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Elementary and secondary school wushu teaching reformation and Chinese traditional cultural development research

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ABSTRACT

With society getting closer to modernization, Wushu has gradually faded out from our lives, in order to inherit our precious Chinese culture, Wushu education has gradually being brought into education important parts. Face to Chinese Wushu education status: little faculty, imperfect education system and so on, Wushu education reforming is a task that allows no delay. In order to let students fast and well grasp Wushu method and technique in limited time, and promote Wushu teaching quality to great limits, teachers should apply effective teaching method under correct theory guidance. The paper carries on reformation research on Chinese elementary and secondary school Wushu education teaching method aspects. The paper takes elementary and secondary Wushu educators and students as research objects, applies analytic hierarchy process method to make analysis and research on basic composition, integrated and decomposing model, collective and group practice as well as the game teaching four kinds of teaching methods from influence of the classroom, students receiving degrees, teaching difficulty and popular degree four perspectives. Finally, it gets that integrated and decomposing model teaching method is the best, it should become Wushu teachers' main teaching methods, and according to practical situation, combine with other three methods with an aim to let students to be easier receiving and absorbing.

KEYWORDS

Analytic hierarchy process; Wushu education; Teaching method; Traditional culture; Development strategy.

INTRODUCTION

Wushu is Chinese excellent national culture, it has profound cultural background, as Chinese special culture phenomenon, by thousand years' accumulation, enrichment and development, Wushu plays irreplaceable roles in teenager physical and psychological health development and national cultural inheritance and carrying forward as well as other aspects. School is necessary institution to pass on scientific and cultural knowledge, which undertakes responsibilities of inheriting national culture, carrying forward national culture, cultivating national talents. Students in elementary and secondary schools are in the period of body puberty, is body functions' constantly thriving period, and also is an important period of learning each kind of knowledge and technology, improving physical quality. Therefore, elementary and secondary school Wushu education has become today's hot topics.

Professor Qiu Pi-Xiang in "Contemporary Wushu education reformation several ponders" pointed out the most important of Wushu education reformation was innovating in teaching contents compilation and teaching methods, could refer to foreign success experiences on Wushu teaching contents reforming, so that let Wushu teaching to gain rapidly development.

Luo Hong-Bin in "Regular universities Wushu teaching existing main problems and countermeasures" clarified that presently universities Wushu teaching methods was relative traditional and also quite single, mainly in the form of teachers teaching and students simulation such kind of teaching way, adopted entertainment,confrontation way and used multi-media to teaching was fewer, which was bad for Wushu teaching effective implementation. Teaching method played crucial roles in Wushu teaching; reasonable, scientific, high level teaching methods could improve students' learning interests and thirst for knowledge, strengthened teaching effects. On the contrary, if compulsively let students to make mechanical simulation, cramming teaching would let students to generate psychological inversion, teaching effects tended to be doubled the work.

Wu Zhong-Shun in "Wushu optional course teaching methods exploration" mentioned Wushu teaching methods that were respectively should first training steps then training skills; combined thinking with training to take exercises; firstly concentrated then took dispersing training as well as firstly "roughly"exercising, then "detailed" exercising and so on, if made comprehensive application on these teaching methods so can more rapidly master Wushu routines.

Qin Zi-Lai in "Regular universities Wushu teaching status and countermeasures research", he thought presently regular Wushu universities Wushu teaching and learning had larger contradiction and conflicts; students loved Wushu event but didn't like Wushu course; daily teaching mainly was technical teaching and ignored theory course teaching. The research result should introduce Universities Wushu educators' emphasis, and explored causes that student loved Wushu event but didn't love attending in Wushu course, and put forward effective solutions, finally improved Wushu teaching efficiency.

On the basis of combining with lots of documents literature and formers researches, the paper utilizes analytic hierarchy process to make analysis and research on Wushu teaching four methods as basic composition, integrated and decomposing model, collective and group practice as well as the game teaching under influence of the classroom, students receiving degrees, teaching difficulty and popular degree, so that obtain teaching methods that is more proper in current stage Wushu teaching and popular among students.

MODEL ESTABLISHMENT

The paper selects four kinds of teaching ways that are respectively basic composition, integrated and decomposing model, collective and group practice as well as the game teaching. Make analytic

hierarchy process of them, factors that should consider is influence of the classroom, students receiving degrees, teaching difficulty and popular degree.

Analytic hierarchy process principle

We use following simple cases analysis to explain analytic hierarchy process basic principle. Assume it has n pieces of objects $A_1, A_2, \mathrm{L}, A_n$ their weights respectively are recorded as $\omega_1, \omega_2, \mathrm{L}, \omega_n$. Now carry on mutual comparison of every two objects, as TABLE 1.

TABLE 1 : N pieces of objects weights paired comparison table

	A_1	A_2	L	A_n
A_1	ω_1/ω_1	ω_1/ω_2	L	ω_1/ω_n
A_2	ω_2/ω_1	ω_2/ω_2	L	ω_2/ω_n
M	M	M	O	M
A_n	ω_n/ω_1	ω_n/ω_2	L	ω_n/ω_n

If use matrix to express the mutual weight relationship, that is:

$$\mathbf{A}=\begin{pmatrix} \frac{\omega_1}{\omega_1} & \frac{\omega_1}{\omega_2} & \cdots & \frac{\omega_1}{\omega_n} \\ \frac{\omega_2}{\omega_1} & \frac{\omega_2}{\omega_2} & \cdots & \frac{\omega_2}{\omega_n} \\ \vdots & \vdots & \ddots & \vdots \\ \frac{\omega_n}{\omega_1} & \frac{\omega_n}{\omega_2} & \cdots & \frac{\omega_n}{\omega_n} \end{pmatrix} \quad \textbf{(1)}$$

The A is judgment matrix. If take weight vector $\omega=(\omega_1 \quad \omega_2 \quad \mathrm{L} \quad \omega_n)^T$,then it has:

$$\mathbf{A}_\omega = \lambda\omega \quad \textbf{(2)}$$

Among them, ω is A feature vector, λ is one feature value of A. In fact, according to linear algebra knowledge, it is clear that λ is matrix A unique nonzero that is maximum feature value,and ω is its corresponding feature vector.

According to above hint, if there is a group of objects, it needs to know their weights, but there is no weighing apparatus, it can get every pair of objects weight ratio by paired comparing their mutual weight, and then construct judgment matrix ;by solving judgment matrix maximum feature value $\lambda_{\max}$ and its corresponding feature vector ω ,then can get the group of objects relative weights. And for such factors that cannot measure, only need to introduce reasonable scale then can also use the method to measure each factor relative importance, so that provide relative evidence for relevance decisions.

Analytic hierarchy process basic steps

Analytic hierarchy process model roughly needs following four steps:

1) Establish hierarchical structure ;
2) Construct every layer that fully used in judgment matrix;
3) Hierarchical single arrangement and consistency test;
4) Hierarchical total arrangement and consistency test.

Hierarchical structure establishment

Analytic hierarchy process solved problems are required to be hierarchic, orderly and logic. Only then it can construct hierarchical scheme. Let tedious problems' elements to form into multiple hierarchies according to its attributes, membership and its relations. Last hierarchical element plays a dominate role in next hierarchical relative elements. In general, these hierarchies can be divided into 3 types:

Target layer (A): The reform of teaching methods of Wushu.

Criterion layer (P):Scheme layer influence factors, P_1 is influence of the classroom, P_2 is students receiving degrees, P_3 is teaching difficulty, P_4 is popular degree.

Scheme layer (C): C_1 is basic composition, C_2 is integrated and decomposing model, C_3 is collective and group practice, C_4 is the game teaching.

Hierarchical structure is as Figure 1.

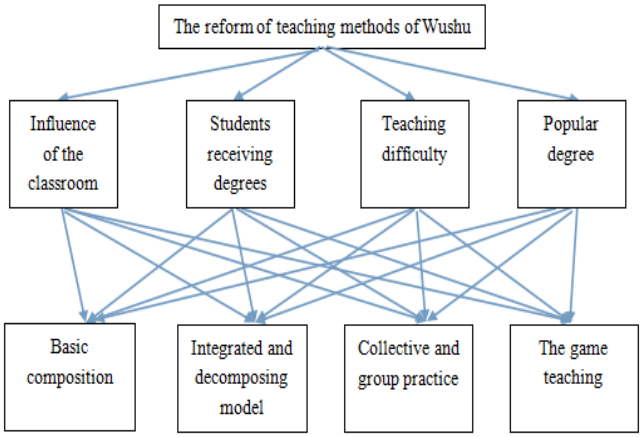

Figure 1 : Hierarchical structure chart

Construct judgment matrix.

According to hierarchical structure, it can construct judgment matrix.

Take every element that has sub membership relations as judgment matrix first element, its affiliated every element successively ranks in the first line and first column behind it.

According to linear algebra theoretical knowledge, if matrix $A=(a_{ij})_{n\times n}$ meets $a_{ij}>0$ and $a_{ji}=\frac{1}{a_{ij}}(i,j=1,2,\cdots,n)$,then matrix A is positive reciprocal matrix.

According to judgment matrix criterion, make mutual comparison of two elements of them, align values on their importance degree according to 1-9; its definition is as TABLE 1.

TABLE 1: Importance scale definition table

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

Reciprocal	If factor i with factor j importance ratio is a_{ij}, then factor j and factor i importance ratio is a_{ji} =1/ a_{ij}

According to above scale table, set judgment matrix A to be:

$$\mathbf{A}=\begin{pmatrix} \mathbf{1} & \mathbf{1/6} & \mathbf{1/5} & \mathbf{3} \\ \mathbf{6} & \mathbf{1} & \mathbf{2} & \mathbf{4} \\ \mathbf{5} & \mathbf{1/2} & \mathbf{1} & \mathbf{3} \\ \mathbf{3} & \mathbf{1/4} & \mathbf{1/3} & \mathbf{1} \end{pmatrix} \quad \textbf{(3)}$$

And constructed scheme layer judgment matrix to different criterion layer is as TABLE 2, TABLE 3, TABLE 4 and TABLE 5.

TABLE 2 : P-C Judgment matrix one

P_1	C_1	C_2	C_3	C_4
C_1	1	1/2	2	3
C_2	2	1	3	4
C_3	1/2	1/3	1	2
C_4	1/3	1/4	1/2	1

TABLE 3 : P-C Judgment matrix two

P_2	λ'_{max}	C_2	C_3	C_4
C_1	1	3	3	5
C_2	1/3	1	2	4
C_3	1/3	1/2	1	3
C_4	1/5	1/4	1/3	1

TABLE 4 : P-C Judgment matrix three

p3	C_1	C_2	C_3	C_4
C_1	1	2	2	3
C_2	1/2	1	3	3
C_3	1/2	1/3	1	2
C_4	1/3	1/3	1/2	1

TABLE 5 : C-P Judgment matrix four

P_4	C_1	C_2	C_3	C_4
C_1	1	1/3	2	3
C_2	3	1	3	3
C_3	1/2	1/3	1	1/3
C_4	1/3	1/3	3	1

Consistency test

Matrix A corresponding maximum feature value λ_{max} feature vector W, it is the priority weight of same hierarchy corresponding elements relative importance to last hierarchy some element through

normalization, the process is called hierarchical single arrangement. Though the process can reduce other factors interference, it is hard to avoid appearing inconsistency to some extent when integrate all comparison results. If comparison results are consistent, then A factor should also meet:

$$\mathbf{a_{ij}a_{jk} = a_{ik}, \forall i, j, k = 1,2,\cdots, n} \quad \textbf{(1)}$$

The positive reciprocal matrix that meets above formula is called consistent matrix. To easy define A can be accepted or not, it should test A inconsistency is very serious or not.

If A is consistent matrix, then

(1) A surely is positive reciprocal matrix.

(2) Transposed matrix A^T is consistent matrix.

(3) A matrix any two lines are in proportions, and factors are above 0 ,therefore $rank(A)=1$,so is the column.

(4) In A, $\lambda_{\max}=n$, n is A matrix order number. Other features roots of A is 0 .

(5) $\lambda_{\max}$ corresponding feature vector $W=(w_1,\mathrm{L},w_n)^T$,then $a_{ij}=\frac{w_i}{w_j}, \forall i, j=1,2,\mathrm{L},n$,so:

$$\mathbf{A}=\begin{pmatrix} \frac{w_1}{w_1} & \frac{w_1}{w_2} & \cdots & \frac{w_1}{w_n} \\ \frac{w_2}{w_1} & \frac{w_2}{w_2} & \cdots & \frac{w_2}{w_n} \\ \vdots & \vdots & \ddots & \vdots \\ \frac{w_n}{w_1} & \frac{w_n}{w_2} & \cdots & \frac{w_n}{w_n} \end{pmatrix} \quad \textbf{(4)}$$

A is n order positive reciprocal matrix,when it is consistent matrix, when and only when $\lambda_{\max}=n$ as well as when A is inconsistent, it surely has $\lambda_{\max}>n$. Thereupon,use $\lambda_{\max}$ and n relationship to test whether A is consistent matrix or not.

A consistency test calculation steps:

Firstly,according to data,it can get:

$$\lambda_{max}=\sum_{i=1}^{4}\frac{(A\omega_A)_i}{n\omega_{Ai}}=4.23102527 \quad \textbf{(5)}$$

And carry on consistency indicator $C.I.$ calculation,

$$C.I.=\frac{\lambda_{max}-n}{n-1}=\frac{4.23102527-4}{4-1}=0.077008423 \quad \textbf{(6)}$$

Secondly, consult corresponding average random consistency indicator $R.I.$. $R.I.$ Value can refer to TABLE 6.

TABLE 6 : Average random consistency indicator R.I. table

Matrix order	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
R.I.	0	0	0.52	0.89	1.12	1.26	1.36	1.41
Matrix order	**9**	**10**	**11**	**12**	**13**	**14**	**15**	
R.I.	1.46	1.49	1.52	1.54	1.56	1.58	1.59	

R.I. Value is got in this way that randomly constructs 1000 sample matrixes. Random select numbers from 1 to 9 as well as its reciprocals to construct positive reciprocal matrix, and determine average value of maximum feature root $\lambda'_{\max}$, and define:

$$\mathbf{RI}=\frac{\lambda'_{\max}-\mathbf{n}}{\mathbf{n}-\mathbf{1}}=\mathbf{0.89} \quad \mathbf{(7)}$$

Finally, solve consistency ratio *C.R.*.

$$\mathbf{C.R.}=\frac{\mathbf{C.I.}}{\mathbf{R.I.}}=\mathbf{0.086526318}<\mathbf{0.1} \quad \mathbf{(8)}$$

When $CR<0.10$, it is thought that A consistency is acceptable, when $CR>0.10$, it is thought that A consistency is unacceptable, it should make proper correction. According to formula (8), consistency passes.

In the process, it also includes hierarchical total arrangement and consistency test, due to article lengths are limited, no theoretical statements here, directly apply it in the following.

Computed result

The model involved algorithm can be implemented by *Matlab* software program; therefore it can get hierarchical single arrangement and hierarchical total arrangement computed result as TABLE 7.

TABLE 7 : Hierarchical total arrangement

	Criterion	Influence of the classroom	Students receiving degrees	Teaching difficulty	Popular degree	Total arrangement weight
	Criterion weight	0.1783	0.5284	0.3606	0.1794	
Scheme layer single arrangement	Basic composition	0.2835	0.4740	0.1663	0.0785	0.3751
	Integrated and decomposing model	0.5339	0.4233	0.2758	0.0948	0.4353
	Collective and group practice	0.4322	0.3314	0.1744	0.1094	0.3347
	The game teaching	0.5773	0.3881	0.1199	0.2080	0.3886

According to above Figure, it can get integrated and decomposing model total arrangement weight is the largest. In order to more intuitional see computed result, we use bar chart to express, as Figure 2.

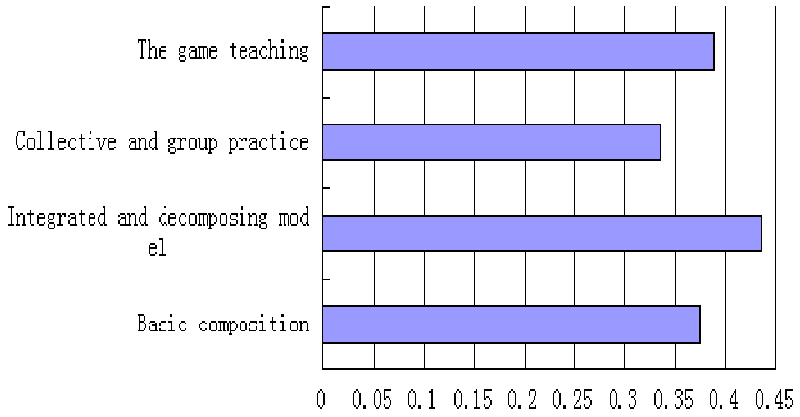

Figure 2 : Membership degree to compare

By Figure 2, we can easily get four kinds of teaching method importance degree. Among them, integrated and decomposing model is better. Secondly is the game teaching, and thirdly is basic composition, and last is collective and group practice.

CONCLUSION

The paper utilizes analytic hierarchy process method to make analysis and research on basic composition, integrated and decomposing model, collective and group practice as well as the game teaching four kinds of Wushu teaching methods. Considered influence factors are influence of the classroom, students receiving degrees, teaching difficulty and popular degree. Finally, it gets that integrated and decomposing model teaching method is the best, secondly is the game teaching, basic composition, and collective and group practice. The result and investigation basically conform to practical situations, it shows the model rationality. Analytic hierarchy process flexibility is higher, application range is wide, so is widely applied in each field. But analytic hierarchy process methods need paired factors importance, according to experiences, it defines comparison value, let same thing evaluation result to be possible different. When comparison value is not correct, it mainly cause wrong results, it should carefully align value.

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