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TEACHING HUMAN ANATOMY AND PHYSIOLOGY BASED ON MODERN EDUCATIONAL APPROACHES

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Brief abstract: This article discusses recommendations for teaching human anatomy and physiology, based on modern educational approaches, as well as problems arising in this process and their solutions.

Keywords: knowledge, abilities, skills, anatomy, physiology, information technology, interactive, virtual laboratories, simulation, 3D model, VR, AR, integration, animation, multimedia, gamification, educational technologies, LMS, mobile application, cloud technologies.

In recent years, systematic actions are being taken to improve the quality and efficiency of the education system in the country, to teach modern concepts and skills in kindergarten students, school children and university students, to establish close cooperation and integration between education systems and the field of science, education of the integrity and continuity of education.¹

Including topics which develop students' practical skills in the curriculum development of biology, technology, visual arts, and mathematics, connecting and supplementing subjects according to their meaning, assessing essential knowledge and skills are considered within the framework of the national curriculum of general secondary education project. In the section of general education subjects, a timeline for the analysis of curriculum has been developed and is being carried out.

Today, in the human anatomy and physiology education, which is based on modern educational approaches, there are:

- A lack of technology and tools used for teaching the subjects.
- A lack of interactive and high-tech educational tools (virtual laboratories, 3D models, etc.).
- Incompatibility of theory and practice, including the lack of practical training and laboratory work.
- Inadequate integration with other biological sciences and medicine.
- the fact that textbooks and lectures are not interesting nor interactive.
- low qualification of teachers in modern pedagogical and technological approaches.

Problems like these exist and it is necessary to eliminate them first.

The following solutions are recommended to overcome existing problems mentioned above:

Providing the educational process with modern educational tools and educational equipment and using them effectively.

Conducting interactive lessons through virtual laboratories, simulations, and 3D models. For example,

¹ Decree No. PF-6108 of the President of the Republic of Uzbekistan on November 6, 2020 "On measures to develop the fields of education and science in the period of new development of Uzbekistan".

using tools, such as Anatomage Table.

Ensuring balance between theory and practice. More emphasis on practical training and providing opportunities for students to conduct laboratory work regularly.

Integration with biology, chemistry, and other related subjects. Delivering integrated interactive lessons and collaborative learning of interrelated topics.

Organization of classes based on interesting and student-friendly educational technologies and methods, extensive use of multimedia tools, introduction of gamification elements.

Regular organization of training courses, conferences, and seminars for teachers on modern pedagogy and information technologies.

Explaining to students the importance of anatomy and physiology in their future careers, motivating them by making the topics more interesting through real-life examples.

These solutions allow effective implementation of modern educational approaches in the teaching of human anatomy and physiology and help to reduce existing problems.

The use of the following modern technologies increases the effectiveness of teaching Human Anatomy and Physiology:

1. Virtual Reality (VR) and Augmented Reality (AR):

VR and AR applications allow students to explore the complex structure of the human body interactively and visually. For example, zSpace, HoloAnatomy and Complete Anatomy applications.

2. 3D Modeling and Simulation:

3D models and simulators provide realistic representations of anatomical structures. Tools, such as Anatomage Table, BioDigital Human and Visible Body, are widely used for this purpose.

3. Interactive educational platforms:

Through interactive lessons, videos and quizzes on educational platforms, such as Khan Academy, Coursera, edX, students can learn information effectively.

4. Gamification:

Make learning fun and engaging with games and quizzes. For example, Quizlet and Kahoot!

5. Simulation Laboratories:

Simulated Patient Labs allow students to perform hands-on experiences in a safe environment. Body Interact and Laerdal Medical are simulation tools.

6. Multimedia Tools:

Videos, animations, and interactive graphics help students understand and learn topics. Channels, like YouTube, AnatomyZone, and CrashCourse, have a huge amount of great content.

7. LMS (Learning Management System):

Lesson planning, providing resources, and monitoring student performance can be done through LMS platforms such as Moodle, Canvas, and Blackboard.

8. Mobile Apps:

With the help of Mobile Apps, students can learn anywhere and anytime. There are also apps like TeachMe Anatomy, Human Anatomy Atlas, Complete Anatomy and mosaic3D.

9. Microlearning:

Step-by-step learning of complex topics through short lessons and mini-videos helps to keep students' attention for a long time.

10. Cloud technologies and storage:

Educational resources can be stored and shared through cloud services such as Google Drive, Dropbox, and OneDrive.

These technologies can make the teaching of human anatomy and physiology more effective and interesting.

In conclusion, modern technologies greatly help students to develop knowledge and skills in studying human anatomy and physiology subjects. These technologies make it possible to organize the educational process in an interactive, interesting and practice-oriented manner. By applying modern approaches, it is possible to increase the efficiency of the educational process and better prepare students for their future professional career.

References:

1. O‘zbekiston Respublikasi Prezidentining 2020 yil 6-noyabrda “O‘zbekistonning yangi taraqqiyot davrida ta’lim-tarbiya va ilm-fan sohalarini rivojlantirish chora-tadbirlari to‘g‘risida”gi PF-6108 sonli farmoni.
2. G‘ofurov A.T., Tolipova J.O. va boshqalar. Biologiya o‘qitish metodikasi. Oliy o‘quv yurtlari uchun darslik. Toshkent, 2013 y.
3. Niyozov Q.A. Biologik ta’lim jarayonida o‘quvchilarda mustaqil va ijodiy fikrlashni rivojlantirish. Namangan, 2019 y.
4. Niyozov Q. A. Biologiya fanini o‘qitishda pedagogik texnologiyalar. – 2017.
5. Niyozov Q. Biologiya ta’limi jarayonida o‘quvchilarda kompetensiyalarning shakllanishida innovatsion texnologiyalarning o‘rni //Toshkent shahar XTXQTMOI da tashkil etilgan «Xalq ta’limi tizimidagi «Mahorat maktablari» faoliyatini tashkil qilishning ilmiy-nazariy va metodologik asoslari» mavzusidagi Respublika ilmiy-amaliy anjumani materiallar to‘plami.–T.:«Fan va texnologiyalar. – 2017.
6. Adashaliyevich N. Q. Senior lecturer, Namangan Regional Center for Retraining and Advanced Training of Public Educators, Republic of Uzbekistan Brief abstract. In this article, it is written about the importance of global network to improve biology teachers’ professional competence and problems in this process and ways of solving them //LBC 94.3 T-2. – C. 340.
7. Niyozov Q. A. O‘QUVCHILARNI TIMSS XALQARO BAHOLASH DASTURIDA KELITIRILGAN TOPSHIRIQLARNI BAJARISHGA TAYYORLASHDAGI MUAMMOLAR VA ULARNING YECHIMLARI //Educational Research in Universal Sciences. – 2023. – T. 2. – №. 4. – C. 1005-1010.
8. Niyozov Q.A., “O‘quvchilarni PISA xalqaro baholash dasturida keltirilgan topshiriqlarni bajarishga tayyorlashdagi muammolar va ularning yechimlari”. Surxondaryo viloyat pedagoglarni yangi metodikalarga o‘rgatish milliy markazida 2023-yilning 30-may kuni “Aniq va tabiiy fanlarni o‘qitishda zamonaviy yondashuv: muammo va yechimlar” mavzusida xalqaro ilmiy-amaliy anjumani materiallari to‘plami.
9. Niyozov Q.A., Qodirjonov B.R., “Biologiya fanidan amaliy mashg‘ulotlarni samarali tashkil etish orqali o‘quvchilarda mustaqil va ijodiy fikr yuritish ko‘nikmalarini rivojlantirish”. Qoraqalpog‘iston Respublikasi pedagoglarni yangi metodikalarga o‘rgatish milliy markazida 2023-yilning 24-may kuni “Yangi metodikalar: zamonaviy pedagoglarning kasbiy va shaxsiy rivojlanishi garovi” mavzusida xalqaro ilmiy-amaliy anjumani materiallari to‘plami.
10. Адашалиевич Н. Қ. Компетенциявий ёндашувга асосланган таълим жараёнида генетикадан масала ва машқларни ўзига хос усуллар ёрдамида ечиш методикаси //Современное образование (Узбекистан). – 2017. – №. 12. – С. 71-77.
11. Adashaliyevich N. Q. Methodology For Developing the Skills Of Working With The Pisa In Future Biology Teachers //Pedagogical Cluster-Journal of Pedagogical Developments. – 2024. – T. 2. – №. 5. – C. 402-406.
12. <https://t.me/nambiolog>
13. <https://ru.khanacademy.org/>
14. <https://coursera.org/>
15. <https://www.edx.org/>
16. <https://www.mozaweb.com/>