Full Length Research Paper

Evaluating administrative service quality of elementary schools: A case study of remote rural area in Taiwan

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The main purpose of this paper is to use the importance-performance analysis (IPA) approach to empirically evaluate the administrative service quality (ASQ) of elementary schools based upon the teachers' perspective at remote rural area in Taiwan. At first, the fifty preliminary ASQs of elementary schools are summarized to design a questionnaire. Then, the IPA approach in conjunction with this questionnaire survey is performed to assist with the main issue. Study results show that eleven ASQs are classified as 'concentrate here' in quadrant 2; whereas the top five ASQs are highly suggested to be improved, including 'there are not plentiful and clean toilets;' 'there are not plentiful books in a library;' 'there are not complete sport and play facilities;' 'there is no convenient and sanitation facilities of drinking water;' and 'the lunch is not delicious and nutritious,' respectively. Furthermore, the results show that the elementary schools should listen attentively to the voice of customer to focus on improving these ASQs of customer requirements. It is suggested that more attentions should be paid to exploit these customer requirements effectively and then develop the profiles of solutions, which should continuously strengthen the perspective of teachers.

Key words: Importance-performance analysis (IPA) approach, administrative service quality, elementary schools.

INTRODUCTION

The role played by schools in Taiwan during early times was mainly 'education program provider.' However, the general conception towards social and education become more open-minded along with the fast changing environment, the standard of service quality delivered by service industry increased accordingly; instead of being satisfied with teaching services provided by school, students' parents actually demand school to deliver diverse education related services. Moreover, the low birth rate has become widely accepted, academic program expected by parent tends to be elite-oriented development, the demand for a comprehensive service quality provided by school therefore is even higher at present. In terms of overall service quality improvement and service efficiency, apart from appropriate hardware and software supposed to be supplied by school, how to combine school administrative functions (for example, academic, student affairs, general affairs and counseling), is in fact an important issue in educational domain (Chen and Yang, 2003; Cheng, 2007; Ting, 2009).

Ting (2009) and Cheng (2007) believe that in order to examine service quality of school, it is necessary to consider school education as one of the service industries. Service providers and customers are two major characters in school service industry. Other roles include the principal, teachers, administration employee and relevant technicians. The principle and administrative directors are classified as high/middle administrators. Teachers are the main providers of educational activity as well as the receivers of school administrative service. Administrative employee and relevant technicians are assistants in school service performance. As to students, students' parents, social people and enterprise sponsors are regarded as external customers, among them, students and their parents are considered as receivers and important influencers of education program and administration service. Social people and enterprise sponsors are categorized as school supervisors.

A research finding established by numerous documentations (Andreassen, 2001; Boulding et al., 2005; Chou et

al., 2009; Disney, 1999; Karande et al., 2007; Kotler, 2000; Lin, 2010; Lovelock and Wirtz, 2011; Lu and Wu, 2010; Lu et al., 2009; Wu et al., 2008) focusing on various industries studies indicate that customer satisfaction is experience accumulation once the demand for service quality has been met, whereas the service quality is the factor of customer satisfaction, and a significant correlation is shown between customer satisfaction and service quality. Based on the gap analysis model (that is, the PZB model developed by three scholars, Parasuraman et al., 1985, 1988), the superior or inferior quality is decided by the gap between expected service (ES) and perceived service (PS), while the source of service quality can be analyzed through the PZB model, and the administrator is thus allowed to have assistance for effectively improving service quality.

As a service provider, the service quality of itself must be improved, that is to say, to evaluate service quality level of one's own is essential above all, the important factors influencing service quality are required to be identified, followed by taking appropriate measures or strategies to improve service quality.

This issue must be highly concerned by service industry. In the viewpoint of customer, there are at least three types of perceived quality produced by various service quality offered by service provider (Grönroos, 2000), including: (1) high quality (that is, ES > PS); (2) acceptable quality (that is, ES = PS); and (3) bad quality (that is, ES < PS). The case of (1) and (2) are produced as perceived qualities, such service quality should be 'maintained;' however, when perceived quality (3) is produced, showing that such service quality should be 'improved.' Consequently, how to assess if the service quality provided by service providers meets requirements of the customers will be the research motivation of this research.

For measuring the service quality of school administration, school teachers are taken by this study as the first research targets, in order to facilitate the examination for recognizing if various attributes of administrative service quality (ASQ) are valued by customers? Or if they are factors for improving school service. For that reason, this study intends to apply the conception of importance-performance analysis (IPA) approach introduced by Martilla and James (1977) for carrying out analysis. The IPA approach is a useful method to evaluate service quality (Ennew et al., 1993; Huang et al., 2009; Leong, 2008; Wu et al., 2010; Yu and Shen, 2011). Since the importance level resulted from the IPA analysis signifies the importance of attribute evaluated by policy maker, and satisfaction indicates current performance status level and attitude of such attribute evaluated by policy maker. This paper hence intends to identify and summarize which are the ASQs valued by school through empirical investigation? Which are the important ASQs that must be maintained or improved?

To sum up, for determining if the concept of this study is sufficient to successfully operate, this study plans to take elementary schools in remote rural area as research targets to perform empirical investigation of aforesaid issue. Specifically, the research purpose of this paper is to apply the IPA approach in measuring ASQs of elementary schools in Taiwan remote rural area.

MATERIALS AND METHODS

Some of the concepts used in this paper are briefly introduced. These include the preliminary ASQs, and the IPA approach.

Preliminary ASQs

As salient features of service quality include intangible, simultaneous occurrence of produce and consumption, perishability and heterogeneity, it is even more difficult to be evaluated than quality of tangible product. Nevertheless, lots of researchers overcome different obstacles and present various measurement models. Among others is the PZB model introduced by Parasuraman et al. (1985), and ten service quality dimensions have been developed, namely, tangibility, reliability, responsiveness, competence, courtesy, credibility, security, access, communication, and understanding, respectively. According to PZB model, service quality is the gap between service expected service and service perceived of customer during service transmission offered by service provider. Later, Parasuraman et al. (1988) simplified the PZB model and developed the SERVQUAL scale as well as five service quality dimensions, which are, tangibility, reliability, responsiveness, assurance, and empathy, respectively. Afterwards, Cronin and Taylor (1992) presented the SERVPERF scale as service measurement tool based on service performance. With the same opinion, Ting (2009) considers that the SERVPERF is superior to other models in evaluating school service quality.

The SERVQUAL model is one of the applicable models of measuring service quality; hence, this study uses this framework to obtain the preliminary ASQs of elementary schools in Taiwan. While interviewing the school principals and related administrators, a list of preliminary ASQs, as shown in Table 1, has been discussed and made known in academic publications and related literature review (Chen and Yang, 2003; Chen, 2008, 2009; Cheng, 2007; Ting, 2009; Wu, 2004, 2007).

The IPA approach

The systematic steps of evaluating schools' ASQs by using the IPA approach to be taken are described thus.

Step 1: Evaluate the degrees of importance and satisfaction of ASQs. Let x_j^h and y_j^h, $j = 1, 2, \ldots, m; \quad h = 1, 2, \ldots, n,$ be the importance value and satisfaction value, measured by Likert's 5-point scale, given to the jth ASQs by the hth teacher (decision-maker, DM), respectively. It can be expressed as $1 \leq x_j^h \leq 5$ and $1 \leq y_j^h \leq 5$.

Step 2: Integrate the opinions of all DMs by using the geometric mean technique, which is more effective in representing the multiple DMs' consensus opinions (Saaty, 1980). In this paper, we use this concept to aggregate all information generated by the questionnaires. Let I_j and P_j denote the consensus opinion evaluation values of importance and satisfaction of ASQs, respectively; then

Table 1. ASQs of elementary schools in Taiwan.

Dimension	Elementary schools' ASQs
Tangibility	Modern educational facilities (A1) A library with plentiful books (A2) Complete sport and play facilities (A3) Convenient and sanitation facilities of drinking water (A4) Green and beautiful campus environment (A5) Plentiful and clean toilets (A6) Free access for the disabled (A7) Well waste sorting and recycling, clean and comfortable campus (A8) Clean working environment (A9) Complete working facilities (computers, printers, copy machines, etc.) (A10) Clear administrative procedure (A11) Complete school website (A12) Delicious and nutritious lunch (A13) Neat and tidy faculty (A14)
Reliability	Correct and updated information (A15) Explicit schedule and certain practice (A16) Updated website information (A17) Well keep various archives/documents (A18) Be sure to check randomly student homework (A19) Perform thoroughly the resolutions made by various executive meetings (A20) Provide various forms of administrative operations (such as applications, registration, etc.) (A21) Register correctly the personnel services (salaries, insurance, leave, etc.) (A22) Implementation systematically health care services (A23) Administrative service are worthy of teachers staff's trust (A24)
Responsiveness	Quickly and explicitly handle suggestions put forward by teacher / student (A25) Effectively handle contingencies at the first time (e.g., injured students) or any emergency (A26) Immediately handle any shortage or recovery damaged facilities (A27) Administrative staff is able to quickly respond to any issue in detail (A28) Communication skills and EQ performance of each department / unit staff (A29) Flexibly and correctly handle administrative issue (A30) Offer assistance in organizing business trip and substitute / transfer (A31)
Assurance	Campus safety (A32) Department / unit staff is capable of responding teachers' concerns with expertise (A33) Attitude of staff delivering service (A34) Assist teacher progress professionally by using resources (A35) Respect teaching autonomy of teaching (A36) Plan training / study programs based on teachers' needs (A37) Offer teacher the information regarding curriculum design and teaching materials compiling (A38) Support teacher to develop teaching program and follow teaching schedule (A39) Encourage teacher to use various teaching methods and multiple assessment approaches (A40) Continuously review and improve service quality (A41) Assist the arrangement of internal / external competition and provide support (A42)
Empathy	Arrange self-strengthening activities, organize recreational activities for faculty and staff (A43) Department / unit staff took the initiative to communicate with teacher (A44) Listen and recognize the inner voice of teacher (A45) Offer channel for teacher to easily contact department / unit staff (A46) Arrange parent-teacher seminars and home visit (A47)

Table 1. Contd.

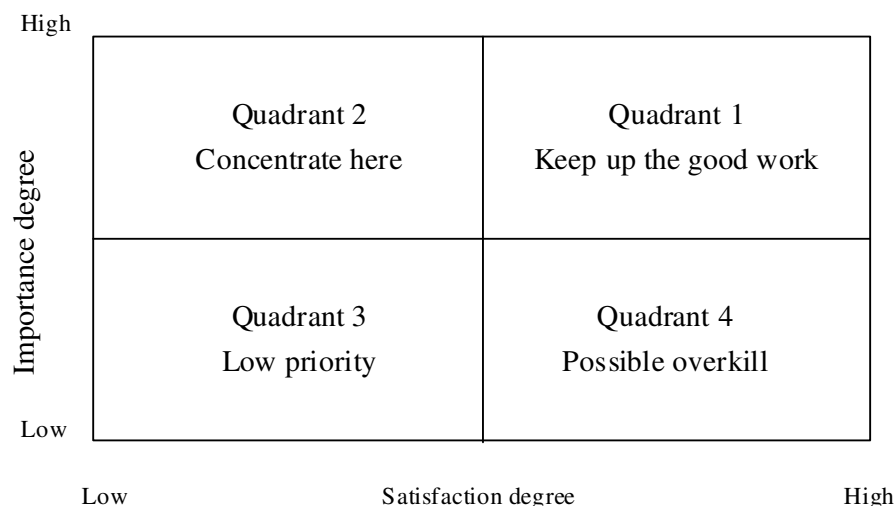|	
Empathy	Encourage the participation in various competitions and offer rewards (A48)
	Encourage job training courses for self-enrichment (A49)
	Department / unit staff can recognize the hard work paid by teaching group (A50)

The codes are shown in the parentheses.

Figure 1. The importance-performance matrix. P.(2/3)

then I_j and P_j can be represented by $I_j = \left(\prod_{h=1}^{n} x_j^h \right)^{1/n}$ and $P_j = \left(\prod_{h=1}^{n} y_j^h \right)^{1/n}$, respectively.

Step 3: Set up the threshold values (TVs). In this paper, the TV of importance (that is, first TV) and the TV of satisfaction (i.e. second TV) of all questionnaires are calculated by the arithmetic mean of all m ASQs (Lu and Wu, 2010). That is, the first and second TVs are $I_t = \sum_{j=1}^{m} I_j \Big/ m$ and $P_t = \sum_{j=1}^{m} P_j \Big/ m$, respectively.

Step 4: Plot the relative position of all ASQs as shown in Figure 1. The figure is plotted in a two-dimensional matrix, which is composed by 'keep up the good work' (in quadrant 1), 'concentrate here' (in quadrant 2), 'low priority' (in quadrant 3), and 'possible overkill' (in quadrant 4). That is:

i. The quadrant 1 represents the importance and satisfaction values are relatively higher than first and second TVs. That means the ASQs in this quadrant should be 'kept up the good work.' The setting up standard of this quadrant is $I_j \geq I_t$ and $P_j \geq P_t$, respectively. This quadrant 1 is the place of competitive advantage for elementary schools.

ii. The quadrant 2 represents the importance value is higher than first TV, but the satisfaction value is lower than second TV. That means the ASQs in this quadrant should be 'concentrated here.' The setting up standard of this quadrant is $I_j > I_t$ and $P_j < P_t$, respectively.

iii. The quadrant 3 represents the importance and satisfaction values are lower than first and second TVs. That means the ASQs in this quadrant is 'low priority.' The setting up standard of this quadrant is $I_j < I_t$ and $P_j < P_t$, respectively.

iv. The quadrant 4 represents the importance value is lower than first TV, but the satisfaction value is higher than second TV. That means the ASQs in this quadrant is 'possible overkill.' The setting up standard of this quadrant is $I_j < I_t$ and $P_j > P_t$, respectively. Some resources of this quadrant can be transferred to the improved place for elementary schools.

Step 5: Obtainment of voice of customer (VOC) aims to calculate the weights of customer demands. Based on the study of Wu et al. (2008), the gap between the importance and satisfaction values of the jth ASQ is multiplied by the importance value of the jth ASQ. Then, we can obtain the original weights for the jth ASQ. For being convenience to analyze, the original weights can be normalized to obtain the standardized weights of all ASQs. The ranking order of improvement of ASQs in elementary schools can be determined. That is, the original weight of the jth ASQ is $OW_j = (I_j - P_j) \times I_j$, the standardized weight is:

$$SW_j = \frac{OW_j}{\sum_{j=1}^{m} OW_j},$$

Table 2. Basic statistics data.

Item	Option	Frequency	Percentage
Gender	Male	30	36.14
	Female	53	63.86
	21-30	13	15.66
	31-40	54	65.06
Age (years old)	41-50	14	16.897
	51-60	2	2.40
	>65	0	0
	Bachelor or associate degree	57	68.67
Education	Master degree	26	31.33
	Ph.D degree	0	0
	1-5	14	16.87
	6-10	36	43.38
	11-15	16	19.28
Seniority (years)	16-20	7	8.43
	21-25	5	6.02
	>25	5	6.02
	Teacher as well as department head	8	9.64
	Teacher as well as group leader	20	24.10
Position	Grade school advisers	46	55.42
	Appointed teacher	9	10.84

Where, $0 \leq SW_j \leq 1, \ \sum SW_j = 1$

CASE STUDY

Questionnaire and data collection, and the IPA results are surveyed as follows:

Questionnaire and data collection

The questionnaire content aims to assess the importance and satisfaction of the fifty ASQs, as shown in Table 1. In order to examine whether the fifty ASQs are valued by the teachers of elementary schools at remote rural area in Taiwan, and whether they are factors that require improvement. The questionnaire of this study was based on a Likert 5-point scale, ranging from 1 for "very unimportant" (strongly dissatisfied) to 5 for "very important" (strongly satisfied).

Regarding the reliability analysis of the questionnaire, the Cronbach's α of the importance and satisfaction of the ASQs were 0.834 and 0.861, respectively, indicating good consistency of the questionnaire. As to validity analysis, the items in the questionnaire were based on academic literature and expert opinions; thus, the questionnaire content had a certain degree of content validity. The total score was subtracted by the score of individual items, the new total-item correlation coefficient was 0.3, which was significant and indicated good construct validity. Since the correlation coefficients of items in this questionnaire were 0.513 to 0.826, they were significant and indicated good construct validity.

The questionnaire survey was carried out from November to December, 2010. In order to increase the return rate and representativeness of the questionnaire, the subjects were taken from several elementary schools and based on the perspective of teachers. A total of 105 questionnaires were distributed, and 83 effective samples were returned, for a valid return rate of 79.1%. Basic information in the questionnaire survey is reorganized in Table 2.

As shown in Table 2, males account for 36.14% and females 63.86%; most participants are 31 to 40 years old (65.06%); most graduated from college or university (68.67%); most are employed 6 to 10 years (43.38%), followed by 11 to 15 years (19.28%); most are grade school advisers (55.42%).

The results of IPA approach P. (1/3)

The results and processes are shown in Table 3. In summary, some important results raised are described further.

For the importance degree, the top five important ASQs

Table 3. The IPA results and the VOC.

Code	Geometric mean				The IPA results	VOC		
	Importance	Rank	Satisfaction	Rank		Original weights	Standardized weights	Rank
A1	4.435	16	3.669	26	Q 1	3.396	0.022	17
A2	4.485	12	3.059	48	Q 2	6.396	0.042	**2**
A3	4.336	22	2.988	50	Q 2	5.844	0.038	**3**
A4	4.751	1	3.538	38	Q 2	5.762	0.038	**4**
A5	4.358	21	3.662	27	Q 1	3.029	0.020	24
A6	4.646	3	3.035	49	Q 2	7.488	0.049	**1**
A7	4.304	28	3.542	37	Q 3	3.281	0.021	19
A8	4.471	13	3.660	28	Q 1	3.629	0.024	13
A9	4.231	37	3.355	46	Q 3	3.706	0.024	12
A10	4.634	4	3.649	30	Q 2	4.565	0.030	7
A11	4.334	23	3.686	24	Q 4	2.811	0.018	28
A12	4.226	38	3.708	21	Q 4	2.190	0.014	37
A13	4.490	11	3.424	45	Q 2	4.789	0.031	**5**
A14	4.082	49	3.910	6	Q 4	0.70	0.005	49
A15	4.495	10	3.633	31	Q 2	3.878	0.025	10
A16	4.520	9	3.866	7	Q 1	2.953	0.019	25
A17	4.217	39	3.695	22	Q 4	2.203	0.014	35
A18	4.291	30	3.843	8	Q 4	1.923	0.013	42
A19	4.088	48	3.945	4	Q 4	0.587	0.004	50
A20	4.275	32	3.826	10	Q 4	1.920	0.013	43
A21	4.155	44	3.754	16	Q 4	1.668	0.011	45
A22	4.568	5	4.090	1	Q 1	2.185	0.014	38
A23	4.395	19	3.834	9	Q 1	2.464	0.016	31
A24	4.427	18	3.689	23	Q 1	3.267	0.021	20
A25	4.523	8	3.722	19	Q 1	3.625	0.024	14
A26	4.713	2	4.056	2	Q 1	3.095	0.020	23
A27	4.309	26	3.536	40	Q 3	3.334	0.022	18
A28	4.314	25	3.585	35	Q 3	3.147	0.021	21
A29	4.430	17	3.469	44	Q 2	4.257	0.028	8
A30	4.379	20	3.522	42	Q 2	3.754	0.025	11
A31	4.463	14	3.966	3	Q 1	2.218	0.015	34
A32	4.560	6	3.775	14	Q 1	3.577	0.023	15
A33	4.273	33	3.673	25	Q 4	2.562	0.017	30
A34	4.334	23	3.772	15	Q 4	2.436	0.016	32
A35	4.265	34	3.713	20	Q 4	2.353	0.015	33
A36	4.560	6	3.533	41	Q 2	4.682	0.031	6
A37	4.237	36	3.608	34	Q 3	2.663	0.017	29
A38	4.143	45	3.463	43	Q 3	2.819	0.018	27
A39	4.137	46	3.610	33	Q 3	2.180	0.014	39
A40	4.201	42	3.737	18	Q 4	1.950	0.013	41
A41	4.179	43	3.653	29	Q 4	2.199	0.014	36
A42	4.308	27	3.585	35	Q 3	3.112	0.020	22
A43	3.920	50	3.741	17	Q 4	0.703	0.005	48
A44	4.209	41	3.537	39	Q 3	2.829	0.019	26
A45	4.293	29	3.309	47	Q 3	4.222	0.028	9
A46	4.265	34	3.789	11	Q 4	2.029	0.013	40
A47	4.121	47	3.786	12	Q 4	1.382	0.009	47
A48	4.214	40	3.785	13	Q 4	1.806	0.012	44
A49	4.281	31	3.901	5	Q 4	1.629	0.011	46

Table 3. Contd.

A50	4.441	15	3.629	32	Q 2	3.450	0.023	16
TVs	4.345		3.650					

Q1: quadrant 1; Q2: quadrant 2; Q3: quadrant 3; Q4: quadrant 4; TVs: threshold values.

are convenient and sanitation facilities of drinking water (A4), effectively handle contingencies at the first time or any emergency (A26), plentiful and clean toilets (A6), complete working facilities (A10), and register correctly the personnel services (A22), respectively.

For the satisfaction degree, the top five satisfactory ASQs are register correctly the personnel services (A22), effectively handle contingencies at the first time or any emergency (A26), offer assistance in organizing business trip and substitute / transfer (A31), be sure to check randomly student homework (A19), and encourage job training courses for self-enrichment (A49), respectively.

Eleven ASQs in quadrant 1 'kept up the good work' include modern educational facilities (A1), green and beautiful campus environment (A5), well waste sorting and recycling, clean and comfortable campus (A8), explicit schedule and certain practice (A16), register correctly the personnel services (A22), implementation systematically health care services (A23), administrative service are worthy of teachers staff's trust (A24), quickly and explicitly handle suggestions put forward by teacher/student (A25), effectively handle contingencies at the first time or any emergency (A26), offer assistance in organizing business trip and substitute/transfer (A31), and campus safety (A32), respectively.

Eleven ASQs in quadrant 2 'concentrate here' include a library with plentiful books (A2), complete sport and play facilities (A3), convenient and sanitation facilities of drinking water (A4), plentiful and clean toilets (A6), complete working facilities (A10), delicious and nutritious lunch (A13), correct and updated information (A15), communication skills and EQ performance of each department / unit staff (A29), flexibly and correctly handle administrative issue (A30), respect teaching autonomy of teaching (A36), and department / unit staff can recognize the hard work paid by teaching group (A50), respectively.

Ten ASQs in quadrant 3 'low priority' include free access for the disabled (A7), clean working environment Clean working environment (A9), immediately handle any shortage or recovery damaged facilities (A27), administrative staff is able to quickly respond to any issue in detail (A28), plan training / study programs based on teachers' needs (A37), offer teacher the information regarding curriculum design and teaching materials compiling (A38), support teacher to develop teaching program and follow teaching schedule (A39), assist the arrangement of internal / external competition and provide support (A42), department / unit staff took the initiative to communicate with teacher (A44), and listen

and recognize the inner voice of teacher (A45), respectively.

Eighteen ASQs in quadrant 4 'possible overkill' include clear administrative procedure (A11), complete school website (A12), neat and tidy faculty (A14), updated website information (A17), well keep various archives/documents (A18), be sure to check randomly student homework (A19), perform thoroughly the resolutions made by various executive meetings (A20), provide various forms of administrative operations (A21), department/unit staff is capable of responding teachers' concerns with expertise (A33), attitude of staff delivering service (A34), assist teacher progress professionally by using resources (A35), encourage teacher to use various teaching methods and multiple assessment approaches (A40), continuously review and improve service quality (A41), arrange self-strengthening activities, organize recreational activities for faculty and staff (A43), offer channel for teacher to easily contact department/unit staff (A46), arrange parent-teacher seminars and home visit (A47), encourage the participation in various competitions and offer rewards (A48), and encourage job training courses for self-enrichment (A49), respectively.

In addition, the weights of customer demands can be obtained by step 5 of the IPA approach, obtainment of VOC. The analytical processes and results are as shown in Table 3. The VOC should be valued, and the top five ASQs that should be improved are as follows, plentiful and clean toilets (A6), a library with plentiful books (A2), complete sport and play facilities (A3), convenient and sanitation facilities of drinking water (A4), and delicious and nutritious lunch (A13), respectively.

Concluding remarks

This paper aims to evaluate the ASQs of elementary schools based upon the teachers' perspective at remote rural area in Taiwan by using the IPA approach. To facilitate the main issue for assessing the ASQs, the five dimensions with fifty factors are employed firstly. These initially important factors have been discussed and publicized in academic and management fields. Subsequently, the proposed IPA approach is used to measure these ASQs. Finally, the systematic appraisal approach is to perform the empirical survey via questionnaires. Study results show that:

1. Eleven ASQs are classified as 'kept up the good work'

in quadrant 1.

2. Eleven ASQs are classified as 'concentrate here' in quadrant 2.

3. Ten ASQs are classified as 'low priority' in quadrant 3.

4. Eighteen ASQs are classified as 'possible overkill' in quadrant 4.

5. The top five ASQs of the VOC should be improved. They are; plentiful and clean toilets (A6), a library with plentiful books (A2), complete sport and play facilities (A3), convenient and sanitation facilities of drinking water (A4), and delicious and nutritious lunch (A13), respectively.

Some discussions are remarked as follows:

1. The ASQ - plentiful and clean toilets (A6). In summary, the score of satisfaction degree is ranked on forty-nine; however, the score of VOC is ranked on top 1. In addition, this factor is positioned in 'concentrate here' of quadrant 2. The investigation results show that toilets numbers of elementary schools in remote rural area are in serious shortage, in addition, they are old, not clean - a problem frequently complained by teachers. The survey performed by this study indicates, with limited budget, these schools are unable to improve or expand toilet appliances; besides, the clean work is usually the responsibility of students, although the hygiene condition reaches students standard, but cannot meet that of teachers. The issue is therefore listed as the most required to be improved according to the survey of this study. The teachers are suggested to offer students more life education training, and highlight the importance of clean service through holding competition events, in order to provide a cleaner toilet to all the users.

2. The ASQ – a library with plentiful books (A2). In summary, the score of satisfaction degree is ranked on forty-eight; however, the score of VOC is ranked on top 2. In addition, this factor is positioned in 'concentrate here' of quadrant 2. As shown by this research result, since agricultural townships are in remote rural area, the library resources of schools located in rural or remote are in severe shortage, they are also in urgent need of more government budget or books denoted by people, in order to enrich library collection and expand library equipment.

3. The ASQ – complete sport and play facilities (A3). In summary, the score of satisfaction degree is ranked on fifty; however, the score of VOC is ranked on top 3. In addition, this factor is positioned in 'concentrate here' of quadrant 2. Compared with schools in urban area, those located at townships in remote rural are usually lacking resources, and in crucial need of government budget granted or social donations, so as to improve sport facilities and recreation equipment. These schools are suggested to continuously demand for higher government budget or hold fundraising events focusing on external customers, with the object to establish a better educational environment.

4. The ASQ – convenient and sanitation facilities of drinking water (A4). In summary, the score of satisfaction degree is ranked on fifty; however, the scores of importance degree and the VOC are ranked on top 1 and top 4, respectively. In addition, this factor is positioned in 'concentrate here' of quadrant 2. Since the water quality of remote rural area has always been in poor condition, and budget allocated in most small/medium elementary schools are often insufficient, the goal of water quality improvement therefore has not been achieved yet, more government budget or social donations are truly in need for accelerating drinking water equipment improvement. These schools are suggested to constantly apply for more budgets or hold fundraising events focusing on external customers, in order to improve the situation.

5. The ASQ - delicious and nutritious lunch (A13). In summary, the score of satisfaction degree is ranked on forty-five; however, the score of VOC is ranked on top 5. In addition, this factor is positioned in 'concentrate here' of quadrant 2. As to the student lunch offered by school, this study suggests to invite internal staff with cooking expertise to participate, for continuously providing different dishes, and further improve the issue.

Moreover, the empirical results show that the elementary schools should listen attentively to the VOC to focus on improving these ASQs of customer requirements. It is suggested that more attentions should be paid to exploit these customer requirements effectively and then develop the profiles of solutions, which should continuously strengthen the perspective of customers. Furthermore, our key focus on these implications are as follows: (1) exploiting eleven 'kept up the good work' ASQs in quadrant 1; (2) strengthening eleven 'concentrate here' ASQs in quadrant 2, as well as paying attentions to develop profile of strategy on this quadrant; and (3) improving ten 'low priority' ASQs in quadrant 3 diligently.

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