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HISTORY OF THE DISCOVERY OF RADIOACTIVITY AND X-RAYS, NUCLEAR EXPLOSIONS EXPLANATION OF THE PHENOMENON RESEARCH USING INTERACTIVE METHODS

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Abstract
The work provides detailed explanations of the history of the discovery of radioactivity and X-rays, ways to study the phenomenon of nuclear explosions using interactive methods, and its scientific novelty is that in order to form students' competencies in teaching the topic, the "Brainstorming" method was used to determine the results of the organized training session. The results showed that the method increased students' interest in the lesson and strengthened their memory.

Keywords: Radioactivity, X-rays, nuclear explosion, interactive method, scientific innovation, student, competency, training session, empirical research, brainstorming, stage.

Introduction

In interactive teaching, the teacher is an active organizer of educational activities, and the student appears as a subject of this activity. Interactive methods not only form activity, creativity, and independence in the process of assimilating information from students, but also contribute to the full implementation of educational goals. Today, we can include the “Brainstorming” method among the most effective interactive teaching methods and techniques in the education system . This method is widely used in solving problems on a given topic. This method encourages students to think broadly and comprehensively about the problem. Using the “Brainstorming” method, it becomes possible to find several solutions to the problem. When using the “Brainstorming” method, the following rules must be followed:

1. To encourage and achieve students' comprehensive and deep reflection on a given problem.
2. Encourage students' thoughts and ideas, avoid criticism, and create conditions for their free thinking.
3. Each student can build on their thoughts and ideas, and change them.
4. Not evaluating the opinions and ideas expressed by students.

If this approach is followed, that is, if their thoughts and ideas are evaluated, students may stop thinking.

Brainstorming is a method of gathering free ideas from learners on a problem and ultimately arriving at a specific solution. There are written and oral forms of the brainstorming method. In the oral form, each learner verbally expresses their opinion to a question posed by the educator. Education recipients own their answers clear and short in a way statement Written in the form

of and given to the question education recipients own their answers paper to the cards short and to everyone visible in a way they write . Education in recipients own his/her opinion only verbal not , maybe writing accordingly statement to grow skill , logic and systematic idea to conduct skill develops . Reported thoughts underestimation education in recipients various ideas to the formation take is coming .

- Research Research Methodology . The "brainstorming" method is implemented depending on the goal set by the educator, namely:

1. When the goal is to determine the initial knowledge of learners, this method is implemented in the introduction to the topic of the lesson.
2. When the goal is to repeat a topic or connect one topic to the next, the transition to a new topic is done in the section.
3. When the goal is to reinforce the topic covered, it is carried out in the reinforcement part of the lesson after the topic.

" Mental" attack method in use main rules :

- reported ideas discussion will not be done and not evaluated ;
- reported every how idea , it even right even if not, consider is taken ;
- in process every one education recipient participation condition

« Mental " attack " method Advantages :

- results underestimation education in recipients various of ideas to the formation take comes ;
- education recipients all participation will come ;
- ideas visualized will go ;
- education recipients elementary knowledge checking see opportunity increases ;
- education in recipients to the topic interest wakes up .

« Mental " attack " method disadvantages :

- education giver by the question right sheep not to receive ;
- education from the giver high to the level achieve of ability demand to be completed .

Topic statement: History of the discovery of radioactivity and X-rays , nuclear explosions the incident research to do

Radiobiology ionizing of the rays organism and his/her to the population indicative the impact inspector science field is , its purpose , in the body ionizer radiation from the influence happened to be changes and that one changes based on lying down mechanisms and laws open the body ionizer radiation harmful , even fatal from the influence protection to do their ways working from the exit consists of .

of radiobiology was formed in the late 19th and early 20th centuries, and at a certain stage of development, the direction of radiobiophysics emerged from it as a separate scientific field. The history of the development of radiobiology and radiobiophysics is divided into the following stages:

Stage I – 1890–1922, and during this period – in 1895, Wilhelm Conrad Roentgen (Germany) discovered X-ray radiation, and in 1896, A. Becquerel discovered the radioactivity of the uranium element (α-, β- , and γ- *radiation).*

Stage II – (1922–1945) during this period, the description of the biological effects of radiation, the continuation of the study of the mutagenic effects of ionizing radiation, the development of

the field of *radiation genetics* , and the quantitative description of the absorption of radiation by matter are carried out.

Stage III – (from 1945 to 1986) – that is, the period after the *Hiroshima-Nagasaki* disaster in 1945, this period is considered the period of development of the mechanisms of biological action of radiation.

Stage IV - the modern era in the study of the effects of radiation exposure (the period after the *Chernobyl disaster in 1986).*

" *radiation disasters* ". In the history of the development of radiobiology and radiobiophysics, "radiation *disasters" - both accidental and deliberate* - significantly contributed to the development of scientific research in the direction of studying the physical properties of radiation and the mechanism of biological action, as well as the development of practical recommendations for the use, storage, and transportation of radiation sources. The " *New Jersey* " disaster. In 1902, a technology for producing light-emitting paints from a radioactive isotope was developed. The " *Nagasaki-Hiroshima* " disaster. On June 6 , 1945 , a V-29 *Enola Gay* bomber of the US Air Force dropped an atomic bomb called Little Boy on Hiroshima (Japan) containing 64 kg of uranium isotopes, which exploded at an altitude of ~576–600 meters above the Earth's surface and within *a* radius *of ~ 1.6* km *with* an explosion equivalent to ~13,000–18,000 *tons of TNT*. Chelyabinsk disaster. On September 29, 1957, an explosion occurred at the Mayak nuclear fuel waste processing and storage chemical plant in the Chelyabinsk region (Russia), resulting in the release of ~20,000,000 *Curies* of radiation into the environment (" *Kyshtym disaster* "), and more than 124,000 residents of the area were exposed to radiation. " *Sellafield* " disaster. The accident that occurred in October 1957 at the "Sellafield" nuclear complex in Windscale (England) was rated at level 5. "SL-1" disaster. The "SL-1" nuclear reactor is located in the desert of Idaho, USA, 65 *km* from Idaho Falls . On January 3, 1961, due to a violation of safety regulations, an explosion occurred in the nuclear reactor, which resulted in the death of 3 people and the release of a large amount of radiation into the environment. " *Jaslovske-Boxunise* " disaster. The accident that occurred on February 22, 1976 at the "Jaslovske-Boxunise" nuclear power plant in the former Czechoslovakia was rated at level 4 on the International Nuclear Event Scale (*INES).* " *Three Mile Island* " disaster. On March 28, 1979, a level 5 accident occurred at the *Three Mile Island nuclear power plant* in Pennsylvania, USA . *The Kramatorsk* disaster . In 1980, a capsule containing a significant amount of radioactive isotope was lost at the Karansk construction materials mining site in Ukraine. *The Goiânia* disaster . In 1987, a component containing an isotope was stolen from a radiotherapy device in Brazil (Goiânia) and then thrown into a garbage can. One of the residents of this area, out of curiosity, collected the blue-ray-emitting powder from this place, took it home and distributed it to his relatives, as a result of which a level 5 radiation release was recorded in the area. *The Tokaimura* disaster . On September 30, 1999, a Level 4 accident on *the INES* scale occurred during a test operation to enrich the isotope content from 5% to 18.8% at the *Tokaimura radiochemical plant* , located in Ibaraki Prefecture on the Japanese island of Honshu, which specializes in enriching the isotope content used as radioactive fuel in nuclear power plants.

Analysis and Analysis and results. This in processes of the results scientific novelty from that consists of the subject in teaching students competencies formation in order to organize done training training the results determination for empirical research Using the " brainstorming " method increases students' interest in the lesson, improves their work, and strengthens their memory. showed.

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