Service Quality Dimensions of Higher Vocational Education: Based on a Survey of a Public Vocational College in South China

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Abstract: *Due to different research tools, research objects and research periods, the research conclusions on the evaluation index system of China's higher vocational education service quality are quite different. Taking nearly 10000 students from a vocational college in Guangdong Province as samples and based on the SERVPERP model, this study revised the six dimensions scale of higher vocational education service quality, and discussed the optimization and application of the six dimensions through comparative analysis with other research conclusions.*

Keywords: *Service quality, Measurement dimension, Higher Vocational Education*

1. Introduction

With the popularization of higher education in China, higher education quality assessment has received more and more attention and social concern. Colleges and universities constantly develop various methods to evaluate the quality of education, and take corresponding improvement measures to actively respond to the requirements of society and schools. Considering the service attribute of higher education, the service quality evaluation methods derived from commodity services and customer services are widely introduced into the service quality evaluation of higher education. Relatively speaking, the research and application of higher vocational education service quality are relatively scattered. With the continuous expansion of the scale of vocational education in China, the diversity of students promotes the differentiation of learning needs and development directions. Therefore, the extent to which schools can meet the different needs of students should be an important basis for colleges and universities to formulate development goals, improve service orientation and improve the level of talent training. It is necessary to incorporate the evaluation of education service quality into the evaluation index system of higher vocational education quality from the perspective of "direct customers" [1]. From the perspective of students' perception, this study constructs an education service quality model suitable for higher vocational colleges, reveals the structural characteristics of higher vocational education service quality, and puts forward suggestions and countermeasures to improve the school service quality.

2. Research status and problems

Focusing on the perceived quality of higher vocational education service [2], the relationship between higher vocational students' satisfaction/complaint and service quality [3] [4], the driving factors of higher vocational education perceived value [5], the national evaluation of higher vocational service education quality [6], and the analysis of higher vocational service quality and importance performance [7], domestic vocational education scholars have carried out empirical research in different regions and colleges using different research tools, forming a batch of qualitative and quantitative research results. In addition to the overall research on the quality of vocational education service, the research direction and object are further subdivided, and a number of research results on employment service [8], professional education service [9], international student service [10] and other aspects have emerged.

In an overview of domestic scholars' research on "service quality of higher vocational education" in the past ten years, researchers have obvious differences in research methods, research tools, scale

structure, dimensions of service quality of higher vocational education and the choice of variables, and the research results are quite different.

The first is the difference between research tools and scales. There are four main types of research tools available at present. The first type is to design the dimensions and variables of service quality measurement and compile the scale of service quality of higher vocational education. The second type is to directly describe the perceived service quality of higher vocational education through customer satisfaction index or its opposite complaint index. The third is to introduce the critical event technology (CIT) method, important performance (IPA) model and other models, and combine these two models to form a new analysis method to study the higher vocational education service quality management; The fourth category uses the SERVQUAL model or SERVPERF model, fully or substantially agrees with and uses the SERVQUAL scale, and may differ in individual dimensions and internal variables. Thus, based on different research tools, the dimensions of service quality in higher vocational services range from 4 to 8.

Second, the differences between the research objects. Samples of various investigations are taken from different colleges and universities in different regions, including internal investigations in the same college, cross-college investigations in the same region, cross-regional college investigations, etc. The research mainly adopts sampling survey method with small sample size.

Third, the research period difference. Each study was conducted over a period of more than 20 years, with a relatively large time span.

There are obvious differences in the selection and weight ranking of the service quality dimensions of higher vocational education in various research conclusions,which are due to the differences in in research tools, objects, periods and regions.

Different research tools will fundamentally affect the construction and interpretation of the service quality evaluation system. Different research objects, that is, different regions have different levels of economic development, educational investment, cultural customs, and there are also large differences in geographical distribution, resource security, student source structure, management mechanism, etc., which means that the sample heterogeneity is relatively high. In the case of small samples, both the sample heterogeneity and the sample space capacity will affect the robustness of the conclusion. In different research periods, the survey subjects have an inevitable imprint of The Times in the aspects of individual preferences, psychological characteristics, behavior patterns, perception and evaluation of education service quality, which brings more uncertainty to the existing experience and paradigm of education service quality evaluation.

In view of the above situation, this research tends to select a small research scope (a typical school as an example) of large sample analysis (for all students) to further explore the measurement indicators of higher vocational service quality at this stage with empirical research, reveal its structural characteristics, and provide updated empirical support for the improvement of education service quality.

3. Methodology

3.1 Research method and process

The service quality gap theory and SERVQUAL model proposed by Parasuraman, Zeithami and Berry (PZB) are recognized as typical methods for service quality evaluation, and are also widely used in domestic higher vocational education service quality research. The SERVQUAL model contains 22 variables in five aspects : tangibles, reliability, responsiveness, assurance, and empathy.

PZB believes that SERVQUAL is a universal method that can be applied to any company to evaluate the quality of the service provided. But Jay Joseph and Steven (J. Joseph Cronin, Jr. & Steven A. Taylor)think that service quality should be measured as an attitude, and only uses performance perception as a measure of service quality. They develop SERVPERP model based on performance on SERVQUAL scale[11], and verify the effectiveness of performance scale through empirical research. The SERVPERP model has higher validity and reliability, and can also be widely used in the field of educational services.

This research will explore the main factors of higher vocational education service quality under the framework of SERVQUAL scale, and use the SERVPERP performance-based method to measure. After the preparation of project pool, pre experiment, formal experiment, factor analysis, reliability and

validity test, the scale meeting the requirements was formed.

3.2 Design of questionnaires

On the basis of referring to the domestic and foreign research literature on the application of the service quality model of higher education and vocational education in recent ten years, the scale item pool is designed according to the characteristics of domestic vocational colleges.

Before the questionnaire was issued, some students were invited to make predictions, and some items that the students thought were more necessary were added according to the feedback. The final questionnaire contains 82 items in 5 categories. Items are classified and numbered according to SQA, SQB, SQC, SQD and SQE. (see table 1)

Table 1: Service Quality Scale of Higher Vocational Education Based on SERVQUAL

Dimension	SubItem	Title No
Tangibles	campus natural environment, living supporting facilities, learning facilities and environment, cultural and sports facilities, faculty image	SQA1-A14
Reliability	eaching quality, ability to provide committed services, ability to meet students' development needs	SQB1-B41
Responsiveness	Feedback platform and approach, timely feedback processing, Effectively solve problems	SQC1-C6
Assurance	The academic and technical level of teachers,Teachers' teaching ability,Faculty Behavior	SQD1-D12
Empathy	Care for students, personalized service	SQE1-E5

3.3 Data collection

The survey is aimed at students in the first and second grades of the school. 11109 questionnaires were distributed in the form of client link, 9740 questionnaires were returned, and 9312 valid questionnaires were obtained, with a valid questionnaire ratio of 95.6%. The distribution of the collected questionnaires in campus, department and major is similar to the actual distribution of students, which can reflect the actual situation of students in a comprehensive and objective way.

3.4 Data analysis

This study uses SPSS online platform(http://spssau.com/) for stastistical analysis of data.

3.4.1 Data inspection

First, the reliability of the current evaluation scale is tested. The analysis data shows that the reliability coefficient of the measured table is 0.992, and the CITC values of all questions are greater than 0.9 after removing two analysis items whose CITC values are less than 0.6, which shows that the overall reliability quality of the data is very high.

Secondly, we measure the validity. The commonality of the questionnaire data is greater than 0.7, and the KMO value is 0.992, which shows that the validity of the scale data is very good. The P-value of of the Bartlett sphericity test is less than 0.001, which is very suitable for factor analysis.

3.4.2 Factor analysis

Table 2: Variance interpretation rate

Rotated variance interpretation	factor 1	factor 2	factor 3	factor 4	factor 5	factor 6
Characteristic root	23.828	15.433	10.181	5.037	4.363	4.088
Variance interpretation rate%□	30.548	19.786	13.052	6.458	5.593	5.242
Cumulative%□	30.548	50.334	63.386	69.844	75.437	80.678

Factor analysis was carried out using the maximum variance rotation method. Six factors were extracted, and their characteristic root values were 23.828, 15.433, 10.181, 5.037, 4.363 and 4.088 respectively, all of which were greater than 1;The variance interpretation rates of the 6 factors after rotation were 30.548%,19.786%,13.052%,6.458%,5.593% and 5.242%, respectively, and the cumulative variance interpretation rates after rotation reached 80.678%, which means that this

evaluation model is effective.((see table 2)

The factor loading coefficient corresponding to each research item is higher than 0.5, which means that there is a strong correlation between the research item and the factor. However, a further analysis of the corresponding relationship between factors and research items shows that some dependent variables do not fully conform to the normal situation in school management. Therefore, it is necessary to further adjust the corresponding relationship between items and recombine the components of higher vocational education service quality elements.

3.4.3 Revision of the scale

The confirmatory factor analysis (CFA) analysis of the five dimensions found that the square root values of "tangibles", "reliability" and " responsiveness " were 0.846, 0.849 and 0.858 respectively, which were less than the absolute values of correlation coefficients between factors: 0.875, 0.926 and 0.926, indicating that the discrimination validity of the three parts was insufficient.(see table 3)

Table 3: Discrimination validity

	Tangibles	Reliability	Responsiveness	Assurance	Empathy
Tangibles	0.846				
Reliability	0.828	0.849			
Responsiveness	0.875	0.926	0.858		
Assurance	0.642	0.794	0.751	0.835	
Empathy	0.641	0.752	0.749	0.779	0.865

Therefore, we classified and merged the items according to six dimensions, and focused on adjusting the three dimensions of "tangibles", "reliability" and "responsiveness", and then we conducted the reliability, validity and validation factor analysis of the adjusted scale again, to verify whether a better discrimination validity was achieved between the factors.

After adjustment, the Cronbachα coefficient of each factor is greater than 0.9, the standard load coefficient of each measurement item is greater than 0.7, the AVE value of average variance extraction is greater than 0.7, and the CR value of combined reliability is greater than 0.9. The AVE square root values of the six factors were greater than the absolute value of the interfactor correlation coefficient, indicating good discriminative validity. (see table 4)

Table 4: Factor analysis results

Factor	Item	Standard load factor	Cronbachα	AVE	Combined reliability
Factor 1	SQA5 Perfect entertainment and sports facilities	0.781			
	A14 Excellent school spiri	0.787			
	SQB9 Perfect management system	0.804	0.991	0.775	0.991
	B26 Provide various social practice	0.916			
	SQC1 Multiple ways to give feedback	0.909			
	C6 Deal with students' feedback timely	0.915			
Factor 2	SQB1 Adequate learning resources	0.825			
	B27 Master advanced theory and technology	0.897	0.980	0.758	0.983
	B35 Good online teaching effect…	0.870			
	B41 Enrichment of practical teaching courses	0.894			
Factor 3	SQD3 Clear course objectives and requirements	0.864			
	D5 Teachers have good expression ability	0.887	0.964	0.728	0.964
	D12 Able to provide career planning guidance	0.844			
Factor 4	SQD1 Teachers behave appropriately	0.916			
	SQE1 Carry out academic exchanges after class	0.938	0.956	0.759	0.956
	E5 The head teacher often communicates with the students	0.787			
Factor 5	SQA1 Canteen service and food quality	0.859	0.939	0.799	0.940
	A4 Dormitory Conditions	0.930			
Factor 6	SQB4 Guidance on job hunting	0.943	0.959	0.821	0.958
	B8 Psychological counseling	0.927			

3.4.4 Regression analysis

Further analyze the prediction relationship between the six factors and the overall service quality of higher vocational education, and make multiple linear regression analysis with the overall service quality as the dependent variable and the six factors as the independent variable. Because there is a certain problem of collinearity of independent variables in linear regression analysis, ridge regression

analysis is used to analyze the model fitting through R square value. The test data shows that the p value is less than 0.01, indicating that the six factors have a significant positive impact on the overall service quality of higher vocational education; The goodness of fit test degree is 0.553, which means that six independent variable factors can explain 55.34% of the change in the service quality of higher vocational education.

The model formula is as follows: The overall service quality of higher vocational education = 0.908 + 0.117 * factor 1ne + 0.124 * factor 2o + 0.101 * factor 3 + 0.068 * factor 4r + 0.232 * factor 5 + 0.114 * factor 6.

4. Conclusion and discussion

4.1 Basic conclusions

4.1.1 The comprehensive evaluation of higher vocational education service quality includes six dimensions

Based on SERVPERF model, this study constructs an evaluation scale consisting of six types of variables to describe the structural characteristics of service quality of higher vocational education.

The first category of variables mainly covers the campus cultural and sports facilities, cultural activities, learning and life management system, opinion feedback and other software and hardware guarantees, reflecting the overall feelings of students on the campus ecological culture, including most "reliability" variables and a few "responsiveness" and " Tangibles" variables; The second type of variable mainly involves courses, training, learning resources and other elements related to knowledge and technical skills learning, which conforms to the characteristics of "reliability"; The third type of variable mainly reflects the personal professional ability of teachers perceived by students, such as expression ability, teaching ability and professional level, reflecting the "Assurance" of service quality; The fourth type of variable mainly reflects the overall image of faculty, the willingness to help students, and the attitude towards students, including " Empathy" and a "tangibles" variable; The fifth type of variable focuses on living services such as accommodation, catering and medical care, which belongs to the "tangibles" variable. A sixth category of variables was also highlighted in this study, which could not be combined during the data analysis and mainly reflected the school's services in employment support, mental health, club events, and organizing activities.

The revised service quality scale of higher vocational education consists of 6 six dimensions, which are divided into "basic support", " curriculum & Instruction", "teacher performance", "emotional input", "living conditions", and "personalized service" according to the aspects involved.(see table 5)

Table 5: The revised service quality elements

dimensions	variables
Living conditions	supporting living conditions ; medical service ; campus environment ; cultural and sports facilities
Curriculum & Instruction	sufficient learning resources; advanced curriculum ; practical Skills in courses ;research-oriented thinking and problem-solving ability ;the using of modern education technology; scientific and adequate assessment ; sufficient opportunities to practice
Basic support	learning atmosphere ; rules and regulations to follow ; diversified feedback platforms; handle feedback in time; Personal diversified development;financial aid guarantee for students with financial difficulties ;sufficient and advanced training equipment; Sufficient classroom space;modern teaching equipment ; Rich library collection ; Extensive network coverage
Personalized service	effective recommendation for job hunting; individual psychological counseling
Teacher performance	good academic ability and technical level ; teaching ability (express clearly, provide discussion opportunities, plan teaching, stimulate learning interest, and focus on curriculum challenges); career planning guidance
Emotional input	attach importance to communication with students ; willing to help students ; care and respect to students

4.1.2 There is a drift in the perceived weight of service quality in higher vocational education education

The results of this survey show that in the quality of higher vocational education service perceived by students, the importance   of factors related to   physical   facilities   is the   highest   and the

importance of factors related to emotions is the lowest.

This conclusion is highly similar to the research conclusions carried out in Fujian in 2007[12] and Shantou in 2020, and partially similar to the research conclusions carried out in Nanjing in 2019.

Especially in the past three years, higher vocational students pay much more attention to the configuration of tangible facilities than the curriculum, teachers and emotional input, and there is a big gap in the influence of human factors (emotional) and non-human factors (environmental facilities, etc.).

4.2 Corresponding strategy

4.2.1 Higher vocational colleges should reasonably evaluate the conclusion and take corresponding measures

Input-output ratio is an important index to measure management performance in educational management activities.

When dormitory, canteen, gymnasium, hospital, campus landscape and other "living environment" become one of the most important dimensions of educational service quality, which has a significant impact on the evaluation of educational service quality and satisfaction, it means that increasing investment in lifestyle and medical facilities and improving students' life experience will have a multiplier effect on the evaluation of school educational service quality.

From the perspective of development strategy, whether higher vocational colleges should focus on the construction of hardware facilities at present, and improve the quality evaluation and school reputation with the best input-output ratio is worthy of further discussion and research.

From the perspective of development strategy, it is worth further discussion and research on whether higher vocational colleges should focus on their resources in the construction of hardware facilities and improve the evaluation and reputation with the optimal input-output ratio.

4.2.2 More attention should be paid to students' employment pressure and mental health

The demand of students' employment guidance and psychological counseling has independently become one of the dimensions of service quality of higher vocational education, which reflects that the Employment and mental health of young people have become the dominant problems that cannot be ignored in higher vocational colleges.

Higher vocational colleges should pay enough attention to the above problems. An employment service and mental health management organization should be set up, and a professional education management team should be deployed to provide students with high-quality career planning, employment recommendation, interview training, mental health education, psychological counseling and counseling, so as to improve students' mental health and ensure youth employment.

4.3 Extended Discussion

Comparative analysis shows that the evaluation of education service quality has the complexity of time-space evolution, and it is difficult to have a unified scheme of "one size fits all".

In order to ensure the scientificity and effectiveness of the evaluation scheme, a normalized evaluation mechanism should be developed to control the reasonable space-time range and maintain the consistency of the data with the same origin.

In the follow-up study, multi-time point data should be used for continuous tracking and verification, and the change rule of the evaluation elements of higher vocational education service quality in a certain period of time should be mined, so as to improve the adaptability and accuracy of the scale in the field of higher vocational education.

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