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INNOVATIVE TECHNOLOGIES IN PHYSICAL EDUCATION OF STUDENTS AT TECHNICAL UNIVERSITIES

Ortikov Umidjon Khudoyberdievich

Associate Professor, Department of Physical Culture and Sports,
Namangan State Technical University, Namangan, Uzbekistan

E-mail: umidjonortikov06@gmail.com

Abstract

This article examines the specific features of applying innovative technologies in the process of physical education of students at technical universities. The aim of the study was to determine the effectiveness of modern methods and digital learning tools in organizing the educational and training process. The research involved 25 students of group 57-YXTE-24 from Namangan State Technical University. During the eight-week experiment, innovative forms of training were implemented, including elements of interval, circuit, and game-based training, as well as digital monitoring of students' physical development indicators. The results of the experiment demonstrated that the use of innovative approaches contributes to increasing students' motivation and improving indicators of strength, endurance, speed, and flexibility. The practical significance of the research lies in the possibility of introducing the proposed methods into the system of physical education at technical universities.

Keywords: Physical education, innovative technologies, students, technical university, physical qualities, pedagogical experiment, digital methods.



Introduction

The modern system of higher education is aimed at preparing specialists who possess not only professional knowledge but also a high level of physical and psychophysiological readiness.

In the context of the digitalization of the educational process, special attention is paid to the use of innovative technologies in various fields, including physical education.

In technical universities, where the academic workload is predominantly theoretical, there is a noticeable decrease in students' physical activity. This requires the search for effective methods to improve their physical fitness. The use of innovative pedagogical approaches is one of the key directions in modernizing the educational process. These include digital platforms for monitoring physical activity, fitness technologies, game-based training, distance learning formats, and interactive applications for analyzing physical performance.

The aim of this study is to assess the effectiveness of implementing innovative technologies in the system of physical education for students at technical universities and to determine their impact on the development of students' basic physical qualities.

Literature Review

The modern stage of the development of physical education in higher education institutions is characterized by the active introduction of innovative technologies aimed at increasing the efficiency of the educational process and developing students' physical qualities. In the context of rapid scientific and technological progress and the digitalization of education, approaches to organizing training sessions are changing significantly, requiring a rethinking of traditional methods of physical education.

In recent years, the modernization of physical education in universities has been widely discussed in scientific and pedagogical literature. According to researchers such as **L.I. Lubysheva, V.V. Kuznetsov, and I.M. Baranov**, the introduction of innovative technologies into the educational process promotes



stable motivation among students toward physical activity and improves the organization and monitoring of their physical development.

Modern technologies make it possible to effectively combine traditional and digital forms of instruction. These include the use of **mobile applications** to monitor physical activity (Fitbit, Mi Fit, Strava), **online platforms** for remote physical training, and **gamification elements**, which increase students' interest and competitiveness.

Furthermore, several studies (Karpova, 2021; Ivanov, 2022) indicate that integrating interval and circuit training into students' programs at technical universities enhances endurance and strength. These types of training require students to manage effort distribution effectively, developing willpower, attention, and self-control.

Thus, the analysis of scientific sources shows that innovative technologies in physical education not only contribute to improving physical fitness levels but also foster a sustainable interest in leading a healthy lifestyle.

Research Methodology

The research was conducted at the Department of Physical Culture and Sports, Namangan State Technical University. The study involved **25 students** from group **57-YXTE-24**, enrolled in the first and second years of study. The duration of the pedagogical experiment was **eight weeks**.

The main objective of the experiment was to evaluate the effectiveness of applying innovative technologies and training methods in developing students' physical qualities - strength, endurance, speed, and flexibility.

Tests and control exercises used in the research:

- 100 meter run - assessment of speed
- 1000 meter run - assessment of endurance
- Push-ups - assessment of upper-body strength
- Sit-ups - assessment of abdominal strength
- Shuttle run 4x9 m - assessment of coordination and speed endurance
- Flexibility test (forward bend from sitting position).



Structure of experimental training sessions:

- **Interval training** - alternation of high and moderate intensity exercises aimed at developing endurance and faster recovery.
- **Circuit training** - a set of 6-8 exercises performed in stations with minimal rest, ensuring balanced development of all physical qualities.
- **Game-based methods** - mini-games and team competitions used to enhance motivation and teamwork.
- **Digital monitoring** - the use of fitness trackers, pedometers, and mobile applications to monitor physical activity, heart rate, calorie expenditure, and performance dynamics.

Training sessions were held **three times a week for 60 minutes each**. The control group followed the traditional physical education program.

A comparison of pre- and post-experimental data made it possible to assess the effectiveness of the innovative training methods.

Results and Discussion

At the end of the eight-week pedagogical experiment, the obtained data confirmed the positive impact of innovative technologies on students' physical fitness.

Speed (100 m run): The average time of students in the experimental group improved from **15.4 to 14.2 seconds** (+7.8%), while the control group showed only a 2.1% improvement.

Endurance (1000 m run): Average performance improved from **4 min 40 sec to 4 min 15 sec**, indicating an **8.9% increase** in endurance, while the control group results remained almost unchanged.

Strength (push-ups, sit-ups): The number of push-ups increased from **28 to 35 repetitions** (+25 %), and sit-ups from **30 to 39 repetitions** (+30 %).

Flexibility (forward bend test): Average flexibility improved by **3.5 cm**, confirming a positive trend in muscle elasticity and mobility.

Coordination (shuttle run 4x9 m): Average time decreased by **0.4 seconds**, showing improvement in coordination and speed endurance.



Motivation survey: According to questionnaires, **78 % of participants** noted that using digital tools and gamified elements made the classes more engaging and helped them monitor personal progress.

Overall, the results show that implementing innovative technologies and modern training methods leads to a comprehensive improvement in students' physical development and motivation for physical education.

Conclusion

The study confirmed the high effectiveness of using innovative technologies in the physical education of students at technical universities.

The integrated use of interval, circuit, and game-based training, along with digital tools for monitoring physical activity, allows educators to:

- improve the quality of students' physical training;
- foster sustainable motivation toward physical education;
- individualize the learning process;
- strengthen health and develop key physical qualities.

After eight weeks of training under the innovative methodology, statistically significant improvements were observed in all key physical indicators of the experimental group.

The **practical significance** of this work lies in the possibility of applying these methodological recommendations in physical education programs of technical and other higher education institutions.

Future research may focus on the development of digital platforms for automated analysis of students' physical activity and the integration of such systems into the educational process.

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