

The Practical Importance of the Use of Innovative Educational Technologies in the Teaching of Technical Sciences

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Abstract: *One of the actual problems of today's modern education system is undoubtedly the new, innovative pedagogical technologies. The conduct or organization of the teaching process through these pedagogical technologies serves as a great way for students to think freely and innovatively. Today's high advances in science, engineering, technology, and manufacturing are automatically putting new social demands on the agenda. Among these social demands, it is important to improve the system, which is the driving force behind the development of society, as well as the development of industries. Although the need for training qualified personnel has emerged in the early stages of industrial development, it has not lost its relevance. The main reasons for this are the emergence of new directions, specialties in connection with the social, economic and cultural development of society, the need for training in them, the professional knowledge, skills and abilities of specialists in a changing, fast-paced period. The formation of a need for consistent growth, as well as an increase in the demand for the ability to withstand strong competition in the labor market as a specialist. This study theoretically and practically analyzes the priorities of the development of the subject "Theory of Hydrometallurgical Processes" and the role and importance of advanced educational technologies in teaching science, and developed a report on "Kinetics and mechanism of selective melting" using modern pedagogical and information technologies. Recommendations have also been developed to improve science teaching. The theoretical and practical significance of the research is determined by the fact that higher education institutions have developed recommendations for the development of high-efficiency methods in the formation of knowledge, skills and abilities of students in the field of "Theory of Hydrometallurgical Processes".*

Keywords— education, pedagogy, metallurgy, pedagogical technology, pedagogical method, hydrometallurgy, "Digest", "Quick question", "Find the metal!".

1. INTRODUCTION

Relevance of the research topic and its justification. One of the most important issues highlighted in the concept of economic development of Uzbekistan is the rational and integrated use of the country's rich mineral resources. One of the main and important directions of the metallurgical industry of Uzbekistan is the involvement in the extraction and production of large metal-bearing deposits located in the territory of the republic [1]. In particular, President Mirziyoyev Shavkat Miromanovich in his speech at the Oliy Majlis on the strategic issues of the Republic of Uzbekistan for the next five years, taking into account the proposals received during the discussion of the draft Action Strategy for further development of Uzbekistan in 2017-2021. and suggested the priorities of the social program: "... No country in the world today, including the Republic of Uzbekistan, is a separate region. These countries are part of certain geographical and political systems of world economic relations. There are not many countries on the world map that have the wealth of Uzbekistan. It is clear that this will attract the attention of world-renowned foreign companies and banks" [2].

Uzbekistan has proven reserves and prospects for a

number of minerals (metals), one of the leading not only in the CIS, but also in the world.

Also, in the framework of the Anti-Crisis Program adopted in the Republic in the context of the pandemic in 2020, it is planned to take measures to increase the competitiveness of enterprises through the introduction of austerity measures, incentives to reduce production costs and production costs [3].

In view of the above, the creation of new modern technologies and production equipment in the metallurgical industry, their introduction into production, acceleration of existing technological processes and the study of kinetics and mechanisms of technological problems and their rational solutions are the current issues of modern hydrometallurgical industry, in this regard, extensive work is being carried out in our country [4]. It is necessary to train highly qualified, well-educated specialists to carry out this work. Vocational education in our country should reach such a level that such education should be able to provide competitive training in our country and abroad, taking into account future developments in science, engineering and technology, as well as the economy [5].

Object and subject of research. The subject of the topic is theoretical and practical issues on the topic "Kinetics and mechanism of selective melting" of the subject "Theory of

hydrometallurgical processes" taught to students of metallurgical education in higher education institutions.

The subject of the subject is a deeper scientific study of the essence of the subject "Theory of Hydrometallurgical Processes" in higher education, the study of factors influencing the process of selective melting, showing the kinetics and mechanism of physical and chemical phenomena. technology, presentations, slides, and interactive methods.

Objectives and tasks of the research. The purpose of the study is to develop students' knowledge, skills and competencies in the kinetics and mechanism of physicochemical reactions that occur during selective melting operations in hydrometallurgical processes.

The task of the study is classified as follows:

- discuss the essence of the selective melting process;
- Classification of factors affecting the rate of selective melting;
- Explain the mechanism of selective melting;
- to highlight the role of internal and external diffusion layers in selective melting;
- to consider ways to accelerate the process of selective melting and to teach the optimal parameters.

The scientific, theoretical, computational and practical laws of science are studied with the help of lectures, computational-practical work, educational and technical literature, as well as in the process of independent learning and independent work.

2. ANALYSIS OF FOREIGN AND NATIONAL LITERATURE RELATED TO THE STUDY

Hydrometallurgy (hydro - water and metallurgeo - mining, metal processing) - is a branch of science and industry on the separation of metals from ores, concentrates and wastes with aqueous solutions of various reagents, and then the separation of metals from solutions. Already in the 16th century, copper metal was extracted from the ores of the Rio Tinto deposit (Spain) using aqueous solutions of solvent reagents. Later, hydrometallurgical methods for the production of platinum, nickel, aluminum from bauxite in Russia, gold in New Zealand, zinc and others in Canada and the United States were developed [6].

To the theory and practice of hydrometallurgy P.R. Bagration discovered the theory of separation of gold by cyanide (1843), and N.N. Beketov and other Russian scientists made significant contributions to the development of hydrometallurgy by developing methods for obtaining metal powders using hydrogen under pressure [7]. In the 1920s, V.G. Chlopin developed the theoretical foundations of radium hydrometallurgy, in the 1930s the theory of the separation of heavy non-ferrous metals, and Plaksin the gold. In particular, academician B.N. Lascorin invented hydrometallurgical methods in the production of aluminum, zinc, copper, cobalt, nickel, uranium, rare and rare metals, and was widely used in the metallurgical industry. More than 20% of copper production abroad, 50-70% of zinc and nickel,

metals such as aluminum, uranium, cadmium, cobalt are extracted by 100% hydrometallurgical methods [8].

Technological processes of hydrometallurgy include: grinding, crushing, concentrating or filtering of mineral grains to the surface, washing and dehydration, transfer of metals and other components into solution, separation of metals from solution by various methods, as well as cleaning and pre-treatment of finished products. give [9]. Preparation processes such as firing, auxiliary and thermal activation are also used to improve the properties of the raw materials. These operations facilitate the conversion of metals into soluble compounds [10].

The subject "Theory of hydrometallurgical processes" is one of the basic disciplines aimed at training highly qualified personnel. Theoretical metallurgy occupies an intermediate position between the fundamental and technological sciences. As a result of the knowledge gained through the study of these disciplines, the student has the opportunity to solve complex practical and theoretical problems, and the knowledge gained from all the fundamental disciplines contributes to the in-depth study of metallurgy. Hydrometallurgy refers not only to the field of technology, but also to substances and their properties, as well as the laws that take place in them, processes such as metallurgical processing [11].

The subject "Theory of hydrometallurgical processes" helps young professionals to easily master the complex processes in production and research [12]. Theoretical metallurgy is the scientific core of the study of new technological schemes and processes. Another important aspect of this course is that it requires a thorough study of modern scientific literature, research and other technological specialties [13].

This subject is intended for students of higher educational institutions, and as far as possible it covers all the topics of the course "Theory of Hydrometallurgical Processes". The use of visual aids (diagrams, pictures, graphics), ie infographics, to make the topics in the subject "Theory of hydrometallurgical processes" relatively easier, helps the student to quickly and accurately master complex information, to dispel the world of imagination [14].

Current literature (textbooks and manuals), electronic textbooks, guidelines and video information technology are used in teaching the subject of the theory of hydrometallurgical processes. Along with the use of new literature published in recent years in the teaching of this subject, professors and teachers of the department of "Metallurgy" TSTU A.A. Yusupxodjaev, Sh.T. Hojiev and Q.T. It is advisable to use the textbook on "Theory of hydrometallurgical processes" written by Ochildiev, as well as guidelines for practical training and laboratory work under the guidance of the same authors. In addition, among the available local literature, a textbook "Theory and tools of hydrometallurgical processes" authored by a professor of the Almalyk branch of Tashkent State Technical University has long been imparting knowledge to students.

The development of modern education has given rise to a new direction - innovative pedagogy. In this regard, the study

of advanced hydrometallurgical technologies of the world is becoming a requirement of the times. The study of these innovative technologies is carried out through the search, reading and analysis of foreign literature. Among the foreign scientists engaged in the theoretical and practical foundations of hydrometallurgical processes are U. Namil, Ch.K. Gupta, T. Havlik, S. Seetharaman, Davenport W.G., King M., Schlesinger M., Biswas A.K., M.D. Turan, Medvedev A.S., Bogatyryova E.V., Stepanov B.A., Khudoyarov S.R., Zelikman A.N., Luganov V.A., Baykonurova A.O., Sajin E.N., Petukhov O.F., Tolstov E.A. we can include experts such as.

All these textbooks and manuals are written in general on the subject of "Theory of hydrometallurgical processes", which includes the theoretical basis, the laws of the process and their application in the practice of hydrometallurgical plants, as well as practical training. In addition, after each chapter, model problem-solving techniques and additional assignments for independent solution are given in order to strengthen students' knowledge. These textbooks and manuals can be used not only by students and masters of the field, but also by engineers and technologists working in industrial enterprises.

3. THE IMPORTANCE OF INNOVATIVE EDUCATIONAL TECHNOLOGIES USED IN TEACHING THE SUBJECT "THEORY OF HYDROMETALLURGICAL PROCESSES"

Before Nowadays, there is a growing interest in the use of interactive methods, innovative technologies, pedagogical and information technologies in the educational process. it teaches them to find their own knowledge, to study and analyze it independently, and even to draw their own conclusions. In this process, the teacher creates conditions for the development, formation, acquisition and upbringing of the individual, and at the same time performs the function of management, direction. In the educational process, the student becomes the main figure. We can use the following modern teaching methods in teaching the subject "Theory of hydrometallurgical processes":

Lecture. Lecture is an oral form of information transmission, during which means of clarity are used. The advantage of the lecture is that the students will have a large amount of information, the teacher can easily control the content and consistency of the presentation even in the presence of many students in the audience. Disadvantages of the lecture include the lack of feedback from students, their inability to take into account their initial knowledge and skills, and their strict adherence to specific audiences and tables [15].

Training. Training is a method of teaching that is a practical aspect of the pedagogical process and the theoretical aspect is only of secondary importance. The benefits of the training are to explore the problem from different perspectives and capture the subtleties of the topic, prepare students to act in real-life situations, as well as increase their motivation and create a positive emotional environment. The main and main drawbacks of the training are that students must be supported

and rewarded after the process is over, otherwise the acquired knowledge, skills and competencies will be lost.

Modular training. Modular learning is the division of learning information into several relatively independent parts called modules. Each of the modules includes its own objectives and methods of providing information. The positive features of the modular learning method are its selectivity, flexibility, and the ability to reposition its structural modules. The disadvantages are related to the different assimilation of the training material and its inexpediency. In addition, the logical connection of the information modules may be lost, resulting in distraction of the student [16].

Distance learning. Distance learning means the use of telecommunications in the pedagogical process, which allows the teacher to teach students from a distance. The positive features of the method are the ability to attract a large number of students, the ability to teach at home, the ability to choose the most appropriate time for students, and the ability to transfer the results of the learning process to various electronic media. The shortcomings here can be attributed to the high demands on the technical equipment of the pedagogical process, the lack of visual communication between teacher and student and, consequently, its low motivation [17].

Digest method. The general meaning of the word "digest" is a collection of brief information about certain areas, topics, processes related to or occurring in them, documents related to events, events, articles, news. A digest in the field of education is a collection of brief information on documents, articles, news related to the education system. For example, it is a collection of brief information on regulations on admission to higher education institutions, expulsion or transfer of students, regulations on innovations and changes adopted [18].

Mental attack. The method of mental attack involves working together in small groups, the main purpose of which is to solve a specific problem. The ideas presented at the beginning of the mental attack are initially collected without any criticism and discussed in later stages, and one of them is the most effective. Brainstorming is effective because it allows even students with minimal knowledge and skills to participate, does not require perfect preparation, develops students' ability to think quickly and participate in group work, has minimal stress effects, develops a culture of communication and discussion. develops the ability to participate. However, this method is not very effective in solving complex problems, does not allow to determine the exact performance indicators of the solutions, complicates the process of determining the best idea of the author, and can distract students from the topic [19].

Rotation method. The rotation method is to reinforce the knowledge of the students in different roles during the lesson process so that they can have a multifaceted experience. The advantage of the method is that it has a positive effect on the motivation of students, helps to overcome the negative effects of regular activities and expand the scope of communication.

The "leader-follower" method. Under this method, a single student (or group) joins a more experienced student (or group) to acquire foreign skills and competencies. The advantages of the method are its simplicity, faster adaptation of students to new activities and increased communication skills. The difficulty is that the student is not always able to understand the deep psychological reasons for making a decision with an experienced partner.

The "pilot" method. Such a simple word is a way of solving topical issues related to the topic or problems currently being studied through the exchange of information and ideas, resulting in an opportunity for students to improve their skills. The advantages of this method are that it depends on real situations in the learning process, as well as giving students the opportunity to use an emotional-governance and meaning-problem approach in decision-making. Shortcomings require that the teacher or debating supervisor pay attention to important details and create competent generalizations to present to students. It is also more likely to have a negative emotional color, including abstract debates.

Mythologists. The method of mythology involves the search for specific ways to solve problems that arise in real conditions. Such a search is based on a metaphor, that is, a non-existent scenario similar to the existing ones is developed. The positive features of the method are the formation of creative pursuits of students to solve problems, develop creative thinking and reduce the level of anxiety of students in the face of new tasks and problems. Negative thoughts reduce attention to logic and actions that are considered reasonable in real situations.

Experience sharing. The experience exchange method involves a short-term transfer of the student to other locations (including other countries) and subsequent return. The experience provided helps to unite the team, improve the quality of communication and expand knowledge. The disadvantage of the method is the possibility of the emergence of stressful situations in the new location, which are associated with the difficulties of personal and technical planning.

Subject discussion. The method of thematic debate is to address specific problems in a particular area of any discipline. This method is similar to the mental attack method, but it differs in that the discussion process is limited to a certain scope. The advantages of this method are related to the fact that the information base of students on the topic under discussion is expanded and the ability to solve specific tasks is formed. The disadvantage can be called the complexity of problem solving, as this goal can only be achieved if the teacher or discussion leader has the ability to convey information clearly and in detail to less informed participants.

Participation in official events. Participation in formal events allows students to participate in exhibitions, conferences, etc. it is important to evaluate the event and compile a short report and then present it to the teacher. It is also planned to prepare and study practical issues and problems related to the topic of the event. The positive aspects of the method are to mobilize the student to search for the


relevant topic of the information event, to develop business communication skills, to improve analytical skills. According to the shortcomings, the emotions and impressions gained after the event can distort the true objective assessment.

Use of information and computer technologies. It is clear from the name of the essence of the presented method - in the pedagogical process computers, laptops, digital projectors, etc. modern, high-tech means of information transmission such as It is presented by the students along with the information being studied (video materials, graphics, etc.) and the object, event or process being studied can be shown in animated form. The advantage of the method is that the presentation of teaching materials can be dynamic, individual elements of the material can be repeated at any time, the teacher can provide students with copies of materials, i.e. in special conditions for later study, such as in the classroom or classroom. The disadvantages are that in many cases there is no interactive communication, the individual characteristics of the students are not taken into account in the process of using the method, and the teacher is not able to have a motivating effect on his students. And separately, as an independent method, we need to talk about special training simulators.

4. ANALYSIS OF NEW PEDAGOGICAL METHODS DEVELOPED ON THE TOPIC

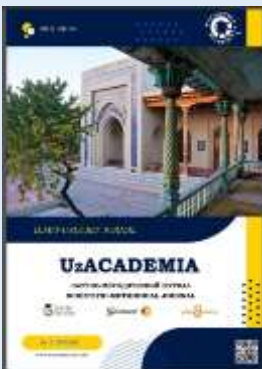
After Pedagogical methods on this topic, such as "Digest", "Quick question", "Find the metal!". The following are the scientific developments of the tested methods on the topic and their results in the teaching process:

4.1. Development of the Digest method New scientific information I:

Source name: International scientific journal "Young Scientist", No. 17 (255), part I. -Kazan: Publishing House "Young Scientist", 2019. pp. 47 - 49.	
	Heading: Metallurgy
Article title:	Development of waste-free technology for gold production
Authors:	Safarov A.Kh., Khojiev Sh.T.
The main content:	
The article discusses the possibility of obtaining additional metal from man-made waste of Navoi Mining and Metallurgical Combine. The plant is said to have accumulated a large amount of gold and silver production waste. By processing these materials, gold, silver and other precious metals can be additionally obtained. By applying this process, the ecology of the environment is improved. The	

	established low-waste production technology simplifies logistics and reduces the cost of raw materials. This is particularly reflected in lower cost prices and costs, resulting in increased profits [20].
	Internet resources: www.moluch.ru

New scientific information II:

Source name: UzACADEMIA: scientific-methodical journal, Vol. 2, Issue 1(12), 2021. pp. 6-16.		
	Heading: Metallurgy	
	Article title: Some thermodynamic aspects of aminothermal reduction of metal oxides	
	Authors: Hojiyev Sh.T., Mirsaotov S.U., Ergasheva M.S.	
	The main content:	
	In the scientific article presented to your attention, the technology of using a new (innovative) method in the hydrometallurgical production of copper metal is proposed. At the same time, solid wastes such as toxic gases and slag are not released during copper production. The thermodynamic possibilities of implementing the proposed innovative technology are mentioned. The authors introduced a new term to science - the concept of "aminothermia" [21].	
Internet resources: www.researchgate.com		

2	What is the most toxic metal?	2	Mercury
3	What is the most commonly used metal in the industry?	3	Iron
4	Which is the most unique metal?	4	Rhenium
5	What is the most musically resonant metal?	5	Dysprosium
6	Which is the most inert metal?	6	Copernicium
7	Which is the most stubborn metal?	7	Palladium
8	Which is the most volatile metal?	8	Hassium
9	Which metal has the longest name?	9	Protactinium
10	Which is the most chemically active metal?	10	Francium
11	Which metal has the most heat and electrical conductivity?	11	Silver
12	Which is the most expensive metal?	12	Californium

It is better to use the "digest" method mainly in the middle of the lesson. The reason is that students must have understood the essence of the main topic before hearing the scientific news of the field presented to them in this way. The effect of the Digest method is that the student has the opportunity to learn about the relevance of the study of the topic, not only the news of local production on this topic, but also new research around the world. When using this method, the student also comes up with creative ideas about improving existing technologies.

4.2. Development of "Quick question" method under the subject of "Most, most, most ...?"



№	Questions:	№	Answers:
1	Which is the brightest metal?	1	Silver

The "Quick question" method is a very effective way to quickly repeat a previous topic at the beginning of a lesson. In this case, the teacher should organize the "Quick question" in such a way that the text of the questions should be shorter and easier to understand, and the answer to the question should consist of a single word or a combination of words. If these requirements are met, it will be possible to quickly and easily assess a large number of students in less time. The disadvantage of this method is that there may be some noise in the classroom. It is important to encourage students who are actively involved immediately after using this method. As a result, other students become motivated, and the conclusion is formed in the student's mind that "it is necessary to read the topic." In the process of using the "Quick question" method, "Most, most, most!" or a "the third is off topic" will make the lesson more interesting [22].

4.3. "Find the metal!" method development


In this case, the students are told by the teacher the properties of the unknown metal, and the students have to find this metal.

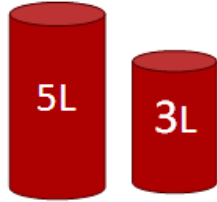



Find the metal!		
№	Properties of metal:	The name of the metal:

1	<p>This element is one of the rare metals with a density of $p = 19.3 \text{ g / cm}^3$ suyuq, a liquidus temperature of $t_{\text{melt}} = 1064 \text{ }^\circ\text{C}$, $t_{\text{boiling}} = 2947 \text{ }^\circ\text{C}$. Chemically it is a very inert and very plastic metal like other original metals. Its Latin name translates into Uzbek as "horizon in the morning". Which metal is this?</p>	
2	<p>This metal is a heavy non-ferrous metal with a density of $p = 8.9 \text{ g / cm}^3$, $t_{\text{melt}} = 1083 \text{ }^\circ\text{C}$, $t_{\text{boiling}} = 2573 \text{ }^\circ\text{C}$. Its Latin name is in honor of the islands of Cyprus. This metal as a biogenic element in skin pigmentation, in the assimilation of iron, also increases grain yield in agricultural wetlands and in soils poor in this element. Which metal is this?</p>	

The results of pedagogical experiments to determine the effectiveness of the "Find the metal!" method showed that when the teacher reads the properties of an unknown metal, the student's mind simultaneously transfers information about the properties of all metals from the database to "random-access memory" (RAM) [23]. The student unknowingly memorizes information about the properties of all metals in order to determine the name of a single metal. Another effect of this method is that there is silence in the audience when the teacher reads the properties of the unknown metal. As a result, the student's listening ability increases and attention to the topic increases.

4.4. "Brainstorming!" method development

1		<p>A. R. Beruni's Mineralogy states that shipwrecks are often observed at the confluence of seas and rivers, and that the reason for this is the taste of the water. Question: Why do ships sink at the confluence of rivers and seas? How do you explain</p>
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		<p>this situation? How does this relate to hydrometallurgy?</p>
2		<p>Experienced Metallurgist: The chemist was given 2 measuring tubes. One is 3 liters and the other is 5 liters. Using these two empty containers, the chemist should take 1 liter of the solution in front of him. How can this be done?</p>
3		<p>Experienced laboratory assistant: 3 containers: 2, 3, 5 liter containers. All three have a total of 6 liters of solution. How can such a volume of solution be evenly distributed in 3 flasks without the use of other measuring vessels?</p>
4		<p>The Wise Jeweler Experience: There are 6 gold coins in front of the jeweler. Only 1 of these is made of real gold. The jeweler is placed in front of a 2-stage scale, which requires him to find a real gold coin in 2 attempts. How can this be done?</p>
5		<p>The Experienced Miner Experience: There are 10 large bags of coins. Of these, 9 coins weigh from 1 gram, and 1 coin weighs 0.9 grams. Using a single-stage scale, find a bag with a 0.9 g coin in one attempt without moving the bags?</p>

The effectiveness of the "brainstorming" method is further enhanced by the fact that each teacher develops a method based on interesting information in their field. It is emphasized by many educators that this method is a very popular and effective method and is widely used in the teaching process. For example, the method of "Brainstorming" presented in the form of the above-mentioned experience of "Fast Laboratory" is taken from a situation that is often encountered in metallurgical plants, preparing the student for the next life, that is, to become the owner of the same profession. When this method is used in the classroom, the student is forced to approach the question both scientifically and logically, and this shapes the logic in the student [24-30].

4.5. Development of the method of "scientific invention"

In this case, the inventor explains to the students the urgency of separating metals from waste or other materials, which is currently a problem on the subject. Students work in groups to figure out an effective way to separate this metal.

Scientific invention		
№	The essence of the scientific problem and the main issues to be considered:	Achievements after solving the problem:
1	Harmful elements from molybdenum solutions are precipitated as sulfide, and a mixture of sulfides such as CuS, FeS, NiS, ZnS, and CdS is formed in the precipitated cake. How can each metal be separated from this mixture of polymetallic sulfides?	<ol style="list-style-type: none"> 1. A patent is obtained for an effective spelling solution; 2. Applies to metallurgical enterprises; 3. A business contract or grant is obtained; 4. Participates in startup projects.
Suggestion of inventive students:		
<i>Make your suggestion in solving a scientific problem!</i>		
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2	To prepare sulfide zinc concentrates for hydrometallurgical processing, they are fired in the "Hot Layer" furnace. During firing, zinc silicate - ZnO • SiO ₂ is formed, and when the flame is selectively dissolved in a solution of sulfuric acid, it is these silicates that form a colloidal system, which worsens the filtration of the solution. What scientific approach is needed to overcome this situation?	<ol style="list-style-type: none"> 1. A patent is obtained for an effective spelling solution; 2. Applies to metallurgical enterprises; 3. The production productivity of the enterprise increases; 4. A business contract or grant is obtained; 5. Participates in startup projects; 6. The project will generate wax revenue.
Suggestion of inventive students:		
<i>Make your suggestion in solving a scientific problem!</i>		
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3	After selective smelting of zinc residues, about 15-20% of zinc remains in the waste cake in the form of ZnO • Fe ₂ O ₃ - zinc ferrite. How can the spirit be separated from them?	<ol style="list-style-type: none"> 1. A patent is obtained for an effective spelling solution; 2. The production productivity of the enterprise increases; 3. A business contract or grant is obtained;
Suggestion of inventive students:		
<i>Make your suggestion in solving a scientific problem!</i>		
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The benefits of using the method of "scientific invention" are great and very effective. Because in this method the student is given the problem of actual production, which is currently relevant. The student has to do a lot of research on the given task, as a result of which he has to use books and websites. If a student is able to solve a scientific problem independently in a completely new way during the performance of the given task, then his scientific and inventive ability is formed. As a result of this work, a student or a group of students can formalize their new ideas and obtain a patent for an invention, or participate in economic contracts and grants established by the departments, and receive financial incentives for their initiative [31-37].

5. CONCLUSION

Modern education, considered as a social institution, is a unit of education of the student, which implements the basic principles of changing the communicative, evolving paradigm of the student from information. Problems of teaching effectiveness in Uzbekistan are being actively developed on the basis of the latest achievements of psychology, computer science and management theory. One of the important directions in solving these problems is the development and implementation of new pedagogical technologies. Pedagogical technology is such a structure of the teacher's activity, in which all the actions included in it are presented in a certain sequence and integrity, and the implementation involves the achievement of the desired result and has a predictive nature. Modern technologies in education are seen as a means of implementing a new educational paradigm. The development trends of educational technologies are directly related to the humanization of education and contribute to the

self-realization of the individual. In this regard, the state, as the main reformer, has issued several resolutions and decrees on the development of this sector.

The Resolution of the President of the Republic of Uzbekistan dated February 7, 2017 No. PF-4947 "Strategy for further development of the Republic of Uzbekistan", the Resolution of the President of the Republic of Uzbekistan dated April 20, 2017 "On measures to further develop the higher education system" charged.

In order to ensure the implementation of these decisions and decrees, special attention is paid to the development of new effective educational technologies for each teacher. In particular, the use of modern and world-recognized pedagogical technologies in the teaching of special subjects not only improves the quality of education, but also contributes to the international prestige of educational institutions in our country.

This research is one of such projects, which is aimed at the development of interactive methods on the topic "Selective melting kinetics and mechanism" on the subject "Theory of Hydrometallurgical Processes."

The main purpose of this topic is to explain to the student the speed and mechanism of the process of separation of metals from rocks of different composition with less effort and a lot of information.

Several different pedagogical methods were analyzed to cover this topic, including educational technology, including Venn diagram, Digest, quick query, brainstorming, "Find the metal!", "Scientific invention".

I think that the knowledge I have gained during my internship will be of great help in educating students.

6. REFERENCES

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