THE USING OF QUALITY FUNCTION DEPLOYMENT ANALYSIS TO ENHANCE THE VOCATIONAL EDUCATION QUALITY IN KLATEN CITY

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ABSTRACT

This paper is proposing a comprehensive framework in order to formulate strategy in Vocational Education. This approach is based on Quality Function Deployment (QFD) analysis. Quality Function Deployment is a management tool which is used in identifying customers’ needs and to provide those requirements to them with Quality Consciousness. This modern technique is used to enhance the quality of vocational education. To produce an accurate formulation of the strategy, do internal and external analysis to find the beginning strategy of the organization. The results of the internal and external analysis is used to determine the technical parameters in the House of Quality (HoQ) as "What/alternative" and "How/criteria". The results showed that the formulation of a strategy to accurately compiled into strategic program of vocational education in the Klaten city.

Keywords: Vocational Educations, Customer Satisfaction, QFD, Development program, Quality.

1. Introduction

As no organization has unlimited resources, and due to competitive dominant environment, formulating the competitive strategies target which lead organization to the macro goals, is very important. That’s why at organization spend their resources on extraneous purposes, they will easily substitute their rivals on behalf of themselves. So they are supposed to formulate the appropriate strategies to attend the competitive area (Zohrabi, A. and Manteghi, N., 2011).

Quality Function Deployment (QFD) is a planning tool used to fulfill customer expectations. It focuses on customer expectations or requirements, often referred as the voice of the customer. It is a team based management tool in which customer expectations are used to drive the product development process. By implementing QFD, an organization is guaranteed to implement the voice of the customer in the final product (Jnanesh, N.A. and Hebbar, C.K., 2008).

The efforts to improve the quality of human resources have been carried out with a variety of innovations in education and training programs. Vocational High School is an institution tasked to prepare well-educated human resources is ready to work. It is based on the learning that is given in the form of vocational high school be in the form of theory and practice. Based on the data obtained from the
head of the automotive industry in the Klaten city mention that vocational education graduates generally is not ready to work. This has an impact on the amount of funds that must be spent by the industry since before they work then the industry must conduct training again.

Strategy to formulate development of vocational education should be designed dynamically. Strategic formulating is not seeing the customer satisfaction will to the educational outcomes are disappointing. Therefore, modern management techniques Quality Function Deployment (QFD) are the right choice to design and develop a dynamic strategic formulating.

2. LITERATURE REVIEW

2.1. What is QFD?

The Quality Function Deployment was originated in the late 1960s to early 1970s, in Japan, by Professor Yoji Akao. QFD is a systematic method and analysis for acquiring the demands of customers. “QFD provides a means of translating customer requirements into appropriate technical requirements for each stage of product development and production (i.e., marketing strategies, planning, product design and engineering, prototype evaluation, production process development, production, sales)” (Sullivan, 1986). A central element in QFD is the so-called ‘House of Quality’ (Poel, 2007). HOQ made up of two main parts, the “What’s” and the “How’s”. While using QFD the most important task is to define and understand the "whats" of the needs of the customers and to define the "Hows" to meet the customer’s need (Tan et al, 1998). Recent studies have indicated that QFD can be a useful mechanism for identifying business priorities and can be effective as a strategic planning tool. (Maritan & Panizzolo, 2009). Strategic QFD with definite method translates the vision into action in a series of logical steps. Therefore it creates innovative strategies for acquiring organisation’s vision (Killen et al, 2005).

2.2. The House of Quality (HoQ)

The primary planning tool used is the house of quality. The house of Quality translates the voice of the customer into design requirements that meet specific target values and matches those against how an organization will meet those requirements. The construction of house of quality is as follows.

![House of Quality](Cohen, 1995)

In the above Figure, the exterior wall in the left side is the customer requirements, the listing of voice of the customer, or what the customer expects in the product. On the right side prioritized customer requirements or planning matrix. The ceiling or the second floor contains the technical descriptors. The centre portion of the house is the relationship between customer requirements and technical descriptors. The roof of the house is the interrelationship between technical descriptors. The foundation of the house is the prioritized technical descriptors this is the structure for the house of quality.

2.3. Costumer Satisfaction

Satisfaction is the level of feelings someone after comparing the work product or the results that her/him feels and hopes. The level of satisfaction is a function of the difference between perceived job and expectations (Kotler et al, 1996: 50). Customer satisfaction is very dependent on the perceptions and expectations of the customer or user. According Gaspersz Vincent (2008: 35) customer satisfaction included the difference between expectations and perceived competence or outcomes. Because of the customer is the person who receives the work
(product) then the customer who determines the quality of a product.

2.4. Steps of Method of Quality Function Deployment

The starting point of the Quality Function Deployment (QFD) is a customer as well as the wants and the needs of the customer. In QFD, this is called the "voice of the customer". The work of QFD is to listen to the voice of the customer. QFD process according to Nasution (1997: 42) begins with the voice of the customer and then continues through the 4 main activities are:

1) Product Planning: translating customer needs into technical requirements.
2) Product Design: translating technical requirements into component characteristics.
3) Planning process: identify the process steps and parameters and characteristics translate into the process.
Planning control process: establishing or determining control methods for controlling the characteristics of the process.

3. RESEARCH METHOD

This research is the development or Research and Development (R and D). This study aims to develop the most efficient work methods so that production costs can be reduced and productivity can be improved institutions. Quality Function Deployment Method is a practice to design a process in response to customer needs. Research carried out to identify the expectations and needs of the consumers of vocational graduate’s labor Motorcycle Technical Skills Competency in this case is the Official Workshop Klaten City as a benchmark (indicator) the quality of graduates by using Quality Function Deployment.

This study used a purposive sample or samples intended. This is because at each workshop, participants were able to represent the workshop. The number of members of the sample in this study was as many as 59 respondents from 12 official Honda workshop, consisting of Managers Workshop, Head of Service, and Mechanical - Mechanical Workshop.

In summary the steps in this research is the survey of customer satisfaction, setting the selected item, setting chart A chart setting C, E and D setting chart, charting B, determination of chart F, and the preparation of the technical development of the institution. To produce an accurate formulation of the strategy, SWOT analysis to find the beginning of the organizations strategic. The results of the SWOT analysis is used to determine the technical parameters in the House of Quality (HOQ) as "What / alternative" and "How / criteria".

4. RESULTS AND DISCUSS

Quality Function Deployment is a practice to design a process in response to customer needs and expectations. QFD translates what consumers need or customers resulting into what agency or company. QFD allows organizations to prioritize customer needs, finding innovative responses to those needs and improve processes to achieve maximum effectiveness.

Quality Function Deployment focuses on developing the skills to design, create and market products that are needed and desired by the customer.

Quality Function Deployment is a method of planning and development of a product structure that enables a development team to clearly define the needs and expectations of consumers, and then evaluate the results of any products and their effects on consumer needs. In the end the company or agency may have a picture that shows how to translate customer needs into technical language.

The house of quality identifies what the customer needs and expectations and how to meet those needs and expectations. House of quality is based on the incorporation of data processing to determine the degree of importance to the interaction parameter technique. For the house of quality images can be seen in table 1 up to 4 and Figure 2.
<table>
<thead>
<tr>
<th>Customer Requirement</th>
<th>Technical Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Increasing the relevance of Student Skills Competency (SSC) with teaching materials and practices</td>
<td>1. Performed of repairing exhaust system disorders</td>
</tr>
<tr>
<td>2. Completeness learning devices (white board, OHP, marker)</td>
<td>2. Carry out overhaul and repair of cylinder head components</td>
</tr>
<tr>
<td>3. Delivery of contents is good and clear from teacher</td>
<td>3. Identifying the damage and identify disturbances in the cooling system of motorcycle.</td>
</tr>
<tr>
<td>4. Repair and rejuvenation practice tools and readiness material practice</td>
<td>4. a. Detecting the damage on hydraulic system of motorcycle.</td>
</tr>
<tr>
<td>5. Implementation of relevant vocational practice and discipline</td>
<td>b. Under take repaired hydraulic system of motorcycle</td>
</tr>
<tr>
<td>6. Innovative learning and interesting especially to theory of material</td>
<td>5. Checking the petrol fuel system components</td>
</tr>
<tr>
<td>7. There is a laboratory computer, multimedia, library and Internet facility</td>
<td>6. Diagnosing disruption in the fuel system gasoline of motorcycle</td>
</tr>
<tr>
<td>8. Improve the quality of Industrial Work Practices</td>
<td>7. Make improvements gasoline fuel system</td>
</tr>
</tbody>
</table>

Interaction symbols between Customer Requirement and Technical Descriptions
1. Increasing the relevance of Student Skills Competition (SSC) with teaching materials and practices
2. Completeness learning devices (white board, OHP, marker)
3. Delivery of contents is good and clear from teacher
4. Repair and rejuvenation practice and readiness material practice
5. Implementation of relevant vocational practice and discipline
6. Innovative learning and interesting especially to theory of material
7. There is a laboratory computer, multimedia, library and Internet facility
8. Improve the quality of Industrial Work Practices
9. Perform of repairing exhaust system disorders
10. Carry out overhaul and repair of cylinder head components
11. Identifying the damage and identify disturbances in the cooling system of motorcycle.
12. a. Detecting the damage on hydraulic system of motorcycle.
   c. Under take repaired hydraulic system of motorcycle
13. Checking the petrol fuel system components
14. Delivery of contents is good and clear from teacher
15. Repair and rejuvenation practice and readiness material practice
16. Implementation of relevant vocational practice and discipline
17. Innovative learning and interesting especially to theory of material
18. There is a laboratory computer, multimedia, library and Internet facility
19. Improve the quality of Industrial Work Practices
20. Perform of repairing exhaust system disorders
21. Carry out overhaul and repair of cylinder head components
22. Identifying the damage and identify disturbances in the cooling system of motorcycle.
23. Checking the petrol fuel system components
24. Carrying out the repair of repairing

Annotation: ①= 9  〇 = 3  △= 1
Table 3. Interactions value between Customer Requirement and Technical Descriptions

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Value (Normalized)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Performed of repairing exhaust system disorders</td>
<td>0.135</td>
</tr>
<tr>
<td>2. Carry out overhaul and repair of cylinder head components</td>
<td>0.324</td>
</tr>
<tr>
<td>3. Identifying the damage and identify disturbances in the cooling system</td>
<td>0.378</td>
</tr>
<tr>
<td>4. a. Detecting the damage on hydraulic system of motorcycle</td>
<td>0.045</td>
</tr>
<tr>
<td>5. Checking the petrol fuel system components</td>
<td>0.049</td>
</tr>
<tr>
<td>6. Diagnosing disruption in the fuel system gasoline of motorcycle</td>
<td>0.046</td>
</tr>
<tr>
<td>7. Make improvements gasoline fuel system</td>
<td>0.046</td>
</tr>
<tr>
<td>8. Identifying damage to engine components</td>
<td>0.324</td>
</tr>
<tr>
<td>9. Engine component inspection</td>
<td>0.351</td>
</tr>
<tr>
<td>10. Carry out the following repair engine components</td>
<td>0.315</td>
</tr>
<tr>
<td>11. Diagnosing the disorder and identify of damage manual clutch system</td>
<td>0.129</td>
</tr>
<tr>
<td>12. Diagnosing the disorder and identify of damage automatic clutch system</td>
<td>0.12</td>
</tr>
<tr>
<td>13. Diagnosing the disorder and identify of damage to the manual transmission system</td>
<td>0.15</td>
</tr>
<tr>
<td>14. Diagnosing the disorder and identify of damage to the automatic transmission system</td>
<td>0.288</td>
</tr>
<tr>
<td>15. Perform the improvements of automatic transmission system</td>
<td>0.387</td>
</tr>
<tr>
<td>16. Diagnose and repair the system disorders suspense</td>
<td>0.141</td>
</tr>
<tr>
<td>17. a. Carry out service work and replacement wheels</td>
<td>0.049</td>
</tr>
<tr>
<td>18. Perform minor repairs on electrical systems and instruments series</td>
<td>0.096</td>
</tr>
<tr>
<td>19. Doing replacement of starter system</td>
<td>0.046</td>
</tr>
<tr>
<td>20. Make improvement in brake system</td>
<td>0.04</td>
</tr>
<tr>
<td>21. Checking and maintenance battery</td>
<td>0.04</td>
</tr>
<tr>
<td>22. Perform repair charging system</td>
<td>0.12</td>
</tr>
<tr>
<td>23. Perform repair ignition system</td>
<td>0.396</td>
</tr>
<tr>
<td>24. Perform replacement ignition system</td>
<td>0.047</td>
</tr>
<tr>
<td>Sum</td>
<td>2.631</td>
</tr>
<tr>
<td>Prosentaze (%)</td>
<td>10.91</td>
</tr>
<tr>
<td>Priority</td>
<td>6</td>
</tr>
</tbody>
</table>

Normalized: 0.045

(continued on next page)
Table 4. Technical Descriptions interactions

<p>| | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
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<td>1. Increasing the relevance of Student Skills Competition (SSC) SMK with teaching materials and practices</td>
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<td>6. Innovative learning and interesting especially to theory of material practice</td>
<td>7. There is a laboratory computer, multimedia, library, and Internet facility</td>
<td>8. Improve the quality of Industrial Work Practices</td>
</tr>
</tbody>
</table>

Annotation:
- Strong positive relationship
- Moderate positive relationship
- No relationship
Figure 2. House of Quality
5. CONCLUSIONS

Based on the order of the parameters technique in the HOQ can be carried out planning techniques to formulate development priorities and performance improvement organization. Strategic planning resulting formulation is:

a. Improved quality of industrial work practices.
   Industry Practice includes technical requirements that have a strong relationship with indicators of competence is a priority. Professional expertise is the mainstay of the Vocational Education. Professional expertise generated by the Vocational Education should really be an excellent graduates who have the knowledge and skills mastered, according to the department. For that students must undergo internship in the form of "Improving the quality of industrial work practices". Industry practice is a form of activity that followed the students to work directly in the world of work as directed with the aim of equipping students with the attitudes and skills in accordance with the direct learning in the industrialized world.

b. Innovative learning and of particular interest for the theory of matter
   Innovative and engaging learning materials specifically for the theory are the basis for mastery of a competency. To obtain a material students are required to be independent, for example with the use of the Internet media and optimize the use of the library. Vocational learning theory must have relevance to the vocational practice because they have a relationship of mutual support.

c. Delivery of content is good and clear from teachers
   Teachers are required to have quality when presenting material to the subject of teaching students. Quality can be measured by a teacher of morality, wise, patient and control subject material when adapting to subject students. A teacher has a responsibility towards the success of their students. Teachers are not only required to be able to transform a set of knowledge to learners (cognitive domain) and aspects of skills (physicomotoric domain), but also have a responsibility to manifest the things related to attitudes (affective domain).

d. Repair and rejuvenation practice tools and readiness of material practice
   Repair and rejuvenation practice tools and material readiness of the practice to be met to support the smooth running of the school workshop. Many students end up unemployed because they are waiting their turn to practice. Outage tools and materials will slow down the learning process of students. Completeness of practice equipment is supporting the skills and knowledge students will practice equipment is often used so that the students can be improved competency skills.

e. Implementation of relevant vocational practice and discipline.
   Vocational practice is one way to apply the theory learned by students. Because of Vocational Practice is the vehicle for implementing the Theory of Vocational students receive, directly or automatically the practice is conducted in accordance with the theory that has received before, which carry out manual handling operations, basic knowledge of motorcycles, air compressor repair and maintain components, perform Overhaul cooling and its components, maintaining gasoline fuel system, clutch repair units and components of the operating unit, maintaining the transmission, brake system repair, ignition system repair, and fixing the starter and charging system.

REFERENCES