The process of creating algorithms for fundamental taekwondo training in the wtf style

UDC 796.856.2

PhD, Associate Professor **G.I. Semenova**
PhD, Associate Professor **I.V. Erkomayshvili**
Postgraduate student **G.A. Ryabov**
Master student **K.K. Pshenitsyn**
Ural Federal University named after the First President of Russia B.N. Yeltsin, Yekaterinburg

Corresponding author: galsem@list.ru

Received by the editorial office on 12.01.2025

Abstract

Objective of the study was to determine the perspective of instructors regarding the implementation of algorithms in the teaching of fundamental techniques in Taekwondo.

Methods and structure of the study. The research was carried out through a survey administered to taekwondo instructors. The survey consisted of both closed and open-ended questions designed to gauge the instructors' experience with the algorithmic approach, their perception of it, and their assessment of its effectiveness. A total of 22 instructors participated in the survey.

Results and conclusions. A significant proportion of taekwondo instructors have been observed to employ the algorithmic approach, which suggests its potential effectiveness in teaching fundamental techniques and enhancing athletic performance. However, there are still challenges to implementing the algorithmic method in training, such as time constraints, a shortage of methodological resources, and a lack of motivation among athletes. These issues require further investigation to enhance the quality of athletes' training. This article will be of interest to coaches, instructors, and anyone seeking to improve their WTF taekwondo training methods.

Keywords: *algorithmization, training, basic strokes, taekwondo WTF.*

Introduction. Modern development of sports requires the introduction of innovative approaches to teaching and training athletes, which is especially relevant for technical sports such as WTF taekwondo. One of such promising technologies is the algorithmization of the learning process [1]. Algorithmization is understood as the sequential construction and implementation of steps aimed at mastering complex technical actions [1, 5]. Scientific research in the field of training athletes in taekwondo at the initial stages indicates the need for a systematic approach aimed at developing basic technical skills [3]. In particular, issues of teaching unsupported complex-coordination actions, which are the basis of taekwondo, require the use of scientifically based methods such as algorithmization [2]. Foreign studies emphasize the effectiveness of algorithmic prescriptions and artificial intelligence for optimizing the training process [4-8].

A structured learning process is a key element in mastering taekwondo technique, especially when it comes to basic strikes. This process includes several stages: demonstration, explanation, practical implementation and analysis. Each of these stages plays an important role in the formation of technical skills in athletes. The need for algorithmization of teaching basic strikes in taekwondo is due to the relevance of forming precise technical skills at the initial stage of training. However, this approach has not been studied deeply enough in domestic scientific literature, especially in taekwondo, despite its successful application in practice by coaches and teachers [1].

Objective of the study was to determine the perspective of instructors regarding the implementation of algorithms in the teaching of fundamental techniques in Taekwondo.

Methods and structure of the study. The survey was conducted using a questionnaire of taekwondo coaches. The questionnaire included closed and open questions aimed at identifying the experience of coaches in using the algorithmic approach, its perception and assessment of effectiveness. The survey involved 22 coaches working in sports schools and clubs in Yekaterinburg and the Sverdlovsk region (SSh No. 19, SSh No. 16, SSh in taekwondo).

Results of the study and discussion. A survey was conducted among taekwondo coaches, the purpose of which was to find out whether they use an algorithmic approach in the process of teaching basic strikes. The results of the survey show that the majority of coaches (90,9%) actively use an algorithmic approach in their training practice (Figure 1). This indicates a high level of awareness among coaches of the importance of structured teaching of basic strikes, which, in turn, can contribute to improving the technique and results of athletes.

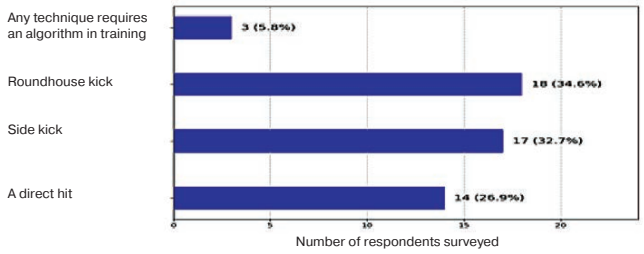

Figure 1. Basic strokes used with the help of algorithmization

Figure 1 shows that coaches most often use algorithmization when teaching turning kicks (34.6%), side kicks (32.7%) and straight kicks (26.9%), which indicates that coaches understand the importance of prioritizing these kicks. Most coaches (90.9%) believe that algorithmization of training has a positive effect on the results of their athletes (Figure 2).

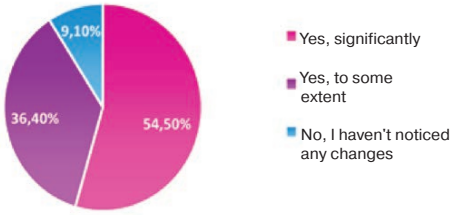

Figure 2. The impact of using algorithms on improving sports results

More than half of the surveyed coaches (54,5%) noted that they use algorithms precisely at the stage of initial training of athletes (Figure 3). This is due to the fact that at this stage it is important to lay the foundations of technique and develop basic skills.

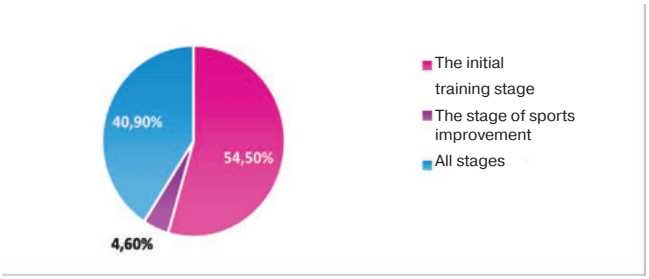

Figure 3. Use of algorithms at the stages of athletes' training

At the same time, a significant part of coaches (40,9%) indicated that they use algorithms at all stages of athlete training. This suggests that many coaches consider algorithms as a universal tool that can be adapted to different stages of training: from basic training to the level of high sportsmanship. Figure 4 presents data on the difficulties in implementing the algorithmic approach to teaching basic strikes in WTF taekwondo. Lack of time for training is the most frequently noted problem (36,7%). Lack of materials or methods – this shortcoming was noted by (33,3%) coaches. Low motivation of athletes is the third most significant problem (23,3%). Difficulties in explaining the technique are the least common difficulty (6,7%).

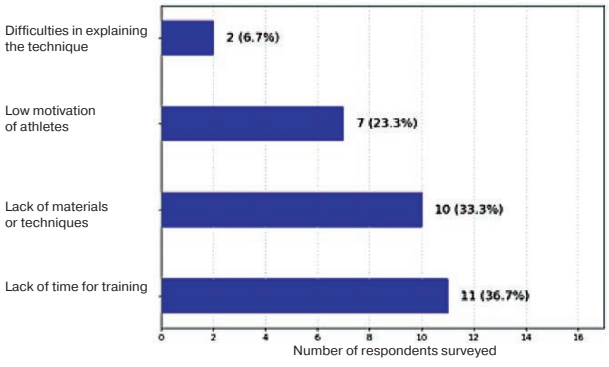

Figure 4. The main difficulties in implementing the algorithmic approach

During the survey, additional resources necessary for the algorithmization of training were identified. The survey results show that video lessons and training seminars were the most in demand among trainers as

necessary resources for improving the algorithmization of training. Methodological materials are also significant, but less in demand compared to the first two categories. The number of participants who consider all of the above resources equally important is significantly smaller (Figure 5).

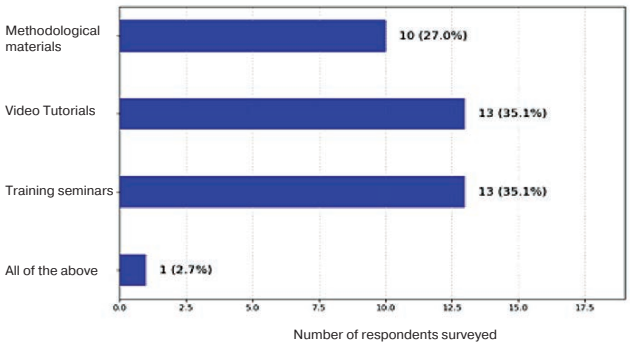

Figure 5. Additional resources for improving the algorithmization of training

Conclusions. The conducted research revealed a high percentage of use of the algorithmic coefficient of the taekwondo coach, which ensures its possible effectiveness in teaching basic strikes and improving the sustainability of results. The main problems of the algorithmic method in training remain: lack of time, lack of methodological materials and motivation of athletes, which requires additional research aimed at improving the quality of training taekwondo athletes.

References

1. Rapoport L.A. Algoritmizatsiya v tekhnicheskoy podgotovke yunykh konkobezhtsev na etape nachalnoy sportivnoy spetsializatsii. PhD diss. Omsk, 1987. 196 p.
2. Rogozhnikov M.A. Obucheniye yunykh tkhekvondistov bezopornym slozhno-koordinatsionnym tekhnicheskim deystviyam. PhD diss. St. Petersburg, 2016. 187 p.
3. Simakov A.M., Bakulev S.E., Chistyakov V.A. Aktualnyye voprosy podgotovki v tkhekvondo na nachalnom etape uchebno-trenirovochnogo protsessa. Uchenyye zapiski universiteta im. P.F. Lesgafta. 2014. No. 1 (107). pp. 148-150.
4. Wang P. Evaluation and analysis of effectiveness and training process quality based on an interpretable optimization algorithm: The case study of teaching and learning plan in taekwondo sport. Applied Artificial Intelligence, 37 (1).
5. Abhariana S.E., Abdolvand N., Abharianc T.E., Memari Z. Performance prediction of taekwondo athletes using machine learning. Journal of Sports Analytics. 2023. Vol. 9. No. 3. pp. 378-389.
6. Shin M., Lee D., Chung A., Kang Y. When Taekwondo Meets Artificial Intelligence. The Development of Taekwondo Techniques. Sports Technology. 2023. Vol. 7. No. 1. pp. 45-60.
7. Huipeng L. Martial Arts Competitive Decision-Making Algorithm Based on Artificial Intelligence. Journal of Sports Engineering and Technology. 2021. Vol. 235. No. 4. pp. 513-528.
8. Pedro C. Cyber-Physical System for Evaluation of Taekwondo Athletes. Machines. 2023. Vol. 11. No. 2. pp. 234-240.