

PATTERN – ASSESSMENT OF COACHES’ THEORETICAL KNOWLEDGE

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Abstract. *Taekwon-do is a martial arts, making it an immeasurable sport. Good knowledge of the sports regulations is extremely important for successful performance in sports competitions. The aim of the present study is to assess the knowledge of coaches related to pattern discipline of Taekwon-do. Methodology: The study was carried out in April – May 2020. The study involved 61 Taekwon-do coaches (32.74±9.34 years) with different sports experience and degree from 19 local Taekwon-do clubs in Bulgaria. The online form test contains a total of 27 questions (4 personal and 23 specialized questions). Results: The largest accumulation of values (most coaches) received a result in the range of 35-46 points (68.58% of all tested). Most tasks have very good discrimination ($0.50 \leq DP \leq 0.71$). The calculated difficulty P of the questions used is in the range of 44-61%. Conclusion: Empirical data show that the test has good statistical characteristics and can be used to assess the theoretical knowledge of coaches about the sports regulations. The data obtained from the pedagogical experiment give grounds to claim that the level of knowledge of Taekwon-do coaches are at different levels. The regular use of a test to assess knowledge related to the rules of competition will increase the knowledge of coaches and reduce missed matches at critical moments.*

Keywords: *coach, education, evaluation, Taekwon-do*

Introduction

Taekwon-do ITF is a modern martial art that has also become a sport over the years. Taekwon-do ITF competitions include five different disciplines – pattern, sparring, special technique, power test and self-defense (comprising over 3200 basic techniques) (Poliszczuk et al., 2016). The competitor must choose whether to take part in all disciplines or to choose only one or two of them.

The desire to improve and reduce the human factor in refereeing provokes periodic changes and updating of the international competition regulations. Among the novelties and facilitations are specialized software to automatically calculate referee scores, as well as video protests that are limited to a few key situations (ITF, 2021). The latest changes made to the International Competition Rules in 2017 introduced the mandatory video recording of matches, as well as the possibility for coaches to have the right to video protest in certain situations (Ilieva-Sinigerova, Konchev, 2021).

The speed and complexity of decisions, the consequences of their actions, the number of competitors and the often-hostile nature of spectators during the sporting event are among the factors that facilitate the making of mistakes (Guillén & Feltz, 2012). Correct judgment is sometimes difficult and in such cases mistakes occur. Maintaining composure and making the right decision in adverse situations is of utmost importance (Nabilpour et al., 2020).

Wrong refereeing decisions can lead to a point being scored, the game being stopped at a crucial moment or an undeserved victory. Human perceptual abilities are limited, and judgment is flawed (Michaluk, 2009). Misjudgments lead to loss of self-esteem and high levels of stress and anxiety (Crust, Azardi, 2010; Crust, Clough, 2005). According to some authors (Nabilpour

et al., 2020), emotional intelligence in referees is extremely important for focus and concentration in their work, which will subsequently affect decisions and protests by coaches.

The new technologies and rule changes have surely influenced the nature of competitions, and coaches and players should embrace new match tactics and strategies in response to the new point system (Cho et al., 2020).

The knowledge that coaches must possess is no longer limited to technical elements and tactics. The competition rules require a quick reaction in controversial moments from the coaches, for which a very good knowledge of the competition rules is also necessary.

Purpose

The aim of the present study is to assess the knowledge of coaches related to pattern discipline of Taekwon-do.

Methodology

The study was carried out in April – May 2020. The study involved 61 Taekwon-do coaches (32.74 ± 9.34 years) with different sports experience and degree from 19 local Taekwon-do clubs in Bulgaria.

After the beginning of the Covid-19 pandemic, the training process was suspended for an indefinite period. The measures that the Bulgarian Taekwon-do ITF Federation took at that time were: sharing training videos (on YouTube), sending materials with theory, and regularly conducting tests on theory material. For their part, sports clubs conducted online training through various platforms, shared training videos, materials, and prepared programs.

Taekwon-do was a martial art and apart from the sports and competition part, great attention was paid to the theory as well. This was also included in the degree promotion exam syllabus. Participation in the tests was voluntary and there was a limit to the number of attempts (just once). At the beginning of each test, the specific requirements for completing it were indicated, as well as a minimum number of points for successfully passing the test. All participants provided written informed consent.

The test for coaches was created using the Google forms software and contained a total of 27 questions (4 personal and 23 specialized questions - closed questions with one or more than one correct answer). The variant of the questions used was marking the correct answer. There was no feedback on each question whether the answer was right or wrong.

Among the advantages of the chosen electronic option for checking the theoretical knowledge of athletes, coaches and judges are: reduced time and simplification of the procedure for checking the tests and setting an objective assessment that does not depend on the personal attitude or bias of the examiner. We find a disadvantage in the impossibility of checking higher levels of the material learned.

The main stages that were observed are: defining the goal, developing the questions and individual test variants, compiling and testing the first variant, analyzing the questions and tasks, deriving norms and developing methodological guidelines for using the test. In the electronic version of the test, there is a key with the correct answers and the function for automatic checking of the results is activated. Questions are closed to avoid difficulty in verification.

In the blanks of all included tests for athletes, coaches and judges, questions with the choice of more than one correct answer (distractor) are assigned a higher number of points for indicating a completely correct answer (2, 3 or more points). This approach was chosen to give more incentive to the participants. In the subsequent a posteriori analysis, the recommendation of experts in the field to give equal weight to all questions (1 point) was followed in order to be able to properly analyze the results. Another recommendation of experts in the field is to include more tasks from the specific theoretical area in order to increase the relative share and weight of the material in the total amount of measured final results.

The questions in each test cover material that has already been learned and that examinees have had sufficient time to learn and consolidate.

The variety of questions that are included in the tests measures not only the level of theoretical knowledge of the examinees, but also provokes their thinking activity of a creative nature (associations, combinatorics, logic, improving memorization, etc.).

Mathematical and statistical methods: descriptive statistics, quantitative and qualitative analysis were applied. Data were statistically analyzed with SPSS and MS Excel.

Results

The "pattern" discipline is a fight with an imaginary opponent, during which blocks and strikes are executed in a certain sequence. Competitions can be held individually and as a team, with differences in competition rules. The first "optional" shape is played in turn by each of the contestants. This allows the referees to focus on the performance and not make a mistake in judging, but also the coaches to monitor the performance of the two competitors.

According to the competition rules, a video protest may be filed after the format has been played to award or not award "0" points to the competitor. The specific requirements for awarding these points are regulated in the rules and it is necessary for the coach to know them very well. The opportunity to review covers up to 5 seconds of the relevant action that is supposed to be the protest. If the coach cannot specify the situation and the reason for his protest, he will not be respected. When the situation is specified, but it turns out that the protest is not justified, the coach loses his right to protest until the end of the match. This fact is extremely important, because in the event of an unfounded first protest and a protest situation arising in the second compulsory form played by the contestants, the winner of the match may actually end up being the loser.

These mistakes and the lack of sufficient knowledge affect the coach's behavior, self-confidence and instructions. This naturally reflects on the competitor and provokes uncertainty and hesitation in his performance, which can be decisive in the final result of the match. Missing out on key meets and draft rankings can lead to a lack of motivation and promising athletes dropping out of the sport.

The study included coaches representing all age groups and gender in ITF Taekwon-do. The data presented in (Table 1) showed the average values for age and obtained test results.

Table 1. *Mean values of coaches'*

Indicator (n=40)	Min	Max	R	Mean±SD	V	Kur.	Skew.
Age	18	48	30	28.7±10.3	35.87	1.880	1.339
Degree	1	6	5	2.5±1.48	59.2	0.785	-0.178
Result	17	48	31	37.14±8.17	21.99	0.112	-0.874

Critical value of Kurtosis (0,617) and Skewness (1,217)

The test holds closed questions with different numbers of distractors. 61 coaches from 16 sports clubs in Bulgaria took part in the research. 27 closed questions will be analyzed.

Minimum estimated age (18 years) and minimum degree (1st dan black belt) are minimum mandatory requirements for the coaching position.

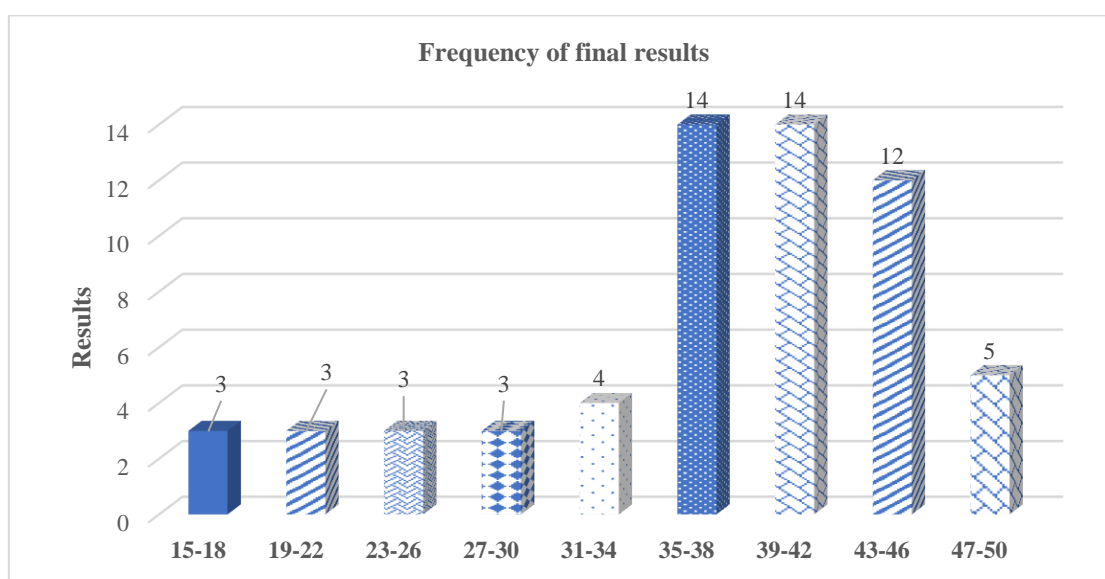


Figure 1. Final results

The lowest score obtained is 17 points and the highest score is 48 points (which is also the maximum possible score). After reviewing the individual results, it was found that 3 of the coaches received the maximum score on the test. It was estimated that 65.57% of the final scores were in the range of 35–46 points (Figure 1).

Aposteriori analysis was applied to calculate the difficulty index of the test questions. The test contained a variety of questions with different numbers of distractors.

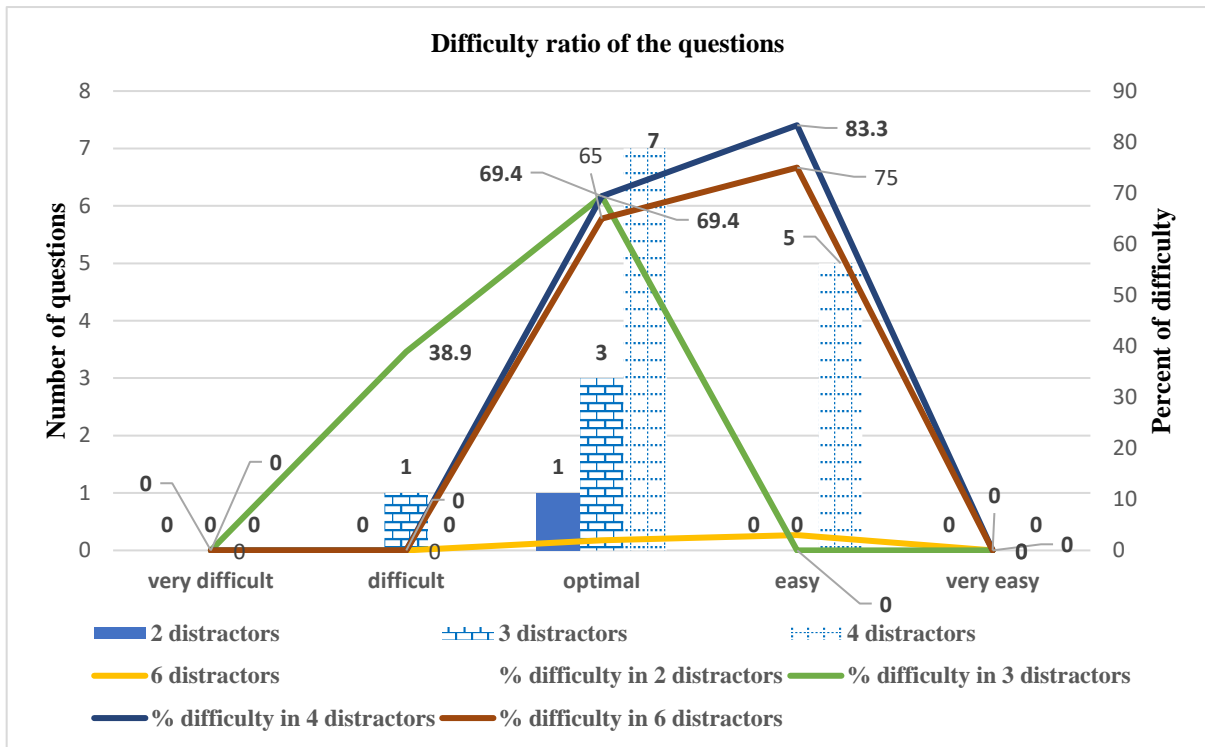


Figure 2. Coefficient of difficulty in pattern

After the analysis was done, it was found that there was 1 question of optimal difficulty with two distractors. For questions with three distractors, 1 difficult question and 3 optimal difficulty level were calculated. Questions with four distractors (total of 5 questions) are of easy difficulty and should be removed from the test. We find an optimal level of difficulty at 7 questions. The most difficult questions with six distractors were calculated 2 with an optimal level of difficulty and 3 with easy, which should be removed from the test.

Further analysis revealed that questions with more than one correct answer (4 or 6 distractors) were most frequently answered incorrectly. The questions were related to "During a form meeting there may be a change of coaches if:" (12 correct answers out of a total of 61 answers); "For which components of a team fitness competition you can receive a judge's assessment of 7 points:" (23 correct answers from a total of 61 respondents) and "Disqualification or 0 points are written for:" (23 correct answers from a total of 61 respondents).

On the other hand, however, we draw attention to the fact that the Google Forms application used is constructed in such a way that it is necessary to indicate all the correct answers to recognize the answer as correct and to give the points for a correct answer. A partially correct answer will not be counted. This fact further complicates the coaches and reduces their overall result. In our opinion, this specificity of the software used increases the difficulty of the questions and allows them to be reused.

After calculating the Discriminant Power Index, it was found that 8 of the questions included were of poor quality and should no longer be used. The remaining 14 questions can be characterized as an "excellent differentiator" and their use continued. Most questions have very good performance ($0.50 \leq DP \leq 0.70$).

A good knowledge of the competition regulations and the specific features of the various disciplines will contribute to additional confidence on the part of the coaches during the meetings and a faster and adequate reaction if a protest is necessary. This is also felt by the competitors, and they feel at ease under the guidance of their coaches. The certainty of an immediate and timely response should a protest be necessary is a very motivating factor for competitors, especially during key meetings. On the other hand, insufficient knowledge of the competition rules will delay the reaction of coaches at critical moments, and this may lead to the loss of prize places or medals. In addition, it will lead to a lack of motivation in the competitors and in some cases even to their abandonment of a racing career.

Discussion and Conclusions

However, in other sports events such as gymnastics, figure skating, and combat sports (e.g., Taekwondo, Judo, and Wrestling), the performance itself is characterized by a series of continuous playing actions with interwoven complexities. The outcome in these sports events is the results of cumulated points because point(s) are given by game referees during the middle of continuous playing actions. Therefore, the scoring process relies heavily on the subjective judgement of game officials and their naked eye (Cho et al., 2020).

Speaking of Taekwon-do, it has become a popular sport with over 120 million children and adults actively participating worldwide. Along with this increased popularity, coaches and federations need evidence-based and scientific development programs (Babic et al., 2022). Studies focusing on technical and tactical aspects of taekwondo could provide interesting and complementary insights into training aspects of this sport. For coaches, it is important to discover the relationship between both technical and tactical actions to increase knowledge on interdependent behaviors and how they are produced. Coaches can use the information obtained regarding the patterns that athletes use in competition to plan visualization sessions and tactical strategies (Menescardi et al., 2019).

At present, Taekwon-do teaching in domestic colleges and universities is generally divided into two teaching methods - theory and practice. In terms of theory, teachers choose textbooks as the basis and write on the blackboard to understand, mainly teaching some basic theoretical knowledge about Taekwon-do. In terms of practice, teaching is carried out in relevant venues. The above two methods are the basic teaching methods for colleges and universities. Nowadays, most colleges and universities choose practical teaching for Taekwon-do teaching. This teaching mode ignores the cultural inheritance of Taekwon-do and the importance of theoretical knowledge of Taekwon-do (Chin et al., 2022).

Expanding the knowledge of sports specialists in various fields, including the rules of competition, is of utmost importance for all levels - sports ministry, sports federation, and the coaches themselves. In addition to the regulatory requirements for increasing the qualifications and knowledge of coaches, personal motivation, and awareness of the need for this are of primary importance for achieving high sports results.

To optimize Taekwon-do teaching methods and promote students' active participation and interaction, it is necessary to innovate the traditional Taekwon-do teaching, to improve the teaching quality of colleges and universities and the comprehensive quality of students. The evaluation system should not only assess the basic theoretical knowledge of teaching but also evaluate the comprehensive quality indicators of students in all aspects (Chin et al., 2022).

Empirical data show that the test has good statistical characteristics and can be used to assess the theoretical knowledge of coaches about the sports regulations. The data obtained from the pedagogical experiment give grounds to claim that the level of knowledge of Taekwon-do coaches are at different levels. The regular use of a test to assess knowledge related to the rules of competition will increase the knowledge of coaches and reduce missed matches at critical moments.

After performing the Aposteriori analysis, questions can be refined and those with good characteristics and good discriminative power included for future use.

Making this reduction in questions allows us to create a test with a better quality of included questions that will be much more informative of the theoretical knowledge of Taekwon-do coaches.

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