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Development of Pre-Service Physical Education Teachers' Competencies in Using Artificial Intelligence Technologies

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Abstract: This article discusses the development of pre-service physical education teachers' skills in using artificial intelligence (AI) technologies. In modern education, AI technologies play a crucial role in enhancing teaching effectiveness and implementing individualized approaches. The article analyzes the role of artificial intelligence in physical education, its potential in monitoring students' physical development, and its integration into pedagogical activities. Additionally, it explores the essential competencies that teachers must acquire for effective AI utilization, the significance of technology in contemporary education, and its advantages. The research findings provide recommendations aimed at improving the professional training of physical education teachers and enhancing the quality of education.

Keywords: Artificial intelligence, physical education, pedagogical technologies, educational innovations, AI utilization.

Introduction: Currently, the rapid advancement of artificial intelligence (AI) technologies is bringing about profound changes in the education system. The process of digital transformation is penetrating all areas of education, including physical education. The use of AI technologies not only optimizes the learning process but also allows it to become more interactive, efficient, and based on an individualized approach.

In physical education classes, AI technologies enable automatic analysis of exercises, accurate evaluation of students' movements, provision of real-time feedback (both verbal and written), as well as maintaining a history of physical activity. This approach enhances students' engagement, helps them perform movements correctly, and contributes to the formation of personalized development trajectories.

However, the effective implementation of such modern technologies largely depends on the competencies of future physical education teachers in using AI. Today, educators face pressing tasks such as correctly selecting AI tools, integrating them into the educational process, ensuring technological safety, and adhering to ethical standards[1].

Therefore, the development and enhancement of AI competencies in the professional preparation of future teachers is becoming one of the most important directions in the education system. This article analyzes the necessity, opportunities, and key directions for developing competencies in the use of AI technologies among students studying physical education. The research employed methods such as literature analysis, the study of advanced international and local experiences, and pedagogical synthesis.

Artificial Intelligence Technologies and Their Role in Education

Artificial intelligence (AI) technologies create new opportunities in the field of education. AI refers to a set of technologies that enable computers or systems to perform tasks that typically require human intelligence. The use of AI in the teaching process makes it possible to address students' individual needs, personalize the learning experience, and monitor their academic progress.

For physical education teachers, these technologies allow for monitoring physical activity, tracking students' health, and developing programs tailored to their changing needs. AI technologies not only enable the analysis of physical performance but also increase student motivation and create opportunities for

teaching physical exercises in an interactive and engaging manner[2].

For instance, specially developed mobile applications and smart devices for physical education classes can measure students' heart rate, breathing rate, and other physical parameters in real time. Such systems allow teachers to quickly assess students' physical condition, identify issues at an early stage, and take appropriate measures in a timely manner.

The Need to Improve Physical Education Teachers' Skills in Using Artificial Intelligence Technologies

In the context of modern pedagogy, it is essential for physical education teachers to develop their skills in utilizing artificial intelligence (AI) technologies. Applying AI in teaching not only enhances the teacher's professional capabilities but also increases the overall effectiveness of the educational process.

With the help of AI technologies, it becomes possible to collect and analyze all data related to students' physical development. Additionally, AI facilitates the implementation of individualized approaches, as it can take into account each student's unique needs and organize a learning process that is tailored accordingly.

To effectively apply AI in their lessons, physical education teachers must acquire a range of competencies. These include the following:

1. Acquiring Knowledge About Artificial Intelligence Technologies

Teachers need to understand the fundamental principles of artificial intelligence technologies, how they work, and how they relate to educational processes. This enables them to use the technologies correctly and understand how to effectively apply them in their lessons[3]. Studying artificial intelligence requires not only the acquisition of technological knowledge but also the consideration of pedagogical approaches.

2. Applying Pedagogical Technologies in Practice

It is important to implement interactive teaching methods in the educational process with the help of artificial intelligence technologies. These technologies are essential for increasing students' interest and making lessons more engaging and effective. For instance, physical education teachers can enhance student motivation by incorporating game elements or gamification methods into their teaching practices[4].

Modern pedagogical technologies—particularly interactive methods based on artificial intelligence—play a significant role in increasing students' intrinsic motivation to learn. Gamification implemented through AI, individualized approaches, real-time feedback, and digital monitoring tools help make the learning process more learner-centered, engaging, and efficient.

This is especially important in physical education, where movement and active participation are key; such technologies provide greater opportunities for students to express themselves and participate actively.

3. Data Analysis and Interpretation Skills

The data collected through artificial intelligence must be analyzed. Physical education teachers should use these analyses to evaluate students' physical performance and monitor their development. In this context, the teacher's analytical thinking skills and understanding of technology play a crucial role.

4. Readiness to Explore and Apply New Technologies

Physical education teachers must constantly seek out new technologies and learn effective ways to apply them in practice. Adapting to innovations and testing new tools in the classroom is essential for enhancing the effectiveness of pedagogical activities.

1. Monitoring Individual and Group Activity

By observing students' physical activity, teachers can identify their changing needs and individual characteristics. In this regard, AI technologies are particularly useful for measuring physical activity, analyzing movements, and presenting overall group achievements. These tools allow for real-time insights that support both individualized instruction and group performance tracking[5, 6].

AI-based technologies not only automate the learning process but also expand the analytical capacity of teachers. Analyzing data collected through AI tools in physical education classes plays a crucial role in assessing students' physical development. In this regard, a teacher's ability to think analytically, understand digital data, and interpret it effectively is of primary importance.

At the same time, a modern teacher must continuously improve their professional practice, seek out new technological tools, and be ready to apply them in their work. The integration of innovative tools into lessons enhances pedagogical effectiveness and strengthens interactive communication with students. Additionally, AI technologies allow for real-time monitoring of individual and group physical activity, motion detection, statistical analysis, and visual presentation of achievements. This facilitates the organization of the educational process based on personalization and differentiated approaches.

Advantages of Using AI Technologies in Education

AI technologies offer a range of benefits to the

educational process:

1. Individualized Learning:

The ability to create personalized programs tailored to students' physical activity and developmental levels. With the help of AI technologies, teachers can monitor each student's physical condition and develop training programs accordingly.

2. Increased Motivation:

Gamification technologies and AI-based mobile applications boost students' motivation. Learners use these technologies to attract teachers' attention, achieve new results, and track their own progress.

3. Efficient Use of Resources:

The effectiveness of physical education classes increases with the use of AI technologies, as the necessary data to monitor students' physical condition is collected and analyzed automatically.

4. Health Monitoring:

AI technologies provide the ability to monitor students' health. Through these technologies, teachers can track physical activity, heart rate, and breathing rate, which allows for the organization of safe and effective lessons. [7, 8].

The Integration of Artificial Intelligence Technologies into Physical Education

The implementation of artificial intelligence (AI) technologies in physical education significantly increases the individualization, effectiveness, and safety of the educational process. First and foremost, these technologies allow for the creation of training programs tailored to the individual characteristics of students, which helps to maximize the development of each student's physical potential. Additionally, through gamification and digital motivation methods, factors such as student interest, competition, and the drive for personal achievements are enhanced. Furthermore, the ability to automatically analyze large volumes of data collected with the help of AI allows teachers to optimize the lesson process, make effective use of time and other resources, and ultimately improve the quality of education. Finally, AI technologies enable constant monitoring of students' physical conditions such as heart rate, breathing, and adaptation to physical exertion, facilitating early detection of problems. This creates a safe, healthy, and personalized learning environment.

CONCLUSION

The use of AI technologies by physical education teachers not only enables effective organization of pedagogical activities but also provides opportunities to optimize students' physical development. To successfully integrate AI technologies into their lessons, teachers need to acquire a wide range of competencies. By mastering these technologies and applying them in their pedagogical practice, they can create new possibilities in the field of physical education. The advantages offered by AI technologies in the educational process positively affect students' access to quality education and their physical development. Therefore, improving physical education teachers' competencies in using AI technologies is crucial for effectively organizing physical education classes in accordance with modern educational demands. This article provides a comprehensive analysis of the role of AI technologies in physical education teachers' pedagogical activities and the necessity to enhance their competencies.

REFERENCES

Anderson, J. & Rainie, L. (2018). Artificial Intelligence and the Future of Humans. Pew Research Center.

Baker, R.S. (2020). Artificial Intelligence in Education: Promises and Implications for Teaching and Learning. UNESCO Education Sector.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial Intelligence in Education: A Review. IEEE Access, 8, 75264–75278.

Bond, M., Buntins, K., Bedenlier, S., Zawacki-Richter, O., & Kerres, M. (2021). Mapping research in student engagement and educational technology in higher education: A systematic evidence map. International Journal of Educational Technology in Higher Education, 18(1), 1-30.

Kuriakose, F. & Iyer, L. (2022). Application of Artificial Intelligence in Physical Education and Sports Training: A New Paradigm. International Journal of Human Movement and Sports Sciences, 10(1), 88-94.

Vellido, A. (2019). The importance of interpretability and visualization in machine learning for applications in medicine and health care. Neural Computing and Applications, 32, 18069–18083.

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial Intelligence in Education: Promises and Implications for Teaching and Learning. Boston: Center for Curriculum Redesign.

Rashid, T. & Asghar, H.M. (2016). Technology use, self-directed learning, student engagement and academic performance: Examining the interrelations. Computers in Human Behavior, 63, 604-612.