

## **IMPROVED TEACHING OF THE SUBJECT “THE INTERACTION OF RADIATION WITH SUBSTANCES” IN HIGHER MEDICAL EDUCATIONAL INSTITUTIONS MODEL**

B. Z. Polvonov 1 ,

E.Kh. Bozorov 2 ,

B. S. Ruzimatova 3 ,

M. Z. Khudoyberdieva 4

1- Professor of Fergana branch of TUIT named after Muhammad al- Khorazmi ,  
bakhtiyor@mail.ru ,

2nd Professor of Nuclear Physics Institute of AScRUz ,

3- Researcher of FerPI ,

4- Researcher of FerSU .”.

### **ABSTRACT**

This in the article student’s competence from physics practical exercises based on information important was one how many pedagogical technologies and their application methods. This is provided in the article in this subject education process interactive technologies, virtual laboratories and other innovative approaches based on organization to grow methodology analysis is made. Also, in the article approaches based on students practical-procedural competence development efficiency discussion will be done.

### **KEYWORDS**

Problem-based learning, microscope, blood, erythrocyte, interference, biological sample, medical physics, medical technology, pedagogical activities, creative thinking, radiation safety, X-ray.

### **Introduction**

In the context of the information education environment that allows the development of the creative potential of the individual on a global scale, the development of modern didactic tools for teaching aimed at developing research activity, creativity, and research skills in specialists is becoming increasingly relevant. This is especially true in the medical field . supreme education in institutions education in the environment modern devices , including medical devices (X-ray) computer tomography , positron emission tomography tomography , nuclear magnet resonance tomography like ) and then applicable electronic devices and automatic controls to know from an expert necessary knowledge and to skills has to be requirement " The radiations substances with each other " impact " science of teaching general didactic principles future medicine of the staff professional competence development procedural and reflection activity efficiency in increasing of education ergonomic requirements rationality and emotionality , theoretical and empirical knowledge based on real education under the circumstances comparativist implementation to grow through to clarify is focused .

In higher medical education institutions **Preparing** future doctors for professional activity is a complex process. In implementing this process, improving the model of the educational process plays an important role [ 1 ] .

## Research methodology.

Based on the results of the scientific research, a model of training for highly competent professional activity in the subject “Interaction of Radiation with Matter” was developed - a logical structure of the methodology for acquiring knowledge and forming skills using new pedagogical technologies that students should master in classroom training and independent learning to achieve the level of a specialist, and the model of teaching the subject “Interaction of Radiation with Matter” in higher medical educational institutions was improved [2].

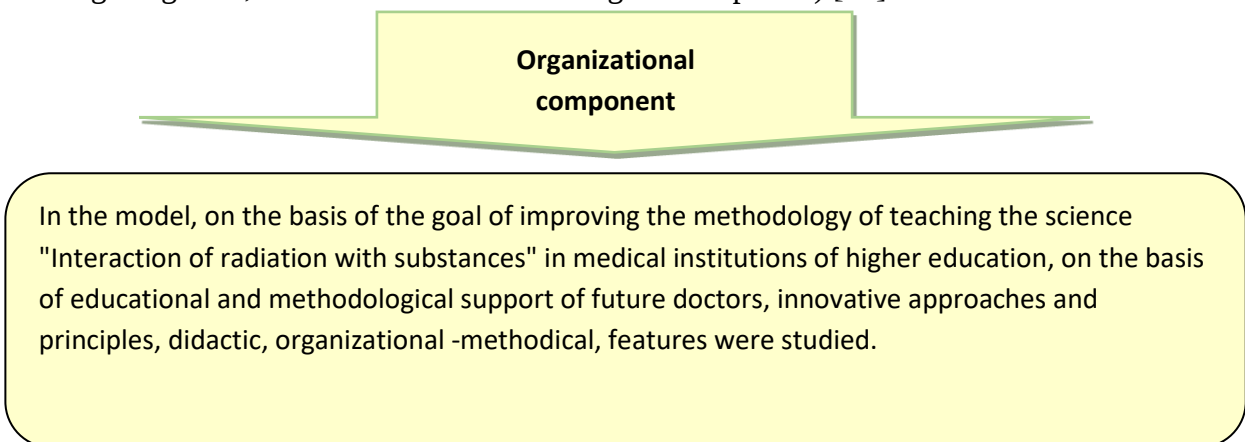
for teaching the subject "Interaction of radiation with substances" in higher medical education institutions consists of the following components: "Purpose", "Organizational", "Content", and "Result". All components are explained below. (Figure1).

Fan the components of the improved learning model are explained as follows:

## Target component

Qualification requirements. Requirements for training doctors in higher medical education institutions scientific research, nuclear medicine equipment operating system , organizational and management, operation, service, and pedagogical activities are envisaged [ 3 ] .The purpose of the model is to improve the methodology for teaching the subject "Interaction of radiation with substances" in higher medical education institutions.

Educational and methodological support - Targeted and effective use of materials prepared for the subjects in the curriculum of the field of treatment, pediatric dentistry (textbooks, study guides, methodological guides, educational and methodological complexes) [ 4 ] .



**Approaches** – The use of the subject “Interaction of radiation with substances” in preparing students of medical, pediatric, and dental education for innovative professional activities was carried out based on (logical, integrative, critical, creative, innovative) approaches [ 4-6 ] .

**The logical approach states** that the model of training future specialists for innovative professional activities consists of the following three components (types of activities that arise on the basis of the characteristics inherent in the new social stage, types of activities with clearly defined professional requirements, and types of activities organized according to the essence of the socio-political structure of the state and its spiritual and moral system). The problem of the specialist model in training is important in determining the content of curricula as well as educational programs.

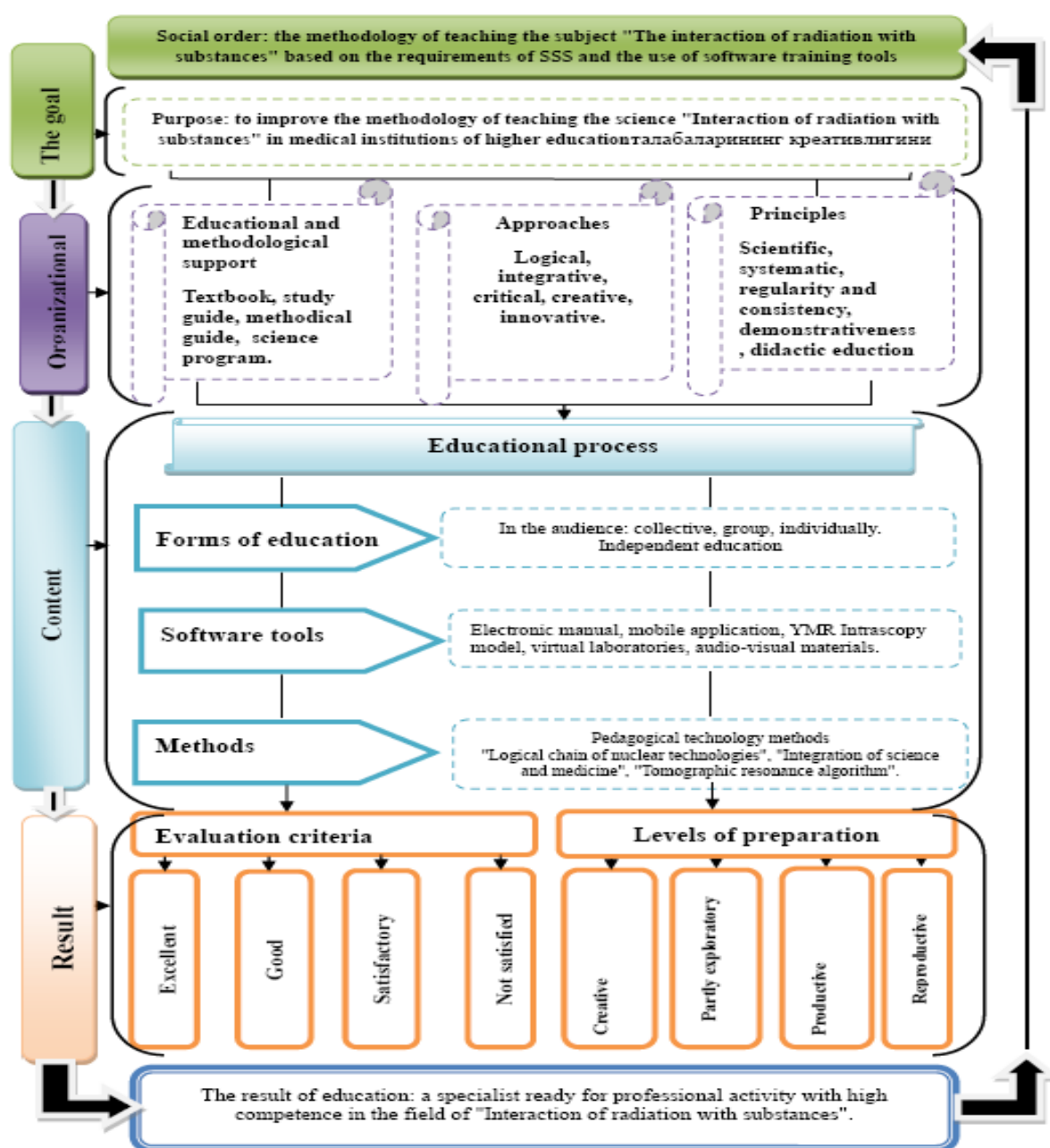
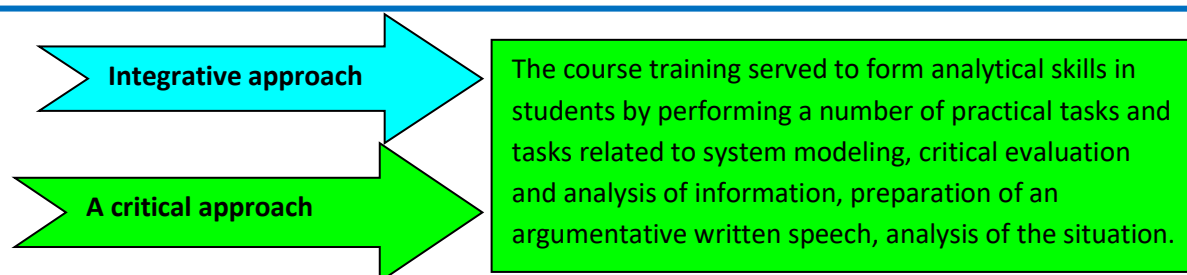
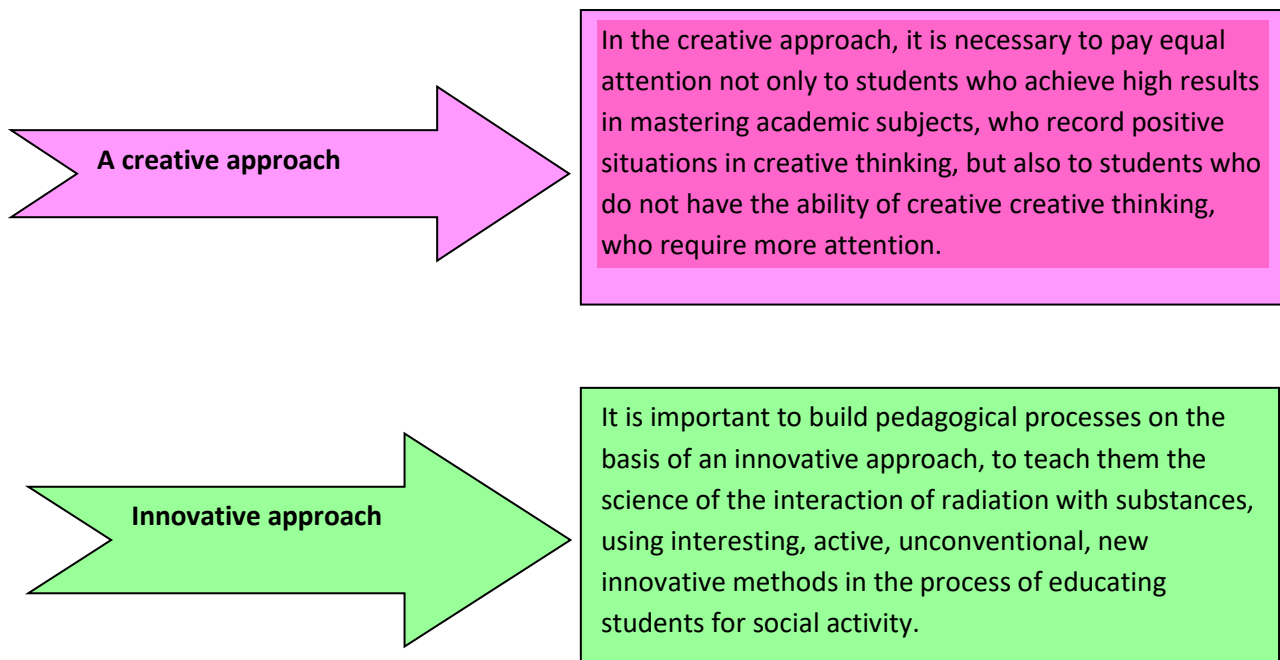


Figure 1. Teaching the science of radiation interaction with matter in higher medical education institutions improved model.



## Analysis and Results

**Principles** – Educational systems can generally be divided into two categories, teacher-centered and student-centered. In teacher-centered education, curricula and teaching processes are strictly approached from the perspective of the medical higher education institution, its supervisory organization and the teacher. In this case, the needs and opinions of representatives of the labor market and students are not taken into account when determining what, how much and how students should learn. The management and organization of the educational process is carried out in a rather centralized manner, and the teacher is considered the only source of knowledge. In such an education system, students do not develop the capacity to think independently, express their opinions, engage in discussions, critically approach problems, and make decisions for themselves [ 2]. The use of the subject “Interaction of radiation with substances” in the preparation of students of the medical, pediatric, and dental education fields for innovative professional activities was carried out on the basis of the principles (scientificity, systematicity, regularity and consistency, demonstration, didactic reduction). The details of each principle are briefly explained below [ 2-5 ] .

The principle of scientificity. Requires that students be provided with scientifically based, practically tested information for teaching . When selecting them , the latest achievements and discoveries of science and technology should be used. In the process of acquiring scientific knowledge , education The students develop a scientific worldview and thinking. The scientific content of the educational material taught in each lesson should be broad and deep and should form not only knowledge, but also thinking and creative abilities in the student. For this, the teacher must consistently increase his scientific potential , be aware of innovative pedagogical technologies, discoveries and scientific innovations. The knowledge that the student is learning must be theoretically based and tested in practical experience.

The principle of systematicity and sequence. In teaching the science of the interaction of radiation with matter in medical higher education institutions, practical lesson topics should be covered in a prescribed manner according to their characteristics. For this, when receiving the knowledge provided,

students should also act in a prescribed sequence and on the basis of the prescribed principle of systematicity and sequence . There should be continuity, that is, connection, consistency between the content of previously explained topics and new topics. Thus, the process is carried out on the basis of the principle of systematicity and sequence, appropriate to the level of knowledge, its internal structure, and the level of students' mastery of knowledge .

It is illogical to teach the subject of "Ionizing radiation detectors and gamma spectroscopy" without first covering the subject of "General nuclear characteristics" in the science of radiation interaction with matter. This situation is controlled by the principle of systematicity.

The principle of regularity and consistency. It requires that teaching be organized in such a way that the teaching of academic subjects is carried out in a strictly logical order, and students consistently acquire knowledge, skills and competencies, while at the same time learning to use them systematically to solve practical tasks. The principle of regularity and consistency is implemented at all stages of the educational process. Its requirements are reflected in textbooks and laboratory exercises, and the materials in them The course is placed according to didactic requirements based on the established goal in the study of the subject . In the work program established for teaching the “Science of the Interaction of Radiation with Matter ” in medical higher education institutions , theoretical and practical exercises are closely linked to each other, and the content of each lesson is consistent with the purpose by clearly defining the learning goal of each lesson. It is advisable for the teacher of the interaction of radiation with matter to clearly define the basic concepts in accordance with the requirements set out in the work program for the subject and to use highly effective methods to convey them to students .

It is important to clearly define and use interactive methods used in teaching the science of radiation interaction with matter , to use various forms of control and tests that determine the level of students' mastery of knowledge and skills during lessons . As the level of knowledge of students increases and develops, the didactic system of presenting the subject is increasingly approaching the principle of regularity and consistency. Using the methods used in teaching practical exercises in the science of radiation interaction with matter, it is possible to further improve the quality of the lesson [2-4].

The principle of demonstration. The purpose of teaching the science of the interaction of radiation with matter is determined by the content of the medical equipment used in practical lessons. The study of this medical equipment allows students to practice and It is necessary to provide medical devices used in laboratory exercises . Demonstration helps to better assimilate this knowledge and integrate it with life events, the process of practical training. The use of various visual aids in practical lessons on the interaction of radiation with matter activates the creative thinking process of students and attracts their attention to the topic being taught, so visual aids are used at all stages of education in helping students perceive new material, consolidate knowledge, as well as in practical activities and in the application of social life resources , and in the formation of practical skills and qualifications. Applying the knowledge given to students in the field of radiation interaction with matter in a demonstrative manner, based on real-life events and phenomena, requires, on the one hand, the clarity of the knowledge being imparted and the use of internal circuits of medical equipment in the teaching process, and, on the other hand, the implementation of direct diagnostic devices in real conditions.

The principle of didactic reduction: In order for students to master knowledge at a high level, the educational material should be reduced to the necessary amount. If the volume of the educational material is too large , the necessary parts should be selected from it. Complex and complex tasks should

be simplified, but the meaning should not change. Therefore, if only basic knowledge needs to be given, it is necessary to try to explain the educational material as much as possible from simple to complex and not to burden the student with an extremely large and extensive educational material. An experienced teacher can explain complex processes in simple words. The principle of conscious mastery of education, on the one hand, assumes independent, active thinking of students, and on the other hand, it involves educating and improving the independence and activity of students, as well as logical, free thinking activities during this very process. Consciousness and activity in teaching depend primarily on the accuracy of mental thinking. Activity in thinking is thinking about things and phenomena, events in the described educational materials or the surrounding objective reality. It is manifested in active thinking processes, that is, in comparison, comparison, analysis-synthesis, abstraction and generalization. According to him, in order to achieve conscious and active mastery, the educational process (each lesson) should be aimed at activating the thinking of students. The principle of consciousness in teaching means such norms as understanding the specific goals of the educational process in students, understanding the studied facts, phenomena, processes and the connection between them, and being able to apply the acquired knowledge in practical activities.

## Conclusion

A mobile application and a computerized model of nuclear magnetic resonance intrascope were developed for students of higher medical education institutions on the subject of "Interaction of radiation with substances" based on software educational tools. In this regard, an improved content of lecture sessions on the subject of "Interaction of radiation with substances" was created in the training of medical specialists in higher medical education, a new topic statement was developed, and an improved model of teaching the subject was developed. The improved content of lectures, practical and laboratory classes on the subject, as well as teaching methods, will increase the effectiveness of students' mastery and prepare highly qualified specialists.

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