KALINICHENKO, Oleksandr
https://orcid.org/0009-0001-8380-7533
Zhytomyr Ivan Franko State University, Department of Physical Education and Basic Military Training, Ukraine

ARTIFICIAL INTELLIGENCE–DRIVEN PERSONALIZATION IN PHYSICAL EDUCATION FOR SENIOR STUDENTS

Relevance of the topic. The digitalization of education and rapid development of artificial intelligence (AI) create new opportunities for personalizing physical education according to students' physical fitness, motivation, and health status (Kalinichenko, 2025; Kalinichenko & Hryban, 2025a). Recent studies confirm the potential of AI, wearable devices, and digital platforms for monitoring physical activity, adapting training loads, assessing performance, and increasing student motivation (Cabinet of Ministers of Ukraine, 2020; Hryban, 2020; Kalinichenko, 2025, 2026a, 2026b; Kalinichenko & Hryban, 2025a, 2025b; Volskyi, 2025). Ukrainian researchers also emphasize the importance of digital and competency-based approaches in school physical education (Hryban, 2020; Kalinichenko, 2025, 2026a, 2026b; Kalinichenko & Hryban, 2025a, 2025b; Otravenko et al., 2021). However, the practical integration of AI into physical education for senior students requires further research.

Aim of the article. The aim is to substantiate the feasibility of using AI technologies to personalize physical education for senior students and to determine their potential for adapting physical loads, learning content, and instructional strategies to individual characteristics.

Presentation of the main material. AI technologies, including machine learning and adaptive systems, make it possible to collect and analyze data on students' physical activity and functional indicators, such as heart rate, exercise intensity, movement efficiency, and recovery. Based on these data, individualized training programs can be developed and exercise intensity adjusted according to students' current physical condition. Wearable devices, fitness trackers, and mobile applications provide real-time feedback, enabling teachers to monitor students' responses to physical activity and modify workloads when necessary. Adaptive algorithms can help identify excessive physical load and recommend reduced intensity or additional rest, thereby contributing to injury prevention and safer learning. AI-based assessment tools can also provide more objective evaluation of physical performance and monitor individual progress. In addition, gamification, personalized goals, and achievement tracking can increase students' motivation and encourage regular physical activity.

Conclusions. The integration of AI into physical education can improve its personalization, effectiveness, and safety by enabling continuous monitoring, individualized training loads, and objective assessment. AI-based tools, including wearable devices, mobile applications, and adaptive algorithms, can increase students' motivation, support physical development, and promote a healthy lifestyle. Further research should focus on effective models for integrating AI into secondary school physical education.

References

Cabinet of Ministers of Ukraine. (2020). *On approval of the Concept for the development of artificial intelligence in Ukraine* (Resolution No. 1556-r, December 2, 2020, as amended by

Resolution No. 1787-r, December 29, 2021). https://zakon.rada.gov.ua/laws/show/1556-2020-%D1%80#Text

Hryban, H. P. (Ed.). (2020). *Physical education: Problems and prospects*. Ruta.

Kalinichenko, O. O. (2025). Integration of digital tools and artificial intelligence into physical education of senior school students. *Bulletin of T. H. Shevchenko National University "Chernihiv Colehium". Series: Pedagogical Sciences, 35*(191), 87–92. https://doi.org/10.58407/visnik.253514

Kalinichenko, O. O. (2026a). Design approaches to creating intelligent physical education tools for senior school students based on artificial intelligence technologies. In *Sport and Physical Education in Higher Education Institutions: Present and Future: Proceedings of the 5th Scientific and Practical Internet Conference with International Participation* (pp. 22–26). Zaporizhzhia Polytechnic National University.

Kalinichenko, O. O. (2026b). Innovative approaches to physical education of senior school students using digital technologies. In *Pedagogical Innovations in Teaching Physical Culture and Sport in Higher Education Institutions: Proceedings of the Scientific and Pedagogical Internship* (pp. 43–49). Academy of Social Sciences.

Kalinichenko, O. O., & Hryban, H. P. (2025a). Artificial intelligence technologies in physical education of senior school students: Theory and methodology. *Scientific Journal of the National Pedagogical Dragomanov University. Series 15: Scientific and Pedagogical Problems of Physical Culture (Physical Culture and Sport), 11*(198), 87–91. https://doi.org/10.31392/UDU-nc.series15.2025.12(199).17

Kalinichenko, O. O., & Hryban, H. P. (2025b). Theoretical and methodological foundations of using artificial intelligence technologies in physical education of senior school students. *Scientific Journal of the National Pedagogical Dragomanov University. Series 15: Scientific and Pedagogical Problems of Physical Culture (Physical Culture and Sport), 11*(198), 74–77. https://doi.org/10.31392/UDU-nc.series15.2025.11(198).14

Otravenko, O., Shkola, O., Shynkarova, O., Zhamardiy, V., Ilyvatskyi, O., & Pelypas, D. (2021). Leisure and recreational activities of student youth in the context of health preservation. *Journal for Educators, Teachers and Trainers, 12*(3), 146–154.

Volskyi, D. S. (2025). Artificial intelligence in sports: A retrospective of development and integration processes in the sports industry, international experience and the current state of the issue in Ukraine. *Scientific Journal of the National Pedagogical Dragomanov University. Series 15: Scientific and Pedagogical Problems of Physical Culture (Physical Culture and Sport), 1*(186), 40–44.