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University basketball teaching development strategic fuzzy evaluation

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ABSTRACT

Presently, world sports events become more and more various, but basketball is still one of China adolescent favorite sports events, in the following, it carries out concrete research on China football teaching. The paper analyzes China basketball teaching status. Firstly, in many schools of China, they already bring basketball teaching into syllabus, and gets good effects, which not only let China basketball to be further popularized, but also increase adolescent interests in basketball, which provides campus guarantee for China cultivating basketball super star. In addition, in investigation, it finds that some students are not very satisfied with basketball teaching, which reflects some problems existing in China education reformation; secondly, utilize fuzzy AHP method, it makes research on China basketball teaching course re-developed. Make evaluation on efficiency of introducing six kinds of teaching courses as basketball technical teaching, basketball theory type teaching, basketball rules teaching, basketball competition teaching, basketball tactics teaching and basketball exercises teaching mode into classroom. Finally it gets: China lays particular emphasis on basketball rules and basketball technology cultivation, it ignores basketball theoretical teaching, therefore, it should increase China basketball other aspects teaching and then propel to adolescent comprehensive development.

KEYWORDS

INTRODUCTION

In contemporary 21st century's China, youth is Chinese future, after all, motherland future competition is talents strength competition, how to cultivate more excellent talents is a problem that China education always working on, from traditional education to examination-oriented education, then from examination-oriented education to current teaching reformation new curriculum education, it always reflects China reformation on education every time and everywhere. In the era of information and technology explosion, countries are fighting for comprehensive strength, and not purely how many talents of high education background is. In the past learning period, there is a popular saying "Math, Physics & Chemistry are the strongest power to the world", with respect to current society, it is far from enough, because contemporary social talents competition is not only competition of education background, knowledge, but also comprehensive quality competition that includes psychological quality, physical quality, because adolescent sound growth is upmost guarantee of adolescent future rapidly development, only own strong physical quality, composed psychological quality, profound knowledge storage then can be called as talents in new century.

In middle school physical quality enhancing methods, basketball teaching is China middle school general accepting way and method, lots of schools have added basketball courses into syllabus, but China basketball teaching starts late, development is slower, which lets China basketball teaching exists including Chinese basketball teaching faculty is not enough, excellent teachers are fewer, impossible to pass on basketball techniques, basketball rules, attack methods to students, China many schools hardware equipment is relative simple and crude, some universities basketball courts are still cement, hoop height and normal competition gap are larger and other problems, these problems seriously affect China cultivating adolescent basketball technology, which hinders China basketball development, and lets China basketball comprehensive ranking in international to be lower. The paper takes basketball teaching as research objects, goes deeper into researching on China partial regular middle schools' basketball teaching, and then gets following important significances:

(1)The research, due to participated investigation objects are more extensive, research schools are representative, so the paper provides important guiding orientations for middle schools' basketball future development in China new curriculum standard, and then let China basketball to be focused in adolescent education.

(2)The paper researches on basketball teaching have certain reference values on further clarifying China basketball teaching faculty, hardware facilities, learning attitudes, basketball exercises status and other problems.

(3)By proposing countermeasures on some cities middle schools' basketball teaching researches, it has very important significances in strengthening basketball tasks and teaching levels, and lets sports teaching levels to be promoted, cultivates China adolescent sports consciousness and psychological quality to healthily develop.

In China campus, basketball is favored by numerous adolescent, and many schools have already listed basketball teaching into syllabus. In basketball teaching research process, there are multiple scholars made outstanding contributions. Huang Xiu-Quan in the article "Rural junior middle school basketball teaching status investigation and analysis in new curriculum standard", by researching on rural basketball teaching in China new curriculum reformation, he got that : with basketball teaching being brought into syllabus by lots of schools, and recognized by lots of schools, China cities and countryside schools have already sped up to support China basketball teaching development, it was clear that Chinese teaching reformation have achieved good efficiency, which provided theoretical support for China adolescent physical health development, and provided guarantee for China sports development. Sun Xiao-Bo in "Henan province Hebi city senior high school basketball teaching status investigation and counter measurement research", utilized multiple methods, by interviewing and investigating, consulted lots of literatures, combined with formers study basis, and got that Henan province Hebi city senior high school's basketball teaching had certain advancements, and faculty expanded, which let China adolescent to deeper understand basketball professional technology, basketball rules. Mao Lei in "Tai Yuan city urban area primary school basketball teaching status investigation research", the article pointed out that adolescent is future of motherland, hope of nation, only let adolescent physical quality, psychological quality to be balanced developed then can let adolescent to become people with four have that are useful to society, Tai Yuan urban area primary schools' basketball courses adding has made premise preparations for cultivating excellent basketball talents, it propels to China basketball ordered development.

The paper through referencing multiple scholars research results, utilizes mathematical methods to make quantitative analysis of benefits to China adolescent basketball teaching, and puts forward effective opinions and escorts China basketball.

MODEL ESTABLISHMENT

China basketball course setting status

Basketball course setting provides supports for China cultivating basketball reserve talents, universities are base of basketball development and meanwhile also important ways to propel to its publicity and popularity. Therefore, analyze China universities organizing basketball teaching is helpful for analyzing basketball teaching status, as TABLE 1.

TABLE 1 : China universities basketball course organizing status

	Basketball professional curriculum	2 terms	3 terms	Basketball optional course
Number of schools with arrangement	8	2	1	8
Proportion (%)	100%	25%	12.5%	100%

Following   TABLE 2 is China universities basketball textbook status investigation statistics, make statistical analysis of them, and gets correlation results on analysis, as following:

TABLE 2 : Universities basketball textbook status investigation statistics

	Higher education state-compiled textbook	Province –compiled textbook	School self-compiled textbook
Number of people	5	3	0
Proportion (%)	62.5%	37.5%	0

By TABLE 2 investigation statistics on China universities basketball teaching status, it finds :China middle schools applied textbook as higher education basketball textbook occupies 62.5%, is current stage most part of schools applied textbook, basketball textbook in these textbooks are more unity compiled by state, because statue published sports aspect basketball textbook is more suitable to China adolescent development.

Province –compiled textbook occupies 37.5%, is little relative higher education state-compiled textbook, is to be further developed, China schools that apply province-compiled textbooks are in the adaptive phase, these textbooks have their own advantages, province –compiled textbook can more adapt to local area adolescent physical status, is more beneficial to promote adolescent basketball levels as TABLE 3.

TABLE 3 : Ordinary university basketball theory course content statistics

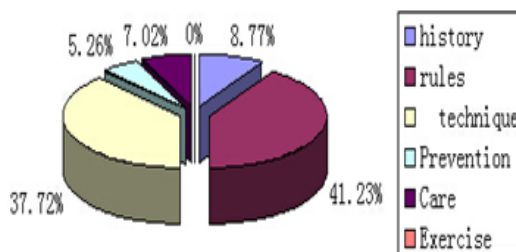|	Basketball history	Basketball rules	Basketball technical and tactics theory
Number of frequency	18	239	167
Proportion (%)	8.77%	41.23%	37.72%
	Prevention theory	Health care theory	Exercise theory
Number of frequency	12	17	0
Proportion (%)	5.26%	7.02%	0%

Figure 1 : The ordinary university basketball theory course content statistics

According to above China curricular research Figure 1, it points out that China basketball course has already been listed into syllabus contents by lots of schools, but Chinese students have 51% students are not satisfied; in China basketball teaching contents, higher education state-compiled textbook occupies 63%, which indicates China basketball teaching exists some problems.

China teaching reformation is important base of China sports development. By reforming China basketball teaching and basketball course teaching contents researches, it gets TABLE 4 and Figure 2:

TABLE 4 : China basketball course teaching course statistics

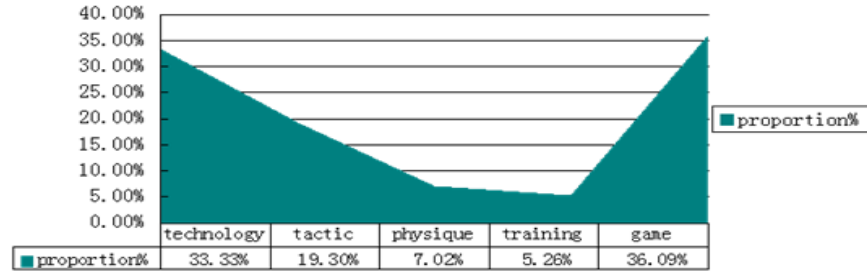|	Technique	Tactics	Physical quality	Referees training	Basketball competition
Number of frequency	344	284	74	53	357
Proportion(%)	33.33%	19.30%	7.02%	5.26%	36.09%

Figure 2 : My student satisfaction situation of basketball course

By above research, it gets that in China basketball teaching course, basketball competition occupies 36%, secondly basketball technical course occupies 33.33%;though China through curriculum reformation, it alleviates burden for students, increases students' extracurricular life, but 25% adolescent are not satisfied with basketball teaching, it is thought that basketball course time is relatively little.

AHP method guiding thought

(1)Establish hierarchical structure

Target layer: China basketball teaching mode satisfaction index

Criterion layer: Scheme influence factors, C_1 is classified techniques teaching, C_2 is theory type teaching, C_3 is rules teaching, C_4 is competition teaching, C_5 is tactics teaching, C_6 is exercises teaching

Scheme layer: A_1 is very satisfied, A_2 is relative satisfied, A_3 is normal, A_4 is not so satisfied

(2) Construct paired comparison matrix

Here apply operational research expert proposed 1~9 ratio scale TABLE 5.

TABLE 5 : 1-9 scale definition

Scale a_{ij}	Definition
1	factor i and factor j have equal importance
3	factor i is slightly more important than factor j
5	factor i is relative more important than factor j
7	factor i is extremely more important than factor j
9	factor i is absolute more important than factor j
2, 4, 6, 8	Indicates middle state corresponding scale value of above judgments

According to above scale TABLE 5, set judgment matrix A as:

$$A = \begin{pmatrix} 1 & 2 & \frac{1}{3} & \frac{1}{4} & \frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & 1 & \frac{1}{2} & \frac{1}{3} & \frac{1}{3} & \frac{1}{2} \\ 3 & 4 & 1 & 1 & 4 & 5 \\ 4 & 1 & \frac{1}{4} & \frac{1}{3} & 2 & \frac{1}{3} \\ 1 & 2 & \frac{1}{5} & \frac{1}{6} & 3 & 1 \end{pmatrix}$$

And constructed scheme layer judgment matrixes correspond to different criterion layers are as following TABLE 6, TABLE 7and TABLE 8:

TABLE 6 : Criterion layer judgment matrix C_1 - C_2

C_1	A_1	A_2	A_3	A_4	C_2	A_1	A_2	A_3	A_4
A_1	2	4	4	5	A_1	1	2	3	5
A_2	1/2	2	4	4	A_2	1/2	1	4	5
A_3	1/3	1/4	1	5	A_3	1/4	1/4	1	3
A_4	1/5	1/4	1/3	1	A_4	1/5	1/6	1/5	1

TABLE 7 : Criterion layer judgment matrix C_3 - C_4

C_3	A_1	A_2	A_3	A_4	C_4	A_1	A_2	A_3	A_4
A_1	1	2	3	5	A_1	1	2	3	3
A_2	1/3	1	3	3	A_2	1/2	1	3	4
A_3	1/2	1/4	1	1/3	A_3	1/3	1/3	1	1/3
A_4	1/7	1/6	3	1	A_4	1/4	1/3	3	1

TABLE 8 : Criterion layer judgment matrix C_5 - C_6

C_5	A_1	A_2	A_3	A_4	C_6	A_1	A_2	A_3	A_4
A_1	1	2	3	4	A_1	1	3	4	6
A_2	1/4	1	2	3	A_2	1/6	1	3	4
A_3	1/3	1/2	1	1/3	A_3	1/4	1/2	1	1/3
A_4	1/4	1/5	3	1	A_4	1/4	1/4	3	1

(3) Calculate weight
To judgment matrix:

$$
A = \begin{pmatrix}
1 & 2 & \frac{1}{4} & \frac{1}{5} & \frac{1}{3} & \frac{1}{2} \\
\frac{1}{2} & 1 & \frac{1}{3} & \frac{1}{4} & \frac{1}{3} & \frac{1}{2} \\
4 & 3 & \frac{1}{3} & \frac{4}{3} & \frac{3}{4} & \frac{2}{5} \\
5 & 4 & \frac{1}{3} & 1 & 3 & 6 \\
3 & 3 & \frac{1}{4} & \frac{1}{3} & 1 & \frac{1}{3} \\
2 & 2 & \frac{1}{5} & \frac{1}{6} & 3 & 1
\end{pmatrix}
$$

Firstly use MATLAB software to make following processing:

$$
\xrightarrow{\ Column\ vector\ normalizat\ ion\ }
\begin{pmatrix}
0.882 & 0.925 & 0.874 & 0.733 & 0.619 & 0.427 \\
0.736 & 0.811 & 0.821 & 0.722 & 0.509 & 0.653 \\
0.652 & 0.657 & 0.773 & 0.604 & 0.527 & 0.662 \\
0.551 & 0.431 & 0.694 & 0.585 & 0.448 & 0.586 \\
0.288 & 0.305 & 0.548 & 0.454 & 0.339 & 0.496 \\
0.186 & 0.063 & 0.167 & 0.145 & 0.185 & 0.386
\end{pmatrix}
$$

$$
\xrightarrow{\ According\ to\ the\ row\ sum\ }
\begin{pmatrix}
2.898 \\
2.196 \\
1.254 \\
0.993 \\
0.874 \\
0.627
\end{pmatrix}
\xrightarrow{\ The\ normalized\ }
\begin{pmatrix}
0.213 \\
0.176 \\
0.715 \\
0.579 \\
0.451 \\
0.322
\end{pmatrix}
= W^0
$$

Then, by $A \times W^0 = \begin{pmatrix} 0.223 \\ 0.156 \\ 0.615 \\ 0.678 \\ 0.552 \\ 0.322 \end{pmatrix}$ it further solves $\lambda^0{}_{max} = 5.155$ 。

     Similarly, criterion layer judgment matrix corresponding maximum feature value and feature vector are successively :

$$\lambda^{(1)}{}_{max} = 2.871, \omega_1^1 = \begin{pmatrix} 0.567 \\ 0.413 \\ 0.902 \\ 0.883 \\ 0.747 \\ 0.624 \end{pmatrix}; \lambda^{(2)}{}_{max} = 2.865, \omega_2^1 = \begin{pmatrix} 0.112 \\ 0.057 \\ 0.872 \\ 0.761 \\ 0.595 \\ 0.385 \end{pmatrix};$$

$$\lambda^{(3)}{}_{max} = 2.859, \omega_3^1 = \begin{pmatrix} 0.406 \\ 0.146 \\ 0.875 \\ 0.769 \\ 0.654 \\ 0.527 \end{pmatrix}; \lambda^{(4)}{}_{max} = 2.841, \omega_4^1 = \begin{pmatrix} 0.406 \\ 0.251 \\ 0.885 \\ 0.741 \\ 0.621 \\ 0.557 \end{pmatrix};$$

$$\lambda^{(5)}{}_{max} = 2.865, \omega_5^1 = \begin{pmatrix} 0.369 \\ 0.321 \\ 0.898 \\ 0.751 \\ 0.624 \\ 0.547 \end{pmatrix}; \lambda^{(6)}{}_{max} = 2.852, \omega_6^1 = \begin{pmatrix} 0.441 \\ 0.242 \\ 0.893 \\ 0.731 \\ 0.544 \\ 0.527 \end{pmatrix}$$

Comprehensive evaluation matrix
     By above computed results, it is clear:

$$R_1 = \begin{pmatrix} 0.567 \\ 0.413 \\ 0.902 \\ 0.883 \\ 0.747 \\ 0.624 \end{pmatrix}; R_2 = \begin{pmatrix} 0.112 \\ 0.057 \\ 0.872 \\ 0.761 \\ 0.595 \\ 0.385 \end{pmatrix}; R_3 = \begin{pmatrix} 0.406 \\ 0.146 \\ 0.875 \\ 0.769 \\ 0.654 \\ 0.527 \end{pmatrix};$$

$$R_4 = \begin{pmatrix} 0.406 \\ 0.251 \\ 0.885 \\ 0.741 \\ 0.621 \\ 0.557 \end{pmatrix}; R_5 = \begin{pmatrix} 0.369 \\ 0.321 \\ 0.898 \\ 0.751 \\ 0.624 \\ 0.547 \end{pmatrix}; R_6 = \begin{pmatrix} 0.441 \\ 0.242 \\ 0.893 \\ 0.731 \\ 0.544 \\ 0.527 \end{pmatrix}$$

Then it gets:

$$R=\begin{pmatrix} 0.567 & 0.112 & 0.406 & 0.406 & 0.369 & 0.441 \\ 0.413 & 0.057 & 0.146 & 0.251 & 0.321 & 0.242 \\ 0.902 & 0.872 & 0.875 & 0.885 & 0.898 & 0.893 \\ 0.883 & 0.761 & 0.769 & 0.741 & 0.751 & 0.731 \\ 0.747 & 0.595 & 0.654 & 0.621 & 0.624 & 0.544 \\ 0.624 & 0.385 & 0.527 & 0.557 & 0.547 & 0.527 \end{pmatrix}$$

Make comprehensive evaluation

Known $W = (\mu_j)_{1 \times m}$, $R = (r_{ji})_{m \times n}$, by:

$$S = w \circ R = (\mu_1, \mu_2, \cdots, \mu_m) \circ \begin{pmatrix} r_{11} & r_{12} & \cdots & r_{1n} \\ r_{21} & r_{22} & \cdots & r_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ r_{m1} & r_{m2} & \cdots & r_{mn} \end{pmatrix} = (s_1, s_2, \cdots, s_n)$$

Here take fuzzy operator as $M(\cdot, \oplus)$ operator, that:

$$s_k = \min\left(1, \sum_{j=1}^{m} \mu_j r_{jk}\right), k = 1, 2, \cdots, n$$

Input above computed result into above formula, it can get:

$$S = (0.124, \quad 0.133, \quad 0.256, \quad 0.439, \quad 0.267 \quad 0.351)$$

Get results

By $S = (0.095, \quad 0.083, \quad 0.267, \quad 0.271, \quad 0.158 \quad 0.126)$, it is clear:

TABLE 9 : China basketball teaching types weight comparison table

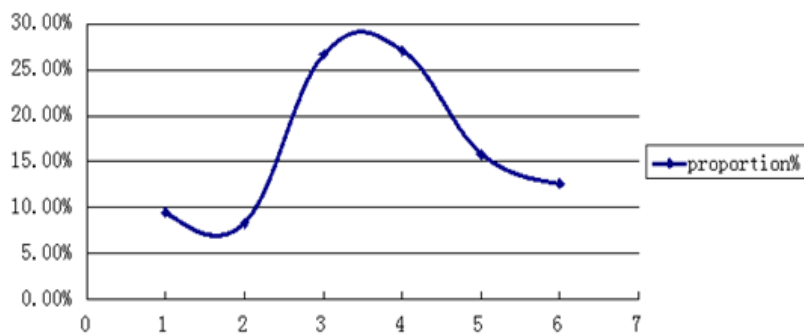|	Techniques teaching	Theory type teaching	Rules teaching	Tactics teaching	Competition teaching	Exercises teaching
Number of people	9.5%	8.3%	26.7%	27.1%	15.8%	12.6%
Total	17.8%		53.8%		28.4%	

Figure 3 : The results

Above TABLE 9 and Figure 3 comparative analysis gets that in China basketball teaching, rule teaching and techniques teaching occupy 53.8%, from which techniques teaching occupies 27.1%, it indicates China basketball teaching lays particular emphasis on basketball techniques and tactics teaching, which builds firm base for adolescent grasping more

masterly basketball skills; Secondly, in order to let adolescent to deepen understand competition, schools strengthen basket rules teaching course, it indicates China basketball is rapidly developing.

CONCLUSION

Firstly, the paper carries out concrete investigation and analysis of China universities basketball course status, it gets: China many schools have already listed basketball course into syllabus, but by investigation on students' satisfaction index, there are still 25% students are not satisfied with it. It reflects that China many schools basketball course may just handle with the form rather than substantial passing on basketball knowledge and technology to adolescent, it highlights China basketball teaching existing problems.

Secondly, the paper utilizes fuzzy AHP method; it makes research on China basketball teaching course re-developed. At first, bring six kinds of teaching courses as basketball technical teaching, basketball theory type teaching, basketball rules teaching, basketball competition teaching, basketball tactics teaching and basketball exercises teaching mode into classroom, it will further strengthen students deepen understanding and techniques grasping on China basketball and basketball movement. And respectively calculate each teaching mode weight, finally it gets: in China schools, basketball rules and basketball techniques teaching are top priority of China basketball teaching, only then can guarantee China basketball reserve forces expanding and developing.

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