

2014

BioTechnology

An Indian Journal

FULL PAPER

BTAIJ, 10(8), 2014 [2748-2754]

Literary multimedia courseware design and production

Dongming Zhao

Jilin Vocational College of Industry and Technology, Jilin 132013, Jilin, (CHINA)

ABSTRACT

With the high development of information today, science and technology propels to each industry and discipline development, at present literary education develops, multimedia utilization has also become literary education ways' important links, but how to reasonable present literary mysteries in multimedia courseware. The paper studies on literary multimedia courseware designing according to AHP method. It gets that in current literary education; literary multimedia courseware designing should mainly start from the content of courseware, courseware composition and modification, as well as audio and video embedding three aspects, and gets each aspect weight.

KEYWORDS

Literary multimedia courseware; AHP; Literary education.



INTRODUCTION

In long term learning and education, literary university education mostly restricts in students' written education, but at ordinary times' students literature works, they often reflects students' understanding and performing in history, literature, and even humanistic character, so deeper literary education lets student to well grasp in history, literature each aspect, it is beneficial to students and well develops students' self literary inspiration, and is also helpful for better interpreting literary arts.

MODEL ESTABLISHMENT

Establish hierarchical structure

At first establish a orderly, clear hierarchical structure for problems, firstly establish three layers relationships, target layer, medium layer, scheme layer. Classified layers numbers are related to research objects complex extent and detailed extent.

The paper based on analytic hierarchy process, it quantizes literary education pattern. Establish target layer, criterion layer, scheme layer relations.

Target layer: Design and production of literary courseware.

Criterion layer: Scheme influence factors, c_1 is aesthetic aspect, c_2 is innovation, c_3 is classroom entertainment, c_4 is rich professional knowledge degree.

Scheme layer: A_1 is the content of courseware, A_2 is courseware composition and modification, A_3 is audio and video embedding. It gets hierarchical structure as Figure 1 show.

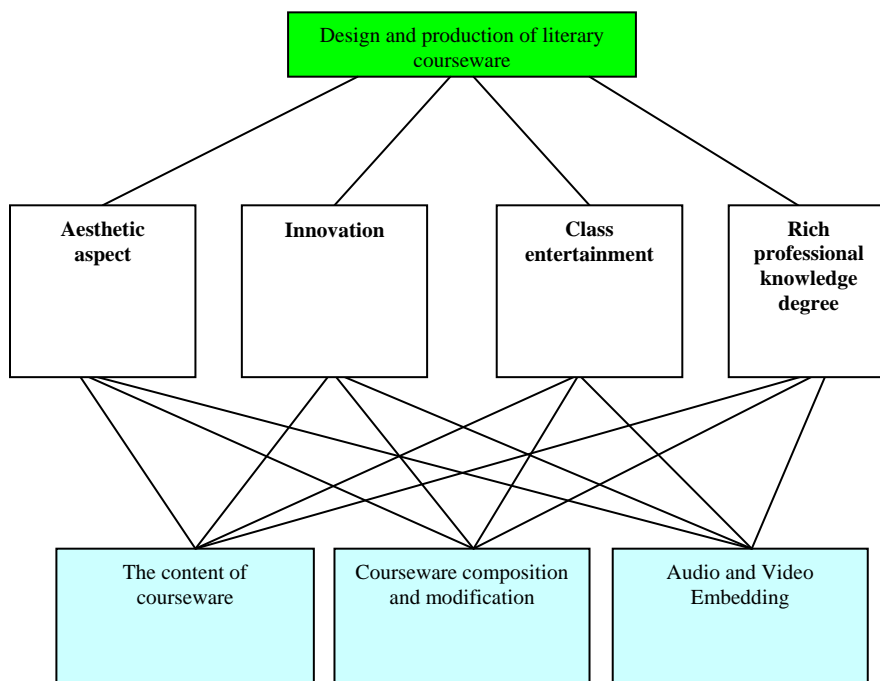


Figure 1 : Hierarchical structure

Construct each layer judgment matrix

In criterion layer, each criterion target occupies different proportions, by researchers researching on criterion layer, and according to number 1~9 and its reciprocal to judge each criterion target occupied weights.

The paper takes TABLE 1 showed 1~9 scale table as evidence, it makes weight analysis.

At first, solve judgment matrix, according to above principle, reference 1~9 scale setting, and according to experts' experiences and refer to lots of documents, it gets paired comparison matrix that are respective as TABLE 2-6.

Among them, TABLE 2 is comparison matrix between target layer and criterion layer, TABLE 3-6 is comparison matrix between criterion layer and scheme layer.

TABLE 1 : 1~9 scale 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 and factor j are relative weak, obtained judgment is reciprocal

TABLE 2: Comparison matrixG

G	c_1	c_2	c_3	c_4
c_1	1	1/4	3	3
c_2	4	1	7	5
c_3	1/3	1/7	1	1
c_4	1/3	1/5	1	1

TABLE 3 : Comparison matrix c_1

c_1	A_1	A_2	A_3
A_1	1	2	1/3
A_2	1/2	1	1/3
A_3	3	3	1

TABLE 4 : Comparison matrix c_2

c_2	A_1	A_2	A_3
A_1	1	4	7
A_2	1/4	1	5
A_3	1/7	1/5	1

TABLE 5 : Comparison matrix c_3

c_3	A_1	A_2	A_3
A_1	1	5	8
A_2	1/5	1	5
A_3	1/8	1/5	1

TABLE 6: Comparison matrix c_4

c_4	A_1	A_2	A_3
A_1	1	3	8
A_2	1/3	1	5
A_3	1/8	1/5	1

Hierarchical single arrangement and consistency test

Use consistency indicator to test:

Set in comparison matrix, λ_{max} is maximum feature value, n is comparison matrix order:

$$CI = \frac{\lambda_{max} - n}{n - 1}$$

CI Value gets smaller; Judgment matrix gets closer to completely consistent. CI gets bigger shows that known degree is lower.

Hierarchy total sorting and its consistency test

$$A = \begin{pmatrix} 1 & 1/3 & 3 & 3 \\ 3 & 1 & 5 & 5 \\ 1/3 & 1/5 & 1 & 1 \\ 1/3 & 1/5 & 1 & 1 \end{pmatrix}$$

By column vector normalization \rightarrow $\begin{pmatrix} 0.224 & 0.182 & 0.32 & 0.3 \\ 0.075 & 0.557 & 0.54 & 0.5 \\ 0.131 & 0.105 & 0.13 & 0.1 \\ 0.251 & 0.115 & 0.1 & 0.11 \end{pmatrix}$

Solve sum by line \rightarrow $\begin{pmatrix} 1.076 \\ 2.32 \\ 0.376 \\ 0.366 \end{pmatrix}$

Normalization \rightarrow $\begin{pmatrix} 0.2615 \\ 0.565 \\ 0.0915 \\ 0.0975 \end{pmatrix} = W^{(0)}$

It can get:

$$AW^{(0)} = \begin{pmatrix} 1 & 1/3 & 3 & 3 \\ 3 & 1 & 5 & 5 \\ 1/3 & 1/5 & 1 & 1 \\ 1/3 & 1/5 & 1 & 1 \end{pmatrix} \begin{pmatrix} 0.2514 \\ 0.555 \\ 0.0965 \\ 0.0965 \end{pmatrix} = \begin{pmatrix} 1.012 \\ 2.275 \\ 0.387 \\ 0.387 \end{pmatrix}$$

$$\lambda_{max}^{(0)} = \frac{1}{4} \left(\frac{1.054}{0.257} + \frac{2.254}{0.786} + \frac{0.257}{0.045} + \frac{0.457}{0.078} \right) = 4.029$$

$$w^{(0)} = \begin{pmatrix} 0.268 \\ 0.55 \\ 0.055 \\ 0.088 \end{pmatrix}$$

Similarly, it can calculate judgment matrix

$$B_1 = \begin{Bmatrix} 1 & 1 & 1/3 \\ 2 & 1 & 1/3 \\ 3 & 6 & 1 \end{Bmatrix}, B_2 = \begin{Bmatrix} 1 & 5 & 5 \\ 1/5 & 1 & 2 \\ 1/5 & 1/5 & 1 \end{Bmatrix}, B_3 = \begin{Bmatrix} 1 & 6 & 8 \\ 1/5 & 1 & 5 \\ 1/8 & 1/5 & 1 \end{Bmatrix}, B_4 = \begin{Bmatrix} 1 & 8 & 8 \\ 1/5 & 1 & 5 \\ 1/8 & 1/5 & 1 \end{Bmatrix}$$

By above, it is clear that they paper uses literary multimedia courseware design and product ion maximum features and feature vectors as weights to make analysis, and establishes weight hierarchical chart, as following Figure 2 shows.

$$\lambda_{\max}^{(1)} = 3.21, \omega^{(1)} = \begin{Bmatrix} 0.262 \\ 0.079 \\ 0.66 \end{Bmatrix}$$

$$\lambda_{\max}^{(2)} = 3.42, \omega^{(2)} = \begin{Bmatrix} 0.665 \\ 0.496 \\ 0.139 \end{Bmatrix}$$

$$\lambda_{\max}^{(3)} = 3.29, \omega^{(3)} = \begin{Bmatrix} 0.544 \\ 0.240 \\ 0.216 \end{Bmatrix}$$

$$\lambda_{\max}^{(4)} = 4.10, \omega^{(4)} = \begin{Bmatrix} 0.185 \\ 0.240 \\ 0.575 \end{Bmatrix}$$

The paper uses consistency indicator to test: $CI = \frac{\lambda_{\max} - n}{n - 1}$, $CR = \frac{CI}{RI}$, as TABLE 7.

TABLE 7 : RI value

n	1	2	3	4	5	6	7	8	9	10	11
RI	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51

By calculation, it gets judgment matrix A , $\lambda_{\max}^{(0)} = 4.073, RI = 0.9$

$$CI = \frac{4.193 - 4}{4 - 1} = 0.28$$

$$CR = \frac{CI}{RI} = \frac{0.028}{0.91} = 0.029 < 0.1$$

It shows A inconsistency test is valid and moves within permissible range, it can use A feature vector to replace weight vector.

(2) Repeat above calculation process, the paper makes consistency test on judgment matrix B_1, B_2, B_3, B_4 , it gets weight vectors.

And it utilizes hierarchical chart drawing out calculation results that are from target layer to scheme layer, as Figure 2 show.

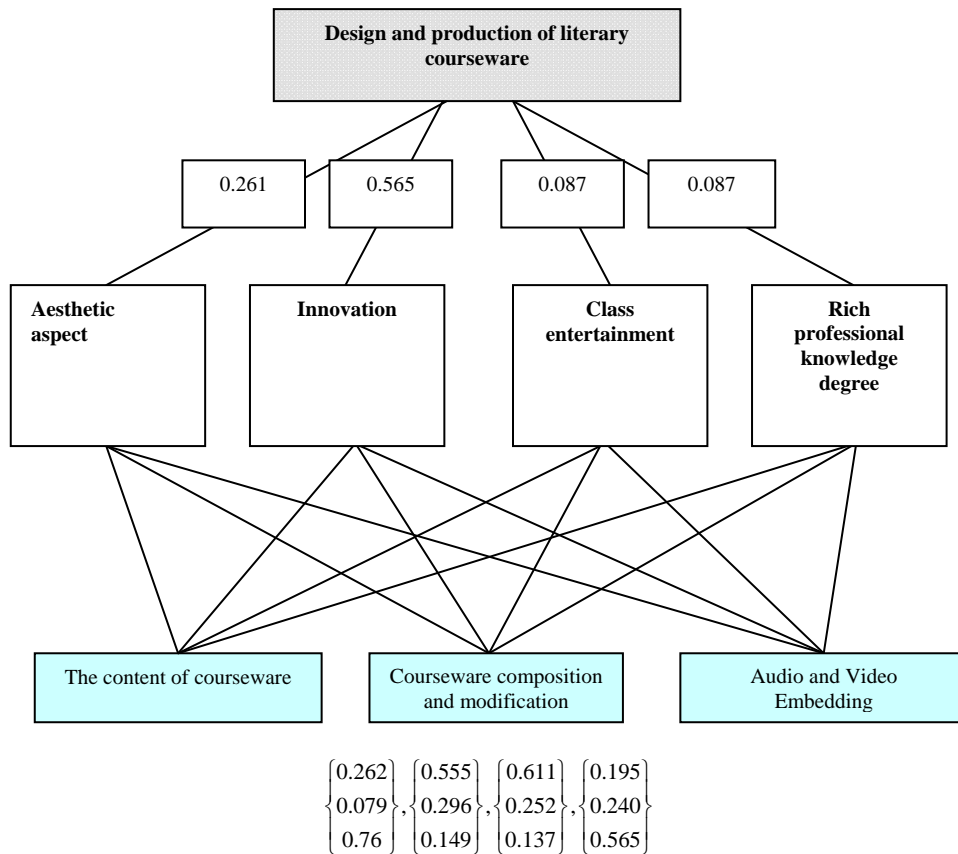


Figure 2 : Hierarchical structure chart

Calculation structure as following:

$$\omega^{(1)} = (\omega_1^{(1)}, \omega_2^{(1)}, \omega_3^{(1)}, \omega_3^{(1)})$$

$$= \begin{Bmatrix} 0.624 & 0.185 & 0.252 & 0.575 \\ 0.234 & 0.240 & 0.089 & 0.286 \\ 0.136 & 0.575 & 0.66 & 0.139 \end{Bmatrix}$$

$$w = w^{(1)} w^{(0)}$$

$$= \begin{Bmatrix} 0.262 & 0.575 & 0.664 & 0.185 \\ 0.079 & 0.266 & 0.220 & 0.240 \\ 0.67 & 0.159 & 0.156 & 0.565 \end{Bmatrix} \begin{Bmatrix} 0.577 \\ 0.055 \\ 0.114 \\ 0.263 \end{Bmatrix}$$

$$= \begin{Bmatrix} 0.405 \\ 0.322 \\ 0.283 \end{Bmatrix}$$

The paper gets conclusion: literary multi-media courseware production, the content of courseware occupies 40.5%, courseware composition and modification occupies 32.2% of total proportions. Audio and Video embedding occupies 28.3% of total proportions.

CONCLUSION

Essentially, educational technology can be called technology of educating people, teaching design ideas and curriculum reasonable designing are particular core contents of it. In long term learning

and education, literary university education mostly restricts in students' written education, so innovative education is particularly important, generally speaking "education on one hand can be understood as understanding educational unique ways, on the other hand, it also is educational most core rational ability." Modern education technology is for improving teaching quality and efficiency, how to better apply is up to understanding on disciplines themselves and also reasonable exploitation and application on science and technology.

REFERENCES

- [1] Wang Gui-Rong; Literary multimedia courseware's design and production principle [J]. *Journal of Chinese audio-visual education*, **8**, (2008).
- [2] Wu Xiao-Dong; What kind of literature education is needed [J]. *Journal of Peking University philosophy and social sciences*, **5**, 27-29 (2003).
- [3] Yang Hong-Cheng; Reading and interpretation: Modern and contemporary literature teaching ideas reflection, and talk about the present situation and problems of humanities education of institutions of higher learning [J]. *Journal of Hainan Normal University (social science edition)*, **05**, (2004).
- [4] Wang Chun-Jie; Multimedia courseware auxiliary teaching existing problems and countermeasures [J]. *Journal of Bethune military medical college*, **05**, (2009).
- [5] Hou Qi, Zhang Chuan-Liang; Effectiveness analysis and thinking on Chinese teaching resource utilization [J]. *Journal of Chinese audio-visual education*, **08**, (2007).
- [6] Wang Yan-Wei, Deng Hai-Li, Wang Yong-Cheng; The application of analytic hierarchy process in water safety evaluation [J]. *Journal of Heilongjiang province water conservancy science and technology*, **03**, (2007).
- [7] Guo Jin-Yu, Zhang Zhong-Bin, Sun Qin-Yun; The application of analytic hierarchy process in safety science research [J]. *Journal of safety production science and technology of China*, **02**, (2008).
- [8] Chang Jian-E, Jiang Tai-Li; Analytic hierarchy process weight determination study [J]. *Journal of Wuhan University of technology (engineering information and management)*, **01**, (2007).