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INTEGRATION OF DIGITAL TECHNOLOGIES INTO THE SYSTEM-ACTIVITY APPROACH IN PHYSICAL EDUCATION: ADVANTAGES AND CHALLENGES

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ABSTRACT: This article is devoted to the study of the integration of digital technologies into the system-activity approach in physical education. The study identified the benefits and challenges associated with the introduction of digital tools into the educational process. Data analysis shows that the use of digital technologies helps to increase students' motivation, improve control over their physical condition and individualize the educational process. At the same time, there are obstacles, such as the need for significant investment and training of teaching staff.

Key words:digital technologies, system- activity approach, physical education, student motivation, individualization of learning, educational process, monitoring of physical condition, teaching staff, technical problems, educational institutions.

Modern society is actively introducing digital technologies into various spheres of life, including education. These technologies are changing traditional teaching methods, offering new tools and approaches that can significantly improve the quality of the educational process. In the context of physical education, this is especially relevant, since traditional methods of physical education often do not take into account the capabilities of modern technologies for monitoring, analyzing and motivating students.

The system- activity approach, which underlies the modern educational paradigm, emphasizes the active involvement of students in the learning process. This approach is based on the principles of the activity approach of L.S. Vygotsky, which emphasizes the importance of active interaction of students with educational material and with each other. In the context of physical education, this means that students should not only perform physical exercises, but also understand their meaning, analyze their results and actively participate in planning their physical development.

Digital technologies offer a wide range of tools to support the activity - based approach. For example, fitness trackers and mobile apps allow students to independently monitor their physical metrics, such as heart rate, steps, and calories burned. Interactive learning platforms and videos can be used to demonstrate proper exercise technique and to conduct virtual competitions.

However, the integration of digital technologies into the system - activity approach in physical education is associated with a number of challenges. In particular, it requires significant financial investments in the acquisition of equipment and software, as well as training teachers to use new technologies in the educational process. In addition, there is a risk that technical problems and lack of infrastructure may hinder the implementation of digital tools.

The purpose of this article is to explore how digital technologies can be integrated into a system-activity approach in physical education, as well as to identify the main advantages and challenges of this process. The study will analyze the current state of the use of digital technologies in educational institutions, identify the main trends and problems, and offer recommendations for optimizing the integration of digital tools into the physical education process.

Theoretical foundations: The system - activity approach assumes active participation of students in the

educational process, where learning occurs through activities that reflect real life. This approach emphasizes the development of key competencies such as self-regulation , critical thinking and collaboration.

The main principles of the system- activity approach:

1. Active participation of students. In the system - activity approach, students are active participants in the learning process. They not only acquire knowledge, but also apply it in practice, participating in various forms of learning activities, including project work, experimental tasks, and collective discussion of problems.
2. Learning through activity. This principle assumes that learning should be closely connected with the students' activities, reflecting real life. Tasks and exercises should be practical and meaningful for the students, which contributes to a deeper acquisition of knowledge and skills.
3. Development of key competencies. The system- activity approach is aimed at developing such important competencies in students as:

- Self-regulation: The ability to independently plan, control and evaluate one's activities.
- Critical Thinking: The ability to analyze information, ask questions, find and evaluate evidence.
- Collaboration: Skills for effective interaction with other people, teamwork, ability to listen and take into account the opinions of others.

Digital technologies in education

Digital technologies play an increasingly important role in the modern educational system. They provide ample opportunities to improve the learning process through the use of electronic devices, software and Internet resources .

The main types of digital technologies in education:

- Electronic educational resources (EER): Online courses, learning platforms, video lessons and interactive learning materials that allow students to learn at their own pace and location.
- Mobile applications: Special devices and applications that help track students' physical activity, monitor their health and provide recommendations for improving their physical fitness.
- Virtual and augmented reality (VR and AR): Technologies that create interactive learning environments where students can practice in realistic environments or learn complex processes in a visual way.
- Interactive whiteboards and touch screens: Equipment that allows for a more dynamic and interactive learning environment.

Digital technologies make it possible to create personalized learning programs tailored to the needs and level of each student. Interactive and multimedia resources make the learning process more interesting and engaging for students.

Technology tools make it possible to more accurately track student progress, analyze their achievements, and identify areas that need attention.

Research Methodology

To achieve the research objective, a mixed method was chosen, which combines quantitative and qualitative data. This approach allows for a more complete and accurate understanding of the process of integrating digital technologies into the system- activity approach in physical education.

The study involved 100 students and 10 teachers from comprehensive schools No. 3 and No. 6 in Fergana, No. 3 and No. 6, No. 3 and No. 6. The students were aged 12 to 16 years and represented different grades and levels of physical fitness. The teachers who participated in the study had different work experience and levels of qualification in the field of physical education.

To collect quantitative data, questionnaires and tests were used to assess the following aspects:

1. Frequency of use of digital technologies: Students and teachers were asked questions about how often they use various digital technologies (mobile applications, interactive whiteboards, etc.) during physical education classes.

2. Level of motivation: Students were asked to rate their motivation for physical education before and after the introduction of digital technologies using a Likert scale (from 1 to 5, where 1 is very low motivation, 5 is very high motivation).

3. Physical performance: Data on students' physical performance (e.g. heart rate, number of steps per day, body mass index) were collected before and after the use of digital technologies to assess their impact

on students' physical performance.

The collected quantitative data were processed using descriptive and inferential statistics. To analyze the differences in motivation levels and physical indicators before and after the introduction of digital technologies, a t-test for dependent samples was used. To analyze the frequency of using digital technologies and their impact on the educational process, correlation analysis methods were used.

Qualitative data were collected using the following methods:

1. Teacher interviews: Teachers were asked open-ended questions about their views and experiences of using digital technologies in physical education, as well as the benefits and challenges they face. Interviews lasted between 30 and 60 minutes and were recorded and transcribed.

2. Observation of physical education lessons: Physical education lessons were systematically observed using digital technologies. Observers recorded the use of digital tools, interactions between students and teachers, and technical and organizational problems that arose.

The qualitative data were analysed using thematic analysis methods. The main themes and subthemes were identified related to the benefits and challenges of using digital technologies, as well as their impact on the educational process and physical well-being of students.

To obtain a comprehensive picture of the study, quantitative and qualitative data were combined using the triangulation method. This allowed us to confirm and clarify the results obtained using different methods, as well as to identify the relationships between quantitative and qualitative aspects of digital integration.

Frequency of digital technology use: 60% of students reported using apps daily, 25% several times a week, 15% rarely or never.

The average level of motivation of students before the introduction of digital technologies was 3.1 (on a scale from 1 to 5), after the introduction - 4.2. The results of the t-test showed a significant increase in motivation ($p < 0.01$).

The average number of steps per day increased from 5,000 to 7,500 steps after using mobile activity monitoring apps. The students' body mass index (BMI) remained within the normal range, but their cardiovascular fitness improved.

Thus, the research methodology based on a mixed method allowed us to obtain a comprehensive and detailed picture of the integration of digital technologies into the system- activity approach in physical education, revealing both significant advantages and key challenges of this process.

The results of the study showed that the benefits of digital integration contribute to:

- Increasing student motivation: 75% of surveyed students noted that the use of digital technologies makes physical education lessons more interesting and exciting.
- Individualization of learning: Digital technologies allow teachers to develop individual training programs that take into account the physical capabilities and needs of each student.
- Improved control and monitoring: 80% of teachers noted that digital technologies help to more accurately track the physical condition of students and their progress using special applications.

The introduction of digital technologies requires significant financial investments in the acquisition of equipment and software. 60% of the teachers surveyed indicated the need for advanced training to effectively use digital technologies. Problems with equipment and software can make it difficult to conduct classes.

The study found that the use of digital technologies significantly increased students' interest and motivation in physical education. The average level of students' motivation increased from 3.1 to 4.2 points on the Likert scale after the introduction of digital technologies. This is explained by the fact that interactive and personalized approaches make classes more attractive and meaningful for students. Mobile applications that provide instant feedback help students track their achievements.

The results of the study confirm that the integration of digital technologies into the system - activity approach has significant potential for improving the quality of education in physical education. However, successful implementation requires solving a number of organizational and technical problems.

1. Provide schools with the necessary equipment and software.
2. Organize systematic professional development for teachers.
3. Create an infrastructure for technical support.

The integration of digital technologies into the system - activity approach in physical education opens

up new opportunities for improving the educational process. It helps to increase students' motivation, improve control over their physical condition and individualize learning. However, the successful implementation of this process requires solving a number of organizational and technical problems. Solving these challenges will allow the most effective use of digital technologies for the development of physical education in educational institutions and the creation of a higher-quality and modern system of physical education.

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