

Methodology For Compiling And Solving Methodological Issues On Topics

Tashbaeva Shoira Kasimovna

Senior teacher of Chemistry Department
Gulistan State University
E-mail: kasimovna@jmail.com

ABSTRACT

The article reveals the most important conditions for solving problematic education and issues in chemistry lessons to increase the effectiveness of the educational process in higher educational institutions.

Keywords:

Pedagogical Technology, Process, Workshop, Problem, Metals, Experiment, Chemistry, Experiment, Method.

The application of modern pedagogical technologies to the educational process requires, first of all, the humanization and democratization of pedagogical relations. Because any pedagogical technology applied without humanizing and democratizing pedagogical relations does not give the expected effect.

Pedagogical technology is a technologically advanced educational event that, based on the needs of society, effectively forms the predetermined qualities of a person and, looking at the educational process as a system aimed at a specific goal, evaluates the influence of its constituent entities, that is, the teacher (pedagogue), indicated in a certain sequence in a given context to students using [1]. An important condition for increasing the effectiveness of the educational process in higher educational institutions is a systematic approach to this process, and the following types of classes are recommended for teachers:

1. Lecture (introductory lecture, thematic lecture, generalizing lecture) classes.
2. Seminar (strengthening knowledge,

designed to independently acquire new knowledge) classes.

3. Modular lesson.
4. Problematic (brainstorming) lessons.
5. Discussion (scientific discussion and free thinking) lessons.
6. Didactic-playful (plot-role-playing, creative, business people, conferences, game exercises) lessons.
7. Test (didactic cards, test tasks, conducted using a cross-control sheet, through information technology control programs) classes [20].

A special aspect of these lessons is based on the problem situations that arise during the lesson.

Modern educational technology in higher educational institutions [2] is the solution to the problem by researching problem teaching. Educational technology, on the other hand, consists in educating the developing educational process, the process of active study of the problem teaching task, conducting research work and the method of thinking.

In the process of problematic teaching,

the student's management of being free and independent is much more effective than comparing reproductive learning methods. The purpose of problem-learning is to search for answers to educational issues, problems and questions in the process of working with students, to master new chemical knowledge along with ways to solve them, to be able to arouse interest in them by giving their thoughts to the teacher (pedagogue) on solving when situations arise regarding the problem lesson process in.

In the course of chemistry of Higher Education, the topic "metals" is almost always one of the subjects that are experimented with in each lesson. The nature of the experiments used (visual experience, practical work and laboratory experiments) is determined by the degree of complexity of the experiment and the nature of the cognitive task carried out in the lesson [2]. As you know, most of the experiments carried out in the chemistry course. it is pictorial and is used only to confirm the phenomena studied. At the same time, students of stage 1-2 and 3 are advised to show not only visual experiences, but also those that have a problematic nature, since they provide activation of students' cognitive activity, teach independent thinking, develop interest in science, expand their knowledge, scientific worldview. Problematic questions that are formed in the process of showing chemical experience students:

- to formulate hypotheses;
- to solve theoretical issues;
- encourages to draw the right conclusions.

Thus, in the course of chemistry, the use

of problem experiments in teaching the topic "metals" is always relevant. Therefore, a pedagogical experiment was carried out to develop a methodology for conducting problem experiments and check the effectiveness of this methodology. The experiment was carried out in the direction of "chemistry and methods of its teaching".

Stages of the experiment:

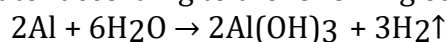
- Conducting problematic experiments in the study of the topics of the "metals" section;
- Testing;
- Conducting a questionnaire survey;

The reason for the choice of topics in the "metals" section is that students often make mistakes when writing equations on the reactions of the interaction of metals with water and acids. The results of the experiment were discussed in the form of a heuristic conversation. We will consider the methodology for organizing experiments using a problematic approach using two specific examples.

1-experience. The interaction of active metals with water. Laboratory equipment and reagents: aluminum Al (granule), sodium na, phenolphthalein, Crystallizer. Progress of work:

For the experiment, we take samples of two active metals (see the series of voltages of metals): Al (granules) and na. Add 2-5 drops of phenolphthalein to the water-filled Crystallizer and pre-purified from kerosene (with dry filter paper) and dried a little na, and put aluminum granule in a test tube with water.

All active metals react with water. Aluminum, being a very active metal, must react with water according to the following equation:



Observations:

Sodium – Na	Aluminum – Al
sodium "runs" on the surface of the water and quickly reacts with it, completely disappearing, and the water turns pink-dark red. $2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2\uparrow$	no signs of a chemical reaction are observed in an aluminum test tube

Problem: there are no symptoms of a chemical reaction with aluminum Al - active metal water?

Discussion of the problem: aluminum is usually protected by an Al_2O_3 oxide film. It is this oxide film that protects aluminum from

active exposure to water, if it is removed, aluminum actively reacts with water.

2-experience. Metallarning acid bilan Reagentlar and giohozlar effect: aluminum Al (granular), occurs Zn granular), HCl 40% acid chloride, phenolphthalein; test tube.

Observations:

Zn	Al
the reaction goes violently, with gas release, phenol-phthalein does not change color $2\text{HCl} + \text{Zn} \rightarrow \text{ZnCl}_2 + \text{H}_2\uparrow$	dastlab, reaction of alomatlari kuzatilmaydi, keyin reaction of shiddatli tarzda gas azhralishi bilan borodin, phenolphthalein rangi yzgarmaydi $6\text{HCl} + 2\text{Al} \rightarrow 2\text{AlCl}_3 + 3\text{H}_2\uparrow$

The problem: all the metals obtained are active, but do they react differently to acid? In particular, aluminum and zinc. Both metals are located close to each other in the asset series of metals, the values of their standard electrode potentials are close to each other

$E^\circ (\text{Al}^{3+}/\text{Al}) = -1,66 \text{ eB}$, $E^\circ (\text{Zn}^{2+}/\text{Zn}) = -0,76 \text{ eB}$.

1-during the meeting, the parties expressed satisfaction with the development of cooperation between Tajikistan and China, as well as the development of cooperation between Tajikistan and China, as well as the development of cooperation between Tajikistan and China.

Shunning like alum sirte yuzasidagg piles of aluminum foil oxide retired suv bilan affects this area, but also the acid-base shell protects as much as possible. Oxide pardaning puff gas furnace refractory aluminum wire isitish orkali tekshirildi. Aluminum melts inside the Al_2O_3 capsule, so its oxide film walls prevent aluminum from leaking when aluminum is heated.

Conclusions from experiments: according to the series of voltages of metals, metals that stand up to hydrogen displace it from an acid solution (as an exception: alkali and alkaline earth metals: they react with water that dissolves acids).

After the subject was studied, a test was carried out on the topics of the "metals" section to check the knowledge of students. To test the effectiveness of the selected method, we used

Progress of work:

3 ml in two numbered test tubes. from 40% HCl solution, Add 2-3 drops of phenolphthalein and place Zn in one and Al granules in the other. Pour a small amount (about 2 cm in height) of 40% HCl solution into a small Crystallizer.

the criterion of the degree of mastery of the subject (mod).

The result of the pedagogical experiment was calculated according to the following formula: degree of mastery of the subject = $\frac{N_5 \cdot 1 + N_4 \cdot 0,64 + N_3 \cdot 0,36 + N_2 \cdot 0,36}{N} \times 100\%$;

N_5 - here is the number of students who rated the Grade " 5 " (In percent);

N_4 - the number of students who rated the Grade " 4 " (In percent);

N_3 - the number of students who rated the Grade " 3 " (In percent);

N_2 - the number of students who rated the Grade " 2 " (In percent);

N is the total number of students in the group (in percent).

The result is up to 60% – the student's level of mastery of the subject (low).

The result is from 60 to 70% - the degree of mastery of the subject (average).

The result is 70% or higher - the degree of mastery of the subject (higher).

The study results in the group of students under study showed the following result: degree of mastery of the subject = $1 \cdot 1 + 6 \cdot 0,64 + 2 \cdot 0,36 + 0,9 \times 100\% = 61,8\%$.

The degree of mastery of the subject showed an average result. A survey was also conducted to determine the effectiveness of this problematic teaching method.

The survey involved 42 students from Stage 1 and 2 students.

The analysis of the study showed that all

students who participated in the survey were interested in modeling the situation when replicating chemical experiments. All surveys noted that there were no difficulties in perceiving the new material taught in the problem education system, noting that students wanted these classes to be used more to explain the new material.

Based on the comparison of the initial and final results of the test, as a result of the experiments carried out during the lesson, it was found that students developed the ability to explain the interaction of certain metals with acids and alkalis, the general chemical properties of metals, which helped to effectively master this topic.

In conclusion, Our research suggests that problematic teaching in visual experiments allows students to actively apply previously acquired knowledge and skills, helps to increase the level of knowledge, the level of understanding of chemical phenomena, and also allows them to gain experience in specific solutions to problematic and creative tasks.

In order for problematic teaching in the educational process to be effective, purposeful, it is necessary to make it part of the basis of the educational process, educational work. With the help of problem Education, a critical approach to solving educational problems and specialty issues in students is carried out, the formation of the skill of learning independently. Thus, problem education contributes to the effective assimilation of students in their cognitive systems and mental and practical activities, is able to effectively use the new knowledge they have mastered in future situations, find speed, distance and time through information technology, through various creative tasks this skill should be turned into a skill, knowledge of educational problems, teaching independent research, gaining creative experience and developing it. After all, studying the issue to work correctly and accurately is considered the main tool that serves to develop logical thinking.

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