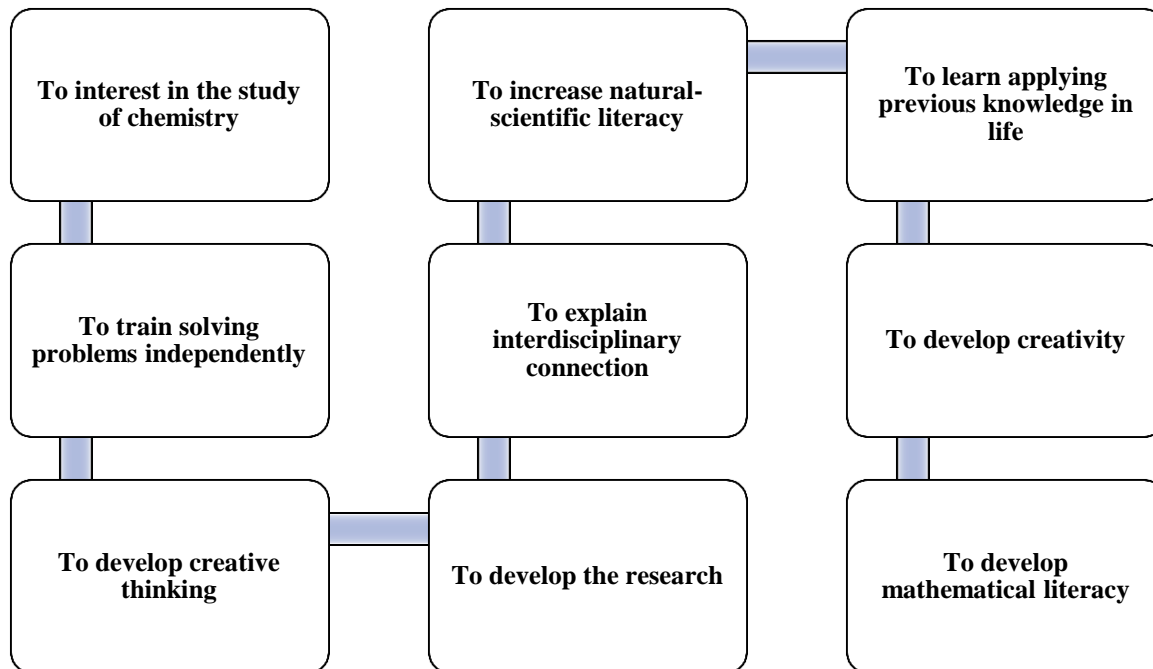


Figure 2. The main tasks of chemistry teachers

Besides traditional methods, it is advisable to use modern non-traditional methods in chemistry lessons, including the “Intellect-map” method. The human brain is a well-structured system that can be compared to a large, diverse, colorful storehouse of information in a variety of areas. When a person expresses an opinion on a certain topic, he uses speeches, stories, conversational methods in oral speech to express his

opinion clearly and understandably and more clearly, also uses visual and practical tools and complex using data structures and enriching them with diagrams, tables, lists, and so on. However, there is a more efficient and convenient way to work with such data today.

It is important to keep in mind in the “Explaining a New Topic” section of the lesson that expressed ideas and completely new information to the student should be presented in a systematic way, based on a specific order or rule. However, it is a bit more complicated to represent this type of information in a drawing, and it takes a lot of hard and long work to make a drawing in this form. The left hemisphere is responsible for this process. This method is one of the newest methods used in education today. The founder of this method was the British researcher Tony Bunzen, who called this method “Mind Maps”. He found that the human brain uses an average of only 5% based on the results of statistical studies. As a result of his many years of research, he wrote 82 works on the subject aimed at increasing the functioning of the human brain. Bunzen tried to study the functions of the brain from the university library. By generalizing features of the brain such as intuition, memory, analysis, reporting, and control, he explored the effects of using it on the learning process. In doing so, he sought to study the process of thinking and comprehension through the medical and physiological literature in relation to the brain and its properties. Even Leonardo Da Vinci realized that he wrote in a completely different way than the others.

“Intellect- map” is a graphical representation of the process of human thinking on a particular topic. The level of memorization of information also depends on the order in which it is given by the teacher. In the 1970s, Tony Bunzen proposed the creation of diagrams in the form of intersecting diagrams using the right hemisphere, which he called “Intellect Map” or “Mental Map”. “Mental map”s are devoted to a specific topic of a particular subject and are a hierarchical representation of the relevant sequence of information on that topic. They tried to use different colors, including red, which was connected to emotions, green one to nature.

To create an intellect- map, the researcher must first do the following:

1. Identify the main aspects of the topic.
2. Search for relevant and related information on this topic.
3. Select the most important information from the collected data.

To create them, you first need to write a term in the middle that contains the central idea. The process of creating an intellect map is a complex creative process, and in the process of its creation, each network is the basis for the next network, which brings together the next chain of ideas. The “Intellect Map” should contain the following words: introduction, argument, conclusion, example, style, attitude, fact. The advantages of the “Intellect Map” method over the traditional methods of presenting information in explaining the topic are:

1. When explaining the topic in this way, there is less information that students need to write, the ideas are presented in a very simple, clear, consistent manner, and in a way that captures the reader’s attention. Taking into account the age

characteristics of the students in the school, the use of methods that help them to concentrate in the classroom will help to achieve the goals set in the lesson.

2. In order to understand the topic, it is enough to look at the diagram once and for all, to understand the relationship and logical sequence between the given ideas. Everything is in place and clear.

3. When using “intellect-maps” in the educational process, a person develops the ability to think (creatively and logically), memory and imagination, which allows to use both hemispheres of the brain fully.

These following steps should be taken in order to create an “Intelligence Map” on a topic in chemistry lessons

1. To start working with maps, take a sheet of paper and think about your idea or project. Once you have chosen a project topic, write down all the ideas about the project and do not criticize or limit yourself. The central point of the map is to put a concept, a problem. The central idea can also be expressed in the form of an image or picture, using three or more colors for the image. The ideas given later for branching are considered to be a logical continuation of this central idea depending on the size of the map and the importance of the ideas presented in it. In this case, all the received information is expressed in writing. The left hemisphere of the human brain is responsible for reading and speaking, and the right hemisphere is responsible for understanding figurative images. The more colorful and visual the information provided, the deeper the understanding of the topic will be for the pupils. Such mental maps can be used at any stage of the lesson process.

2. Reflection phase. At this stage, questionnaires will be taken. The questions such as “What are your new insights?”, “What are your new lesson ideas?” are asked from pupils. In the next stage, we will continue the ideas given in the second stage. We write down ideas that can reveal the essence of the ideas expressed earlier.

3. Complexing the training. According to Bunzen’s viewpoint, writing a summary in table form using several different colored pens has a positive effect on the quality of education. We can also use diagrams, charts, and pictures instead of text to make the map look better and the ideas more consistent. Change the font size, line thickness, and graphic size. Mark important data blocks with lines. Use as many unifying images and shapes as possible to present emotional expression on the map. There are not firm rules for the use of colors and images, as everyone’s associative connections are diverse. The bright images of the map allow you to remember it better. When creating these drawings by hand, it is important that the drawing is high quality, clean, beautiful and eye-catching. Important aspect of technology is that it is not only a means of visually presenting the thought process, but also a means of diagnosing it.

Step 4. Filling in the gaps in knowledge and understanding. Cards will be distributed to pupils. The card is painted in green for 10-9 points, yellow for 5-6 points, red for 1-3 points. The first is understandable, the second is partially understandable, and the third is incomprehensible.

The areas of application of the “Intellect- Map” method are very diverse:

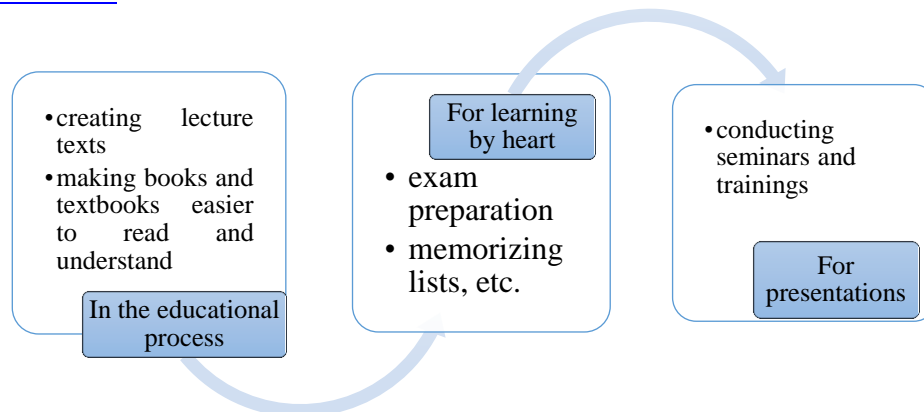


Figure 3. Fields of application of the “intellect-map” method

“Intellect map” can be created on a computer using special software. There are ready-made templates, using which you can create a map easily and quickly. There are several such special programs on the internet: paid and free ones. The names and functions of some useful links are explained below:

1. Coggle (web) - for beginners.
2. Mindly - (macOS, IOS, Android) - for mobile use;
3. Draw.io (web, macOS, Linux, Windows, Chrome OS) - free;
4. iMindMap (macOS, Windows) - for analyzing the map deeply;
5. MindMup - web) - create mass intelligence cards;
6. MindMeister (web, iOS, Android, macOS, Windows) - for teamwork;
7. SmartDraw - web) - for linear intelligence cards;
8. SimpleMind (macOS, Windows, iOS, Android) -to create intelligence cards from PDF files;
9. LucidChart (web, iOS, Android) - for those, who want to create a real flow chart, not just a card.

This method, created by Tony Buzen, helps to restore vivid, fast thinking ability, improves memory, develops creativity, and helps to make connections between our minds and senses in finding answers to all questions. As a result, a person will be able to solve any question or problem quickly and correctly. Today, the method is widely used by more than 250 million people worldwide. Motivating students using such active methods is the basis of modern investigation.

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