Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 14564 - 14570
Received 05 March 2021; Accepted 01 April 2021.

Improvement of Teaching Methods in Electrical Materials in Universities

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Abstract: In this article, the Chain word method is given, which allows students to remember the topics rose when teaching electrical materials using modern advanced pedagogical technologies, independently comment on concepts expressed by students on any topic, thereby allowing the teacher to quickly check students' knowledge.
Key words: teaching skills, method, Chain word's method, dielectric, transformer oil, rubber, and ceramics.

Today is a fast time the most alternative way to increase the effectiveness of education is considered to be the organization of lessons using interactive methods. Conducting effective research aimed at improving the quality of teaching technical sciences in the world, the introduction of innovative and information technologies in the educational process, integration, use of advanced educational technology, the creation of modern teaching aids aimed at developing students' intellectual potential, creativity and knowledge being carried out. In the world's leading research centers and higher education institutions, experts have developed recommendations for improving the teaching process of technical sciences on the basis of innovative and information technologies, the application of scientific developments in the educational process on theoretical, methodological and methodological bases. Improving the effectiveness of teaching technical sciences at the international level, the theoretical foundations of science with the help of information technology and innovative pedagogical technologies special attention is paid to the formation.

The issues of improving the education system and upbringing a harmoniously developed generation have risen to the level of a priority of state policy. The country's education system is undergoing large-scale reforms to introduce innovative technologies and information and communication tools into the educational process, increase the intensity and effectiveness of teaching, and bring them into line with world standards. In the concept of development of the public education system of the Republic of Uzbekistan until 2030"Improvement of teaching methods, gradual implementation of the principles of individualization in the educational process, the introduction of modern information and communication technologies and innovative projects in the field of public education." In this regard, the development of new electro technical materials that serve to increase the economic potential, the study of their composition, structure and properties, their application in certain areas are important issues of modern technologist earns. The use of advanced and modern teaching methods, the introduction of new information and pedagogical technologies are important for students to master the subject "Electrical materials" in technical higher education institutions.

Textbooks, teaching and methodical manuals and instructions, lecture texts, handouts, electronic materials, virtual stands, samples and models of electrical materials in working condition are used in the study of the subject. Appropriate advanced pedagogical technologies

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are used in lectures and practical lessons. Pedagogical technology is the optimization of forms of education, taking into account the technical and human capabilities and their interrelationships. Is a systematic approach to the creation, application and definition of the whole process of knowledge acquisition? In order to master the science, students need to master the concepts of classification of electrical materials, to be able to apply their knowledge in electrical engineering. Therefore, in the process of educating them, it is necessary to conduct lessons using new advanced pedagogical technologies. Because this subject is now being taught to first-year students, to be able to engage them in science, to conduct lessons using ways that are convenient for them to master. The concepts of "new" and "innovation" are important in any innovation. Innovation introduced into various attitudes and processes is manifested in the form of content specific, subjective, local and conditional ideas. Private novelty refers to the change, renewal of one of the elements of an attitude, object or process [2]. Subjective novelty is the self of a particular object the update represents a necessity. Local innovation serves to describe the practical significance of the innovation being introduced for a particular object. Conditional novelty, on the other hand, serves to shed light on a set of specific elements that enable a complex, progressive update to take place in an attitude, object, or process. The introduction of interactive teaching methods in the education system is one of the important factors in modern training. For educators today it is not enough to have a deep knowledge of the specialty and to impart a large amount of knowledge to an audience full of knowledge-hungry young people. According to many studies, a new approach to teaching is one of the most important and effective ways to take an active approach in teaching students. Students will easily understand, comprehend, be interested in, and remember the material provided only when they are actively involved in the learning process. So the main innovation today is teaching requires the use of interactive methods. One of such interactive methods is the "Chain word" method, one of the new interactive methods, which is currently being developed and improved. Therefore, today this method is used due to pedagogical skills. The chain word method is one of the longest methods, which a word game is based on the topics covered. The essence of style: This style is a topic covered based on r, can be applied before starting a new topic. The aim of this method is for students to memorize the topics covered, to comment independently on the concepts given by the student on a given topic, thereby providing an opportunity to check and evaluate their knowledge, and for the teacher to assess all students in a short time. The purpose of the style: Students' mastery of the topic covered in the lesson and mastery of basic concepts on the topic to determine their levels, to be able to express their knowledge independently, to assess their level of knowledge, to work individually and in groups, as well as to be able to apply the acquired knowledge in interpreting the basic concepts of the subject. Application of the method: to assess the level of mastery of the topic covered in all types of lessons, to repeat, reinforce or conduct intermediate and current control, as well as to check the knowledge of students before starting a new topic designed to get b. This style can be organized individually, in groups, or as part of a lecture or practice session. This method can also be used for homework assignments. Materials used in the lesson: handouts, pen (or pen), slide. Training schedule: Students will be introduced to the requirements for the course; If the lecture will be held in class, before starting a new topic if passed, a table will be provided on the topic covered, through a presentation; The presentation

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is taught by a teacher; Students write the answer in their notebooks; After the questions have been read in full, a presentation with answers is provided; Students test their knowledge. If this method is used in practice classes: Students are divided into groups according to circumstances; Handouts will be distributed to group members;

The handout is made in the form of a table, the table consists of two columns, the series of questions is selected depending on the shape of the topic; Students will be introduced to the concepts presented in the handout on a previous topic or a new topic. Students will be given as many squares or dots as possible in the handouts next to the questions on the topic; Students can go to the other side of the table to find the answer to the question and comment on it. Teacher distribution reads the concepts given on the topic in the material and together with the team identifies the correct explanation of each concept or is introduced on the screen through the slide with the explanation of each concept; Each student will identify the differences in the answers marked with the correct answer, gain the necessary understanding, self-check, evaluate, and reinforce their knowledge once again. From the process of studying the subject of "Electrical materials", its sections, i.e. modules in separate teaching; it has 4 modules, the first important part of which is dielectrics. Dielectrics play an important role in electrical engineering. It is used to separate conductive parts (different potentials from each other) in order to insulate them from each other. In addition, electrical insulating materials are used in electrical capacitors to provide capacitance even at different times and at certain factors and temperatures to create the appropriate capacitance. Its properties in dielectric materials the group that can be changed on the basis of control is called active dielectrics (signet electrics). Dielectric materials have a gaseous, liquid and solid appearance; there is another group in the preparation of hardening materials, which is in a solid (lacquer, compound) state during liquid exploitation. It is organic and inorganic according to its chemical nature [3, 4]. Organic dielectrics include substances that contain mainly oxygen, hydrogen, nitrogen, halogens and other elements in the composition of carbon compounds. The rest is inorganic and contains compounds of silicon and aluminum. Many organic materials are flexible, elastic to valuable mechanical properties, from which fibrous films are made. They are therefore widely used, but are not used in high-temperature insulating parts due to their very low heat resistance, which is a disadvantage. Inorganic materials, on the other hand, are brittle without being flexible and elastic, but are very sensitive to heats durable. Therefore, they are widely used in high-temperature insulation work. Gaseous dielectrics: Gaseous dielectrics include all gases, gases in the form of a mixture of natural air, gas and water vapor. Most often, gases are used as dielectrics in gas-filled capacitors, switches. Air ensures reliable operation as a dielectric because it surrounds all electrical devices. When the open wires in the air broke the air layer, the humidity increased the formation of a crown in the form of purple coal causes energy wastage. In any gas, charged particles (electrons, ions) move in a chaotic manner under the influence of an electric voltage. Under the influence of an external ionizer (space, sunlight, radioactive light from the Earth), charged particles of gases often receive energy, that is, they transfer the valence electrons of the gases to their atoms, resulting in the formation of positive ions. The electrons formed are far from free themselves or a negative ion may accumulate in the atom after a certain period of time. In a chaotic heat motion, electrons interact with positive ions to form a neutral atom or molecule. This process is called recovery or

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recombination. If a metal is placed between the electrodes and a gas is placed, the charged particles move along the direction from one pole to the other electrode under the influence of the electric field. As a result, the electrons and ions in one electrode mix with the other electrode and took flows. How large the current is depends on the passage of charged particles per unit time. Among them, natural air plays an important role as insulation. In any electrical installation, the air between the insulating material and the conductive part also serves as air insulation (mainly overhead line). Electrical engineering is widely used in the compressed form of gases at low temperatures (such a device is called cryoelectrotechnics). Nitrogen also has the same electrical strength as air, but less is applied because it causes erosion as a result of constant contact with conductive parts. It does not contain oxygen, so the materials it touches form oxides. Hydrogen is of great importance in electrical engineering. It is widely used in the cooling of generators, synchronous compensators in the cooling of electrical materials for high thermal conductivity. That is, in hydrogen cooling instead of air, the power loss in the rotor is reduced because this loss is close to the density of the gas. Yanking a generator synchronous compensator, the rotation of the blades in a hydrogen atmosphere is light and the F.I.K is high.

Liquid dielectrics are mainly petroleum oil - transformer oil. Oil is transformer switch, application property as insulation in the reactor, high electrical resistance. Such oils are obtained by boiling, refining various mixtures of oil by stepwise distillation. Some oils are also used in the preparation of the alloy as an example clay material. That is, when this material combines with oil, water drips. That is, it is used to clean the oil. Transformer oil is colorless, is a combination of different carbohydrates. Under normal conditions, the standard: Kinematic viscosity 17-18.5 mm / s 200S and 5-6.7 mm / s 500S the combustion temperature of the steam is 135-1400S Freezing temperature -450S It is dangerous to burn if there are several tons. Freezing temperature is one of the main factors, and in open transformer substations in cold high places a separate arctic oil (ATM-65 i.e. -700S) is used for example oil switch. Mica is an electrically insulating material with natural minerals and high electrical conductivity is used in turbo generators and hydro generators, hoisting crane engines in basic conditions due to its high heat resistance, mechanical strength. In nature, it has a crystalline appearance, melts in the form of a flat plate and solidifies in layers. In nature, the habitat is found mainly in our country, India and Russia. An important compound for its chemical composition is muscovite. In addition, mica contains iron, sodium, calcium and others also occurs in compounds. Muscovites are colorless or reddish-blue. Muscovite is sheet or wrapped, and individual mica pieces are joined together using glue, lacquer, or dry resin. Mica and mica plastids: The main types of mica and minacity insulation are mica and mica plastics. Mica (SAMICA) mica and muscovite waste are thermally processed at a temperature of 9000C. Glass is an inorganic quasoamorphic material that contains a complex system of various oxides reaches. The properties of the glass may vary depending on its composition and preparation technology. The density of lead-containing glass is very high. The compressive strength of the glass is high and the glass does not melt suddenly. When heated, the viscosity gradually decreases. Mainly 400-16000S end belongs to quartz glass. The luster of ordinary glass is the visibility of its spectral rays. Some additives give color to the glass. The types of glass are as follows. - Condenser bottles - radiant bottles - light bulbs - mixed bottles. Ceramic materials are inorganic materials that are prepared as a result of firing the finished or

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finished product at a high temperature. As a result of combustion, the product is transformed into a complex chemical, physical process with the desired properties. Ceramic materials were prepared by mixing water with pure clay. Mechanical strength increases after burning. In recent times, the presence of ceramic materials in the presence of partial clay in generals is being prepared. Ceramic materials are different: semiconductors are used as magnetic materials, mainly as electrical insulation materials. It has high mechanical strength, dielectric dissipation angle, small heat resistance and other high performance. Ceramic [porcelain] is the main electrical insulating material. The technological process removes high-quality clay (kaolin) mixtures and mixes them well with water. Turned pressed cast to get the figure, can be plastered. In the manufacture of porcelain or insulator dried to make water. The next stage consists of glazing and firing. Glaze is a porcelain material that is resistant to external mechanical shock, moisture protection from external atmospheric pollution.

Chainword method

№	Questions	Answers
1	What materials do not conduct electricity well by themselves (.....)	Dielectric
2	Inorganic insulating material with very good mechanical strength (.....)	Ceramics
3	The name of a group of minerals with a mechanically strong, fibrous structure (.....)	Azbest
4	What oil is the most widely used oil in electrical engineering (.....)	transformer
5	What dielectric materials are used in electrical gloves (.....)	rubber

The advantage of this method is that the previous topic is repeated and students develop skills in the basic phrases on the topic, as well as on the basis of mutual discussions between students. The disadvantage is that it requires great skill and knowledge from the teacher. Students must also have a high level of knowledge and skills formed. In conclusion, we can say that innovative activity is based on theoretical knowledge, practical, based on the orientation of the mental, intellectual, physical strength of the teacher to a specific goal. Acquiring skills and competencies, supplementing practical activities with theoretical knowledge, developing knowledge, design, communicative speech and organizational skills. The following are important in preparing a teacher for innovative activities: - equipping with knowledge of professional ethics; - To provide knowledge about the traditions of teacher-student; - to study the problems of formation of spirituality; - teaching the secrets of enlightenment; - Achieved in the pedagogy of foreign countries study and analysis of best practices; - Development of long-term plans. [5] In essence, the innovative activity of pedagogy is the creation of a new technological process or a new improved product based on scientific research, development, and experimental work, the use of scientific and technical achievements.

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