

The construction of customer satisfaction model of ideological and political education for college counselors basing on fuzzy mathematics theory

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Abstract: The method of fuzzy mathematics is introduced to evaluate the teaching satisfaction of the ideological and political education by the counselors. In accordance with the steps for the construction of the model, the model variables are set and the fuzzy mathematics theory is conceptualized. Combined with specific cases, the survey data are obtained, and empirical study is carried out on the fuzzy mathematics theory. The parameters are estimated and fitted by using the AMOS20.0 to determine the fuzzy mathematics theory after the evaluation coefficient is standardized. This model is used to make quantitative analysis on the customer satisfaction of the ideological and political education by the counselors, which is conducive for the counselors taking the corresponding measures to improve the student satisfaction on the ideological and political education and increase the work level and service quality of the ideological and political education construction.

1. Introduction

Since the 18th National Congress of the CPC, the central government and many local governments have vigorously advocated ideological and political education, and jointly held various ideological and political education festivals with publishers and bookstores, associations, non-governmental organizations and media organizations, which has brought about a great mass enthusiasm for the ideological and political education [1-2]. Not long ago, the news that the legislation of ideological and political education was included in the legislative plan of the State Council immediately became a social hot spot. This fully shows that ideological and political education has risen to the national strategic height, and it is urgent to improve the national ideological and political education rate [3-4]. However, the promotion of ideological and political education activities such as reading festivals, reading weeks, and reading months in various places can play a certain role in promoting the ideological and political education and contributing to the scholarly China and cultural power goals. The key is to understand the student satisfaction for the construction of ideological and political education culture [5]. Taking the students as the customers, improving the service quality of ideological and political education and culture construction and meeting the ideological and political education needs of students has become a concern of organizers of various ideological and political education activities [6]. As one of the organizations to promote the construction of ideological and political education culture, the purpose of the counselors is to meet the needs of students, and to analyze the satisfaction of students' ideological and political education needs, which is the primary link to promote the construction of the ideological and political education.

2. Fuzzy Mathematics Theory

Fuzzy mathematics theory is an empirical research method. Fuzzy mathematics theory can mainly be divided into seven steps as the following: conceptualization of model, confirmation of model, identification of model, estimation of parameters, evaluation of model adaptation degree, modification of model and model compound effect. The conceptualization of the model refers to the

development of potential variables and observed variables in the model based on theoretical assumptions or empirical evidence; the confirmation of the model is to describe the nature and number of the estimated parameters; the identification of the model is to use the observation data analysis results to determine whether the parameter estimation is sufficient, whether the single value and the unique value of the parameter can be confirmed based on the collected observation data; the estimation of the parameter is based on the execution result of the A-MOS program to determine whether the covariance matrix implied by the hypothetical model is equal to the observed or actual covariance matrix. Whether the estimated parameters are significantly different from 0; the evaluation of the model fit degree should refer to different fit degree indicators for comprehensive judgment. The fit degree indicator allows the researcher to evaluate the quality and integrity of the measurement and structural models, and then the indicator values support The conceptual model and theoretical hypothesis proposed; the modification of the model refers to the temporary modification with the theoretical data; the composite effect of the model refers to the better model of the analysis modification, which can also be adapted to different samples from the same population, and whether the samples of different populations can also be used to obtain the desired adaptation results. Hence, a complete fuzzy mathematical theory can be shown by the flow chart as the following.

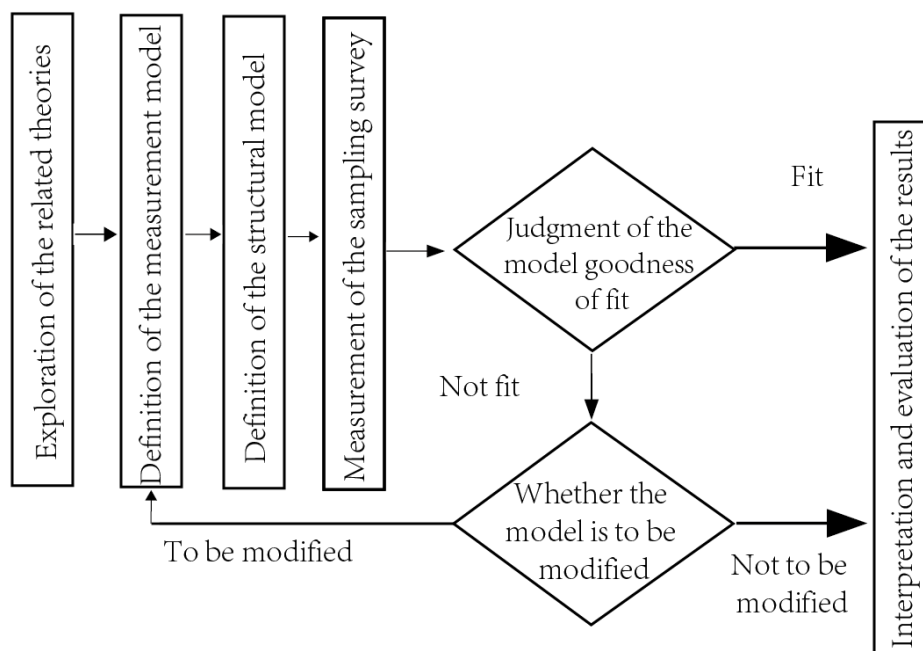


Figure.1 Flow chart of the construction of the model based on the fuzzy mathematics theory

3. Construction of the Customer Satisfaction Model for the Ideological and Political Education by Counselors

The concept of the customer satisfaction on the ideological and political education by the counselors is derived from the concept of customer satisfaction. The so-called customer satisfaction refers to the feeling state of pleasure or disappointment formed by the customer after comparing the perceived effect (or results) of a product with the expected value. Then, the ideological and political education by the counselors customer satisfaction refers to the feeling state of pleasure or disappointment formed by the students after comparing the quality of service (or level) of the counselors in promoting the construction of ideological and political education culture with the expected value. In particular, it can be described as an indicator system for objectively evaluating the service quality of ideological and political education construction. It is an evaluation of the service quality of ideological and political education construction from the perspective of students, and then the objectives of the individual students are evaluated and summarized through certain methods.

There are a number of factors that may affect the perceptions of the students on the ideological and political education construction services. It can be said that all aspects of counselors' work will affect students' satisfaction with ideological and political education and cultural construction. With reference to the representative literature on ideological and political education construction in China, the factors affecting the customer satisfaction of the ideological and political education by the counselors can be divided into the following points: (1) Construction of the infrastructure for the ideological and political education; (2) teaching resources; (3) counselors (4) Ideological and political education service by the counselors. The above four factors affect the external factors of fuzzy mathematics, which affects the customer satisfaction of the ideological and political education by the counselors. The set model potential variables and observed variables are shown in Table 1 as the following.

Table 1 Variables of the customer satisfaction model for the ideological and political education by the counselors

Latent variable	Measured variable
Construction of the infrastructure for the ideological and political education	Ideological and political education atmosphere (a1), reading seat (a2), computer (a3)
Teaching resources	Book type (a4), journal type (a5), accessibility of the digital resources (a6)
Counselors	Service attitude of the librarians (a7), service ability of the librarians (a8), professional ideological and political education literacy of the librarians (a9)
Ideological and political education service by the counselors	Service content of the ideological and political education by the counselors (a10), promotion activities of the ideological and political education by the counselors (a11), service methods of the ideological and political education provided by the counselors (a12)
Ideological and political education satisfaction of the students	Overall satisfaction (a13), situation of the satisfaction compared with the expectations (a14), evaluation on the importance of the promotion for the ideological and political education by the counselors (a15)

In accordance with the set variables, the conceptual model for the customer satisfaction of ideological and political education by the counselors is established, and the evaluation relationship hypothesis between variables in fuzzy mathematics theory is proposed. H1: The ideological and political education infrastructure hypothesis has a direct positive correlation with the customer satisfaction of the ideological and political education by the counselors; H2: teaching resources have a direct positive correlation with the customer satisfaction of the ideological and political education by the counselors; H3: The satisfaction of counselors on the customer satisfaction of the ideological and political education by the counselors has a direct positive correlation; H4: ideological and political education has a direct positive correlation with the customer satisfaction of the ideological and political education by the counselors; H5: the correlation between the external and external potential variables. In accordance with the relationship between variables, the fuzzy mathematical theory conceptual model for the customer satisfaction of the ideological and political education by the counselors can be established (as shown in Figure 2 as the following).

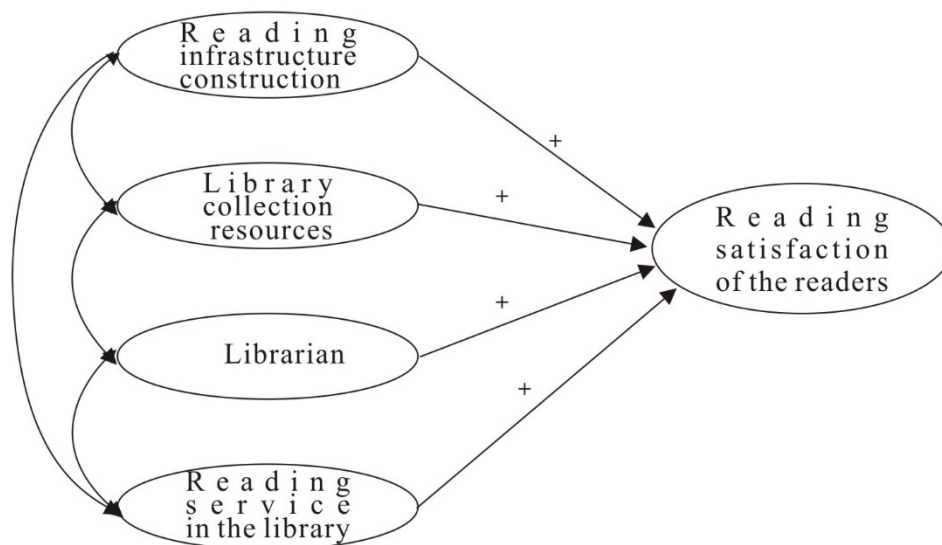


Figure. 2 Concept of the customer satisfaction model for the ideological and political education by the counselors

4. Empirical Study on the Customer Satisfaction Model of the Ideological and Political Education by the Counselors

4.1 Analysis on the Reliability and Validity of the Questionnaire Data

Before the structural equation analysis is carried out, the reliability and validity of the questionnaire data should be analyzed first. Reliability refers to the degree to which the measurement (data) is consistent or stable. Validity is the degree to which a measurement tool can correctly measure the trait to be measured. At present, the internal consistency coefficient is commonly used in academia, that is, Cronbach's α is adopted to test the reliability of the data. In this study, SPASS 19.0 is used to carry out reliability analysis to obtain Cronbach's α coefficient. The results are shown in Table 2 as the following. The Cronbach's α coefficient greater than 0.7 indicates that the data is reliable.

In most studies, factor analysis is often applied to analyze the validity of questionnaire data. The data was summarized by performing a KMO test and a Bartlett spherical test on five latent variables, respectively, as shown in Table 3. Generally, the KMO statistic is greater than 0.9, and the best effect is above 0.7, and below 0.5 is not suitable for factor analysis. From the table, we can see that most of the KMO values of each latent variable are 0.7, and only the KMO value of the counselors is 0.653, hence factor analysis can be carried out for all of them. In addition, significant results can be obtained for some of the variables. The statistic Sig values of the Bartlett spherical test are less than 0.01, indicating that there is a significant correlation between the observed variables in the questionnaire, and the questionnaire data is suitable for factor analysis, as shown in the following.

Table 2 Summary table of the Cronbach's α coefficient for the reliability analysis of the questionnaire data

Latent variable	Cronbach's α	Standardized Cronbach's α	Number of terms
Construction of the infrastructure for the ideological and political education	0.736	0.783	3
Teaching resources	0.810	0.854	3
Counselors	0.683	0.691	3
Ideological and political education service by the counselors	0.856	0.859	3
Ideological and political education satisfaction of the students	0.823	0.827	3
Total	0.831	0.836	15

Table 3 KMO and Bartlett test summary table of the validity analysis on the questionnaire data

Latent variable	KMO	Sig.	Number of terms
Construction of the infrastructure for the ideological and political education	0.746	0.000	3
Teaching resources	0.913	0.000	3
Counselors	0.653	0.002	3
Ideological and political education service by the counselors	0.932	0.000	3
Ideological and political education satisfaction of the students	0.762	0.000	3

4.2 Establishment and Calculation of the Student Satisfaction Intelligent Evaluation Indicator System

After the factor analysis is carried out, we can make use of the AMOS 20.0 to establish and calculate fuzzy mathematics theory. In accordance with the corresponding conceptual model, the software is used to establish the model. Before the modeling is performed, the H5 hypothesis evaluation coefficient is determined as the fixed parameters 0 and 1, and then the free parameter estimation is carried out on the model to obtain the standardized model result map (as shown in Figure 3). The H1 hypothesis is 0.59, the H2 hypothesis is 0.74, the H3 hypothesis is 0.37, and the H4 hypothesis is 0.85, as shown in the following.

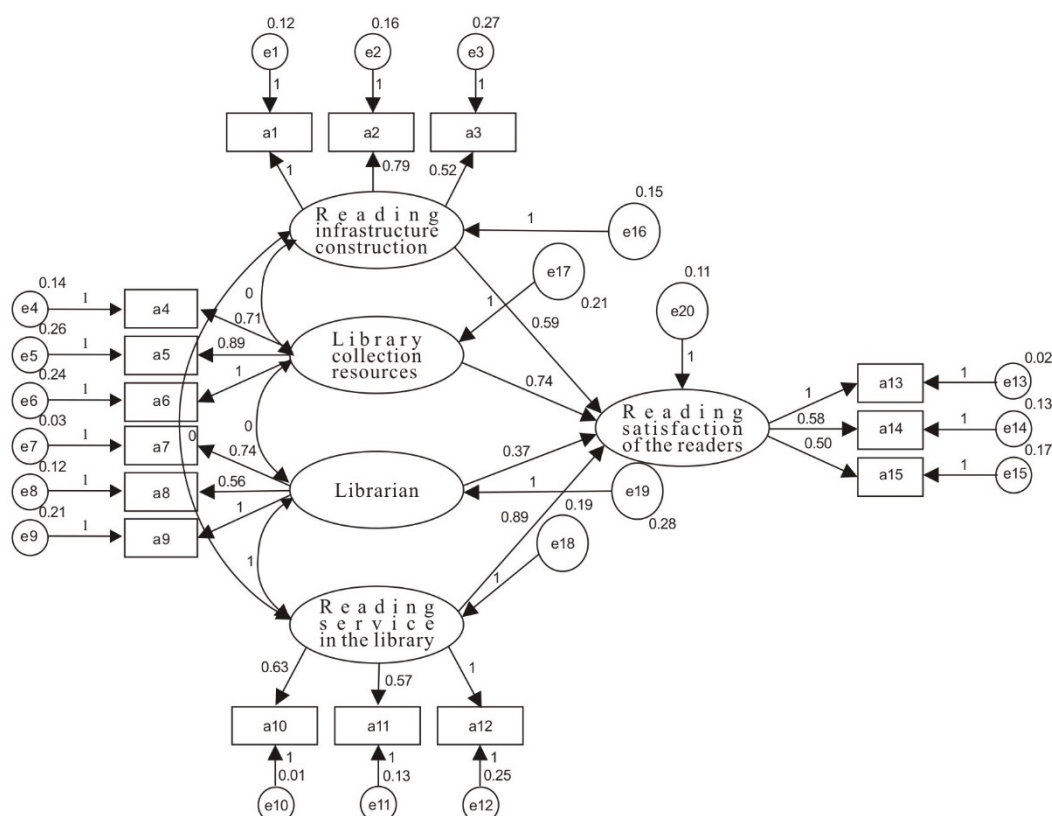


Figure. 3 Diagram of the standardization results of the student satisfaction intelligent evaluation indicator system evaluation

The results of the model are reviewed and presented in the model annotation (as shown in Figure 4 as the following): The degree of freedom of the model is 86, which is an over-recognition model, suitable for structural equation analysis. The chi-square value is 95.96, and the significance probability value is 0.973, which is greater than 0.05. The significant level is not reached, and the matrix representing the observation number is consistent with the hypothetical model matrix, as shown in the following.

5. Example Illustration and Analysis

Under the condition that the theoretical model has good fit with the actual survey data, it indicates that the various hypothetical variables in the theoretical model can be used as indicators to evaluate the level of ideological and political education construction. The customer satisfaction of the ideological and political education by the counselors is positively correlated with the service quality of ideological and political education construction. The higher the satisfaction of the students on the ideological and political education is, the better the service quality of ideological and political education construction is.

In accordance with the determined indicators for evaluating the level of ideological and political education construction, design questionnaires, analyze the data and construct the customer satisfaction model for the ideological and political education by the counselors. The following is an evaluation on the customer satisfaction of the ideological and political education of the counselors in the colleges and universities.

Factors that affect the customer satisfaction of the ideological and political education by the counselors (Y) include the construction of the infrastructure for the ideological and political education (X1), teaching resources (X2), counselors (X3), ideological and political education service by the counselors (X4). Among the four level indicators, each indicator is affected by three third-level indicators. The degree of influence of each level of indicator can be determined in accordance with the weight of the factor load factor (model evaluation coefficient). It can be seen from Figure 3 that the load coefficients of the four secondary indicator factors are $X1 \rightarrow Y: 0.59$, $X2 \rightarrow Y: 0.74$, $X3 \rightarrow Y: 0.37$, $X4 \rightarrow Y: 0.85$, and their sum is 2.55, then X1 The weight is $0.59/2.55=0.231$. In a similar way, the weight of X2 is 0.29, the weight of X3 is 0.145, and the weight of X4 is 0.333 and so on. Hence, the weights of the third-level indicators can be obtained as the following: $a1 \rightarrow X1=0.433$, $a2 \rightarrow X1=0.342$, $a3 \rightarrow X1=0.225$, $a4 \rightarrow X2=0.273$, $a5 \rightarrow X2=0.342$, $a6 \rightarrow X2=0.385$, $a7 \rightarrow X3=0.322$, $a8 \rightarrow X3=0.243$, $a9 \rightarrow X3=0.435$, $a10 \rightarrow X4=0.286$, $a11 \rightarrow X4=0.259$, $a12 \rightarrow X4=0.455$, $a13 \rightarrow X5=0.481$, $a14 \rightarrow X5=0.279$ and $a15 \rightarrow X5=0.24$.

By weighting the average of the scores of a group of three-level indicators (measured variables $a1 \sim a11$), the corresponding second-level indicators ($X1 \sim X5$) satisfaction scores can be calculated. For example, the average score of each three-level indicator (measurement variable) is calculated in accordance with the score data of the questionnaire, and the weighted average of the score is calculated in accordance with the weight of each measurement variable, and the satisfaction score of each secondary indicator (latent variable) can be obtained. Hence, the calculated X1 satisfaction score is 4.105, X2 satisfaction score is 3.921, X3 satisfaction score is 3.236, and X4 satisfaction score is 2.961. Finally, the student satisfaction score of the college's ideological and political education culture construction by the counselors is calculated to be 3.765, which suggests that the overall evaluation of the students on the work level and service quality of the ideological and political education construction in the school is relatively satisfied. From the satisfaction scores of the above two indicators, we can see that the satisfaction scores of the school counselors in ideological and political education services are relatively low, indicating that to properly carry out the work in the ideological and political education culture construction by the school counselors, the key is to properly carry out the ideological and political education services by the counselors. Each counselor can refer to the case analysis ideas to evaluate the customer satisfaction of the ideological and political education by the counselors.

6. Conclusion

In the study of the ideological and political education, the fuzzy mathematics theory is applied to evaluate the student satisfaction of the ideological and political education document construction by the counselors. The observable variables are adopted to determine the potential influencing factors of the customer satisfaction on the ideological and political education by the counselors. Through the empirical research, the relationship between the ideological and political education infrastructure construction, the ideological and political education service by the counselors and

other factors and the customer satisfaction of the ideological and political education by the counselor is established. In addition, quantitative analysis on the customer satisfaction on the ideological and political education by the counselors are carried out and the countermeasures are put forward. The research is conducive for the managers of the counselors taking the corresponding measures to improve the ideological and political education satisfaction of the students and increase the work level and service quality of the ideological and political education construction.

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