AJPDIS
GLOBAL RESEARCH NETWORK

AMERICAN Journal of Public Diplomacy and International Studies
Volume 4, Issue 02, 2026 ISSN (E):2993-2157

Methods of Teaching Technical Elements of Wrestling to Students with Physical Disabilities Based on Video Analysis

Ashirov Anvar Azamat ugli
Doctoral student at the Uzbek-Finnish, Pedagogical Institute

Abstract: In this article, the issues of improving the process of teaching wrestling elements to students with physical disabilities were studied scientifically and pedagogically based on the use of video analysis technologies. The study paid special attention to the issues of individualizing training sessions based on the principles of adaptive physical education, expanding the possibilities of visual perception of movements and self-control. The results obtained show that the systematic use of modern information and communication technologies, in particular video analysis tools, in adaptive physical education classes is of great importance in increasing the physical fitness, movement skills and motivation of students with physical disabilities to training.

Keywords: adaptive physical education, wrestling, video analysis, students with physical disabilities, movement skills, pedagogical experience.

Today, the widespread involvement of people with disabilities in physical education and sports is one of the urgent socio-pedagogical tasks facing society. Special attention is paid to the development of an inclusive education and adaptive physical education system worldwide. In this process, strengthening the health of students with disabilities, increasing their physical fitness and motor activity, as well as ensuring their social adaptation and personal development, is of great importance.

In particular, there is a growing need to organize training with students with disabilities studying in higher education institutions based on scientifically based, safe and effective methods. Traditional training methods may not always be effective for this category of students, therefore, individualizing the training process and introducing visual and digital technologies are becoming an urgent issue.

The level of study of the problem. An analysis of scientific and pedagogical literature shows that the issues of organizing adaptive physical education and sports training have been widely covered by many domestic and foreign researchers in recent years. An analysis of existing research shows that traditional methods of explanation and demonstration predominate in teaching wrestling elements to students with physical disabilities. The issue of using video analysis technologies on a systematic and methodological basis and experimentally substantiating their pedagogical effectiveness has not been sufficiently studied in the scientific literature. Therefore, the development of a methodology for teaching wrestling elements based on video analysis technologies and determining its pedagogical effectiveness is an urgent scientific problem for the theory and methodology of adaptive physical education.

The purpose of the study is to determine the pedagogical effectiveness of the methodology based on video analysis technologies in the process of teaching wrestling elements to students with physical disabilities.

The objectives of the study are to analyze the didactic potential of video analysis technologies in teaching wrestling elements, to develop a training methodology adapted for students with physical disabilities, and to determine its impact on movement accuracy, coordination, and balance indicators.

This study was organized as a pedagogical experiment with the participation of students with physical disabilities studying at a higher educational institution. During the study, the health status, level of physical development, and functional training indicators of the participants were studied at the initial stage. Based on the data obtained, students were divided into an experimental group (n=15) and a control group (n=15) using the equalization method, which served to ensure the objectivity of the research results.

In the experimental group, training sessions on wrestling elements were conducted based on a specially developed methodology based on video analysis technologies. This methodology was based on the principles of adaptive physical education and aimed at ensuring an individual approach to each student. At the initial stage of the training, wrestling elements and movement combinations were demonstrated using video materials. These videos served to explain the technical structure of the movements, the sequence of execution, and safety rules.

The movements performed by the students during the training were videotaped, and at the end of the training, they were analyzed together in a slowed-down and replay mode. During the video analysis, technical errors, loss of balance, and shortcomings in movement accuracy made by the students were identified, and individual methodological recommendations were given to eliminate them.

In the control group, training sessions on wrestling elements were conducted based on a traditional pedagogical approach, that is, through verbal explanations and practical demonstrations by the trainer. During the training, technical movements were mainly demonstrated directly, and correction of individual errors was limited to verbal recommendations.

Table 1 below compares the level of mastery of wrestling elements in the experimental and control groups before and after the experiment. The data in the table allow us to analyze the changes that occurred in the indicators of balance, coordination, and accuracy of movement during wrestling training of students with physical disabilities.

The closeness of the indicators of the experimental and control groups before the start of the experiment indicates that the initial level of physical and functional training of the participants was almost equal. This fact ensures the correct organization of the pedagogical experimental conditions and the objectivity of the results obtained.

At the end of the experiment, significant positive changes were observed in the indicators of the experimental group in all evaluated parameters. This indicates that training based on video analysis technologies helped students to consciously and effectively master wrestling elements. Although the control group also showed some improvement, this improvement was lower than in the experimental group.

In general, the data presented in Table 1 confirm that video-based training sessions are more effective than traditional training methods in developing motor skills of students with physical disabilities.

According to the data presented in Table 1, the balance time in the experimental group was on average 18.4±2.1 seconds before the experiment, but at the end of the experiment this indicator increased to 25.6±2.3 seconds. As a result, a significant increase of 7.2 seconds was recorded in the level of balance. In the control group, this indicator increased from 18.7±2.0 seconds to 21.1±2.2 seconds, an increase of 2.4 seconds. This demonstrates the high effectiveness of video-based training in developing balance compared to traditional methods.

Table 1. Indicators of mastery of wrestling elements in the experimental and control groups

t/r	Indicators	Group	Before the experiment (X±σ)	After the experience (X±σ)	Change
1	Balance (seconds)	Experience	18,4±2,1	25,6±2,3	+7,2
		Supervision	18,7±2,0	21,1±2,2	+2,4
2	Coordination test (scores)	Experience	6,2±0,8	8,5±0,7	+2,3
		Supervision	6,3±0,9	7,1±0,8	+0,8
3	Movement accuracy (%)	Experience	62,0±5,4	78,3±4,9	+16,3
		Supervision	61,5±5,1	68,2±5,0	+6,7

The results of the coordination test also confirm that the positive changes in the experimental group were much higher. In particular, in the experimental group, the level of coordination before the experiment was on average 6.2±0.8 points, while after the experiment this indicator increased to 8.5±0.7 points, that is, the amount of increase was 2.3 points. In the control group, the coordination indicators increased from 6.3±0.9 points to 7.1±0.8 points, and the increase was limited to 0.8 points. These results indicate that the use of video analysis technologies is of significant pedagogical importance in the development of coordination skills. Significant positive changes were also observed in the experimental group in terms of movement accuracy indicators. At the beginning of the experiment, this indicator was 62.0±5.4%, and at the end of the experiment it increased to 78.3±4.9%, that is, the total increase was 16.3%. In the control group, the accuracy of movements increased from 61.5±5.1% to 68.2±5.0%, an increase of 6.7%. This difference indicates that the experimental group had a higher level of conscious mastery of movements and a reduction in technical errors.

Conclusion. The results of the conducted pedagogical research clearly confirmed the high pedagogical effectiveness of the methodology based on video analysis technologies in teaching wrestling elements to students with physical disabilities. During the study, it was found that the video analysis-based training used in the experimental group had an effective effect on the conscious, consistent and technically correct mastery of movements by students.

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