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Establishing the Educational Evaluation System of Academic Advising for Sino-foreign College

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Abstract: The paper is to establish an evaluation index system on academic advising for sino-foreign college students in Chinese universities. Because there is almost no formal academic advising system for sino-foreign college students in China, the researchers made some investigations and looked for some authoritative articles to establish the indexes. Then through mathematical methods, the rationality of data was checked and the weights of the indexes were determined. Finally we got the equation to evaluate the final score and then got the comprehensive evaluation.

Keywords: Educational evaluation system, academic advising, sino-foreign college

1. Introduction

Nowadays, as education is more and more emphasized, various educational patterns appear. Sino-foreign education becomes an important part among the new patterns. According to the information from Chinese Ministry of Education, until 2014, there were 12 regions having sino-foreign schools in mainland China and 54 of them were allowed to run (Wu, 2016). This educational pattern has been more and more common during these years.However, sino-foreign education is not mature enough in China. As for academic advising institution which seems a relatively new concept in Chinese universities, we have searched online for all the sino-foreign colleges in mainland China and found that there is none of them having formal academic advising institution. Though it seems that some have websites for students to ask for guidance, after we investigated further, we found these websites are just deceptions and are not really useful.

For the concept "academic advising", American universities have a long history on it. Harvard University is known as the pioneer of academic advising. As time goes, until 2011, about 70% American universities have academic advisory body and it is designed to solve students' problems on study and future plan (Wang & Zeng, 2015). Learning from them, a few Chinese universities also established academic advisory institutions for students' future development. To catch up with the preeminent education and improve the quality of sino-foreign education, an academic advising institution is necessary. When we establish the institution, it is important to ensure the quality of the institution. Only when the quality of the institution is high, we can help the students effectively. Hence, we build an evaluation system to test the quality of academic advising for sino-foreign colleges.

2. The Concept of Evaluation System and Design of Evaluation Indexes

2.1 The Concept of Evaluation System

The evaluation system is the key to judge the quality of academic advising. It plays a guiding role for advisors in advising. It contains evaluation object, evaluation index, weight of index and evaluation criterion (Zheng, 2012).

First, evaluation object is something or someone we evaluate to. Here the object includes the advisor, counselor, course, etc. Therefore, to let them all included, we make the quality of academic advising as our evaluation object. Second, evaluation index is a specific standard for the object. In an evaluation system, there are always many indexes since we need to judge the object from different

perspectives. Generally speaking, the indexes are often decomposed to 3 levels at most. Here we decompose the indexes to 2 levels, because the second-level indexes are concrete and clear enough.

Third, weight of index is a constituent ratio, which can measure the relative importance that each index accounts for in the evaluation index system. There are many methods of determining the weight. We can divide them into two types: subjective method and objective method. Subjective method, like AHP and Delphi's method, needs experts to determine the weights. However, it is easily influenced by individual. Objective method, such as PCA, CA and FA, determines the weights according to the original data. However, it often has complex calculations and is easily influenced by random error. In conclusion, these two types both have weakness and we need to select an appropriate method due to our situation to minimize the error.Last, evaluation criterion is a measurement to each index and to the whole object. It is often represented by grade (A, B, C, D etc.) or quantitative score (1, 2, 3, 4, 5 etc.). Here we choose quantitative score as evaluation criterion to make it easy for us to calculate.

2.2 Design of Evaluation Indexes

To establish the indexes, we visited some universities which have a long history of academic advising, like Tsinghua University and Beijing Jiaotong University. In addition, we also did interviews to some foreign professors who teach in the sino-foreign college of China Agricultural University and have academic advising institution in their alma maters. Given the evaluation systems of those universities, the interviews, some literal research papers and our own ideas, we created the indexes as shown in Table 1 and Table 2.

Table 1: Academic advising evaluation index-1.

First-level Index	Second-level Index
I_1= advisor's attitude and the quality of content provided by advisor	X_1=patience X_2=reliability of information provided X_3=passion X_4=respecting student privacy X_5= coordinating the relationship between instructors and students X_6=conveying students' suggestions to college X_7=contributing to improve study environment X_8=timely informing internship and social practice opportunities X_9=providing accessory services (such as language help, simulate interview and resume revising)
I_2= professional ability of advisor	X_{10}=qualification of advisor X_{11}=professional ethics of advisor X_{12}=current situations of students who have consulted the advisor X_{13}=academic record of counsellor (as an advisor) X_{14}=attitude of counsellor (as an advisor) X_{15}=attendance of counsellor (as an advisor)

Table 2: Academic advising evaluation index-2.

First-level Index	Second-level Index
I_3= academic advising as a course	X_{16}=clarity of syllabus X_{17}=quality of course X_{18}=zest of course X_{19}=rationality of examination X_{20}=rationality of time management X_{21}=punctuality of the instructor X_{22}=appearance of the instructor X_{23}=responsibility of the instructor X_{24}=seriousness of recording attendance X_{25}=ability of controlling classroom discipline X_{26}=consistency between teaching process and syllabus X_{27}=accessibility of the course
I_4= the effectiveness of advising (the amount of information students accept)	X_{28}=student's understanding of current job market X_{29}=student's understanding of future development X_{30}=student's understanding of his/her objective occupation requirements X_{31}=student's understanding of the process of applying higher education (including undergraduate and postgraduate application) X_{32}=skills that student acquires from accessory services X_{33}=skills that student acquires from relative lectures X_{34}=skills that student acquires from relative research programs provided by advisors (including programs with foreign universities) X_{35}=skills that student acquires from internship and social practice opportunities provided by advisors

For convenience, we use I_1-I_4 to represent four first-level indexes and use x_1-x_{35} to represent 35 second-level indexes. When we designed the indexes, we mainly considered four principles. First, the purpose of academic advising is to serve for students, so the indexes focus on whether the students do get benefit from the advising. The demand of students for advisors is the most important thing for indexes. Second, the problems reflected by the indexes can be solved or improved. The purpose of the evaluation system is to find the weakness of academic advising and to improve the quality of advising. An index will make no sense if the advisor or college is unable to improve the problem reflected by it.Third, the indexes should be accessible to measure. The final evaluation is quantitative, so the indexes have to be available for statistic analysis.

Last, pertinence of sino-foreign college is important. Because the evaluation system is for sino-foreign college, we designed the indexes, such as x_9, x_{13}, x_{14}, x_{15}, x_{16}, x_{26}, x_{31}, x_{32} and x_{34}, for these special students. Because sino-foreign colleges have a relatively high requirement of language level, x_9 and x_{32} are to help the students with their language problems. In some sino-foreign colleges, due to that most undergraduate students need to go abroad after they studied at home for 2 or 3 years, the counselors are also undergraduate students who stay in China. These counselors are suitable for being an advisor, which is also a good way for students to consult. Hence x_{13}, x_{14} and x_{15} are for counselors as advisors. x_{16} and x_{26} are only useful in sino-foreign colleges because general courses in Chinese universities do not have syllabus. x_{31} and x_{34} are very important because students in sino-foreign colleges need to know many information about foreign universities, including courses, programs and applications. However, Chinese Internet makes students hard to get the information. Hence they need advisors to give them efficient messages.

3. Design of Questionnaire and Investigation among Students

To check the rationality of our indexes and to determine the weight of each index, we made a questionnaire and collected students' views.

3.1 Design of Questionnaire

In the first section of our questionnaire, we designed six questions to get the basic information of the participants. Due to that the evaluation system is for sino-foreign college students we asked that whether the participant is full-time sino-foreign college student to rule out those who are not studying in this kind of college. Then we brought the respondents to the topic by asking whether their colleges have academic advising department. We also asked about the content and form that academic advising should have to let the students who do not know academic advising well have a basic impression about it. After answering these questions, they could understand the following questions easily and make rational answers.

In the second section, we asked the respondents to grade for the indexes according to the importance of the indexes. Full score is 5, which also means the index is very important. 1 means the index is least important. There are five levels (1, 2, 3, 4, 5, from least important to most important) in total. Combined with students' views, we can check the rationality of our indexes and determine the weights of the indexes.

3.2 Distribution and Collection of Questionnaire

Because the questionnaire is for sino-foreign college students, we mainly disseminated the questionnaires in some universities that have this kind of college, such as China Agricultural University, Hefei University, University of Science & Technology of Anhui and Changchun University of Technology. These universities were randomly picked and most feedbacks we got are effective.

The questionnaire was published via Sojump (www.sojump.com), an on-line survey website that is commonly used by college students to do research. The questionnaire was distributed and collected from April 11, 2016 to April 27, 2016. During the roughly 2 weeks, 332 questionnaires were collected in total. Due to the filtering question, the real sample volume is 311. Among the participants, over 70 percents students are sophomores or with higher grade. That means most students are very familiar and experienced with the study in university, which improves the credibility of the result.

3.3 The Reliability Analysis of Questionnaire

In order to test the reliability of our survey, we made the reliability analysis. We observed that some students graded the lowest point for all the indexes, so these data is not reliable. However, if we regard these samples as invalid samples, some effective information may be missed. Hence we still retain this part of the result.

Under normal circumstance, if the Cronbach's Alpha of the data is greater than or equal to 0.6, it means that the data is reliable. By means of SPSS, we got that the Cronbach's Alpha for all the data reaches 0.982; and the alphas for each four indexes are all higher than 0.9. Therefore, the questionnaire has a good internal consistency and is strongly reliable as shown in Table 3. Furthermore, it also shows that each index is independent, and the content and the evaluation standard are clear (Zheng, 2012; Wang, Guo, Xing, Wang, Li, Zhang, et al. 2013).

Table 3: Reliability statistics.

Index	Cronbach's Alpha
I_1	0.942
I_2	0.919
I_3	0.966
I_4	0.952
total	0.982

3.4 The Validity Analysis of Questionnaire

Because the content validity is difficult to quantitatively measure, we use factor analysis to measure its construct validity. Via construct validity, we can know the degree of coherence between the index and the measurement results. As shown in Table 4, Bartlett's Test of Sphericity shows that the significant probability is 0.000, which is less than 0.05. Therefore it rejects the null hypothesis, which demonstrates that factor analysis is suitable for it. In Kaiser-Meyer-Olkin Measure of Sampling Adequacy, the KMO value is 0.969. According to the criteria given by the statistician Kaiser, if KMO is greater than 0.9, it shows that the data is fit for factor analysis.

Table 4: Statistics of Bartlett's Test of Sphericity and KMO Measure.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.969
Bartlett's Test of Sphericity	Approx. Chi-Square	12289.335
	df.	595
	Sig.	0.000

Then, we used the principal component analysis method to extract the common factor of the 35 items, and 4 common factors were extracted after maximum variance skew rotation. The cumulative contribution rate of the 4 common factors is 74.5%, and each second-level index has a relatively high load value (greater than 0.4) on one of the common factors while has a relatively low load value on the other common factors. Hence it has good structure validity. It also shows that we well understand the actual situation and make a fair design of the index (Wang, Guo, Xing, Wang, Li, Zhang, et al. 2013).

4. Determination of Indexes and Weights

4.1 Index Screening

To screen some irrational indexes, we take the three series 75% as the screening index (Ji, 2011). If the average score of an index is less than 3.75, the index is not qualified. However, we can observe that the average score of each index is more than 3.75, so we regard them all qualified and retain all the indexes.

4.2 Determination of Indexes

There are many methods to determine weights. Many people use AHP to determine weight of evaluation indexes, which needs experts' opinion and is subjective. In addition, because our evaluation indexes are for sino-foreign college and there are few experts in this field, we fail to obtain sufficient experts' opinion. Hence we do not use such methods that need experts' opinion of weight.

Here we use two objective methods--variation coefficient method and principle component analysis to determine weight. In the end, the comprehensive weight is the arithmetic mean of two results calculated by two methods.

4.2.1 Determination by Variation Coefficient Method

Variation coefficient method can eliminate the error caused by different means. In variation coefficient method, we take standard deviation coefficient which is most commonly used as the indicator of weight. Standard deviation coefficient is the standard deviation per unit of mean. The weight of each index is the percentage of its standard deviation coefficient accounting for in the sum of standard deviation coefficients of all the indexes (Men & Liang, 2005; Wu, Liang, & Li, 2013).

4.2.2 Determination by Principal Component Analysis

Principal Component Analysis can determine the weight by describing the relationship between each original index. The eigenvalues of extracted principal components should be larger than 1. In addition, the total cumulative of the extracted principal components should be larger than 50%. Here there are 4 extracted components and the total cumulative is 74.525%, which meets the requirement. It also means the 4 components can basically reflect the information of the original indexes. The details are shown in Table 5.

Table 5: Total variance explained.

Component	Extraction Sums of Squared Loadings		
	Total	*% of Variance*	*Cumulative %*
1	21.761	62.173	62.173
2	1.594	4.555	66.728
3	1.561	4.459	71.187
4	1.168	3.338	74.525

Then to get the index vector of each original index, we make the numbers in component matrix divided by the square root of the eigenvalues of corresponding principal components.

In this method, the indicator of weight we use is the coefficients in the comprehensive score model. The coefficients are the sums of the index vector of each original index multiplied by the corresponding percentage of variance contribution rate of the principal component accounting for in the total cumulative.

Finally, the weights are the percentages of each coefficient accounting for in the sum of the coefficients (Zhang, 2006).

4.2.3 Comprehensive Weight

The comprehensive weight is the arithmetic mean of two results calculated by the two methods. Table 6 shows the weights calculated by the two methods and the comprehensive weight. W_1 is the weight calculated by variation coefficient method. W_2 is the weight calculated by principal component analysis. W_3 is the comprehensive weight.

Table 6: Academic advising evaluation index weight.

Index	W_1	W_2	W_3	Index	W_1	W_2	W_3
X_1	0.027	0.031	0.029	X_{19}	0.020	0.030	0.025
X_2	0.027	0.031	0.029	X_{20}	0.020	0.029	0.025
X_3	0.033	0.030	0.032	X_{21}	0.021	0.026	0.023
X_4	0.027	0.030	0.028	X_{22}	0.022	0.024	0.023
X_5	0.031	0.033	0.032	X_{23}	0.019	0.027	0.023
X_6	0.030	0.033	0.031	X_{24}	0.024	0.025	0.024
X_7	0.029	0.034	0.031	X_{25}	0.021	0.028	0.024
X_8	0.031	0.032	0.031	X_{26}	0.020	0.028	0.024
X_9	0.031	0.033	0.032	X_{27}	0.020	0.028	0.024
X_{10}	0.045	0.026	0.035	X_{28}	0.030	0.024	0.027
X_{11}	0.037	0.029	0.033	X_{29}	0.020	0.024	0.027
X_{12}	0.040	0.029	0.035	X_{30}	0.029	0.025	0.027
X_{13}	0.042	0.029	0.035	X_{31}	0.028	0.023	0.026
X_{14}	0.042	0.031	0.036	X_{32}	0.030	0.025	0.027
X_{15}	0.045	0.027	0.036	X_{33}	0.033	0.028	0.030
X_{16}	0.020	0.031	0.025	X_{34}	0.033	0.029	0.030
X_{17}	0.020	0.030	0.025	X_{35}	0.031	0.028	0.030
X_{18}	0.022	0.030	0.026				

5. Synthetic Evaluation

When students finally make evaluation, only second-level indexes could be scored. The maximum score is 5 points, and students can only score positive integral points in the evaluation. To get the final evaluation score, we can multiply the score of each index that a student gives with their respective weight (here is the comprehensive weight on table 6) and then add them up. The sum is the final score that a student evaluates to the academic advising. In the end, the arithmetic mean of the final scores from all students is the comprehensive score for the academic advising (Song, Lv, & Su, 2014). The formula below shows how to calculate the final score. Y is the final score. n is the amount of indexes, so here n is 35. x_i is the point a student scores for the ith index. $W3_i$ is the comprehensive weight of the ith index.

$$Y = \sum_{i=1}^{n} x_i \, W3_i \quad (1)$$

6. The Reflection and Conclusion about the Evaluation System

Due to that few universities have sino-foreign college and there is almost no formal academic advising for this type of college in China, we have no academic advising evaluation system to refer to. Hence the system we build may not be very reasonable or comprehensive. In order to compensate for the potential drawback, we hope that after the two-year practice of the system, we could make a more reasonable questionnaire to test the rationality of our system again. We will also continue to seek the experts in this field to improve the evaluation system.

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