

Analysis of Influencing Factors of College Students' Sports Ability Cultivation

----- Based on the Weighted Average Method

Zhiqiang Huang

South China Institute of Software Engineering.GU, Guangzhou, 510990, China

Keywords: Sports Ability, Impact Indicator, Weight Confirmation

Abstract: This paper studies the formation mechanism of college students' comprehensive ability of sports, and takes the multi-disciplinary principles of sociology, psychology and physical education as the guidance, and combines the expert interview method to establish a three-level index system that affects the training factors of sports ability, and through the questionnaire method and Mathematical analysis method, weights the indicators to provide a theoretical reference for scientific analysis of the stratification of college students' comprehensive ability of sports.

1. Research Objects and Methods

1.1 Research Object

The indicators that affect the cultivation of college students' comprehensive sports ability are studied.

1.2 Research Methods

Mainly through the national academic journal network, academic literature database, national electronic library and education websites, the "sports ability of college students", "influencing factors of sports ability" and "sports evaluation indicators" are searched for keywords, collecting relevant papers, journals, Monographs, newspapers and periodicals, combined with psychology, sociology, and physical education principles are organized and analyzed.

Through the interviews between physical education colleges and college physical education experts and sociologists, combined with the literature method and questionnaire method, the index system that affects the comprehensive ability of college students' sports is established.

In order to analyze the influence degree of each index on the formation of sports ability, an online questionnaire survey was sent to the students' sports department, sports association, sports team members, physical education teachers and ordinary students of Guangzhou University Software and Software College. A total of 386 questionnaires were sent out, and the actual recycling was carried out. Using the retest method, the questionnaire was retested by 50 people, and the repetition rate was 93%. The test results proved that the reliability of the questionnaire was significant.

The numerical and mathematical analyses of the 350 questionnaires were carried out. The data obtained were statistically analyzed by EXCEL. The mathematical calculation method was used to analyze and determine the weight coefficient of each index in the index system.

2. Research Process

2.1 Questions Raised

The comprehensive ability of college students' sports, that is, the ability of college students in sports social activities, the comprehensive ability structure of sports can be summarized as follows: 1. Master the use of "three basic skills", second, self-assessment exercise ability; third, psychological quality and adaptability; Physical fitness and physical ability. In the physical ability structure, the realization of a goal in one field may require the cultivation of multiple physical ability of students, and the physical ability of one side may also contribute to the realization of goals

in multiple fields [1]. In the ordinary colleges and universities, the individual differences in the comprehensive ability of students' sports are outstanding. The formation of sports ability and the influencing factors are conducive to the efficient and high-quality development of physical education in colleges and universities.

2.2 Dimension Selection

In the process of cultivating comprehensive sports ability of college students, it is mainly determined by consciousness, individual ability, school sports, family intervention, and collective atmosphere campus environment [2]. Therefore, the determination of impact indicators is mainly refined from the following dimensions:

Sports ideology: Sports ideology is the core of sports ability. Consciousness is the root of human action. Sports consciousness involves invisible aspects such as sports values, sports thought guidance, and sports moral cultivation.

Sports ability structure: It has the characteristics of individual attributes and is the guarantee of sports participation. Including body shape, sports quality, mastery of sports skills, sports knowledge, frequency of physical activity, individuals in different stages of growth, body, consciousness, thinking, and cognition are all positively changing. The development of physical and physical ability helps to improve participation in sports activities. The frequency, and with the establishment of the concept of sports and the mastery of action learning methods, the attitude of participating in physical exercise is constantly changing.

Physical education background: Physical education is an important part of comprehensive quality education, and it is also the main systematic method to accept sports knowledge and cultivate sports ability. School physical education and amateur physical education are the two main forms of physical education. They are the main way to cultivate physical ability. The two complement each other and complement each other, which encourages individuals to learn from sports ignorance and sports, and through the whole process of sports ability formation.

Family sports intervention: Parents' sports attitude and sports consciousness are important factors influencing college students' participation in physical exercise. Parents' participation in physical exercise is closely related to college students' physical exercise behavior. The situation of siblings participating in physical exercise has certain effect on college students' physical exercise behavior. Influence, family economic situation is the key factor affecting college students' participation in physical exercise. The influence of college students' family residence on college students' physical exercise behavior is more significant [3].

Collective sports atmosphere: mainly refers to the collective sports atmosphere of the class. The sports planning, member structure and sports performance of the class will also have a proportional effect on the participation of individual sports and the formation of sports ability. In a fixed environment, group consciousness changes individual consciousness, and individual consciousness is assimilated by group consciousness.

Campus sports environment: The campus sports environment is a tangible level, including sports equipment, sports clubs, sports funds, and sports construction. The campus sports environment is an important platform for students to participate in sports activities and cultivate sports ability. The campus sports environment has a wide-ranging influence on the formation of college students' sports ability.

2.3 Indicator Construction

By consulting the database, the existing literature lacks the research on the construction of the impact index system of college students' comprehensive ability. This paper combines the selected dimensions to decompose the growth process and learning environment of college students, and combines externalization indicators with internal indicators to conduct expert interviews and reliability analysis. Six selected first-level impact indicators, 22 second-level impact indicators, and 62 third-level impact indicators were selected, and expert surveys were conducted on the identification and effectiveness of the indicators to confirm that the selected indicators have the impact on the comprehensive ability of college students. Feature attributes, in line with the

requirements of the questionnaire survey.

2.4 The Need for Weight Determination

Indicator analysis is the specificization and conceptual operation of the evaluation objectives [4]. Given the difference in professional and knowledge structure, the group has different understanding of the importance of the indicators in the process of cultivating the physical ability of college students, and is able to be scientifically determined. The degree of relevance of the indicator to the research object, and the weight of the impact indicator is determined.

3. Indicator Weight Determination

For the determination of the weight of the first-level indicator and the second-level indicator, this paper adopts the analytic hierarchy process, that is, the questionnaire fill-in person gives a quantitative representation based on the objective facts, subjectively judges the relative importance of each of the first- and second-level indicators, and then mathematically determines each The weight of an indicator [5]. In the questionnaire, indicators represent the importance of indicators affecting the development of physical ability, 1 is the most important, 2 is the second most important, and so on, n is the least important. In order to distinguish the influence of each indicator, the indicators are calculated in the calculation. Through the analysis of the questionnaire, the frequency of the indicator is filled in the Excel table, and the weight of the indicator is obtained by the calculated weighted average method [5]. The calculation steps are as follows:

First, calculate the average score of the first-level indicator single ticket (accurate to the second decimal place)

$$x_i = \frac{\sum_{j=1}^n (n+1-j) p_{ij}}{\sum_{j=1}^n p_{ij}} \quad (i = 1, 2, \dots, n) \quad (1)$$

Where: indicates the importance ranking indicator; indicates the total number of primary indicators; indicates the frequency of the corresponding indicator, and then calculates the weight of the first-level indicator (accurate to single digits)

$$y_i = \frac{x_i}{\sum_{i=1}^n x_i} \cdot 100 \quad (i = 1, 2, \dots, n) \quad (2)$$

Fill in the results of the calculations to form the first-level indicator weights (Table 1)

Table 1 Determination of the weight of the first-level indicators of the factors influencing the comprehensive ability of college students' physical education

Importance and frequency							Mean	Weights
	1	2	3	4	5	6		
Primary indicator								
Sports ideology	126	14	48	50	56	56	3.82	18
Sports ability structure	42	70	62	85	49	42	3.56	17
Physical education background	35	35	58	54	98	70	2.99	14
Family sports intervention	13	64	73	46	63	91	2.99	14
Collective sports atmosphere	48	98	46	66	43	49	3.70	18
Campus sports environment	86	69	63	49	41	42	3.95	19

Analysis: In the first-level impact indicator, the weight value is greater than "14" or more, indicating that the impact is significant. The "sports ideology", "collective sports atmosphere" and "campus sports environment" in the first-level indicators have a significant impact on the

comprehensive ability of students' sports. Individuals have the consciousness of physical integrity, the stronger the purpose and consciousness of sports participation, the collective sports play an important role in cultivating individual sports ability. The campus environment as a dominant factor is the platform and carrier of individual sports activities, school sports. The convenience and diversity of the environment have a significant effect on improving students' interest and participation in sports learning.

First, calculate the average single-item score of the second-level indicator under the first-level indicator (accurate to the second digit after the decimal point)

$$z_{i_k} = \frac{\sum_{j=1}^{10} q_j \cdot p_{i_k, j}}{\sum_{j=1}^{10} p_{i_k, j}} \quad (3)$$

Wherein, the score indicating the rank is; the frequency indicating the score of the second grade indicator under the first level indicator, and then calculating the weight of the second level indicator under the first level indicator (accurate to the single digit)

$$y_{i_k} = \frac{z_{i_k}}{\sum_k z_{i_k}} \cdot y_i \quad (4)$$

Second, fill in the calculation results into a table to form a secondary indicator weight

Analysis: The results show that the weights of the secondary impact indicators in the corresponding first-level indicators are relatively balanced, indicating that the impact of each impact index on the cultivation of college students' sports ability is relatively consistent, such as "school physical education background" "amateur sports The weight of education is "4", which indicates that the input of the questionnaire is more uniform and less biased. Physical education is an educational process with clear objectives, detailed plans, and organized body and personality. As a complete system, its basic characteristics emphasize education and teaching. School sports and amateur sports are interdependent and interdependent. An interactive relationship. School sports reflect the learning and effects of student motor skills, while amateur sports reflect students' motivation to participate in sports. Other secondary indicators also show the same characteristics. In the results, they also reflect the differences in the importance of some secondary indicators. For example, there are subjective deviations in some secondary indicators such as "sports guiding ideology" and "school funding expenditure".

The third-level indicator adopts the index assignment method, that is, the most important assignment is 10 points, the second most important assignment is 9 points, and so on. The least important one is to fill in the questionnaire, and the questionnaire is filled with the self-time and experience to assign the third-level indicator. The larger the value, the more important this indicator is, the smaller it is, the less important it is. Through the statistics of the recovery questionnaire, the distribution of the frequency of the three-level index is calculated, and the weight of the indicator is obtained by the calculated weighted average method [5]. The calculation steps are as follows:

First, calculate the average single-item score of the third-level indicator under the second-level indicator under the first-level indicator (accurate to the second digit after the decimal point)

$$z_{i_{kl}} = \frac{\sum_{j=1}^{10} q_j \cdot p_{i_{kl}, j}}{\sum_{j=1}^{10} p_{i_{kl}, j}} \quad (5)$$

Wherein, the score indicating the ranking is; the frequency indicating the corresponding score of the third-level indicator under the second secondary indicator under the first-level indicator

Secondly, calculate the weight of the third level indicator under the second level indicator under

the first level indicator (accurate to the first digit after the decimal point)

$$y_{i_{kl}} = \frac{z_{i_{kl}}}{\sum_l z_{i_{kl}}} \cdot y_{i_k} \quad (6)$$

Then, by manually comparing the results of the second digit after the decimal point, the deviation of the individual data due to rounding is corrected.

Finally, the calculation results are filled in the form to form a three-level indicator weight.

Analysis: The weight of the third-level indicators is also balanced in the corresponding secondary indicators, indicating that the impacts are more consistent, but there are individual differences. For example, the “number of venue equipment” has a weight of “1.5” than “site”. The position of the device (1.2) The rate of use of the site (1.3)” has a large contribution rate in the secondary indicators of “sports equipment”, indicating the influence of the “number of field devices” in the training of sports capacity and the “sports equipment”. Medium is the most important. Other three-level indicators can also make the same weight judgment and clarify the degree of influence of each indicator.

4. Suggestions

There are many factors influencing the cultivation of college students' sports ability. With the rapid development of social economy, the changes of college life style and individual sports concept, the weight of each factor index is also changing. By studying the weight of each index, it aims to explore college sports. The essence of comprehensive ability training, colleges and universities as the final stage of college students' school sports, should think from the multi-dimensional space of college students' thoughts, life, biology, psychology, etc., through effective measures such as policy, humanities, environment, curriculum, management Multi-level and multi-faceted stimulating students' desire to learn sports, enhance physical fitness, and improve their athletic ability, and urge students to master the ability to use sports knowledge to serve themselves and serve the society, thus establishing a correct outlook on sports life.

Acknowledgements

Fund Project: 2017 Guangdong Higher Education Teaching Research and Reform Project (Guangdong Gaoxin 2018-1-730)

References

- [1] HAN Xinjun. On the Physical Ability and Cultivation of College Students in Ordinary Colleges and Universities [J]. Zhejiang Sports Science, 2006(01):52-54.
- [2] Zhong Zhenxin, Chen Zhonglin, Tu Weishi. College Students' Physical Ability and Training Strategies [J]. Journal of Physical Education, 2002(06):80-82.
- [3] HAN Yan. Analysis of Family Factors Affecting College Students' Physical Exercise Behavior [J]. China Science Education Innovation Guide, 2009(36):245.
- [4] YE Wei, ZHOU Zhe, YU Zhen-feng. Study on Evaluation Index System of Wushu High Level Sports Teams in Colleges and Universities in China [J]. Journal of Beijing Sport University, 2013, 36(12):104-108+114.
- [5] Huang Dahai. Design of physical education evaluation system and intelligent evaluation system design [D]. Qufu Normal University, 2001.