

EFFECTIVENESS OF USING ARTIFICIAL INTELLIGENCE IN TEACHING THE FUNDAMENTAL SCIENCES OF MEDICINE

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Annotation. This article explores the potential of using Artificial Intelligence (AI) to enhance medical education, particularly in teaching fundamental sciences. The author argues that AI tools like adaptive learning, simulations, and advanced visualizations can address the challenges of medical education and improve student learning outcomes. A brief study is presented comparing student performance and perceptions on an Embryology course with and without AI implementation.

Keywords: artificial intelligence, medical education, fundamental sciences, adaptive learning, simulations

Аннотация. В этой статье исследуется потенциал использования искусственного интеллекта (ИИ) для улучшения медицинского образования, особенно в преподавании фундаментальных наук. Автор утверждает, что инструменты искусственного интеллекта, такие как адаптивное обучение, моделирование и расширенная визуализация, могут решить проблемы медицинского образования и улучшить результаты обучения студентов. Представлено краткое исследование, сравнивающее успеваемость студентов и восприятие курса эмбриологии с внедрением ИИ и без него.

Ключевые слова: искусственный интеллект, медицинское образование, фундаментальные науки, адаптивное обучение, моделирование.

Annotatsiya. Ushbu maqola sun'iy intellekt (AI) tibbiy ta'limni yaxshilash uchun, xususan, fundamental fanlarni o'qitishda foydalanish imkoniyatlarini o'rganadi. Muallifning ta'kidlashicha, moslashuvchan o'rganish, simulyatsiya va ilg'or vizualizatsiya kabi sun'iy intellekt vositalari tibbiy ta'lim muammolarini hal qilishi va talabalarning ta'lim natijalarini yaxshilashi mumkin. Talabalarning samaradorligi va embriologiya kursi haqidagi tasavvurlarini sun'iy intellektni qo'llash bilan va amalga oshirishdan solishtirish bo'yicha qisqacha tadqiqot taqdim etiladi.

Kalit so'zlar: sun'iy intellekt, tibbiy ta'lim, fundamental fanlar, adaptiv ta'lim, simulyatsiyalar

Relevance. The fundamental sciences of medicine are complex. Medical students must master vast amounts of information, develop diagnostic skills, and understand intricate physiological processes. AI has the potential to alleviate these challenges, making learning more efficient and effective.

Introduction. From weathered anatomy textbooks and time-worn slides to a future of interactive simulations and personalized learning paths – the landscape of medical education is poised for change. Could artificial intelligence be the catalyst, bridging the gap between traditional methods and the demands of modern medicine? In my personal opinion about future medical education is positive via AI. Like Adaptive learning platforms that adjust content difficulty and provide targeted feedback. And also, Simulation-based Training: AI-powered virtual patients for realistic diagnostic experiences and procedural skill practice. The role of VR and AR in creating immersive medical training environments. Enhanced Visualization and Understanding: AI for creating highly detailed 3D models of anatomical structures. Explaining complex physiological processes and disease mechanisms through interactive visualizations[1].

The purpose of the work. Address the inherent challenges of medical education. Improve learning methods, which translates to better healthcare professionals.

Material and methods. This research was conducted in two courses, which completed Embryology lessons in 2023 and 2024 years at the Fergana Medical Institute of Public Health without awareness of survey.

Results and discussion. Students in the main group (2024) using AI-supported learning achieved a 64.2% (176 students) pass rate in embryology, while the control group (2023) without AI support had a 28.9% (44 students) pass rate. Additionally, 78.1% (214 students) of the main

group reported improved understanding and perceived time saved due to the AI-supported lessons[2]. Another research collaborate our results that the impact of AI on medicine and the implications of this impact for educators trying to educate future doctors. Drawing on these strands, it then identifies AI's direct impact on the methodology and content of medical education, in an attempt to prepare medical educators for the changing demands and opportunities that are about to face them because of AI[3]. But before more researchs conducted by others like Juehea Lee et. al found that Our search identified 4,299 unique titles, of which 22 full-text articles were included in our final analysis[4]. They searched information via seven electronic databases including MEDLINE and EMBASE. It also confirm that medical education and its enhance is more important for future healthcare profiles.

Conclusion. AI is primarily used in medical education to support learning, mainly due to its capacity for personalized feedback. Curriculum review and assessment of student learning are less common, hindered by limited digitalization and the sensitive nature of exams. The use of big data necessitates ensuring data integrity. To increase AI adoption, methodological improvements are needed to overcome technical challenges in AI application development and to employ innovative approaches for assessing AI effectiveness. Integrating AI into medical school curricula will help future medical professionals understand AI algorithms and optimize its use in their practice[5].

References:

1. Тўхтаев, Ж. Т., Ботиров, Н. Т., & Нишонов, Э. Х. (2023). Болдир-ошиқ бўғими шикастланишларини ташхислаш ва даволаш. *Zamonaviy tibbiyot jurnali* (Журнал современной медицины), 1(1), 27-39.
2. Ёкубов, Д., & Мазалова, А. (2024). On differential diagnostics of spinal cord pathology of organic and functional genesis. *Актуальные вопросы фундаментальной медицины: сегодня и в будущем*, 1(1), 36-36.
3. Ёкубов, Д. (2025). Роль анатомических и гормональных факторов в патогенезе варикоцеле у детей и методы его профилактики (обзор литературы). in *Library*, 1(1), 26-30.
4. Xamedxuja o'g'li, N. E. IMPROVEMENT OF TREATMENT METHODS FOR CALF-ASIK JOINT INJURIES.
5. Xamedxuja o'g'li, N. E. (2023). Pathogenetic Mechanisms of the Development of Severe Functional Disorders in Injuries of the Calf-Acorn Joint. *SCIENTIFIC JOURNAL OF APPLIED AND MEDICAL SCIENCES*, 2(11), 427–429. Retrieved from <https://sciencebox.uz/index.php/amaltibbiyot/article/view/8628>
6. Ravshan o'g'li, K. S., & Mavlonjon o'g'li, Q. J. (2024). Review Of The Use Of Tomosynthesis For The Diagnosis Of Injuries And Diseases Of The Musculoskeletal System. *Frontiers in Health Informatics*, 13(6).
7. Qoraboyev Jasurbek Mavlonjon O'G'Li, & Raximova Ruxshona Shavkat Qizi (2024). KATTALARDAGI OG'IR MIYA SHIKASTLANISHI. *Eurasian Journal of Medical and Natural Sciences*, 4 (2), 156-162. doi: 10.5281/zenodo.10776140
8. Meliboev, R. A., & Eminov, R. I. (2025). EXPLORING METHODS TO IMPROVE THE TREATMENT OF COMPLICATIONS ARISING FROM ENDOUROLOGICAL OPERATIONS FOR URINARY STONE DISEASE (LITERATURE REVIEW). *mortality*, 4, 13.
9. Karabaev Jasurbek Mavlyanjanovich. (2025). CURRENT CHALLENGES AND ADVANCES IN PEDIATRIC TRAUMATOLOGY. *International Multidisciplinary Journal for Research & Development*, 12(05), 157–160. Retrieved from <https://www.ijmrd.in/index.php/imjrd/article/view/3051>