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DIDACTIC PRINCIPLES OF IMPLEMENTATION OF INTEGRATION AMONG THE DISCIPLINES OF NUCLEAR PHYSICS AND BIOLOGY, CHEMISTRY, MATHEMATICS, COMPUTER SCIENCE

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Abstract:
The content of the interdisciplinary integration component of the methodology of Teaching Nuclear Physics on the basis of an integrative approach in higher educational institutions of pedagogy is described in connection with the disciplines of Biology, Chemistry, Mathematics and informatics.

Keywords: integration, Biology, Chemistry, Mathematics, biophysics, interdisciplinary.

Introduction

Promising plans are being developed in our country, such as the use of nuclear energy, the use of nuclear power plants, wind and solar energy to solve the problem of electricity shortages. The use of Atomic Energy in these promising plans is one of the main links. Today, such priorities as" training of personnel in nuclear energy, development of educational institutions, equipping educational and practical laboratories in the field of nuclear physics with laboratory and educational-laboratory equipment, layouts and analytical simulators " are established.With modern knowledge of the nuclear physics department in order to ensure the implementation of the decision, future physics is one of the priorities facing the teacher training education system.

Methodological aspects of the development of the scientific worldview of students in teaching the theoretical foundations of physics in our republic B.M.Mirzahmedov, D.Shadiyev, M.Dzhorayev, O.N.Akhmadzhanov, K.R.Nasriddinov, O.Q.Joydikov, S.Q.Kahhorov, G.S.Farova, Q. Sh.Tursunov and others were studied in scientific research. U. S. Begimqulov, B.S.Abdullayeva, A.D.Asqarov, N.A.Kayumova, G.A.Umarova, P.M.Jalalova, Sh. Khaydarova, A.M.Khudayberganov, I.O.And in the scientific work of zakhidov and others, the issues of improving the quality of education and the role of information and communication technologies in the training of future pedagogical personnel, the use of interdisciplinary communication in laboratory training were studied. B.S.In the scientific and methodological work of Yuldashev and others, issues of introduction of nuclear technologies in medicine, production and energy, training on the basis of integration with the production of nuclear physics were considered.

From the above pedagogical studies, it can be seen that pedagogy indicates that in increasing the effectiveness of teaching the Nuclear Physics Department in higher educational institutions, specific aspects of this science should be taken into account. In the study of microelam phenomena, it is necessary to remember that they coexist in relation to other processes in nature. Ya.A.Given Komensky's opinion that" the totality of all interaction in nature must be studied in the same connection", the need for an integrative approach in the teaching of atomic and nuclear physics arises. To this end, in order to improve the effectiveness of Teaching Nuclear Physics, a model of teaching methodology was developed based on an integrative connection with all disciplines provided for in the educational plan of physics and astronomy. The methodological model is mainly considered as components of an integrative approach, interdisciplinary, between types of training and internal integrations. In addition, on the basis of the stages of thematic, problematic, conceptual, theoretical and

dialectical integration, the methodology of teaching a lecture, practical, laboratory and independent educational training on the principle of continuous connection, correct and reverse communication is improved.

The implementation of communication with the sciences of Biology, Chemistry, Mathematics, Informatics in nuclear physics is not the use of random examples and facts, but the targeted activity of the teacher in ensuring the connection of knowledge obtained as a result of studying various educational subjects, the emergence and development of interdisciplinary connection.

Establishing communication in teaching can only be carried out when the teacher has didactic material, which reveals the main directions for the implementation of the connection of nuclear physics with the sciences of Biology, Chemistry, Mathematics, Informatics. This material should provide students with an integrated system of knowledge arranged in a given sequence. Therefore, it is important to find the optimal ratio between the total and the amount of biophysical and other materials.

The following principles should be based on the selection of data in order to carry out the connection with the sciences of Biology, Chemistry, Mathematics, Informatics in the training of nuclear physics.

1. Biophysical data must be organically linked to the materials of the nuclear physics science program.
2. Biophysical materials are of general educational and educational value and should reflect generally accepted theories and laws.
3. Information of biophysical content should have the same correct meaning from both nuclear physical and biological point of view.
4. Biophysical data is easy to master and should not cause mental strain on students.
5. Biophysical data should serve the natural scientific thinking of students and the development of a scientific worldview.
6. Biophysical data should serve to clarify and generalize natural scientific concepts.
7. Physico-chemical data must be interconnected with the data of the nuclear physics curriculum.
8. Physicochemical facts should also be reliable in considering both the yadrophysical and chemical point.
9. The selected data should not cause mental strain in students (evoking a mental attack).

The above-mentioned aspects of the interaction of nuclear physics and biology, chemistry and other sciences make it possible to select the necessary information for the implementation of interdisciplinary linking in nuclear physics training. The following table 1 provides a summary of topics in the study of the Nuclear Physics section of the general physics course and selected biophysical, chemical science subjects.

Table 1. **Content of chemical, biophysical topics in the teaching of nuclear physics**

Nuclear physics	**Biophysical data**
Radioactivity phenomenon	Types of radioactive radiation and their ability to be absorbed in different environments.
Methods for recording charged particles	Sensitivity of Man, animals and plants to radioactive radiation.
Obtaining radioactive isotopes and their application	The use of" marked " atoms in medicine, agriculture and biology.
Radiation dose and biological protection concepts	Biological effects of radioactive radiation. Application of radiation in plant selection and radiostimulation. The concept of biological protection.
Chemical data content in Teaching Nuclear Physics	

Nuclear model of Atom. Boron's quantum postulates.	Atom structure, planetary model
Elements of quantum mechanics, the Schryodinger equation.	The difference between the Bor-Rutherford and Shryodinger models of the atom.
Pauli principle	Mendeleev the structure of the system of chemical elements. Quantum numbers, electronic shells.
Atomic nucleus	Nuclear charge and the number of electrons in an atom. Isotopes
Radioactivity	Chemical reactions observed in Alpha and beta decay.
Radioactive decay law	Radioactive isotopes.
Nuclear reactions	Conservation laws. Chemical reactions characterizing nuclear reactions

From the table above, it can be seen that interdisciplinary integration has the following possibilities:
- the influence of integration processes to reveal the modern directions of the progress of science;
- to reveal the generalized content of physical, mathematical, chemical, biological and other knowledge;
- formation of ideas about science not only as a system of knowledge, but also as a system of methods;
- revealing the history of Science and its practical application;
- revealing the social significance of the natural-scientific Sciences;
- to reveal the content of the connection of a particular science with philosophy;
- implementation of the principle of Science in the content of Education.

Thus, the implementation of a complex interdisciplinary link in the teaching of nuclear physics serves to increase the effectiveness of education, to prepare specialists with high competence.

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