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Research Article

REASONS AND SPECIFIC ADVANTAGES OF TEACHING PHYSICS IN MEDICAL INSTITUTES

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Usmonov Saidjon Abdusubxon o'g'li
Faculty of the Department of Biomedical Engineering, biophysics and Information Technology of the Fergana medical Institute of Public Health, Uzbekistan

ABSTRACT

Medicine and physics are two areas that constantly surround us in our daily lives, but since they are so intertwined, every day the impact of physics on the development of medicine is increasing, thanks to which the medical industry is modernized. This allows many diseases to be treated or stopped and controlled. This article also provides information on the role and importance of teaching physics in the field of medicine.

KEYWORDS

Laser technologies, applied physicists in medicine, work and heat, malignant tumors, didactics of Higher Education, physics, mathematics, computer science teaching theory.

INTRODUCTION

The use of physics in medicine is undeniable. In fact, any instrument used by doctors, from a scalpel to the most complex devices for accurate diagnosis, is made possible by functions or advances in the world of physics. It is noteworthy that physics has always played an important role in medicine, and at one time these two directions were the only science. Laser technologies are actively used in the modern world. No center of modern medicine can do without them. The most obvious example is surgery [2]. With the help of laser beams, surgeons can perform extremely complex operations. The powerful beam of the laser allows you

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to remove harmful tumors, and this does not even require cutting the human body. You need to select the desired frequency. Many inventions of physicists used in medicine have been time-tested and very successful.

Literature analysis

Physics and medicine are closely related disciplines: many important discoveries in the field of physics were made by doctors-which at first glance seems unusual. For example, in the 40s. XIX century. Yu R. R. Meyer, a ship's doctor, sailed in the tropical region to determine the difference in venous blood color between the inhabitants of countries with hot and cold climates. The reason is, due to the high temperature, the body produces less heat, as a result of which arterial blood is less oxidized and remains almost the same red color as when passing into the vessels. It was found that there is a relationship between the consumption of the substance and the production of heat [4,1,8]. Mayer formulated the principle of "nothing happens from nothing" as the basis of the first law of thermodynamics, which considers the exchange of energy between the system and the environment in the form of work and heat. It is a German physiologist who has carried out research in the field of fermentation and heat generation in living organisms. Mathematically based by Helmholtz, explaining the position of dialectical materialism on the eternity and non-perturbation of motion and matter, the universal law of nature, the law of conservation and transformation of energy. It is a German physiologist who has carried out research in the field of fermentation and heat generation in living organisms. Mathematically based by Helmholtz, explaining the position of dialectical materialism on the eternity and non-perturbation of motion and matter, the universal law of nature, the law of conservation and transformation of energy. In the experiments of physiologists on animals, many electrical phenomena were detected: the Italian physiologist and anatomist L. Galvani's experiments on the skeletal muscles of the frog were published in A. Formed the basis of the Volta study and ended with the invention of the Volta column. Professor of anatomy of the St. Petersburg Academy of Sciences Daniel Bernulli wrote his famous equations to explain the circulatory system, became the founder of hydrodynamics. Paracelsus is a professor of physics, medicine and surgery. Avicenna was a healer, naturalist, who made a number of important discoveries in mechanics, etc.k. As the head of the Department of biophysics of the Physics Faculty of Moscow State University, professor and Tverdislov said: "Physics was originally done by doctors in Europe, but now physics is lending its debts to medicine" [8].

METHODS

Interactive educational technologies are widely used in teaching physics, mathematics and informatics to students of the Faculty of Medicine. Taking into account the peculiarities of teaching students at a

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natural science and humanitarian University, this technology allows you to simplify the perception of educational material, to see the reflection of disciplines in the educational and professional activities of medical students. Consequently, in our opinion, as a methodological basis for organizing the teaching of Physics, Mathematics and informatics to students of the Faculty of Medicine, the following should be taken:

- the theory of personality-oriented education, as well as the theory of personality development, ideas about communication, the multifactorial nature of personality formation at all stages of its socialization;
- laws and principles of didactics of Higher Education;
- principles of consistency, activity, individual, holistic, environmental, activity and other approaches;
- work dedicated to building an educational environment in educational institutions, including a medical profile;
- ideas for humanizing education in the context of the need to change educational material;
- theoretical research in the field of theory and methodology of teaching physics, mathematics, Informatics.

In the learning process, there should be three interconnected elements that allow you to take into account the interests and characteristics of students: Stages of preparation-accuracy, procedural-meaningful and reflexive-assessment at the Center for organizing the teaching of Natural Sciences for students of medical higher educational institutions. When referring to the first element:

- The preparatory measures necessary to carry out the organization of training, that is, the determination of goals and educational tasks for each educational lesson and ways to achieve them, as well as the selection of special educational and methodological literature;
- Working with the content of the main didactic units (DB), that is, changing the educational material taking into account the individual characteristics of students. It is recommended to include the following in the second element:
- Selection of optimal types of educational activities within the framework of the topic under study (discussion, role-playing games, frontal conversation, educational situations, problem solving, experiment, etc.)
- Selection of assignments for independent work of the student outside the audience (general, taking into account the capabilities and abilities of students of a particular study group, taking into account the size of didactic units and individual units determined by the training standard). The third is the choice of criteria for assessing the development of basic didactic units by

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students, for example, the level of work in the lesson (active, passive, disposable), knowledge of current material, work with electrical equipment or computers, the ability to apply current knowledge in practice when solving computational problems or tasks, the ability to draw conclusions based on characteristic dependencies, etc. In the course of theoretical analysis and observations, we have identified the General Laws of teaching physics, mathematics and Computer Science: the composition of educational materials and practical aspects in other areas of knowledge, for example, technologically oriented content (principles of work of medical technology, processes and phenomena from the point of view of computer technology, mathematical modeling of Biosystems, etc.);

Equal cooperation between students and a teacher, both in the audience and outside the audience (the exception is that this cooperation often occurs with the limited participation of both at the level of student research circles); manifestation of tolerance towards students who lag behind in the learning process and help them learn difficult questions in Physics, Mathematics and informatics;

 collective, group and equally individual forms in training;

 types of educational activities that help develop the personal interests and abilities of students.

So, the most important didactic principles in the organization of student education at a medical university are as follows::

 The purposeful consideration of the interests of students in the educational process, the implementation of educational activities based on their characteristics and capabilities in teaching a particular subject;

 Student individuality, ensuring the necessary conditions for the realization of the capabilities of his personality;

 Non-discrimination of ability in teaching specific discipline.

Thus, the theoretical foundations of the organization of teaching physics, mathematics and Informatics in medical higher educational institutions were identified, which are the following methodological approaches and pedagogical technologies:

 Knowledge-based approach;

 Competence-based approach;

 Activity-based approach;

Approach to tasks;

 Personality-oriented approach;

 Modular learning, problem learning;

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 Programmed teaching, individual teaching;

It is known that a number of physiological processes in the human body are based on general physical laws [4]. As well as treatment methods, many diagnostic methods are based on the application of physical principles, the use of physical phenomena and processes. Most medical devices are physical devices in design. Medicine uses the results of theoretical and experimental advances in physics. Thus, physics is very important for medicine as a whole, as well as for the formation of a future doctor. Together with the elements of general physics related to the physical methods of diagnostics and treatment used in medicine, the issues of practical biophysics necessary for a doctor, the principles of the device of the appropriate equipment form the content of physics studied in medical higher educational institutions. The science of" physics, mathematics " is included in the main part of the Mathematical, Natural Science and medical-biological cycle. As a result of studying the physical component of this science, students should know:

 the main physical phenomena and laws that lie in the Zamiri of the processes occurring in the human body;

 features of the influence of physical factors on the body;

 physical basis of medical equipment activities;

 safety rules,

 work with physical devices;

 the rules for the use of ionizing radiation and the risks associated with their impact on biological tissues; methods of protection and dose reduction;

 Basic Laws of biomechanics and its importance for dentistry; being able to use physical equipment;

 work with magnifying equipment (microscopes, optical and simple magnifying glasses); ownership of the simplest medical devices (phonendoscope, neurological hammer, etc.);

 dental concept apparatus, medical and dental instruments;

RESULTS

The use of professionally oriented physical assignments in the preparation of future doctors affects the educational results of students, helps to develop the creative personality of the future specialist, to form his cherished attitude to the profession of a doctor. Professionally oriented physical tasks can be used to study new material during training sessions, repeat, consolidate and generalize what has been learned, and organize independent work of students beyond the audience and audience. The use of professionally oriented physical tasks makes it possible to individualize the educational process.

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REFERENCES

1. A.N. Remizov. “ Tibbiyot va biologik fizika” . Davlat ilmiy nashriyoti Toshkent- 2005. 583 PP.
2. https:\\inscience.uz\\index.\\php\socinov\\index Tibbiyot institutlarida fizika fanini o‘qitishning o‘ziga xos jihatlari.
3. https:\\daryo.uz Miya bilan boshqariluvchi proez, 3D printerlarda yasalgan tana a’zolari yoki robot jarroh- tibbiyotning XXI asrdagi g‘aroyib texnologik yutuqlari.
4. https:\\ict.xabar.uz Tibbiyotda butunlay o‘zgartiradigan 11 ta texnologik innovatsiya.
5. Jaxongir Isroiljonovich Xomidjonov Academic Research in Educational Sciences Volume 3 | Issue 3 | 2022 ISSN: 2181-1385 Cite-Factor: 0,89 | SIS: 1,12 DOI: 10.24412/2181-1385-2022-3-146-153 SJIF: 5,7 | UIF: 6,1
6. “BIOFIZIKA MODULINING TIBBIYOT KADRLARINING TAYORLASHDAGI O‘RNI” Shokirova Gavxarhon Nazirg’ulomovna, Ph.D Farg‘ona davlat universiteti, katta o’qituvchi Muxtorova Madinaxon Ma’rufjon qizi CAMU tibbiyot universiteti Pediatriya yo’nalishi 1 kurs talabasi
7. Rahima Safarova “Tibbiyot institutlarida fizika fanini o‘qitishning o‘ziga xos jihatlari” Жамият ва инновациялар – Общество и инновации – Society and innovations Special Issue – 1 (2021) / ISSN 2181-1415
8. Ahmadaliyeva G. H. et al. YARIMO ‘TKAZGICH MODDALAR VA ULARNING XARAKTERISTIKALARI //Евразийский журнал академических исследований. – 2022. – Т. 2. – №. 1. – С. 91-93.
9. Yusubjanovna A. M. BIRINCHI TIBBIY YORDAMNING AHAMIYATI VA UNI BAJARISHNING UMUMIY QOIDAIARI //PRINCIPAL ISSUES OF SCIENTIFIC RESEARCH AND MODERN EDUCATION. – 2023. – Т. 2. – №. 1.
10. Abdusubxon o’g’li U. S. et al. YURAK ISHEMIK KASALLIKLARI VA ULARNI OLDINI OLISHNING ZAMONAVIY USULLARI //PRINCIPAL ISSUES OF SCIENTIFIC RESEARCH AND MODERN EDUCATION. – 2023. – Т. 2. – №. 6.