

# Research on the Evaluation System of Bilingual Teaching in Accounting Courses

Ming Chen<sup>1, a</sup>

<sup>1</sup>Ginling College, Nanjing Normal University, Nanjing, 210097, China.

<sup>a</sup>chenming.1008@163.com

## Abstract

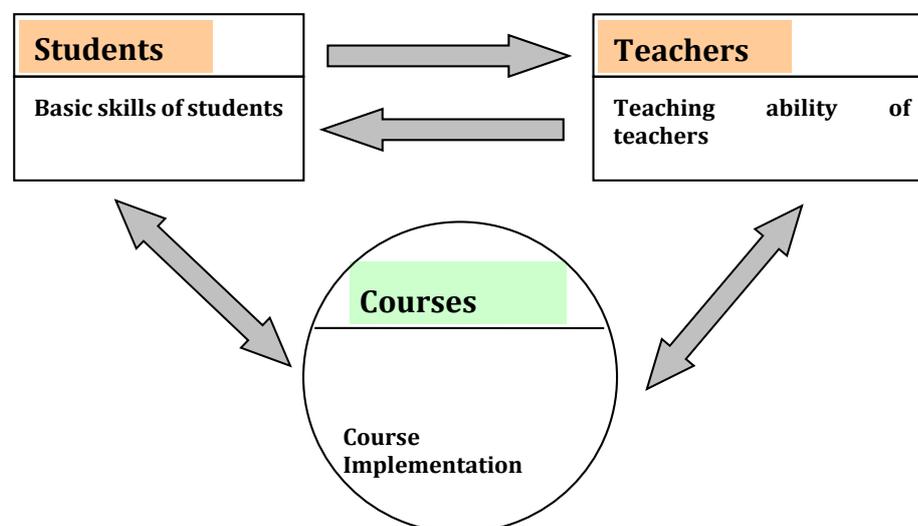
The bilingual teaching of accounting courses is an obvious trend in universities. However, neither students nor teachers can accurately determine the key elements of bilingual teaching at present. Therefore, it is necessary to conduct in-depth research on the evaluation system of bilingual teaching in accounting courses. In this paper, we use the AHP method to construct the evaluation index system of bilingual teaching in accounting courses, including 10 detailed indicators such as students' learning attitude and teaching ability. On this basis, the data is collected through questionnaires and processed with the help of YAAHP software. The final conclusion is as follows: the motivation of students' subjective learning must be activated first, and both the student's learning attitude and the teacher's teaching attitude are the most important factors related to the quality of teaching.

## Keywords

Bilingual Teaching, Accounting Courses, Evaluation System, AHP.

## 1. Introduction

Bilingual teaching has become a trend in universities today, and more and more schools offer a variety of bilingual courses. Bilingual teaching refers to teaching that uses more than two languages as the medium of instruction. One language is not necessarily the mother tongue of the students. The goal is to allow students to master two languages fully or in a balanced manner, or to promote students to learn and use a second language [1]. The emergence of bilingual teaching has multiple socio-cultural backgrounds.



**Fig 1.** The schematic diagram of relationships between subjects in a bilingual teaching program

As a major with more international exchanges, the major of finance and accounting is especially necessary for bilingual teaching. However, in the context of bilingual teaching in finance and accounting majors, it should be clear which courses are suitable for bilingual teaching [2]. Moreover, bilingual teaching should focus on the professional knowledge involved in the curriculum itself, or should pay more attention to the basics of English. These issues have become the key factors that affect the scientific and effective implementation of bilingual teaching in finance and accounting majors. Therefore, it is very important to make a scientific and reasonable evaluation of bilingual teaching in accounting courses [3].

## 2. Methods

In this paper, the Analytic Hierarchy Process (AHP) method is used to research the evaluation system of bilingual teaching in accounting courses the model of AHP method covers the following 5 steps:

### 2.1. The establishment of hierarchical model

The problem is divided into three specific levels according AHP method: the first level is the Target Hierarchy, it represents the goal to be resolved; the second level is the Criterion Hierarchy, it will refine the target to the relevant secondary indicators; the third level is the Index Hierarchy, it will further refine the detailed indicators.

### 2.2. The construction of judgment matrix

The judgment matrix is used to determine the relative importance of each element in the hierarchy (for an element of the previous hierarchy), the number 1-9 and its reciprocal usually used to present the value of it.

### 2.3. The Single Sequence of the Hierarchy

The single sequence of the hierarchy is the process of determining the weight of the sequence of importance of the elements associated with it (for an element in the previous hierarchy). Its specific method of operation is to calculate the eigenvalues and eigenvectors of the judgment matrix. For the judgment matrix  $A$ , the eigenvalues and eigenvectors satisfying  $AW = \lambda_{\max}W$  are calculated. Where  $\lambda_{\max}$  is the largest eigenvalue of  $A$ ,  $W$  is the normalized eigenvector corresponding to  $\lambda_{\max}$ , the component  $W_i$  of  $W$  is the weight value of the corresponding element single sequence [4].

For the judgment matrix  $A$ , if  $a_{ij}=a_{ij}/a_{jk}$  ( $i,j,k=1,2,3,\dots,n$ ) is satisfied, it is said to be fully consistent. But this situation is generally impossible to achieve, so it is necessary to conduct a consistency check on the basis of the single sequence of the hierarchy. Then the consistency index  $CI$  of the measurement matrix  $A$  have to be calculated ( $n > 1$  order square matrix), where  $CI = (\lambda_{\max} - n) / (n - 1)$ . When  $CI = 0$ ,  $A$  is called fully consistent. And there is the greater the  $CI$ , the worse the consistency of  $A$ . The consistency ratio  $CR$  and the average random consistency index  $RI$  are introduced to test whether the judgment matrix  $A$  has a satisfactory consistency [5].

### 2.4. The Total Sequence of the Hierarchy

Calculate the same level of all factors for the highest level (the total target) relative importance of the sorting weights, called the total ranking of the hierarchy [6]. If the previous hierarchy  $A$  contains the  $m$  elements  $A_1, A_2, \dots, A_m$ , the value of the total sequence of the hierarchy  $A$  are  $a_1, a_2, \dots, a_m$ . The weights value of the  $n$  elements  $B_1, B_2, \dots, B_n$  of the next hierarchy  $B$  are  $b_{1j}, b_{2j}, \dots, b_{nj}$  respectively (where  $b_{ij} = 0$ , if  $B_i$  is not associated with  $A_j$ ), then the value of the total sequence of the hierarchy  $B$  are shown in Table 1.

**Table 1** The schematic diagram of the total sequence of the hierarchy

Sequence	A1	A2	...	Am	The total sequence of the hierarchy
	a1	a2	...	am	
B1	b11	b12	...	b1m	$\sum_{j=1}^m a_j b_{1j}$
B2	b21	b22	...	b2m	$\sum_{j=1}^m a_j b_{2j}$
...	...	...	...	...	...
Bn	bn1	bn2	...	b1m	$\sum_{j=1}^m a_j b_{nj}$

If  $\sum_{i=1}^n \sum_{j=1}^m a_j b_{ij} = 1$ , then its total sequence of the hierarchy is the normalized normal vector [7].

### 2.5. Consistency Test

The calculation steps for consistency test of the total sequence of the hierarchy are as follows:

$$CI = \sum_{j=1}^m a_j CI_j \tag{1}$$

$$RI = \sum_{j=1}^m a_j RI_j \tag{2}$$

$$CR = \frac{CI}{RI} \tag{3}$$

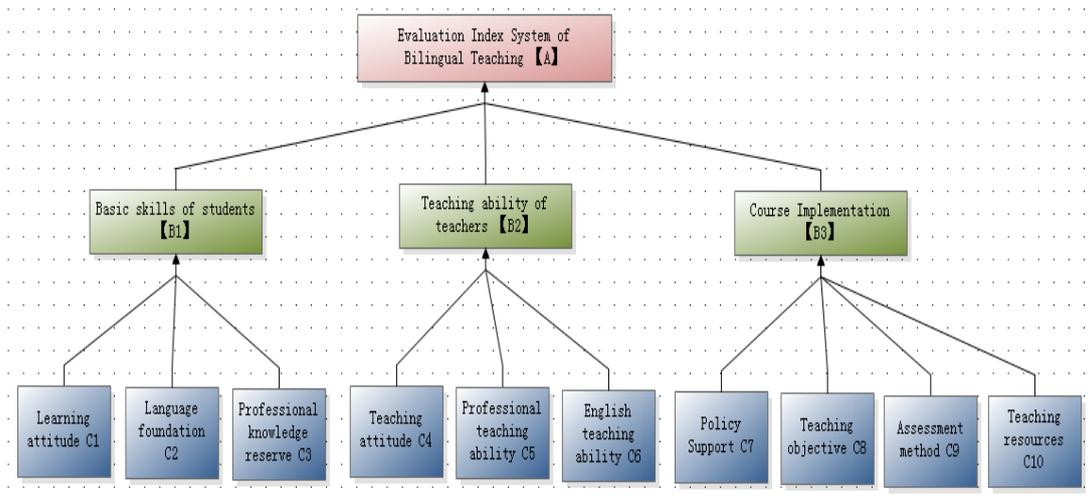
When  $CR < 0.1$ , the judgment matrix A has a satisfactory consistency; otherwise, when  $CR \geq 0.1$ , the consistency of the judgment matrix A can not be accepted, and it needs to be adjusted until it is satisfied [8].

### 3. Results

This article constructs the evaluation index system of bilingual teaching in accounting courses according to the Analytic Hierarchy Process (AHP) method.

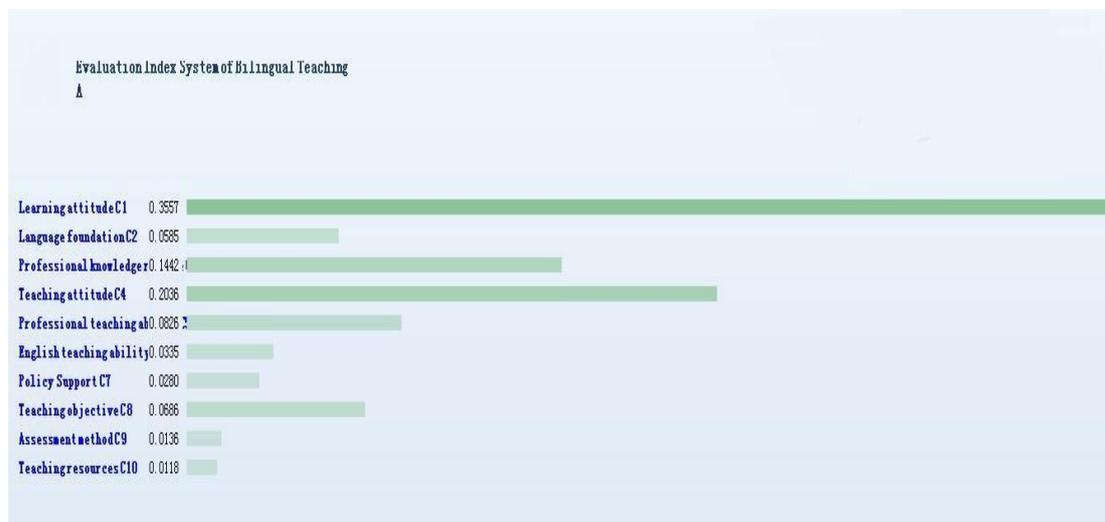
The target hierarchy is evaluation index system of bilingual teaching, while the criterion hierarchy consists of basic skills of students (B1), teaching ability of teachers (B2) and course implementation (B3). And the corresponding index hierarchy includes 10 detailed indicators [9].

Specifically, the index hierarchy corresponding to Basic skills of students (B1) includes three detailed indicators: learning attitude (C1), language foundation (C2) and professional knowledge reserve (C3). The index hierarchy corresponding to teaching ability of teachers (B2) includes three detailed indicators: teaching attitude (C4), professional teaching ability (C5) and English teaching ability (C6). While the index hierarchy corresponding to course implementation (B3) includes four detailed indicators: policy support (C7), teaching objective (C8), assessment method (C9) and teaching resources (C10). The schematic diagram of the evaluation index system of bilingual teaching in accounting courses according framework was obtained with the help of YAAHP software (as shown in Fig.2).



**Fig 2.** The schematic diagram of the evaluation index system of bilingual teaching in accounting courses

In this article, accurate data are collected using the questionnaires. On this basis, the collected data are processed with the help of YAAHP software. The total weight values for each indicator of evaluation index system of bilingual teaching in YAAHP Software is shown in Fig.3, and the specific weight values and their sequences are shown in Table 2.



**Fig 3.** The total weight values for each indicator of evaluation index system of bilingual teaching in YAAHP Software

On this basis, the 10 detailed indexes are regrouped according to the weight value  $W$ . Indicators with a weight of  $0.1 \leq W \leq 1$  are divided into group (1), including learning attitude (C1), teaching attitude (C4) and professional knowledge reserve (C3). The indicators with weights of  $0.05 \leq W < 0.1$  are divided into group (2), including professional teaching ability (C5), teaching objective (C8) and language foundation (C2). And the indicators with weights  $0 \leq W < 0.05$  are divided into group (3), including English teaching ability (C6), policy support (C7), assessment method (C9) and teaching resources (C10)[10]. The detailed grouping and sorting results are shown in Table 3.

**Table 2** Evaluation index system of bilingual teaching in accounting courses

Target hierarchy	Criterion hierarchy	Index hierarchy	Total weight value	Sequence	Importance category
Evaluation Index System of Bilingual Teaching A	Basic skills of students B1 0.5584	Learning attitude C1	0.3557	1	( 1 )
		Language foundation C2	0.0585	6	( 2 )
		Professional knowledge reserve C3	0.1442	3	( 1 )
	Teaching ability of teachers B2 0.3196	Teaching attitude C4	0.2036	2	( 1 )
		Professional teaching ability C5	0.0826	4	( 2 )
		English teaching ability C6	0.0335	7	( 3 )
	Course Implementation B3 0.1220	Policy Support C7	0.0280	8	( 3 )
		Teaching objective C8	0.0686	5	( 2 )
		Assessment method C9	0.0136	9	( 3 )
		Teaching resources C10	0.0118	10	( 3 )

**Table 3.** The results for the importance categories of 10 detailed indicators

Importance category	Sequence	Index hierarchy	Total weight value	Weight value range
(1)	1	Learning attitude C1	0.3557	$0.1 \leq W \leq 1$
	2	Teaching attitude C4	0.2036	
	3	Professional knowledge reserve C3	0.1442	
(2)	4	Professional teaching ability C5	0.0826	$0.05 \leq W < 0.1$
	5	Teaching objective C8	0.0686	
	6	Language foundation C2	0.0585	
(3)	7	English teaching ability C6	0.0335	$0 \leq W < 0.05$
	8	Policy Support C7	0.0280	
	9	Assessment method C9	0.0136	
	10	Teaching resources C10	0.0118	

#### 4. Conclusions

(1) Among the three secondary indicators of student foundation, teacher ability, and curriculum implementation, the student foundation is the most important, and teacher ability is the second, and curriculum implementation has the lowest weight among these three. Therefore, in an accounting bilingual course, the motivation of students' subjective learning must be activated first, teachers must fully help students to learn professional knowledge, and finally the specific curriculum implementation plan needs to be optimized.

(2) Among all the 10 three-level detailed indicators, the student's learning attitude has the highest weight and has the greatest impact; the teacher's teaching attitude is the second most important indicator; and teaching resources are the least important of all 10 three-level detailed indicators index. It can be seen that in an accounting bilingual course, both the

student's learning attitude and the teacher's teaching attitude are the most important factors related to the quality of teaching. On this basis, the learning ability of students and the teaching ability of teachers need to be improved. In comparison, the external factors such as assessment methods and teaching resources have less influence on the effect of bilingual courses in accounting.

## Acknowledgements

This research was financially supported by: (1) National Natural Science Foundation of China (No: 41901244); (2) The Philosophy and Social Science Fund of Education Department of Jiangsu Province (No: 2019SJA0228); (3) The Starting Research Found from Nanjing Normal University (No: 184080H202A47).

## References

- [1] J.R. Wang. Research on evaluation index of bilingual teaching on mathematics major in provincial universities, *Journal of Xi'an University (Natural Science Edition)*, vol.19 (2016), 7-11.
- [2] M.Y. Hu, H. Zhu. Research on the evaluation index system of bilingual teaching effect in application-oriented universities, *Journal of Chifeng University (Soc.Sci)*, vol. 40 (2019), 134-138.
- [3] F.F. Ni. Investigation on bilingual teaching in higher education and development strategies, *Journal of Guangdong Polytechnic Normal University*, vol.12(2015),74-81.
- [4] F. Dweiri, S. Kumar. Designing an integrated AHP based decision support system for supplier selection in automotive industry, *Expert System with Application*, vol. 72(2017), 467-468.
- [5] G. Peter. Approximation schemes for parallel machine scheduling with non-renewable resources, *European Journal of Operational Research*, vol. 258 (2017), 113-123.
- [6] S. Tyagi, S. Agrawal. An extended Fuzzy-AHP approach to rank the influences of socialization-externalization-combination-internalization modes on the development phase, *Applied Soft Computing*, vol. 52(2017), 505-518.
- [7] A. Fallahpour, E.U. Olugu. A hybrid model for supplier selection: integration of AHP and multi expression programming (MEP), *Neural Computing & Applications*, vol. 28(2017), 499-504.
- [8] D. Kumar, Z. Rahman. A fuzzy AHP and fuzzy multi-objective linear programming model for order allocation in a sustainable supply chain: A case study, *International Journal of Computer Integrated Manufacturing*, vol. 30(2017), 535-551.
- [9] X. Li, M.J. Ma, J.H. Wang. An analysis of the status quo of the application of bilingual teaching of the undergraduate curriculums in colleges and universities and its countermeasures, *Journal of Xiangnan University*, vol. 27(2006), 106-121.
- [10] Y. Liu. Analysis on the current situation of the bilingual education in the Guangxi higher education, *Research on Higher Education of Nationalities*, vol. 6(2018), 29-35.