International Journal of Scientific Engineering and Science
Volume 3, Issue 11, pp. 54-58, 2019. ISSN (Online): 2456-7361

An Empirical Study on University Canteen Satisfaction Survey-A Case Study of Jiangsu University

Huang Wenjing
School of Finance and Economics, Jiangsu University, Zhenjiang 212013, People's Republic of China

Abstract*—*The Canteen of university is an important guarantee for the smooth development of teaching and scientific research. It concerns the immediate interests of students and the harmony and stability of universities and society. It has attracted widespread attention from all sides. This paper takes the canteen of Jiangsu University as an example, uses the data obtained from the questionnaire survey, and uses SPSS22.0 software to perform descriptive statistical analysis, factor analysis and regression analysis to evaluate the student's satisfaction with the canteen. The results show that students are generally satisfied with the canteen. The main factors that affect the satisfaction of the canteen are product quality, service quality, and canteen hardware. Finally, based on the conclusions of the analysis, some suggestions were made to improve the canteen work.

Keywords*—*University Canteen, Customer Satisfaction, Factor Analysis, Regression Analysis.

I. INTRODUCTION

Canteen is an important part of the logistics of universities. It provides catering services for university students to ensure their healthy growth. The management of university canteen naturally becomes the top priority in the logistics management. The vast majority of students live on campus, and their daily consumption in the canteen has become the most common consumption in their lives. Many studies have shown that the main consumption of students is dietary, and the vast majority of dietary consumption occurs in university canteen. In recent years, due to rising prices and rising labour costs, many canteens still face difficulties in operating after receiving relevant subsidies. At the same time, canteens of universities face the contradiction between public welfare of education and laws of the market economy, and the contradiction between increasing dining requirements of students and their limited economic conditions. In university, the most important thing for a student is to have a healthy body. Daily diet is especially important. Canteen should not only play a role in providing food, but also should ensure the nutrition and safety of student's diet and promote the health of student's life. Therefore, the quality of universities canteens and how satisfied students are with the canteen are directly related to the stability of the university.

Carrying out investigation and analysis of university students' satisfaction with the canteen can not only allow the canteen managers to understand the thoughts of consumers and needs of the canteen, help the canteen to better improve the management level, promote logistics self-construction, but also make the necessary improvements to the canteen through influencing factors Research. This paper analyses the students 'satisfaction with the university canteen, helps the university logistics managers to grasp the students' daily dining consumption situation, provides a theoretical basis for accurately understanding the students 'consumption concepts, and has practical significance for the university logistics department to better manage the canteen.

II. LITERATURE REVIEW

Cardozo (1965) was the first person to combine customer satisfaction with marketing, and his idea caused a lot of discussion in the theoretical world. Howard (1969) put forward that customer satisfaction is a kind of inner feeling that customers think of the value of buying a certain product. The benefits brought by buying a product are directly proportional to the price they pay.

Regarding the satisfaction of university canteens, Almanza et al. (1994) believed that the main factors affecting students' satisfaction with canteens were the quality of meals, the location of canteens, the hygiene of meals, and the price of meals. Meyer et al. (1998) conducted a study on a canteen in a middle school in United States, and believed that the main factors affecting the satisfaction of canteens are the aesthetics of the menu design, the appearance of the food, the delicious taste, the service attitude of the canteen staff, the price of the food, and the pleasant dining environment. Liu Rungang et al. (2013) conducted a survey on customer satisfaction in Changzhou University, and concluded that dining conditions, service quality, and canteen products need to be improved, and proposed targeted approaches. Liu Can et al. (2019) used a stratified cluster sampling method to conduct a questionnaire survey on 840 students in an university in Shanxi. They studied the level of university students' satisfaction with the canteen and its influencing factors. Han Dongxu and Ren Xiangzhao (2018) used a sample of students in a university in Tianjin to verify the impact mechanism on the satisfaction of the university canteen from the aspects of quality, economy, environment and service.

Judging from the current situation of customer satisfaction about canteen, there are two major problems: First, the evaluation of the school canteen's satisfaction and the index system are incomplete, and some key indicators are lacking;

second, the evaluation method is relatively simple, just simple Weighted, and no factor analysis or structural equation model is used for analysis.

III. Questionnaire Design and Survey

According to the research purpose of this paper, the questionnaire mainly investigates the various factors that affect students' satisfaction with university canteens. The questionnaire includes the following three parts. The first part is the basic information of the respondent, mainly including gender, grade, average monthly living expenses, and the number of consumptions in canteens each week. This part aims at better understanding the consumption situation and consumption needs of customers with different characteristics in the canteen. The second part specifically surveys the satisfaction of the school canteen, which is the main part of the questionnaire, including thirteen Indicators: meal price, meal type, meal taste, meal size, meal freshness, meal hygiene, staff attitude, queuing time, dining environment, business hours, tableware situation, canteen location, employee hygiene. According to the Likert scale, the perception of each indicator is divided into: very satisfied, satisfied, generally satisfied, dissatisfied, and very dissatisfied, and assigned 5 points, 4 points, 3 points, 2 points, and 1 point respectively. The third part is an open-ended question, the purpose of which is to ask students' suggestions for university canteens for the final analysis and conclusion.

For the sample collection, the students in Jiangsu University were selected as the survey objects. The relevant questionnaire design website was used to distribute the designed online questionnaires. A total of 200 questionnaires were retrieved, of which 187 were valid questionnaires, with an effective rate of 93.5%.

IV. Analysis of Customer Satisfaction in University Canteen

4.1 Descriptive Statistical Analysis

Descriptive statistical analysis of the questionnaire was conducted to discover its internal laws, and further analysis was performed accordingly. Descriptive statistical analysis is to analyze the various characteristics of a set of data and describe the various characteristics of the measurement sample and the characteristics of the overall population it represents. This paper uses SPSS22.0 software to carry out statistical analysis on the obtained questionnaire data, and obtains the approximate situation of the sample.

4.1.1 Sample description

The sample description is a general analysis of the students' gender, grade, average monthly living expenses and the number of weekly consumption in the canteen. The purpose is to understand the composition of students dining in the canteen of Jiangsu University. The sample structure is shown in Table 1 below.

It can be seen from Table 1 that among the 187 valid questionnaires recovered, the proportion of men and women surveyed is close, of which 56.1% are men and 43.9% are women. The distribution of education is mainly undergraduate and graduates are the minority. In terms of expenditure distribution, there are more people who spend 1,000 to 1,500 RMB, accounting for 46.5%, and those who spend 1500 to 2,000 RMB are second, accounting for 32.6%. In terms of the number of canteen consumption, "15-21 times a week" account for the vast majority, accounting for 62.5%, which indicates that the daily meals of students are still dominated by canteen consumption.

TABLE 1. Sample statistics

Type	Item	Quantity	Percentage
Gender	Male	105	56.1%
	Female	82	43.9%
Grade	Freshman	33	17.6%
	Sophomore	59	31.6%
	Junior	52	27.8%
	Senior	26	13.9%
	Postgraduate	17	9.1%
Average monthly living expenses	1000RMB below	16	8.6%
	1000-1500RMB	87	46.5%
	1500-2000RMB	61	32.6%
	2000RMB above	23	12.3%
Number of weekly consumption in canteens	0-7	8	4.3%
	8-14	57	30.5%
	15-21	122	65.2%

4.1.2 Descriptive statistical analysis of satisfaction

It can be seen from Table 2 below that among the 13 observation indicators, the sample average does not exceed 4 or is less than 2, that is, there is no satisfaction or very satisfaction and dissatisfaction or very dissatisfaction. Among them, the average value of food prices, types of food, taste of food, and queuing time is low, indicating that students are not satisfied with these factors. Among all the observation indicators, the average of 4 items is below 3 points, and the rest are above 3 points, but the highest is only 3.39 points, which indicates that the student's satisfaction with the university canteen is not high, at most it is only general satisfaction. There is still much room for improvement in all aspects of the canteen.

TABLE 2. Descriptive statistical results of satisfaction

Indicator	Min	Max	Average	SD
Price	1	5	2.98	0.963
Type	1	4	2.86	0.923
Taste	1	4	2.7	0.851
Size	1	5	3.13	0.916
Freshness	1	5	3.11	1.021
Meal Hygiene	1	5	3.16	1.005
Staff Attitude	1	5	3.18	0.993
Queuing Time	1	5	2.95	0.98
Dining Environment	1	5	3.07	0.988
Business Hours	1	5	3.32	1.046
Tableware Situation	1	5	3.2	1.034
Canteen Location	1	5	3.39	1.056
Employee Hygiene	1	4	3.16	0.848
Overall Satisfaction	1	4	3.14	0.796

4.2 Analysis of the Validity of the Questionnaire

4.2.1 Reliability analysis

Reliability analysis is to keep the method uniform and repeat the measurement on the same object to determine the consistency of the obtained results. Reliability analysis is a

commonly used analytical method to test the validity of questionnaires. The reliability analysis of the questionnaire includes internal reliability analysis and external reliability analysis. Internal reliability is used to measure internal consistency between the detected indicators. The higher the internal consistency, the greater the reliability of the results obtained.

The reliability test in this paper mainly tests the internal reliability; using Cronbach's α reliability coefficient as the measurement basis. The value of α coefficient ranges from 0 to 1. The closer the α coefficient is to 1, the stronger the reliability and the greater the internal consistency. Generally speaking, when the α coefficient is higher than 0.7, the reliability is high. When it is lower than 0.5, it is best to consider redesigning the questionnaire. The overall Cronbach's α value of the canteen satisfaction questionnaire in this paper is 0.931, which meets the reliability conditions of the questionnaire, indicating that the internal consistency and stability of the overall variables of the questionnaire are good.

4.2.2 Validity analysis

Validity, that is, effectiveness, is the most basic indicator of the questionnaire and is divided into three types: content validity, criterion validity, and structure validity. When evaluating validity, content validity and criterion validity are generally not evaluated, because criteria are difficult to determine, and structure validity is usually evaluated. KMO and Bartlett spherical tests are usually used to measure structural validity, and these indicators are used to test the suitability of factor analysis. A KMO value of 0.9 or above indicates that it is very suitable; between 0.8 and 0.9 indicates that it is suitable; between 0.7 and 0.8 indicates that it is acceptable; 0.6 indicates that it is not suitable; and 0.5 or less indicates that it is extremely unsuitable. Bartlett's spherical test is used to detect whether the variables are independent. When the significance is less than 0.05, it indicates that the variables have significant correlation, which is suitable for factor analysis.

The SPSS 22.0 was used to perform KMO and Bartlett spherical tests on 13 observational indicators obtained from the canteen satisfaction survey of Jiangsu University. The results are shown in Table 3 below. It can be seen from Table 3 that the overall KMO value of the questionnaire is 0.868. The canteen satisfaction questionnaire has a high structural validity and is suitable for factor analysis. At the same time, the chi-square statistical value of the Bartlett spherical test is significant, which is less than 0.05. It also shows that the questionnaire overall scale is suitable for factor analysis.

TABLE 3. KMO and Bartlett spherical test results

	KMO measure of sample adequacy	0.868
Bartlett spherical test	**Approximate chi-square**	466.080
	Df	78
	Significance	0.000

4.3 Building a Satisfaction Model

This paper uses factor analysis to establish a satisfaction model. According to the reliability and validity test results of the questionnaire, we know that the data collected by the questionnaire is suitable for factor analysis. SPSS 22.0 was used to perform factor analysis on each of the observation indicators of the canteen in the questionnaire. As shown in Table 4, the first 3 factors can explain the total variance of 70.774% of the original 13 observation indicators, so these 3 factors are retained.

TABLE 4. Total variance explained

Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	7.19	55.373	55.373	7.198	55.373	55.373	3.114	23.954	23.954
2	1.05	8.124	63.497	1.056	8.124	63.497	3.047	23.442	47.396
3	0.94	7.278	70.774	0.946	7.278	70.774	3.039	23.378	70.774

TABLE 5. Factor load matrix after rotation

Variables	**Indicators**	F_1	F_2	F_3
Product quality	Price	0.023	0.488	0.675
	Type	0.439	0.238	0.703
	Taste	0.424	0.024	0.789
	Size	0.039	0.489	0.7
service quality	Freshness	0.607	0.292	0.407
	Meal Hygiene	0.715	0.394	0.163
	Queuing Time	0.67	0.142	0.461
	Dining Environment	0.785	0.237	0.046
Canteen hardware	Dining Environment	0.325	0.608	0.48
	Business Hours	0.248	0.765	0.21
	Tableware Situation	0.465	0.594	0.261
	Canteen Location	0.334	0.786	0.153
	Employee Hygiene	0.547	0.520	0.453

The maximum load variance method is used to perform orthogonal rotation on the factor load matrix to obtain the rotated factor load matrix as shown in Table 5. It can be seen from Table 5 that the 13 items corresponding to the satisfaction indicators of the canteen in Jiangsu University fall within three different factors, and are named as: product quality, service quality, and canteen hardware. According to the factor load after rotation, the product quality includes 4 observation indicators, mainly meal price, meal type, meal taste, and meal size; the service quality includes the freshness of the meal, the hygiene of the meal, the attitude of the staff, and the queue time; the canteen Hardware includes dining environment, business hours, tableware, canteen location, and employee hygiene.

In order to calculate the satisfaction score of each student for the university canteen, regression analysis was used to estimate the factor score coefficient. Use SPSS22.0 to calculate the factor score coefficient matrix, and combine the factors in Table 4 to explain the total variance of the original variables to calculate a comprehensive score model for each student's satisfaction with the canteen:

$$F = (0.23954 * F_1 + 0.23442 * F_2 + 0.23378 * F_3) / 0.70774$$

The satisfaction score of each student can be calculated

from the above equation, and the statistical results are shown in Table 6. It can be seen from Table 6 that students' satisfaction with the university canteen is not high. More than half of the students feel dissatisfied and only 25.1% of students feel generally satisfied.

TABLE 6. Satisfaction score statistics

Score	Quantity	Percentage (%)
$F \leq 2$ (very dissatisfied)	7	3.7
$-2 < F < 0$ (dissatisfied)	101	54.0
$0 \leq F < 2$ (generally satisfied)	47	25.1
$2 \leq F < 3$ (satisfied)	23	12.3
$F \geq 3$ (very satisfied)	9	4.9

In order to find the decisive factors that affect students' satisfaction with the university canteen, using SPSS22.0 software, the three factors obtained through factor analysis of the canteen satisfaction survey results were used as independent variables, and overall satisfaction was used as the dependent variable for linear regression analysis. The analysis results are shown in Table 7 below. It can be seen from the regression results that the adjusted R square is 0.749, which indicates that the regression equation has a good fit. The significant probability value corresponding to the F value is 0.000 less than 0.01, which indicates that the overall regression effect has reached a significant level, and the overall stability and reliability of the regression equation is high. At the same time, it can be seen from the VIF that the variance expansion factor is less than 10, indicating that there is no co-linearity between the three factors and will not affect the regression coefficient. The resulting regression equation is:

Overall Satisfaction = 0.375 * Service Quality + 0.297 * Canteen Hardware + 0.504 * Product Quality + 3.143

TABLE 7. Regression results

Adjusted R^2	0.749		**F**	55.625	**Sig.**	0.000	
Independent Variable	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**Collinearity Statistics**	
	B	**Std. Error**	**B**			**Tolerance**	**VIF**
(Constant)	3.143	0.053		58.935	.000		
Service Quality	0.375	0.054	0.471	6.97	.000	1.000	1.000
Canteen Hardware	0.297	0.054	0.374	5.528	.000	1.000	1.000
Product Quality	0.504	0.054	0.633	9.367	.000	1.000	1.000

V. CONCLUSION AND SUGGESTION

Descriptive statistical analysis, factor analysis, and regression analysis show that students' satisfaction with the university canteen is not high. The main factors affecting satisfaction include product quality, service quality, and canteen hardware. From the regression equation above, it can be seen that the product quality coefficient has the largest impact on the overall satisfaction of the canteen, followed by the quality of service, and the smallest impact on the canteen hardware. In order to improve the management level of the university canteen and effectively improve the student's satisfaction with the university canteen, work can be strengthened from the following aspects.

First, we must attach importance to students' opinions and communicate more with students. The university canteen satisfaction survey not only can learn the specific satisfaction level of students for various indicators, but also can specifically promote the canteen to summarize and improve its own management. If feedback to the students on the problems found in the satisfaction survey can be rectified, the students' enthusiasm for suggestions will be improved, and a healthy development will be formed. Only by forming a good communication mechanism can students be able to correctly grasp the evaluation standards, provide information objectively, and make effective suggestions.

Second, improve the quality of diet products. From the analysis of the survey results, we know that product quality has the greatest impact on canteen satisfaction, but student satisfaction with this factor is the lowest. Therefore, universities should provide diversified food services to meet the needs of students at different levels. The price of the canteen should not be too high. When the canteen is profitable, it is necessary to consider the affordability of the students' economics, because they have no financial resources, and mainly rely on their parents. The canteen should provide diversified food services to enrich the variety of meals, such as adding some spicy dishes, and adding staple food such as porridge, rice, noodles, and flour.

Third, enhance staff's overall quality and service awareness. The canteen employees directly serve the students, such as cooking and cleaning tableware, so the service level and quality of these employees directly affect the student's satisfaction with the canteen. The canteen should strengthen the education and training of employees, improve the employee assessment mechanism, clearly distinguish between rewards and penalties, mobilize the enthusiasm of employees, increase the speed of service, improve service attitude, and impress service awareness.

Fourth, improve the hardware facilities of the canteen. To improve students' satisfaction with the canteen, they must not only update the old catering kitchenware and equipment, improve the dining environment, add televisions, air conditioners and other facilities, rationalize the functional area of the canteen, strengthen the cleanliness of the halls and tableware, but also pay attention to the quality and hygiene of the canteen products, starting from the details and improving from the needs of students. At the same time, a significant feature of the university canteen is that meals are concentrated. Therefore, the opening time of the canteen should be reasonably arranged and add credit card machines. Staff should be added to avoid the disorder of the order when students concentrate on meals.

REFERENCES

[1] Gao Qing. Statistical Analysis of Influencing Factors of Public Service Satisfaction [J]. Soft Science, 23 (2): 80-84, 2009.

[2] Li Yingdan, Cao Ying, Liu Haixia. Analysis of Influencing Factors of Satisfaction of University Canteen Based on SEM [J] .Statistics and Consulting, (03): 53-55, 2015.
[3] Liao Ruling. Exploration and Practice of Scientific Management of Canteen Work under the Socialization of University Logistics [J] .University Logistics, (06): 34-36, 2016.
[4] Cardozo, Richard N. An Experimental Study of Consumer Effort, Expectation and Satisfaction [J]. Journal of Marketing Research, (8): 244-249, 1965
[5] Howard John A, Jagdish N Sheth. The theory of buyer behavior. New York Wiley.PP27-28, 1969
[6] Almanza, B.A., Jaffe, W., & Lin, L. Use of the Service Attribute Matrix to Measure Consumer Satisfaction[J]. Hospitality Research Journal. 17(2): 63-75, 1994.
[7] Meyer, M. K. Students' Satisfaction with Middle/Junior High School Foodservice Vice and Nutrition Programs [J], Journal of the American Dietetic Association. 9(9):105, 1998
[8] Han Dongxu, Ren Xiangzhao. Survey on Satisfaction of University Canteens and Analysis of Countermeasures——a case study of a University in Tianjin [J] .Modern Business, (18): 186-188, 2018.
[9] Singh.Understanding the Structure on Consumer Satisfaction Evaluation of Service Delivery[J]. Journal of the Academy of Narketing, pp. 223-234, 1991.
[10] David Marshall, Rick Bellb. Meal constructi on: exploring the relationship between eating occasion and location [J]. Food Quality and Preference, 14: 53-64, 2003.