

An Empirical Study on Self-evaluation of School Maturity Using International Standard ISO 9004

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Abstract—The purpose of this research is to discuss the organization maturity by using the International Standard ISO 9004 Self-evaluation Maturity Model. A private high school in Jonor, Malaysia was selected as the research object. Within the selected 5 dimensions, 27 questions are designed to the sampling which is mainly from the students and staff in this school. The analysis focuses on the difference between expected outcomes and self-evaluation results. According to the analysis, the average value of self-evaluation dimensions from the best to the lowest is D3 Resource Management with the highest score 2.08. It is the level between level 2 (Awakening) with reactive proposal and level 3 (Enlightenment) with formal sustainable proposal, belonging to the middle and lower level. However, the D4 Service Implementation is the lowest score (1.4). It is between level 1 (Uncertainty) and level 2 (Awakening) with reactive proposal, belonging to the low lower level. Based on the results, self-adjustment, improvement and suggestions are recommended.

Keywords—ISO 9004 International Standard; Self-evaluation; Maturity

I. RESEARCH BACKGROUND AND MOTIVATION

Cultivation of talents is the foundation of national construction and economy development, from family education to school education till lifelong learning which is an experience of permanent management (Gao, 2009). During the globalization times, the educational competitive power has become the foundation of the national competitive power (Cai, 2004). This study builds five dimensions, 27 audits questions of self-assessment by the international standard ISO 9004 code as an important tool of assess case study school educational quality maturity degree, provide case study school's educational quality self evaluation. Moreover, through the results of self evaluation we can know case study school educational management system present situation, as a mirror of maintenance and improve management system, seeking effective strategy and corrective measure from it to improve case study school's educational quality.

Research purposes are shown as follows:

- to apply the 27 audits questions of five dimensions by ISO9004 international standard code for case study school educational quality.

- to understand the current situation of case study school educational quality.
- to analyze the difference between the case study school self evaluation maturity degree and target.
- to submit a plan of educational improvement to improve case study school's educational quality maturity degree.

II. LITERATURE REVIEW

A. International Educational Quality

There are more than 500,000 organizations has used ISO 9000 standard. There also has verification by just third part and certificate of quality guarantee system by market and customers (QAU, 2004). During pushing ISO 9000 organization there are lots of the nature of the education unit, such as college primary and middle school even preschool education system.

B. The Meaning of Educational Quality

Education is a complicate system between their characteristic of quality and commodity conception are little different. Quality in education means the quality of education depends on the evaluation of educational product degree of applicability and accuracy by customers. Providers make educational product specifications according to customer's desire and try to make the product conform to the specification.

The quality of education is related to the level of talent cultivation, it is the basis of the national human quality, improving the quality of school education, forming a school of excellence has become the core of the school education at the present stage. (Qiu, 2009) Although educational quality is a abstract concept, but the educational quality is capable to boost the quality of education, it also is an educational activity that shows the content that can continue to meet the expectations and goals that we have identified.(Wu. & Lin., 1994) Thus, if you wanted to understand the meaning of the quality of education, the first to discuss would be the meaning of "quality". Zeng (2006) defined the meaning of educational quality is " Department of quality education refers to the education system and educational products and services delivery, to comply with the statutory order, in pursuit of excellence and perfect performance, to meet the

education object and all education related customer expectations and create excellent customer satisfaction. "

C. Five Requests of International Educational Quality Management

The international quality management ISO 9000/IWA2 system contains five requests: Education quality assurance management system, management responsibility, resource management, service realization, measurement analysis and improvement, and it were divided into 23 provisions.

The self assessment tool used in this research is based on the guidelines of the international standard ISO9004. It also contains the key elements and the independent self evaluation of the fine items table. Evaluation table model can be based on the organization's characteristics from the definition of the organization's exclusive assessment table. Capability maturity degree is a new way to evaluate, in the field of management science is widely used currently, the school maturity degree of self evaluation research direction, in order to investigate the effect of education quality management capability maturity origin, current situation and application in self assessment.

D. ISO9004 standard Capability Maturity Model

According to the ISO9004 standard, this paper puts forward the evaluation model and criterion of the maturity of organization management system: Take the self evaluation tools is according to the international standard ISO 9004 guidelines as a benchmark, includes all key elements and fine independent self assessment form and according to the characteristic of the case study school from defining school exclusive assessment form. Then according to the ISO 9004 standard in the proposed system of school management maturity evaluation model and criteria, aimed the case school in terms of the quality of education, self audit, put forward a set of self evaluation tools, the capability maturity is divided into five grades.

- Level1: No formal program;
- Level2: Reaction type program;
- Level3: Formal, stable system program;
- Level4: Value continuous improvement;
- Level5: Achieve the best operational level.

According to ISO 9004 standard requests, it focuses on promoting overall organizational performance and efficiency; strive to continuously improve the results. Instead of using certification or contract terms for the purpose, but the emphasis on data collection and analysis, therefore it can be used with other systems complement each other, or used separately in order to achieve a consistent standard. Therefore, this study used above the maturity level of performance as a self assessment criterion level of adherence to the standard, to explore the present situation of the quality of case study school education.

III. RESEARCH FRAMEWORK AND METHODS

A. Research Framework

The international standard ISO 9004 to evaluate the maturity model, and examine the maturity method as the research framework used in this study.

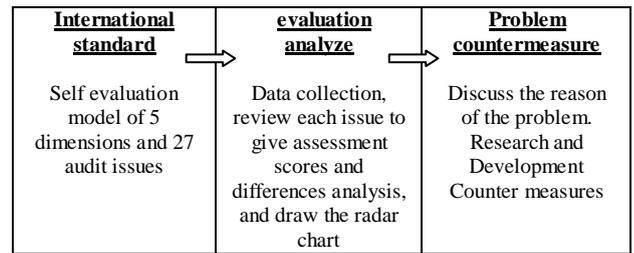


Fig. 1. Figure1 the research framework

This research is a case study, taking New Wenlong Chinese High School as an example. The reason for adopting a case study is because this study focuses on the single school.

- Use ISO900: The five dimensions 2000 educational quality performance maturity are: D1 Education quality assurance management system, D2 Management responsibility, D3 Resources management, D4 Service implementation, D5 Measure, analyze and improvement to achieve self evaluation, so it is a method for collecting case data by using multiple methods.
- This research is based on the five dimensions self evaluation to analyze case study school issues. It not only can discuss current problem but also can figure the reasons out before the discussion. Therefore analyze it fine can obtain where the real questions are.
- The purpose of this study is diagnosis school current problems, and propose improvement measure, focus on diagnostic remedy way. According to the four characteristic should accord the features from this study.

B. Introduction for the Case

The special case we research in the paper is a school that locate in a small town in the west coast of the Johor state in Malaysia, It is a small, private, autonomous and independent middle school(for short: independent middle school), the number of students in this school is amount 400~500.

It has 65 years history since the school planted and established by the Zhenzhong Zheng and some warm-hearted Chinese educator in 1950. This school is very famous in the 1960s, and the amount of the students is reach up to 810. In 2014, the executives in this school realized the importance of "quality education", in order to improve the administrative efficiency, the education quality and then the students' study efficiency, the executives provide help not only in the administrative affairs but also in the finance, they spend more money on school teachers' train and try to improving the teaching hardware equipment. What is more, they are

optimistic to pushing the teaching training, the forums, the entrance examination cathedral, school anniversary donation activities and the communication with China and Taiwan's corporation students. The independent middle school collect the cohesion of our teachers, students, parents, alumni and social elites together, following the mote of the "mentality, kindness and courage", all of our people are try hard to get goal to establishing a high quality education school.

C. The Research Process of the Extent of the Education Quality Self-Evaluation

The extent of the education quality self-evaluation analysis method that we adopt in the independent middle school can be decided into 3 stages.

1) *The first stage: the structural model of the independent middle school's education quality:* According to the operable terms in chart 4 to 8 in the ISO9004: 2000 principle, the continued success elements of the school can be concluded to this 5 aspects: D1 Education quality assurance management system, D2 Management responsibility, D3 Resource Management, D4 Product implementation, D5 Responsibility, authority and communication. The characteristic of the self-assessment model is developed in 5 aspects and 27 questions; the elevator is the administrative staff. And the purpose of the evaluation is to understanding the school's quality, and compare the difference between the school's construct situation and the finally goals.

2) *The second stage: the process of the school's self-assessment, The explain of the self-assessment process:*

a) *The object that carry out the self-assessment: The teaching Administration and Affair's Office in the independent middle school that locate in a small town in the west coast of the Johor state in Malaysia.*

b) *Basing on the ISO9004 international standard, it is supported to make the self-assessment sheet according to the 27 questions in the self-assessment efficiency.*

c) *With the help of the chairman in the teaching Administration and Affair's Office and the 4 assistants, accomplishing the self-assessment on November 18, in 2014.*

3) *The third stage: The score sheet and the estimate level of the self-assessment:* According to the evaluate index in this school's efficiency maturity, it is main through the way of the self-assessment sheet, rely on the maturity level evaluation, the maturity degree is the level 1 (No formal proposal) to the level 5 (up to the optimal operation), the evaluate score is 1~5, the high score indicates that the efficiency of the program is excellent, On the contrary, the low score indicates that the efficiency is not good.

4) *The fourth stage: Analysis the difference of the self-assessment maturity:* This step is aim to the school's superior administrator; rely on the school's education quality supervisory system in wispy elements to running the maturity self-assessment. The self-assessment sheet is according to the 5 elements and respective rule of derail

problems, the level of the maturity is devised into 1 (No formal proposal) to 5 (up to the optimal operation), the score is amount 1 to 5. The elevator base on the detail problems in the evaluate sheet, according to the school's education quality management system, giving the evaluate result under the real situation of the cheek. The mature level is higher, the score is higher, and then average the final detail principle, the final average score is the mature level of the elements in this aspect.

IV. SELF-EVALUATION RESULTS

This research is based on the 27 questions of ISO9004 international standards of self performance maturity evaluation. A private high school in Johor, Malaysia is chosen as the case study. The sampling of this research is mainly from the students and staff in this school. The analysis focuses on the difference between expected outcomes and self-evaluation results. Based on the results, self-adjustment, improvement and suggestions are recommended "Table I".

A. The Results of Self-Evaluation in 5 Selected Dimensions

TABLE I. 5 DIMENSIONS OF SELF-EVALUATION (ANALYZED RESULTS)

Dimensions	Self-evaluation (average) (1)	School maturity score (2)	Difference between current and expected goals (3)	Improvem ent rank (4)
D1 Education quality assurance management system	1.88	5	-3.12	3
D2 Management responsibility	1.91	5	-3.09	4
D3 Resources management,	2.08	5	-2.92	5
D4 Service implementati on	1.40	5	-3.60	1
D5 Measure, analyze and improvement to achieve self evaluation	1.75	5	-3.25	2

B. Difference Analysis

According to the results above, the rank of the self-evaluation from the first to the last is clear. The first is the D3 Resource Management (2.08). The second is the D2 Management Responsibility (1.91). The third goes to the D1 Education Quality Assurance Management System (1.88). The fourth rank is D5 Measure, analyze and improvement to achieve self evaluation (1.75). The last one is D4 Service Implementation (1.4). From the differences, the differences between average value of self-evaluation and school expected maturity value are the results of dimensions.

Therefore, the larger the difference is the lower performance result. It is clear that the D 4 Service Implementation with negative result (-3.6) and D5 (-3.25) are the two items which needed to improve at first.

C. Analysis Discussion

The dimension D4 is the first item needed to improve. Therefore, it is necessary to analysis the differences among the 6 questions within this item. According to the following

table, it is obviously that the self-evaluation score for item (7.3) design and innovation is 1.08, with differences score - 3.92 which is the lowest. Then the self-evaluation score for the related benefit process (item 7.2) is 1.13, with difference score -3.87. The self-evaluation score for item (7.1) service implementation is 1.25, with difference score -3.75. The fourth is item (7.4) purchasing and followed by item (7.5) production and service. The final one is item (7.6) measurement and supervision “Table II”.

TABLE II. THE RESULT OF 6 SELF-EVALUATION QUESTIONS WITHIN D4

Item / Evaluated differences	(7.1) Service implementation	(7.2) Related benefit process	(7.3) Design and innovation	(7.4) Purchasing	(7.5) Production and service	(7.6) Measurement and supervision
Self	1.25	1.13	1.08	1.42	1.50	2.00
Expected	5.00	5.00	5.00	5.00	5.00	5.00
differences	-3.75	-3.87	-3.92	-3.58	-3.50	-3.00
Rank	3	2	1	4	5	6

In the dimension of D4, the service implementation refers to certain innovation plan and control principles for educators’ courses and activities. For example, the teaching activities should based on the inputs of effectiveness of course book implemented, teachers’ ability, students’ learning outcomes and homework design. The outputs should focus on the performance evaluation, knowledge and skill taught and teaching media or equipment used. In items of course plan, the course design should base on the learning outcomes of the subject. The teaching content should meet the social requirements and should also be approved by the external auditors. Finally, it is necessary to check the effectiveness of course implemented and the influence of course control in order to adjustment documents. Within this

dimension, the result is between level 1 (no formal proposal) and level 2 reactive proposal, therefore, there is certainly room for improvement.

In terms of dimension D5, the self-evaluated score for this item is -3.25. According to the table 3, the difference score for item (8.1) measurement, analysis and improvement and item (8.3) unsuitable control are the same -3.5. It is indicated that the school manager is unsatisfied with the measurement, analysis and improvement for the school performance evaluation. The self evaluated score is only 1.5, locating between levels 1 no formal proposal and level 2 reactive proposals; therefore, there is certainly room for improvement.

TABLE III. THE RESULT OF 5 SELF-EVALUATION QUESTIONS WITHIN D5

Item / Evaluated differences	8.1 Measurement, analysis and improvement	8.2 Measurement and supervision	8.3 Unsuitable control	8.4 Data analysis	8.5 Improvement
Self	1.50	2.08	1.50	2.00	1.67
Expected	5.00	5.00	5.00	5.00	5.00
differences	-3.50	-2.92	-3.50	-3.00	-3.33

According to the “Table III”, the self-evaluated score for item (8.3) unsuitable control and item (8.4) data analysis are the same (1.5). It is indicated that the school manager is unsatisfied with the management process and analysis measurements, locating between levels 1 no formal proposal and level 2 reactive proposals, therefore, there is certainly room for improvement.

V. RECOMMENDATIONS AND CONCLUSIONS

The result of education quality maturity self-evaluation is between ISO9004 (no formal proposal) and (with formal sustainable proposal), belonging to the middle and lower level. The average value of self-evaluation dimensions from the best to the lowest is D3 Resource Management with the highest score 2.08. It is the level between level 2 (Awakening) with reactive proposal and level 3

(Enlightenment) with formal sustainable proposal, belonging to the middle and lower level. However, the D4 Service Implementation is the lowest score (1.4). It is between level 1 (Uncertainty) and level 2 (Awakening) with reactive proposal, belonging to the low lower level. Therefore, it is the factor that should be improved first. Based on the above analysis, the following recommendations are suggested.

A. Suggestions for Dimension D4 Service Implementation

The service implementation includes design and innovation. Firstly, the school should have design and innovation plan and control principle which are based on the current courses and education service provided. It is suggested to use the resource management sources to gain more media resources and improve the teaching activities, course design and process system innovation. Secondly, it is

also important to strength the lively and diversity of course book so that the student interests will be also improved. The improving effectiveness in studying can not only raise the confidence of customers for education quality but also can improve the school reputation.

B. Suggestions for Dimension D5 Measurement, Analysis and Improvement

It is better to set up the data collection process and standards. The analyzing method and process should be evaluated to ensure the teaching quality and efficiency. Except the choosing, deciding and transforming value, the measurement should be also implemented by observation and qualitative or quantitative research. Finally, the process control for related attendance or staff should adjust and change the measurement when they find something unsuitable in teaching process or activities. The adjustments should be recorded and reviewed every year.

ACKNOWLEDGEMENT

Thanks for both Lufen Zhou and Wuder Tsay to offer data from post graduate of Shute University, Taiwan and Johor Chinese Independent High School, Johor, Malaysia.

REFERENCES

- [1] Chinese Language Independently Education Reform Program (2005), Association of Chinese Schools in Malaysia.
- [2] New Win long Chinese middle School 60 Anniversary Special Issue. (2010). pp. 17-33.
- [3] J. Wu. 2007. ISO/IWA2 International Education Quality Management in the Application of 'Kaohsiung Friendly Campus Tutoring Work'. Master Dissertation, National Sun Yat-sen University, Kaohsiung.
- [4] Q. Wu., M. Huang., W. Xu. 2002. Education Performance Responsibility Research. Taipei: Higher Education.
- [5] Z. Li., J. W. 2011. Continuing Successful Management: ISO9004: 2009 Standards Explanation for Modern Enterprise Management. Beijing: China Standard Publisher.
- [6] J. Huang. 2013. Seeking the Management Standard path to promote the School Transformation. Shanghai Quality. Vol. 7: 23-27.
- [7] Q. Yang., Z. Fu. 2010. Evaluation of Quality Management Maturity Model. Project Management Technology. 9 (3): 23-27.
- [8] G. Yang. 2010. Organization Ability: the Secret of Enterprise's Continuing Success. Beijing: China Machine Press
- [9] M. Guan. 2010. Using ISO 9004: 2009 Standards to Improve the Education Quality Assurance Management System. System Management Information. Vol. 89:1-2.
- [10] M. Guan., M. Wu. 2013. Building the Continuing Successful Maturity Evaluation Model for Enterprise. Journal of Management and System Engineering. Vol.12: 69.
- [11] M. Guan. 2003. Ability Maturity Integrated Model applied in System Engineering. Journal of Nankai University. 47(4): 45-48.
- [12] ISO/TC176 /SC2(2008).ISO9001:2008Quality Management Systems –Requirements.
- [13] ISO/TC176/ SC2 (2009). ISO9004:2009 Managing for the Sustained Success of an Organization—A Quality Management Approach.