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An Empirical Study on Offensive and Defensive Ability of College Men's Football Teams Based on TOPSIS-RSR Comprehensive Evaluation Method

Jingshan Zhang[1], Lorna A. Espeso[2]

[1,2]Graduate School, Adamson University, Manila 1000, Philippines)

Abstract:
This study aimed to explore the characteristics and rationality of ranking offensive and defensive abilities of 32 college football teams and their division into tiers, as well as the application effects in teaching and training experiments. A combination of literature review, questionnaire survey, TOPSIS method, RSR method, and experimental method were primarily employed. The objective was to furnish a more extensive theoretical reference basis for future college football team training. The findings revealed that the TOPSIS-RSR method was capable of assessing each team's outcomes objectively and quantitatively. However, potential errors were identified in the evaluation process stemming from the final match results, necessitating multifaceted considerations between teams and players. Numerous internal and external uncertain factors, such as time, individuals, and coaches, were acknowledged. The application of the TOPSIS-RSR comprehensive evaluation method to football training technology was found to assist college students with specific football skills in enhancing their technical proficiency. It was concluded that for athletes with variable factors such as age, athlete level, and training years at different phases, the rational arrangement of training cycles must be thoroughly considered.

Keywords: TOPSIS-RSR; college football; offensive and defensive abilities; empirical analysis

INTRODUCTION

As a competitive sport dominated by skills and combat, football is known as "ballet on the green field". In China, football can be traced back to the Northern Song Dynasty, and it has a relatively broad mass base among the people. However, with the advancement of modern society, there is still a large gap between my country's football competition level and the international football powers, especially men's football. In order to get rid of this weak situation, the country has invested a lot of manpower and material resources in football from top to bottom to improve the competitive level of our country's football. As a special project supported by the state, campus football is an important means of cultivating

students' physical literacy and promoting physical and mental health. It has also attracted much attention in the education field in recent years. In order to further improve the effect of campus football experimental training, this study adopts the TOPSIS-RSR (Technique for Order Preference by Similarity to Ideal Solution with Relative Superiority Ranking) method to comprehensively explore the comprehensive implementation of campus football experimental training with multi-dimensional data analysis and evaluation. Quality. Football experimental training is an important part of students' sports activities. It cultivates students' teamwork spirit, improves physical fitness and develops sports skills. Try to introduce the TOPSIS-RSR method to comprehensively evaluate campus football experimental training from multiple angles, including technical level, physical fitness, etc. This helps players or coaches more accurately grasp the advantages and disadvantages of training, and provides scientific basis for improving and optimizing training plans. Therefore, this study selected 32 members of the men's football team of Sichuan Sports College for an 8-week training experiment, aiming to provide theoretical reference for the further development and improvement of campus football experimental training.

1 Methodology

1.1 Research objects

This study takes 32 players of the men's football team of Sichuan Sports College as the subjects of questionnaire survey and experiment.

1.2 Research methods

1.2.1 Questionnaire survey method

This study conducted a questionnaire survey on the opinions of the TOPSIS-RSR method on the comprehensive evaluation of football offensive and defensive ability through a self-compiled athlete questionnaire (32). The content of the questionnaire is in addition to the basic demographic information characteristics of the athletes (age, grade level , athlete level, training years, etc.); the main survey contents of the questionnaire include: Do you agree that the comprehensive evaluation results of each football team's offensive ability are related to the final match results? Significant difference? Do you agree that there is a significant difference between the comprehensive evaluation results of each football team's defensive ability and the final match result? Do you agree with the team's offensive and defensive ability level based on the TOPSIS-RSR evaluation method? Do you agree with the team's offensive and defensive ability level calculated based on the TOPSIS-RSR method? Normalized values of offensive indicators; whether the normalized values of the team's defensive indicators calculated based on the TOPSIS-RSR method are recognized; whether the grading of the team's offensive and defensive abilities based on the TOPSIS-RSR method is recognized.) The above main questions are evaluated and scored in the form of a four-point scale (for example, strongly agree, 4 points; agree, 3 points; disagree, 2 points; strongly disagree, 1 point). A total of 32 questionnaires were distributed to athletes, and 32 questionnaires were effectively recovered, with an effective rate of 100%. The questionnaires were

distributed and filled out by athletes during class or training to avoid problems such as the loss of questionnaires or difficulties in later collection, and improved the effectiveness of the questionnaires. According to the statistical results , the age of the questionnaire respondents is divided into two stages, under 20 years old and over 21 years old, accounting for 31.25% (10 people) and 68.75% (22 people) respectively; the grade levels are divided into four levels, freshmen,sophomore, junior and seniors, accounting for 15.625% (5 people), 25% (8 people), 43.75% (14 people) and 15.625% (5 people) respectively; the athlete level is divided into four levels, namely Level 3, Level 2, Level 1 and national level, accounted for 21.875% (7 people), 59.375% (19 people), 12.5% (4 people), 6.25% (2 people) respectively; the training years of athletes are divided into three levels, namely 3 years and below, 4-5 years, and 6 years and above, accounting for 18.75% (6 people), 62.5% (20 people), and 18.75% (6 people) respectively.

(1) Validity test. The athlete questionnaire designed by this research was evaluated by 4 of the above 8 participating interview experts. 10 points were set for each of the main questions of the questionnaire, and finally a comprehensive score was conducted. , through experts to evaluate the validity of the rationality of the questionnaire question settings. It can be found from Table 1 that the average scores of the three main questions are 7.9 points, 8 points and 8 points, and the overall score is 8.1 points. According to the principle that the higher the expert score, the better the validity of the questionnaire, which shows that the setting of the questionnaire questions is reasonable and the next step of research can be carried out.

Table 1 Experts' ratings of the validity of the content of the questionnaire

content score	Expert 1	Expert 2	Expert 3	Expert 4	average score
Questionnaire question 1	7.5	8	8	8	7.9
Questionnaire question 2	7	8	8	9	8
Questionnaire question 3	8	8	8	8	8
Comprehensive level of questionnaire	8	8	8	8.5	8.1

(2) **Reliability test.** The reliability test of the questionnaire in this study is to use the reliability analysis in spss25.0 software to test the main questions of the questionnaire. The test results show (Table 2) that Cronbach's α coefficient is 0.773. According to the reliability coefficient, it is between 0 and 1, indicating that the reliability of the scale is relatively high and acceptable.

Table 2 Reliability statistics

Cronbach Alpha	Number of items
0.773	3

1.2.2 Experimental method

(1) Selection of subjects: According to the arrangement of the training plan, this study selected 32 athletes from the men's football team of Sichuan Sports College as subjects based on a questionnaire survey. They have a certain training foundation and physical fitness and often represent the school in Sichuan University College Football Competitions. In addition, before the experiment, the subjects were informed about the upcoming training plan and their consent was obtained.

(2) Test location and equipment: The training venue for this study is the artificial turf standard football field in Sichuan Sports College. The equipment for this experiment includes a laptop, several footballs, several football flag poles, a camera, etc.

(3) Training time: This experiment was arranged according to the school team training plan, lasting 8 weeks, training three times a week, and 2 hours each time.

(4) Selection of test indicators: Based on the training plan, the researcher selected eight football offensive and defensive indicators to evaluate athletes' offensive and defensive abilities. Statistics were made to compare the differences in offensive and defensive abilities of the team before and after the experiment guided by TOPSIS-RSR method. The test indicators are direct shot, target shot, diagonal shot, key pass, tackle, assists, interception, ball control and comprehensive evaluation.

1.2.3 Mathematical statistics method

For the questionnaire data and pre- and post-experiment test data collected in this study, a model was first developed in an Excel spreadsheet to conduct preliminary screening and analysis of the initial data. The questionnaire data were then analyzed descriptively, and the experimental data was subjected to a paired sample *T* test to obtain corresponding results.

2 Result analysis and discussion

2.1 Athletes' cognitive performance on the differences between the offensive ability evaluation results of each team and the final match results using the TOPSIS-RSR method

According to the statistical data results in Table 3 , athletes' evaluation of the correlation between the TOPSIS-RSR method's offensive ability evaluation results of each team and the final match results is divided into four levels for evaluation. Among them, most of the athletes who participated in the questionnaire strongly agreed that there is a high degree of correlation between the evaluation of offensive comprehensive ability and the final match result, accounting for 65.6% (21 people); 9 athletes held the same view, accounting for 28.1%; there were 2 athletes, accounting for 6.3%, who disagreed or below. It can be seen from this that when athletes participated in the questionnaire survey, they basically unanimously believed that the offensive ability of a team is highly correlated with the final match result. This is also the true experience of athletes in practical training and matchs.

Table 3 Athletes' cognitive performance on the correlation between TOPSIS-RSR method in comprehensive offensive ability evaluation & final match results

Correlation	Strongly Agree	Agree	Disagree	Strongly disagree
Evaluation of comprehensive offensive ability & final match results	21 (65.6%)	9 (28.1%)	0 (0%)	2(6.3 %)

2.2 Athletes' cognitive performance on the differences between the TOPSIS-RSR method's defensive ability evaluation results of each team and the final match results

According to the statistical results in Table 4 , there are 13 athletes, accounting for 40.6%, who strongly

agree with the correlation between the TOPSIS-RSR method's defensive ability evaluation results of each team and the final match results; The number of athletes who had a favorable view was 17, accounting for 53.1%; the number of athletes who disagreed was 2, accounting for 6.3%; the number of athletes who strongly disagreed was 0%. In general, most athletes agreed during the questionnaire survey that the evaluation of comprehensive defensive ability is highly correlated with the final match result, and the rate of agreement or above was 93.7%. Therefore, this group of athletes can deeply understand the importance of defense in football matches; and also agree with the TOPSIS-RSR method in evaluating the difference between the defensive ability of football matches and the final match results, and provide an objective and reasonable evaluation of each team's performance in the match. The defensive ability in the match has important value in the impact on the entire match.

Table 4 Athletes' cognitive performance on the correlation between TOPSIS-RSR method in comprehensive defensive ability evaluation & final match results

Correlation	Strongly Agree	Agree	Disagree	Strongly disagree
Comprehensive defensive ability evaluation & final match results	13 (40.6%)	17 (53.1%)	2 (6.3%)	0(0 %)

2.3 Analysis of athletes' cognitive performance on the impact of TOPSIS-RSR method on the comprehensive offensive and defensive ability of each team

the statistical results in Table 5 , there are 14 athletes, accounting for 43.8%, who strongly agree with the cognitive attitude of the TOPSIS-RSR method on the comprehensive offensive and defensive ability of each team; the number of athletes who agree is 12 , accounting for 37.5%; the number of people who disagree is 6, accounting for 18.8%; the number of people who strongly disagree is 0. It can be seen that most of the 32 college football players who participated in the questionnaire agreed or above on the team's offensive and defensive capabilities, accounting for 81.3%. However, compared with the above-mentioned opinions that disagree and below, the data shows that 6 people disagree, which is significantly higher than the data results in the two tables above. Therefore, it is obviously feasible to use the TOPSIS-RSR method to evaluate the offensive and defensive indicators of each team during football matches and obtain the comprehensive competitive ability of each team. However, there will also be certain flaws. For example, analyzing problems based solely on technical and tactical indicators while ignoring factors such as the athletes' psychological quality, sports intelligence, and physical fitness during the match will cause fluctuations in the results of the match. Therefore, the TOPSIS-RSR method can only evaluate the results of each team from an objective and quantitative perspective, and there may be certain errors with the final match results during the evaluation process (this error is caused by a variety of external factors. Uncontrollable), just like the opinions held by athletes in the questionnaire survey, it is necessary to consider multiple internal and external factors such as teams, players, individuals, coaches, etc. This is also needed in future research. Issues to be further tracked and resolved.

Table 5 Athletes ' cognitive performance on the correlation between the TOPSIS-RSR method and the team's offensive and defensive ability levels				
Correlation	Strongly Agree	Agree	Disagree	Strongly disagree
The team's offensive & defensive ability level	14 (43.8%)	12 (37.5%)	6 (18.8%)	0(0 %)

2.4 Analysis of test results of various indicators of athletes before and after the experiment

According to the pre- and post-experiment data results of various indicators of subjects participating in the test in Table 6 , in the post-experiment test, the subjects' test level except for penalty kick skills was lower than the pre-experiment test level (3.94 Except for ± 0.84 , 3.84 ± 1.17 ; $P > 0.05$), all other technologies improved to varying degrees in the experimental test after 8 weeks. Among them, the pre-experiment test levels of technical indicators such as orthoshots, key passes, and interceptions were 4.19 ± 1.09 , 4.09 ± 1.12 , and 3.84 ± 0.95 respectively. The post-experiment test levels were 4.44 ± 1.27 , 4.25 ± 1.27 , and 3.97 ± 1.38 respectively. After comparison before and after the experiment, although the levels of these three technical indicators have improved slightly, there is no significant difference P (0.058 , 0.258 , 0.402) > 0.05; however, oblique shots, steals, assists, ball control, and comprehensive evaluation, etc. In the pre- and post-experiment tests, the technical level of the indicators has been greatly improved. Except for the steal, which has a significant difference between the pre- and post-experiment tests (T = -2.436 , P =0.021) <0.05, the other four technical indicators have improved significantly in the pre- and post-experiment tests. There were very significant differences in the tests before and after the experiment (T = -3.15 , P = 0.004 , T = -2.897 , P = 0.007 , T = -3.271 , P = 0.003 , T = -3.79 , P = 0.001) <0.01. This shows that the application of the TOPSIS-RSR comprehensive evaluation method to the practical training guidance and monitoring of football can improve the daily training level of athletes to a certain extent. On the basis of this single technical improvement, it can also improve the overall competitive level of athletes. , the statistical data results of comprehensive evaluation from the table can reflect this situation. Therefore, it has certain theoretical and practical value to combine some new comprehensive evaluation methods to guide sports training in future training.

Table 6 Statistical table of test results of various technical indicators of athletes before and after the experiment					
Test indicators	Test group (n=32 people)		*T*	*sig*	*P*
	Before experiment M±SD	After the experiment M±SD			
Direct shot	4.19 ± 1.09	4.44 ± 1.27	-1.969	0.058	$P > 0.05$
Target shot	3.94 ± 0.84	3.84 ± 1.17	0.619	0.54	$P > 0.05$
diagonal shot	3.69 ± 1.09	4.16 ± 1.25	-3.15	0.004	$P < 0.01$
key pass	4.09 ± 1.12	4.25 ± 1.27	-1.153	0.258	$P > 0.05$

Tackle	4.00 ± 1.27	4.38 ± 1.60	-2.436	0.021	$P < 0.05$
Assist	4.22 ± 1.13	4.69 ± 1.71	-2.897	0.007	$P < 0.01$
intercept	3.84 ± 0.95	3.97 ± 1.38	-0.849	0.402	$P > 0.05$
Ball control	27.97 ± 6.74	29.72 ± 8.88	-3.271	0.003	$P < 0.01$
Comprehensive assessment	57.13 ± 10.29	60.78 ± 14.96	-3.79	0.001	$P < 0.01$

2.4.1 Different age stages

In order to further refine the technical differences between athletes in the pre- and post-experiment tests, this study will conduct in-depth comparisons at different time periods with four variables, including age, grade level, athlete level and training years, to provide athletes of different ages or athlete levels with It brings some inspiration in training. According to the statistics of athletes of different ages before and after the experiment in Table 7 , the technical index levels of athletes aged 20 and below improved to a certain extent before and after the experiment. In terms of diagonal shot, a very significant difference in technical evaluation before and after the experimental test (T = -3.674, P = 0.005) <0.01; there is a significant difference in interception and comprehensive evaluation between the pre and post-experimental tests (T = -2.449 , P = 0.037 ; T = -2.355 , P = 0.043) <0.05; there is no statistical difference in other technical indicators between the test results before and after the experiment (T = -1.809 , P = 0.104 ; T = -2.25 , P = 0.051 ; T = -0.802 , P = 0.443 ; T = -0.688 , P = 0.509 ; T = -1.406 , P = 0.193 ; T = -1.874 , P = 0.094)>0.05. In addition, there was a contrast in the technical level of target shot between athletes aged 21 and above in the pre- and post-experiment tests (before the experiment: 4.09 ± 0.921 ; after the experiment: 3.95 ± 1.253) (T = 0.901 , P = 0.378)> 0.05, and the technical level of other indicators has also improved to a certain extent. However, there were statistical differences in indicators such as diagonal shot, tackle, assists, ball control, and comprehensive evaluation before and after the experiment (T = -2.73 , P = 0.013 ; T = -2.485 , P = 0.021 ; T = -2.531 , P = 0.019 ; T = -2.843 , P = 0.01 ; T = -3.482 , P = 0.002) <0.05; there is no statistical difference in other technical indicators between the pre- and post-experiment tests (T = -1.418 , P = 0.171 ; T = -0.826 , P = 0.418 ; T = -0.767 , P = 0.451)>0.05. It can be seen from this that during the 8-week experimental test, the test results of various technical indicators for athletes aged 21 and above were better than those of athletes aged 20 and below to a certain extent, both before and after the experiment. The main reason is that athletes aged 21 and above have longer or better overall training time and understanding of training plans than athletes aged 21 and below. However, it is undeniable that the TOPSIS-RSR method can improve the individual skills and comprehensive technical levels of athletes when providing football training guidance to athletes of different ages. But it also needs to be emphasized that the training process should vary from person to person, because a very small number of team members are not suitable for the guidance of this comprehensive assessment method in practical training during the training process, resulting in a decrease in exercise level instead of an increase. It may be that the experimental test period is too short (8 weeks), and some athletes are slow to adapt to the new training guidance method and need longer time to adapt. Therefore, football is a collective confrontational sport. The success of one athlete cannot

make a qualitative leap for the entire team. Only the balanced development and adoption of each player in the corresponding position can produce good results. Therefore, in future experimental tests, 16 weeks or more can be used to test the training effects of athletes, so as to avoid some athletes having difficulty adapting in a short period of time.

Table 7 Statistical table of results of pre- and post-experiment test levels of athletes of different ages

Test indicators	Group/person	20 years old and under			21 years and above		
		M±SD	*T*	*sig*	M±SD	*T*	*sig*
Direct shot	Before experiment	3.90 ±0.738	-1.809	0.104	4.32 ± 1.211	-1.418	0.171
	After the experiment	4.30±0.675			4.55 ± 1.438		
Target shot	Before experiment	3.40 ± 0.699	-2.25	0.051	4.09 ± 0.921	0.901	0.378
	After the experiment	4.00 ± 0.667			3.95 ± 1.253		
diagonal shot	Before experiment	3.30 ± 0.483	-3.674	0.005**	3.86 ± 1.246	-2.73	0.013*
	After the experiment	3.90 ± 0.568			4.36 ± 1.364		
key pass	Before experiment	3.70 ± 0.823	-0.802	0.443	4.27 ± 1.202	-0.826	0.418
	After the experiment	3.90 ± 0.876			4.41 ± 1.403		
Tackle	Before experiment	3.80 ± 0.789	-0.688	0.509	4.09 ± 1.444	-2.485	0.021*
	After the experiment	4.00 ± 1.155			4.55 ± 1.765		
Assist	Before experiment	3.90 ± 0.738	-1.406	0.193	4.36 ± 1.255	-2.531	0.019*
	After the experiment	4.20 ± 0.789			4.91 ± 1.974		
intercept	Before experiment	3.50 ± 0.707	-2.449	0.037*	4.00 ± 1.024	-0.767	0.451
	After the experiment	3.90 ± 0.568			4.14 ± 1.583		
Ball control	Before	25.7 ±	-1.87	0.094	29.0 ± 7.746	-2.84	0.01*

	experiment	2.830	4			3	
	After the experiment	27.4 ± 4.600			30.86 ± 10.063		
Comprehensive assessment	Before experiment	54.5 ± 5.778	-2.355	0.043*	58.32 ± 11.721	-3.482	0.002**
	After the experiment	56.0 ± 7.303			62.95 ± 17.075		

Note: * means $P < 0.05$; ** means $P < 0.01$

2.4.2 Different learning stages

According to the results of the test data of various technical indicators of athletes at different learning stages before and after the experiment statistics in Table 8, In the pre- and post-experiment tests, except for the tackling technique, which was lower than before the experiment after the 8-week experimental test (4.40±1.14, 4.20±1.643), the test results of other technical indicators of the freshmen group athletes were overall better than before the experiment. technical level, but there is no statistical difference in various technical indicators between the pre-experiment and post-test comparisons of the freshmen group (P >0.05). In the sophomore group, in the pre- and post-experiment tests, except for the shooting (3.50±0.756, 3.38±0.744) and interception (3.63±0.744, 3.50±0.926) skills, the athletes' skills in the pre- and post-experiment tests were worse than the pre-experiment test levels. The technical indicators were all better than the pre-experiment test levels to a certain extent, but the comparison before and after the experiment found that there was no statistical difference (P >0.05). In the junior group, in the tests before and after the experiment, except for the technical level of the burst shot (4.09±0.921, 3.95±1.253) which was slightly worse than the technical level before the experiment, the other technical indicators were better to a certain extent. Technical level before the experiment; among them, technical test indicators such as diagonal shot, tackle, assists, ball control and comprehensive evaluation were found to have statistical differences through paired sample testing (T = -2.730 , P = 0.013 ; T = -2.485 , P = 0.021 ; T = -2.531 , P = 0.019 ; T = -2.843 , P = 0.01 ; T = -3.482 , P = 0.002) <0.05 . In the senior group, the technical level of each indicator of the athletes in the pre- and post-experiment tests must be better than the pre-experiment technical level to a certain extent. Among them, indicators such as target shot, tackle, assist, ball control and comprehensive evaluation Comparisons before and after the experimental test found that there were statistical differences (T = -4.000 , P = 0.016 ; T = -6.000 , P = 0.004 ; T = -3.207 , P = 0.033 ; T = -3.508 , P = 0.025 ; T = -3.350 , P = 0.029) < *0.05* . It can be seen that in the experimental tests of freshmen and sophomore athletes, the levels of some technical indicators fluctuated before and after the experimental tests. The reason may be that freshmen and sophomores have greater learning pressure and study more subjects, resulting in insufficient time invested in previous training, most of these athletes are not low-level athletes. There are also certain difficulties for these athletes to be exposed to new training guidance methods in the short term. This is also one of the factors that accounts for the fluctuation of its technical level in experimental tests. The technical level of junior and senior athletes in various indicators before and after the experimental test was stable, and to a

certain extent, it was better than the test level before the experiment. There were even obvious differences in some indicators in the test before and after the experiment. In addition, according to the data results in the table, athletes' football skills increased as their grades increased. This also shows that as athletes advance in the learning stage, they also understood more thoroughly the methods of sports training in a short term, so as to improve their individual or comprehensive technical levels. Therefore, in the future training guidance process, when using the TOPSIS-RSR method to guide the training of athletes, the experimental test time should be demarcated according to their different ages and different learning stages. For senior athletes, an 8-week experiment can be used. Verify the practical effect; for lower-grade athletes, more than 8 weeks should be used to conduct the experiment, so that the lower-grade athletes can better adapt to the benefits brought by the TOPSIS-RSR method in training guidance, which will help improve this part. Athletes' enthusiasm and participation in practical training play a large role. Therefore, combined with the above analysis, it could be concluded that athletes at different grade level have different levels of understanding of the TOPSIS-RSR comprehensive evaluation method in practical training guidance, and senior athletes are better able to understand the value of this method in practical training guidance in the short term.

Table 8 Statistical table of pre- and post-test level results of athletes at different learning stages

Test indicators	Group	Freshmen	Sophomore	Junior	Senior
		M±SD	M ± SD	M±SD	M ± SD
Direct shot	Before experiment	3.80±0.837	4.13±0.641	4.32±1.211	4.80±1.304
	After the experiment	4.40±1.14	4.25±1.035	4.55±1.438	5.60±1.949
Target shot	Before experiment	3.60±0.548	3.50±0.756	4.09±0.921	4.60±0.894
	After the experiment	3.80±1.304	3.38±0.744	3.95±1.253	5.40±1.14*
diagonal shot	Before experiment	3.40±0.548	3.38±0.518	3.86±1.246	4.80±1.304
	After the experiment	3.80±1.095	4.0±1.069	4.36±1.364*	5.20±1.095
key pass	Before experiment	3.60±1.14	3.75±0.886	4.27±1.202	4.80±0.837
	After the experiment	4.0±1.225	4.13±0.991	4.55±1.224	5.60±1.817
Tackle	Before experiment	4.40±1.14	3.75±0.886	4.09±1.444	4.60±1.817

	After the experiment	4.20±1.643	3.88±1.126	4.55±1.765*	5.80±1.643**
Assist	Before experiment	4.0±1.0	4.0±0.535	4.36±1.255	4.60±1.517
	After the experiment	4.40±1.14	4.13±0.991	4.91±1.974*	5.80±1.789*
intercept	Before experiment	3.60±1.14	3.63±0.744	4.0±1.024	4.40±1.14
	After the experiment	4.0±1.0	3.50±0.926	4.14±1.583	4.80±1.643
Ball control	Before experiment	26.4±5.413	26.13±3.91	29.0±7.75	32.8±8.585
	After the experiment	28.6±7.668	27.25±5.97	30.86±10.06*	36.8±10.43*
Comprehensive assessment	Before experiment	55.0±9.434	55.38±7.25	58.32±11.72	64.0±11.59
	After the experiment	59.0±14.25	56.25±8.79	62.95±17.07**	73.2±17.06*

Note: * means $P < 0.05$; ** means $P < 0.01$

2.4.3 Different athlete level stages

Athlete level is the final performance of athletes after long-term training and competition. According to my country's classification of athlete levels, it can currently be divided into five levels: level 3, level 2, level 1, national level and international level. The level of each level represents the technical level of the athlete. The higher the level, the longer the training time and the higher the standards of competition. For example, international level athletes are generally awarded the sports level of this specification after obtaining corresponding rankings in important international competitions. This is a symbol of honor for the athlete's career. According to the test data results of various indicators before and after the experiment of athletes of different athlete levels statistics in Table 9 , athletes with athlete level 3 are slightly better than the technical level before the experiment in the pre- and post-experiment tests except for direct shot. (Before experiment: 2.86 ± 0.690 ; after experiment : 3.00 ± Except for 0.577), the results of other technical indicators after the experiment are slightly inferior to the results of the pre-experiment test to varying degrees. The main reasons for this contrast are: first, it is difficult for low-level athletes to achieve results in short-term experimental tests due to their technical level and understanding of technical training methods; second, due to the compact arrangement of experimental tests, unreasonable distribution of the number of athletes lead to biases in data processing. Therefore, in future experimental tests, athletes of different levels should be reasonably assigned to participate in different cycles of tests, so that contrast is less likely to occur. Among level 2 athletes, all indicators of the pre- and post-experiment tests have improved to a certain extent compared to before the experiment.

Among them, statistical differences in direct shot, assist, key passes, tackle, ball control and comprehensive evaluation have been found, there are (T = -4.379 , P = 0.000 ; T = -2.388 , P = 0.028 ; T = -2.727 , P = 0.014 ; T = -3.293 , P = 0.004 ; T = -3.859 , P = 0.001 ; T = -3.605 , P = 0.002) <0.05 , and there is no statistical difference in other indicators (P > *0.05*). Among level 1 athletes, the post-experiment tests have improved compared to the pre-experiment tests. Among them, seven indicators including direct shot, target shot, diagonal shot, tackle, assist, ball control and comprehensive evaluation have been tested and found to have statistically significant differences (T = -5.000 , P = 0.015 ; T = -5.000 , P = 0.015 ; T = -5.196 , P = 0.014 ; T = -7.000 , P = 0.006 ; T = -7.000 , P = 0.006 ; T = -4.243 , P = 0.024 ; T = -10.967 , P = 0.002) <0.05. There is no statistical difference between the other two indicators in the comparison between pre- and post-experiment testing (P > 0.05). Among the national level athletes, the athletes have improved before and after the experimental test, but there is a statistical difference (T = -16.000 ; P = 0.04 < 0.05) are only comprehensively evaluated, mainly because National level athletes have a high technical level and it is difficult to make a breakthrough in a short period of time. However, judging from the comprehensive evaluation indicators, the overall ability of national level athletes in the test has been improved to a certain extent. .

From the above analysis, the differences in the technical level of athletes during the pre- and post-experiment testing processes are mainly concentrated among level 2 and level 1 athletes, because these athletes have received relatively systematic football technical and tactical training. For TOPSIS -The RSR method can be used in practical training to adapt and improve oneself in a short period of time. However, it is difficult for third-level athletes to make new breakthroughs in a short period of time due to insufficient systematic football training, unstable techniques and tactics, and limited training knowledge. Therefore, this is also an important factor in the training contrast of this group of athletes. For national level athletes, because of its inherent technical and tactical system, football theory and technical and tactical knowledge are relatively solid and have reached a certain level. Therefore, it is still difficult to use the TOPSIS-RSR method to guide the training of these athletes in a short period of time to achieve a qualitative breakthrough. However, they can effectively understand the method. If the method is implemented into practical training for a long time, good results will be found in this group of athletes. Thus, in future practical training, it is recommended to use the TOPSIS-RSR comprehensive evaluation method to guide and evaluate the training effects of athletes on the spot. However, the training cycle should be reasonably arranged according to the different levels of athletes, so that it can be effective for low-level athletes. A longer period of time from exploration, adaptation to improvement.

Table 9 Statistical table of pre- and post-test results of athletes with different athlete levels

Test indicators	Group	Level three	Level 2	Level 1	National champion
		M±SD	M±SD	M±SD	M±SD
Direct shot	Before experiment	2.86±0.690	4.21±0.535	5.00±0.816	6.0±0.0
	After the	3.00±0.57	4.37±0.597	6.25±0.50*	8.5 ± 0.0

	experiment	7			
Target shot	Before experiment	3.14±0.690	3.84±0.375	4.50±0.577	5.5±0.707
	After the experiment	2.43±0.535	3.95±0.78	5.75±0.50*	8.0±0.0
diagonal shot	Before experiment	2.57±0.535	3.58±0.607	4.75±0.50	6.0±0.0
	After the experiment	2.43±0.535	4.32±0.671**	6.25±0.50*	7.5±0.707
key pass	Before experiment	2.86±0.690	4.05±0.621	5.0±0.0	6.5±0.707
	After the experiment	2.57±0.535	4.47±0.513*	5.75±0.50	8.0±0.0
Tackle	Before experiment	2.57±0.535	3.89±0.567	4.75±0.50	7.0±0.0
	After the experiment	2.43±0.787	4.42±0.902*	6.50±0.577**	7.5±0.707
Assist	Before experiment	3.00±0.577	4.16±0.602	4.75±0.50	7.0±0.0
	After the experiment	2.57±0.787	4.68±0.749**	6.50±1.0**	8.5±0.707
intercept	Before experiment	2.86±0.690	3.74±0.452	5.0±0.0	6.0±0.0
	After the experiment	2.57±0.535	3.79±0.631	6.0±0.816	7.5±0.707
Ball control	Before experiment	19.86±2.673	27.47±1.679	36.0±1.826	45.0±0.0
	After the experiment	18.0±3.266	29.89±3.143**	39.0±3.162*	58.0±2.828
Comprehensive assessment	Before experiment	42.29±5.024	57.84±2.167	69.0±2.582	77.0±2.828
	After the experiment	40.43±5.623	60.95±4.183**	79.5±3.416**	93.0±4.243*

Note: * means $P < 0.05$; ** means $P < 0.01$

2.4.4 Different training years stages

The length of an athlete's training time determines the degree to which he or she has mastered a certain sport's technology and is a key factor in demonstrating his or her technical level. According to the pre-

and post-test data results of athletes with different training years in Table 10 , the technical level of various indicators of athletes with training time of three years or less has declined compared to before the experiment, for example, diagonal shot Six indicators including tackle, assist, intercept, ball control and comprehensive evaluation showed that the test technical level after the experiment was worse than before the experiment. In other words, the 8 weeks of training did not bring any improvement in these technical indicators to the athletes with this training period. good effect. However, some indicators have produced certain effects. For example, three indicators such as direct shot, target shot and key passes show that the technical level after the experiment is better than before the experiment. Even in the indicator of key pass, the technical level after the experiment is better than that before the experiment. There was a statistical difference in the post-comparison (T = -3.162 ; P = 0.025) <0.05. Among athletes with 4-5 years of training, the performance of various technical indicators tested after the experiment must be better than the test results before the experiment to a certain extent, including diagonal shot, tackle, assist, ball control and comprehensive evaluation. Comparing the pre- and post-experiment test scores for each indicator, it was found that there were statistical differences (T = -4.682 , P = 0.000 ; T = -3.559 , P = 0.002 ; T = -3.269 , P = 0.004 ; T = -4.467 , P = 0.000 ; T = -3.822 , P = 0.001) < 0.01 . Among athletes who have been training for six years or more, the results of various technical indicators in the experimental test after 8 weeks are better than the test level before the experiment to a certain extent. The level of direct shot, tackle, assist, intercept, ball control and comprehensive evaluation, a statistical difference were founded before and after the experiment (T = -5.000 , P = 0.004 ; T = -2.712 , P = 0.042 ; T = -3.796 , P = 0.013 ; T = -2.712 , P = 0.042 ; T = -5.117 , P = 0.004 ; T = -3.068 , P = 0.028) <0.05 , and there is no statistical difference in other indicators (P > *0.05*).

From the above analysis, athletes show different competitive levels in different trainings. From the time period of three years and less to the time period of six years and more, it can be seen that the athletes' experimental tests in 8 weeks The competitive level of Chinese athletes is on the rise both before and after the experiment; the longer the training years, the more stable the technical indicators will be in the test and the higher the score will be, but vice versa. In addition, the TOPSIS-RSR comprehensive training method has produced certain effects in an 8-week experiment among athletes with different training years. However, compared with athletes with training years of 4 years or more, athletes with training years of three years or less have a certain effect. In contrast, the test scores of some indicators after the experiment are not even as good as the test scores before the experiment, and the technical performance is extremely unstable. This is highly related to the problems existing at different athlete levels, different grade levels and different ages analyzed above. Therefore, for athletes with lower training years, a longer training time should be set in experimental tests so that they can have enough time to adapt to the new training method, while for athletes with longer training years, 8 weeks of training are enough, because these athletes have a certain accumulation of theory and technology and can understand new training methods in a timely manner. However, for professional football players who have been training on the front line, the training periods should be reasonably arranged because of

their technical level.

Table 10 Statistical table of results of pre- and post-experiment test levels of athletes with different training years

Test indicators	Group	Three years and below	4-5 years	Six years and above
		M±SD	M±SD	M±SD
Direct shot	Before experiment	2.67±0.516	4.30±0.571	5.33±1.211
	After the experiment	3.00±0.632	4.35±0.745	6.17±1.169**
Target shot	Before experiment	3.17±0.753	3.85±0.489	5.00±0.894
	After the experiment	2.33±0.516	4.00±0.725	5.50±0.548
diagonal shot	Before experiment	2.67±0.816	3.65±0.671	4.83±1.472
	After the experiment	2.50±0.837	4.40±0.821**	5.00±1.414
key pass	Before experiment	2.67±0.516	4.15±0.587	5.33±1.366
	After the experiment	3.33±0.516*	4.35±0.671	6.00±1.549
Tackle	Before experiment	2.67±0.816	3.95±0.826	5.50±1.378
	After the experiment	2.17±0.408	4.55±0.826**	6.33±1.506*
Assist	Before experiment	3.00±0.632	4.20±0.696	5.50±1.378
	After the experiment	2.50±0.837	4.80±0.951**	6.67±1.862*
intercept	Before experiment	2.83±0.753	3.80±0.616	5.00±0.894
	After the experiment	2.50±0.548	3.95±0.826	5.83±1.472*
Ball control	Before experiment	19.67±3.266	27.90±3.024	36.50±8.118
	After the experiment	17.67±3.777	30.40±4.122**	40.33±9.730**
Comprehensive	Before experiment	42.17±6.853	57.95±4.501	69.33±9.114

assessment	After the experiment	40.83±8.519	61.65±7.659**	78.00±15.697*

Note: * means $P < 0.05$; ** means $P < 0.01$

To sum up, the results of the 8-week experiment on the 8 individual indicators selected by college football players were relatively good. The comprehensive evaluation scores after the experiment were greatly improved compared with those before the experiment. In other words, the results of the 8-week experiment were relatively good. The overall competitive ability of the 32 athletes has improved. In addition, in order to further refine the effects of athletes in the 8-week experimental test, different ages, different grade level, different athlete levels and different training years were used as dependent variables, and before and after the experiment were used as independent variables for analysis. It was found that athletes in the experiment had a positive correlation with the extension of age, grade level, athlete level and training years. Athletes with higher grade and athlete level, age and training years had a better understanding of training methods in the experimental test, resulting in the best test results, which is directly related to their more complete mastery of football theory and skills; however, athletes with lower grade and athlete level, younger age and shorter training years produced half the result with half the effort in the experimental test. As a result, most of the technical indicators in the post-experiment test were worse than the pre-experiment technical level. This may be because the novel training method prevented them from adapting in a short period of time, resulting in confusion and contrast in their own training system. Therefore, in the future experimental training process, by introducing new training methods to improve the competitive level of athletes with training years or low athlete levels, the training cycle should be extended to allow these athletes enough time to adapt to the new training methods. Coaches must also provide repeated guidance and adopt teaching measures that vary from person to person and teach students in accordance with their aptitude. Only then can it be possible to tap into the potential abilities of these athletes and thereby improve the overall competitive level.

2.5 The impact of experimental testing on the improvement of athletes' technical level

There are currently relatively many experiments on college football teaching and training, but the experimental methods are almost all aimed at students who are new to football, using some external method to decompose and teach the technical movements that students learn. For example, "video feedback teaching" is used, that is, the technical movements practiced by students are recorded and analyzed by video shooting, and problems existing in the videos are collected and fed back to students for improvement [1] ; "Case Teaching Method" ", that is, through relevant events in a certain quarter to analyze the techniques, tactics used in the match, the style of referees' on-the-spot sanctions, etc., and intercept relevant learning content according to the needs of classroom teaching [2, 3] . In addition, there are also traditional teaching methods that teach students technology, such as using action decomposition teaching, that is, through generalization, differentiation, fixation, automation and other steps to allow students to master complete technical actions [4, 5, 6] . This study is different from previous experimental research on football teaching in colleges and universities. The experimental subjects

selected in this study all have a certain technical foundation in football and have corresponding training years and sports levels. Compared with most previous studies, The experimental subjects are all college students who are new to football and lack sports foundation, which makes it difficult to select experimental technical indicators and arrange novel training plans. However, the sports subjects selected in this study can deeply explore the required experimental test indicators and integrate the TOPSIS-RSR comprehensive evaluation method into the implementation of the training plan. Through the above-mentioned questionnaires and the data processed in the experiment, it can be found that through the 8-week experimental test, the athletes' test scores after the experiment were better than the test levels before the experiment to varying degrees. However, by subdividing it into different groups for examination, it can be found that the athletes participating in the experiment will have higher sports performance in the experimental test as the years of sports training, sports level and level of teaching received are higher. It is especially concentrated between second-level and first-level athletes. This group of athletes has been exposed to systematic football training and has relatively good theoretical knowledge reserves. The most important thing is that this group of athletes has a large space for developing sports skills. Therefore, in the experimental test, these athletes also showed the best sports test ability, which is similar to Zhan Qiang's research results in "Training Diagnosis and Treatment of Non-Adaptive State of Competitive Ability of College Football Players" [7]. In addition, although athletes with lower sports levels and shorter training years did not show outstanding performance in the 8-week experimental test, there was even a contrast. However, if this group of athletes can have a longer period of training, their technical improvement space will be the largest, because compared with athletes with higher sports levels, these athletes have a relatively weak technical foundation and have more room to explore; at the same time, for For national master-level athletes, their own skills have reached a relatively high peak. The technical space that can be developed in a timely manner using advanced training methods for guidance is still relatively limited, and these athletes can only be developed through a longer period. The technical movements are more refined and the technical and tactical cooperation between the players is more tacit [8]. Therefore, applying the TOPSIS-RSR comprehensive evaluation method to football training technology and conducting 8 weeks of experimental training will be helpful for college students with a certain football skills foundation to improve their technical level. However, for athletes whose age, sports level, training years, etc. are variable factors at different stages, the reasonable arrangement of the training cycle must be fully considered. At present, looking at the variables of athlete level as an example, the effect of "Level 3 < Level 2, Level 1 > National level Athletes" has been formed in the study. Therefore, for athletes at this level, we need to focus on the arrangement of training cycles, and for athletes at lower sports levels, we need to consider the arrangement of training plans based on the principles of individuality, teaching in accordance with their aptitude, and targeting the target [9, 10]. In addition, judging from the results of the questionnaire survey, almost all college football players who participated in filling out the questionnaire agreed with whether the application of the TOPSIS-RSR comprehensive evaluation method in football training technology can improve players' offensive and defensive abilities. Therefore, in the current teaching and training

environment, college football players hope to improve their technical level through technological assistance. The TOPSIS-RSR method is a good example, which is useful for the method to be used in other sports. Technical supervision and evaluation are feasible.

3 Conclusion

1. The TOPSIS-RSR method can only evaluate the results of each team from an objective and quantitative perspective, and there may be certain errors with the final match results during the evaluation process (this error is caused by a variety of external factors, Uncontrollable), it requires multi-level consideration of internal and external factors such as the team, players, individuals, coaches, etc.
2. Apply the TOPSIS-RSR comprehensive evaluation method to football training technology and conduct 8 weeks of experimental training, which will be helpful for college students with a certain football skills foundation to improve their technical level. However, for athletes whose age, athlete level, training years, etc. are variable factors at different stages, the reasonable arrangement of the training cycle must be fully considered.

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