

## BASKETBALL RESERVE TALENTS MANAGEMENT MODEL FOR EXCELLENCE IN HEILONGJIANG PROVINCE, CHINA

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### Abstract

From 2019 years international basketball competitions, it can be seen that the level of competitive basketball in China has seriously declined, which is closely related to the insufficient management of basketball reserve talents. Therefore, how to improve the basketball reserve talents management model of excellence in Heilongjiang province, China has become an important research topic. The objective of this research were to: 1) Study the current situation and affecting factors of basketball reserve talents management for excellence in Heilongjiang province, China. 2) Analyze factors positive effect basketball reserve talents management model for excellence in Heilongjiang province, China. 3) Examine and confirm basketball reserve talents management model for excellence in Heilongjiang province, China. This research employed a mixed research methodology combining a quantitative and qualitative research methods. First, in the qualitative research section, analyze and understand the current situation and influencing factors of the management model for excellence basketball reserve talents in Heilongjiang province, China total 10 persons. Subsequently, In the quantitative research section, collect data using questionnaire survey method and analyze using structural equation model total 582. Finally, In the qualitative research section, data collection was conducted through focus group discussions with key informants total 15 persons. The research findings showed that human resources, training & competition, financial support, school system, sports sciences have a significant positive impact on the basketball reserve talents management model for excellence in Heilongjiang Province, China. And 2) The structural equation model of the basketball reserve talents management model for excellence in Heilongjiang Province, China has passed reliability and validity tests, and the model's fitness index has reached the standard ( $\chi^2/df=1.113$ , RMSEA=0.012, CFI=0.943, NFI=0.921, GFI=0.915, TLI=0.911, IFI=0.962). This study has laid the foundation for the management of basketball reserve talents in Heilongjiang Province, China; Enrich the theoretical literature and research of this professional thesis; Can assist management departments in formulating targeted development policies.

**Keywords:** Basketball Reserve Talents, Management for Excellence, Human Resources, Training & Competition, Financial Support, School System, Sports Sciences.

## 1. INTRODUCTION

Basketball originated in 1891 and has been developed for more than one hundred and twenty years, becoming a popular global sport, loved by people from all over the world. As the marketization and professionalization of China's competitive basketball reform is getting faster and faster, the demand for high-level competitive basketball reserve talents is increasing, and the quality of basketball reserve talents' cultivation is a great constraint to it". lv (2020).

At present, basketball reserve talents management model for excellence in Heilongjiang province, China there are mainly the following problems: Human resources is relatively weak, the overall delivery of reserve talent quantity is small, poor quality. Basketball funding allocation is insufficient, the lack of social support. Lack of professional guidance, insufficient coaching ability, lack of dedication of coaches, comprehensive strength to be further improved. Therefore, the researcher has an interest in creating basketball reserve talents management model for excellence in Heilongjiang province, China for improve the quality of basketball reserve talent, promote the development of basketball, and provide valuable references for the construction of professional teams.

## **2. LITERATURE REVIEW**

### **2.1 The study summarized the current situation and countermeasures of basketball reserve talent cultivation under the background of integration of sports and education**

Physical education is an integral part of education, education is an extended function of physical education, the return of physical education to education is imperative, and at the educational level, an important way to achieve health is through physical education. Peng (2021) The integration of sports and education is the establishment of a competitive sports reserve talent training system led by the education system, achieving the return of sports to the source of education, and reflecting the most basic training goals of education and sports. Pan& Liu (2018) the development of "integration of education and sports" faces many problems. To further promote the development of the integration of education and sports, it is necessary to first improve the top-level design, continuously innovate institutional logic, and develop from different institutional logic perspectives. Liu (2020) found that the use of funds in the cultivation of reserve talents in competitive sports is not optimistic. On the one hand, most of the funds invested are for infrastructure construction, and more are invested in frontline teams, hoping to achieve good results as soon as possible. However, there is a common problem of insufficient investment in the development of second and third tier teams.

### **2.2 Research summary the mechanism of Basketball Reserve Talent Cultivation**

The term "mechanism" generally refers to the process and manner of interaction between the components of a working system. Yang (2012) the mechanism for the training of reserve talents for competitive sports is to allow all areas of the training of reserve talents for sports to give play to their passion for sports, and a reasonable training mechanism is in fact a platform for realizing the sustainable development of competitive sports. Zhang (2018) The root cause of the shortage of basketball reserve talents in our country lies in, an incomplete reserve training system; a rigid reserve education system; an imperfect economic system, and defects in the coaching system. Meng (2017) Forward the development strategy of school sports joint cultivation mechanism of competitive basketball reserves: Building a platform for school sports joint cooperation in basketball; constructing an incentive mechanism for school sports joint talents; expanding the source of funding to promote the development of school sports joint development.

### 3. RESEARCH HYPOTHESES

H1: Human resources factor affecting the basketball reserve talents management for excellence. H2: Training & competition factor affecting the basketball reserve talents management for excellence. H3: Financial support factor affecting the basketball reserve talents management for excellence. H4: School system factor affecting the basketball reserve talents management for excellence. H5: Sports sciences factor affecting the basketball reserve talents management for excellence.

### 4. RESEARCH METHODOLOGY

The first step is to collect data through in-depth interviews and analyze the current situation and influencing factors of the excellent management mode of basketball reserve talents in Heilongjiang Province. The second step is to collect data using the China Online Questionnaire Platform, process and analyze the data using SPSS and SmartPLS 4.0 software, and construct the basketball reserve talents management model for excellence in Heilongjiang Province, China. The third step is to examine and confirm the influencing factors and structural equation model of the basketball reserve talents management model for excellence in Heilongjiang Province, China using the focus group discussion method. The sample data for this study comes from within Heilongjiang Province. The sample is personnel related to the basketball reserve talents management model for excellence in Heilongjiang Province, China. It is generally recommended that the sample size be at least 20 times the number of observable variables used in the defined sample program (Lindeman et al., 1980). The number of observable variables is 20, so the minimum sample size required is  $(18 \times 20) = 360$  samples. Therefore, this study actually distributed 600 questionnaires and ultimately obtained 582 valid questionnaires.

### 5. STRUCTURE EQUATION MODELING

#### 5.1 Reliability Analysis

This article adopts Cronbach  $\alpha$ . The coefficient is used to measure reliability. The value of this indicator is between 0.00 and 1.00. It is pointed out that reliability is an indicator used to measure consistency and stability, and the closer the value of this indicator is to 1.00, the higher the reliability of the data. Generally speaking, an Alpha value of less than 0.6 for Cronbach is considered a poor result, an Alpha value of greater than 0.7 for Cronbach is considered an acceptable result, and an Alpha value of greater than 0.8 for Cronbach is considered a good result with high reliability. Therefore, 0.6 should be a critical value for this indicator. From the table below, it can be seen that the average value of each variable in the predicted sample is around 3.5, with a maximum average of 3.6497 and a minimum average of 3.2925. The difference between the maximum average and the minimum average is within 0.5, indicating that the data in this sample is very good. The Cronbach Alpha value of the variable named Price Sensitivity in the pre-test sample is the smallest at 0.883 and greater than 0.8, indicating that the variable has good reliability. The Cronbach Alpha values of other variables are all greater than the optimal value of 0.9, indicating that these variables have good reliability. Therefore, the reliability analysis of the predicted samples indicates that the entries for each variable are

stable and consistent. The number of items, mean, standard error, and Cronbach Alpha values for each variable are shown in the table below.

**Table 1: Summary of Reliability Analysis**

Variable	Dimension	N of item	Average Value	Standard Error	Cronbach's Alpha
Human Resources	Athletes	6	3.589	0.717	0.899
	Coaches	4	3.570	0.729	0.855
	Managers	4	3.580	0.801	0.861
Training & Competition	Training content & method	4	3.463	0.752	0.881
	Training Facilities	4	3.541	0.861	0.863
	Type of Competition	4	3.341	0.827	0.901
Financial Support	Sources of funding	4	3.238	0.818	0.913
	Budget spending	4	3.278	0.756	0.911
	Medical protection	4	3.344	0.762	0.894
School System	The relationship between learning & Training	4	3.334	0.854	0.896
	Interest in learning	4	3.349	0.858	0.898
	Learning mechanism	4	3.338	0.862	0.893
Sports Science	Sports Physiology	4	3.331	0.854	0.896
	Sports Psychology	4	3.343	0.852	0.894
	Sports Medicine	4	3.329	0.717	0.896
Basketball reserve talents management model for excellence in Heilongjiang	Enter the CBA professional	3	3.321	0.729	0.881
	Participation in international/national competitions.	3	3.281	0.810	0.884
	Winning prizes in competitions	3	3.295	0.752	0.868

## 5.2 Validity analysis

As shown in the table 3, it can be seen that the absolute values of factor loading coefficients for each question item are all greater than 0.5, indicating a corresponding relationship between the options and factors. In addition, each item corresponds to its factor, named as athlete, coach, etc. The corresponding relationship of each factor is shown in Table 4, and the commonality values of all research items are higher than 0.5, indicating a strong correlation between research items and factors, and factors can effectively extract information. To explore the items and dimensions corresponding to different factors, exploratory factor analysis and confirmatory factor analysis were conducted separately.

**Table 3: Rotation factor loading coefficient and common factor variance result**

Extract factors	Question items	Extract factors	Question items
Athletes	Q1-Q6	The relationship between learning & training	Q39-Q42
Coaches	Q7-Q10	Interest in learning	Q43-Q46
Managers	Q11-Q14	Learning mechanism	Q47-Q50
Training content & method	Q15-Q18	Sports Physiology	Q51-Q54
Training Facilities	Q19-Q22	Sports Psychology	Q55-Q58
Type of Competition	Q23-Q26	Sports Medicine	Q59-Q62
Sources of funding	Q27-Q30	Enter the CBA professional	Q63-Q65
Budget spending	Q31-Q34	Participation in international/national competitions.	Q66-Q68
Medical protection	Q35-Q38	Winning prizes in competitions	Q68-Q71

This confirmatory factor analysis (CFA) was conducted on a total of 18 factors and 71 analysis items. As shown in the Table, it can be seen that the AVE values corresponding to a total of 18 factors are all greater than 0.5, and the CR values are all higher than 0.7, indicating that the data analyzed in this study has good convergent validity.

**Table 4: Validation Factor AVE and CR Index Values**

Factor dimension	AVE	CR	Factor dimension	AVE	CR
Athletes	0.597	0.899	The relationship between learning and training	0.683	0.896
Coaches	0.595	0.855	Interest in learning	0.687	0.898
Managers	0.608	0.861	Learning mechanism	0.676	0.893
Training content & method	0.649	0.881	Sports Physiology	0.682	0.896
Training Facilities	0.612	0.863	Sports Psychology	0.679	0.894
Type of Competition	0.695	0.901	Sports Medicine	0.683	0.896
Sources of funding	0.724	0.913	Enter the CBA professional	0.712	0.881
Budget spending	0.720	0.912	Participation in international/national competitions.	0.718	0.884
Medical protection	0.680	0.895	Winning prizes in competitions	0.688	0.869

Next, the fitting results of the validation factors were evaluated for these 18 factors. The fitting results are shown in Table 5, and it was found that they all met the criteria with good discriminant validity.

**Table 5: Model fitting effect**

Index	$\chi^2/df$	GFI	RMSEA	RMR	CFI	NFI	NNFI
criterion for judgement	<3	>0.9	<0.10	<0.05	>0.9	>0.9	>0.9
value	1.217	0.917	0.019	0.035	0.959	0.941	0.918

### 5.3 Discriminant validity

Compare the correlation coefficients of each variable with the square root of the average extracted variance (AVE) to test the discriminant validity of the econometric model, as shown in Table 6: the square root of AVE for each variable is greater than the correlation coefficients between the factors, indicating that the econometric model has good discriminant validity.

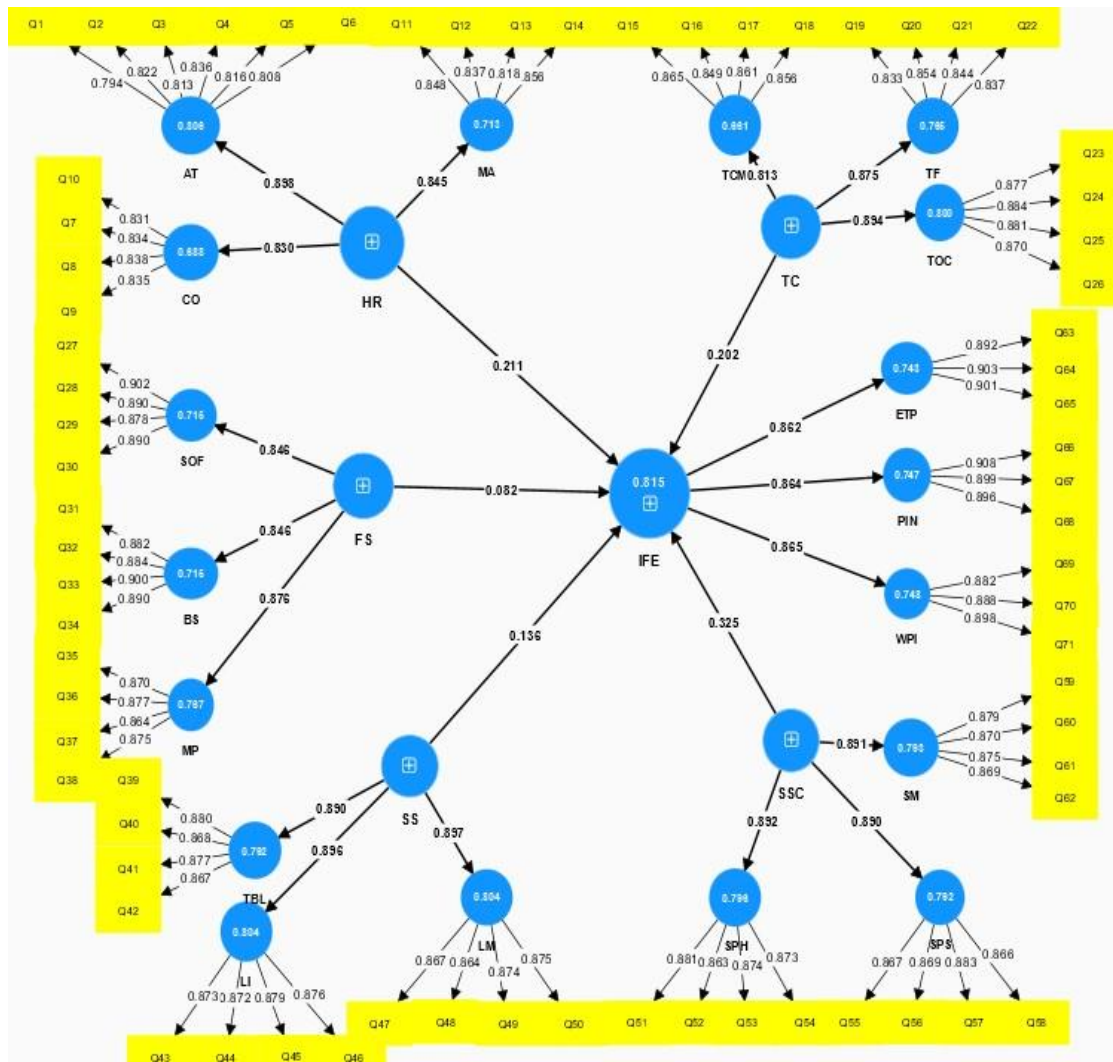
**Table 6: Variable correlation coefficient matrix and AVE square root**

variable	Human Resources	Training & Competition	Financial support	School system	Sports sciences	Basketball reserve talents management model for excellence in Heilongjiang province, China
Human Resources	0.962					
Training & Competition	0.831	0.836				
Financial support	0.974	0.719	0.799			
School system	0.899	0.732	0.724	0.806		
Sports sciences	0.816	0.776	0.728	0.745	0.852	
Basketball reserve talents management model for excellence in Heilongjiang province, China	0.825	0.78	0.732	0.732	0.832	0.778



In this analysis, the external load of the indicator should be higher than all cross loads on other variables. If this condition is not met, the item needs to be deleted. The cross loading matrix of this study is shown in Table 6: the loadings of each variable on the relevant factors are much higher than those on other factors, indicating that the scale has good discriminant validity and convergent validity.

### 5.4 Structural Equation Model



#### 5.4.1 Evaluation of measurement models

The commonly used indicators of model fit mainly include the following four aspects: (1) chi square statistics ( $\chi^2$ ) Ratio to degrees of freedom (df): If  $\chi^2/df$  is less than 3, the model is better, and the fitting effect between the sample data and the model is better. (2) Goodness of fit index (GFI): The minimum requirement for this indicator is usually a GFI greater than 0.85, and it is best to have a GFI greater than 0.90, with the closer it is to 1, the better. (3) The square

root of approximation error (RMSEA): If the index is less than 0.10, the better. (4) Model Fit Index: This article uses three model fit indicators: CFI, NFI, and IFI. The values of these three indicators can be greater than 0.85, and the closer they are to 1, the better the fitting effect of the model. According to Table 9, when fitting the model, it was found that all indicators met the standards, so it is considered that the model has a good degree of adaptability. The results are shown in Table 6

**Table 6: Model fitting test**

Inspection indicators	Fit criteria	Model fitting index	fitting effect
$\chi^2/df$	<3	1.113	Ideal
RMSEA	<0.10	0.012	Ideal
CFI	>0.85	0.943	Ideal
NFI	>0.85	0.921	Ideal
GFI	>0.85	0.915	Ideal
TLI	>0.90	0.911	Ideal
IFI	>0.90	0.962	Ideal

The other two indicators of convergence validity were tested: Cronbach  $\alpha$  and composite reliability. According to the description of the previous pre experiment, the Cronbach Alpha value and composite reliability between 0.6 and 0.7 are generally acceptable. The Cronbach Alpha value and composite reliability value between 0.7 and 0.9 indicate slightly higher reliability. Cronbach Alpha value and composite reliability value greater than 0.9 indicate very high reliability. In this study, the composite reliability of all variables ranged from 0.855 to 0.932, indicating high internal consistency among potential variables.

The fourth indicator for testing convergence validity is the average extraction variance (AVE). In the measurement model, the value of AVE should be greater than or equal to 0.5. In this study, the AVE values of all variables ranged from 0.51 to 0.812. The AVE values of all variables are greater than the recommended value of 0.5, indicating that the AVE requirements of this study are met. Among them, the AVE of human resources is 0.79, the AVE of training and competition is 0.808, the AVE of financial support is 0.711, the AVE of the school system is 0.653, the AVE of sports science is 0.754, and the AVE of the excellent talent reserve talent management model in Heilongjiang Province, China is 0.711.

Research has confirmed that the above convergence validity indicators all meet the conditions, therefore the measurement model in this study has good convergence validity.

#### 5.4.2 Structural model path coefficients/relationships

It will test and validate the research hypotheses proposed in this article, including direct effects and moderating effects. In this study, the path coefficients of the PLS algorithm in Smartpls 4.0 were used to measure the impact. If the path coefficient is greater than 0, it indicates a positive impact. A path coefficient less than 0 indicates a negative impact. The size of the path coefficient represents the magnitude of the impact. Meanwhile, the t-value must be greater than the critical value, and the P-value must be less than the critical value to confirm significance. The direct effect test is shown in the table: Human resources have a significant positive impact on the basketball reserve talents management model for excellence in Heilongjiang province,

China ( $\beta = 0.231$ ,  $t = 9.664 > 1.960$ ,  $P = 0.000 < 0.05$ ), assuming H1 is validated. Training and competition have a significant positive impact on the basketball reserve talents management model for excellence in Heilongjiang province, China ( $\beta = 0.233$ ,  $T = 7.635 > 1.960$ ,  $P = 0.000 < 0.05$ ), assuming H2 is validated. Assuming H3 is validated, financial support significantly positively affects the basketball reserve talents management model for excellence in Heilongjiang province, China ( $\beta = 0.088$ ,  $T = 6.067 > 1.960$ ,  $P = 0.000 < 0.05$ ). The school system has a significant positive impact on the basketball reserve talents management model for excellence in Heilongjiang province, China ( $\beta = 0.139$ ,  $T = 4.326 > 1.960$ ,  $P = 0.000 < 0.05$ ), H4 was validated. Sports science has a significant positive impact on the basketball reserve talents management model for excellence in Heilongjiang province, China ( $\beta = 0.250$ ,  $T = 5.337 > 1.960$ ,  $P = 0.000 < 0.05$ ), assuming H5 is validated.

**Table 7: Hypothesis Testing**

Assumption	Path relationship	Path Coefficient	P value	Decide
Assumption	Human Resources->the basketball reserve talents management model for excellence in Heilongjiang province, China	0.231	0.000	Supported
Assumption	Training& Competition ->the basketball reserve talents management model for excellence in Heilongjiang province, China	0.233	0.000	Supported
Assumption	Financial support->the basketball reserve talents management model for excellence in Heilongjiang province, China	0.088	0.000	Supported
Assumption	School system->the basketball reserve talents management model for excellence in Heilongjiang province, China	0.139	0.000	Supported
Assumption	Sports sciences->the basketball reserve talents management model for excellence in Heilongjiang province, China	0.250	0.000	Supported

## 6. CONCLUSION

The basketball reserve talents is a systematic project that involves multiple aspects such as human resources, training and competition, financial support, sports science, and school systems, each of which plays a crucial role in the development of athletes. The following is a summary of the impact of these factors: 1) Human resources, excellent coaches, and professional talents are the key to cultivating basketball reserve talents. They not only provide professional training guidance, but also provide necessary psychological support and life guidance for athletes, playing a decisive role in their comprehensive development. 2) Training & competition, systematic and scientific training, and rich competition experience are crucial for improving the technical and competitive level of athletes. Training helps athletes lay a solid technical foundation, while competition provides a platform for testing training effectiveness and exercising psychological resilience. 3) Adequate financial support can provide necessary training resources, facility construction, technical application, and competition opportunities for basketball reserve talents, which is crucial for promoting the growth of athletes and enhancing the overall strength of the team. 4) School education ensures that athletes can receive



balanced academic education while pursuing athletic performance.5) Sports science can optimize athlete training plans, improve training efficiency, accelerate recovery speed, and reduce injuries, which has an important impact on the long-term development and health management of athletes.

## 7. SUGGESTION FOR FURTHER RESEARCH

This study is the author's first study on the factors affecting the management mode of basketball reserve talents in Heilongjiang Province, China. After the preliminary research results are formed, a more comprehensive and in-depth investigation and research will be conducted. Firstly, in order to select a more comprehensive survey sample, a survey will be conducted on basketball related respondents in various regions of China, especially in provinces and cities with CBA teams, to enrich the sample composition and help understand the overall situation of basketball reserve talent cultivation in the country. Then, we can actively explore and apply the latest sports technologies, such as wearable devices, motion data analysis software, virtual reality (VR) technology, etc., which can improve the accuracy and efficiency of training. Therefore, expanding research ideas can increase the interpretability of the article. Finally, dividing the research variables and controlling the number of topics in the variables may help improve the effectiveness of each variable in the model.

### Reference

- 1) Peng, G. & Gao, Q.-Y. (2021). Research on the professional development of physical education in China under the perspective of integration of sports and education. *Journal of Sports Culture* (02), 96-102.
- 2) Liu, W. & Pan, K. F.. (2018). "The Dilemma of the Development of the Organization of Teaching and Sports Integration - Based on the Perspective of Multiple Institutional Logic. *Journal of Beijing Sport University* (03), 54-59.
- 3) Liu, Bo, Guo, Z., Wang, Song, Chen, Yi-Ying & Zhang, Bel. (2020). Integration of sports and education: the demands, dilemmas and exploration of the cultivation of competitive sports reserves with Chinese characteristics in the new era. *Journal of Physical Education* (06), 12-19
- 4) Zhang, Liansheng. (2018). New thinking of China's basketball competitive reserve personnel training - reforming the system, teaching according to the material. *Contemporary sports science and technology* (15), 209-210
- 5) Meng, W.. (2017). Research on the innovative mechanism of cultivating reserve talents of competitive basketball in school-sport union. *Youth Sports* (07), 55-56.
- 6) Lü, W. G. & Zeng, Z.. (2020). Research on the risk prevention model and mechanism of sudden marathon death in China based on WSR. *Research in Physical Education* (02), 1-8.
- 7) Yang, J.. (2012). Analysis of the operation mechanism of training reserve talents in Chinese competitive basketball. *Contemporary Sports Science and Technology* (07), 57-58.
- 8) Deng, W.J.(2018).Research on dynamic chain management system of core competitiveness of competitive sports in China .*Journal of Beijing Sport University*. (2): 101-108.
- 9) Du,P.X.(2018).Research on Collaborative Mechanism of College Security Management Based on Synergy Theory [Dissertation]:China University of Geosciences (Beijing).

- 10) Dang(2023)Training manners for reserve human resources of basketball players for overseas and vietnam. European Journal of Physical Education and Sport Science.
- 11) Dan, W., & Jeong, Y., (2023). Combined training and explosive strength in basketball players' lower limbs. Revista Brasileira De Medicina Do Esporte.
- 12) Dang.(2023)Training manners for reserve human resources of basketball players for overseas and vietnam. European Journal of Physical Education and Sport Science.
- 13) Gong,B.(2021). Research on Reserve Talent Cultivation System of Chinese Men's Basketball National Team[Dissertation].Beijing:Beijing Sports University.
- 14) Gao,F.J.&Zeng,Q.T.(2021).Explorations and Reflections on the Integration of Physical Education and Sports for the Healthy Development of Youth in the New Era.Journal of track and field (athletics),(12):60-62.
- 15) Hu,B.(2022).Research on the cultivation strategy of youth basketball reserve talents in Hunan Province based on SWOT-AHP model[Dissertation]Hunan:Hunan University of Science and Technology.