

The enhancement of education and industry alignment using quality function deployment

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Abstract. Discrepancy between the occupation of graduates of JHS (Junior High School) and VHS (Vocational High School) in city X with the content of subject materials at school indicating that there is an unaligned phenomenon between the educational world with occupational and industrial world. Based on the phenomenon, an alignment effort is needed using QFD (Quality Function Deployment) method. In this research, the QFD is constructed on two objects, which are JHS and VHS. The construction of QFD started with breakdown process into 4 points of view, which are from input, process, output, and tracer study. After that, the QFD is constructed considering 6 related stakeholders, which are the student, teacher, parent, educational institution management, industry, and government. Next, 5 technical responses which have the highest sumscore are chosen. The technical responses are then be analyzed about the interaction from all of the House of Quality (HOQ). The result from the research is 1 incision of technical response, answering 3 competencies (hardskill, softskill, attitude) from the 4 stakeholders that is data center. The benefit from the data center is easing the connection between the job seeker and employer due to online accesibble data centre. This way it reduces the unalignment between the educational world and occupational world.

Keywords: Allignment, Educational World, Occupational World, Quality Function Deployment, Data Center

1. Introduction

In this part, the research background, problem formulation, and research objective will be shown.

1.1 Research Background

In one of the largest city in Indonesia an unemployment problem occurs. According to data obtained from the central statistic beaurau, the number of open unemployment in the city experienced fluctuations starting from 2011 to 2017. In August 2011, the number of open unemployment totaled 75,954 people, in 2012 amounted to 71,997 people, in 2013 amounted to 78,914 people In 2014 there were 85,345 people, in 2015 amounted to 102,914, and in 2017 there were 89,479 people (Central Bureau of Statistics, East Java Province, 2011-2017). According to experts, the condition of the Open Unemployment Rate (TPT) is still not ideal because the employment conditions at the full employment level are characterized by TPT in the range of 3-4 percent (Central Statistics Agency, 2017). Whereas TPT in the city from 2011 to 2017 has not been at the 3-4 percent level so it is necessary to attempt to reduce the number of TPT to the level of full employment.

Labor absorption is currently not maximized due to various obstacles. The two problems that are most problematic are the discrepancies between work and the field of expertise / competence of disciplines and workers who are underqualified (Mardiana, 2017). The unemployment rate is caused by not all employment opportunities receive workers with criteria according to their needs. This can be caused by a lack of competence and qualifications possessed by high school and vocational high school graduates in the city.

Efforts to harmonize education and industry have actually been carried out by the Ministry of Education and Culture in accordance with a Presidential Instruction. The revitalization program carried out by pilot VHSs includes the development and alignment of the curriculum with industry, learning innovations that encourage 21st century skills, and so on (Effendy, 2017). Based on the results of the educational and industrial alignment organization survey, it was found that alignment index (AI) in the city was 0.53 for SHS and 0.72 for VHS. From these values it can be seen that education is not fully aligned with industry.

The initial hypothesis regarding this condition is because the workforce feels wrong in the field of expertise so that they lack control of the knowledge learned which results in less competent in the area of expertise, then choose to work with a background not from the area of expertise.

1.2 Problem Formulation

From the various facts above it can be concluded that the conditions of education in high schools and vocational schools are not in harmony with the qualifications required by the world of work. In order to harmonize education with the needs of the world of work, it needs support from all parties such as increasing the role of government in fields related to education and the industries by increasing or adding new programs that can increase the absorption capacity of graduates, teacher participation as teachers, the role of school management, and the role of the industrial world.

1.3 Research Objective

The purpose of this research is: 1) To get an overview of program effectiveness to increase the absorption capacity of high school and vocational high school graduates that has been done by the city government, 2) To find out the absorption capacity of graduates or the description of employment of high school and vocational high school graduates in the city, 3) To formulate efforts to increase the absorptive capacity of high school and vocational high school graduates in the city, which caused by an inconsistency between education and industry and lack of competence and reduce the occurrence of inconsistencies between the fields of expertise / competence of the scientific discipline with the industries

2. Methods

In this part, first the research procedure will be discussed. Then the method of data collection will be presented.

2.1 Research Procedure

The procedure of the research is explained below.

A. Initial Identification Stage

1) Literature Study

Conducting literature studies to collect the theoretical basis and the basis of the method to conduct the research

2) Formulation of Problems and Research Objectives

After literature study, the next step is to formulate the problem and determine the objectives of the research to be conducted.

3) Formulation of Problems and Research Objectives

Identifying problems based on field conditions, namely the absence of alignment between the world of education and the industrial world, then formulating the problems and determining the research objectives to be carried out and achieved in this research.

B. Data Collection and ProcessingPhase

At this phase primary and secondary data collection and data processing are carried out. After collecting data, then the data is processed using the Quality Function Deployment (QFD) method.

C. Data Analysis and Interpretation Phase and Preparation of Repair Recommendations

The analysis carried out includes analysis of 1/2 technical response that has the highest weight of each HOQ that has been made. Then proceed with the analysis of the technical response of the slices contained in each stakeholder. Then the recommendations for improvement recommendations were made based on the results of the analysis of the technical slices of the slices contained in the 4 stakeholders who could answer 3 competencies needed by the industry (hardskill, soft skills, attitude)

D. Stage of Conclusion and Suggestion

The last stage of this research is drawing conclusions from the research that has been done. Then given advice and recommendations for further research

3. Result and Discussion

In this part, first the explanation of the steps to create a House of Quality (HOQ) for the 3 objects of this study, namely high school and vocational school at 4 levels and 6 stakeholders will be given. This HOQ is made on 4 levels, namely input, process, output, and tracer study. The HOQ is then also made for 6 stakeholders, namely students, parents, teachers, school management, industry, and government. HOQ manufacturing concept was also carried out in compiling this QFD are determining attributes, forming planning matrix, determining technical response, determining relationship between attributes and technical response, determining relationships between technical responses, and compiling a complete and complete House of Quality (HOQ) to find out what technical response only priority. The following is the stage for making the HOQ.

3.1 Voice of Customer (VOC) from Industry or Attributes from High School and Vocational Graduates

In determining the VOC from the industry, a questionnaire was made containing the competencies that must be possessed by high school and vocational high school graduates the importance of each competency, and the industry's assessment of each of the competencies possessed by current graduates.

Table 1 Table of High School and Vocational Graduates Attribute

Competency	No.	High School and Vocational Graduates Attribute
<i>Hardskill</i>	1	Ability to complete work instructions using the knowledge already possessed
	2	Mastering Ms. Office (Word, Excel, Power Point)
	3	English language skills (passive minimum)
	4	Mastering graphics and image editing
	5	Ability to collect data and information
	6	Ability to process data and information
	7	Ability to make report
<i>Softskill</i>	8	Presentation skills
	9	Ability to communicate well
	10	Customer Orientation (prioritizing customer satisfaction)
	12	Good time management
	13	Able to analyze the situation
	13	Ability to adapt to the work environment
	14	Ability to negotiate
	15	Work Ethics
	16	Confidence
	17	Initiative and creative
	18	Able to work together
	19	Open minded
	20	Personal toughness faces challenges and obstacles
	21	Able to work under pressure

Table 2 Table of High School and Vocational Graduates Attribute
(*Continue*)

<i>Attitude</i>	22	Honesty
	23	Responsible
	24	Discipline
	25	Have sympathy and empathy

3.2. Establishment of a Planning Matrix

Planning matrix determination aims to weigh each attribute. This planning matrix determination is carried out to determine the importance of each attribute, benchmarking with competitors, and calculating the weight.

Determining the level of importance for each attribute is done by distributing questionnaires to the industry. The results of the recap assessment of the level of importance of the attributes are used as the level of importance or RII (Relative Importance Index).

After determining the level of importance of each attribute, the next stage is to determine the graduates to be benchmarked. In this study three benchmarks were carried out, namely for the first benchmark high school and vocational high school in the city region, then the second benchmark was high school and vocational high school graduates from outside the region, and the third are high school and vocational high school graduates from neighbouring country. Benchmarking is done to determine the target value and evaluation score that is used to find the IR (Important Ratio) value.

3.3 Technical Response Making

Based on the description of the attributes described earlier, a technical response can be obtained that can answer the needs of the attributes.

3.4 Making House of Quality

In this research, 66 HOQ was developed. The HOQ concludes the comparing from the stakeholders and competencies. In this paper, an example of one HOQ will be presented. The presented HOQ in in input level which the stakeholder is SHS student.

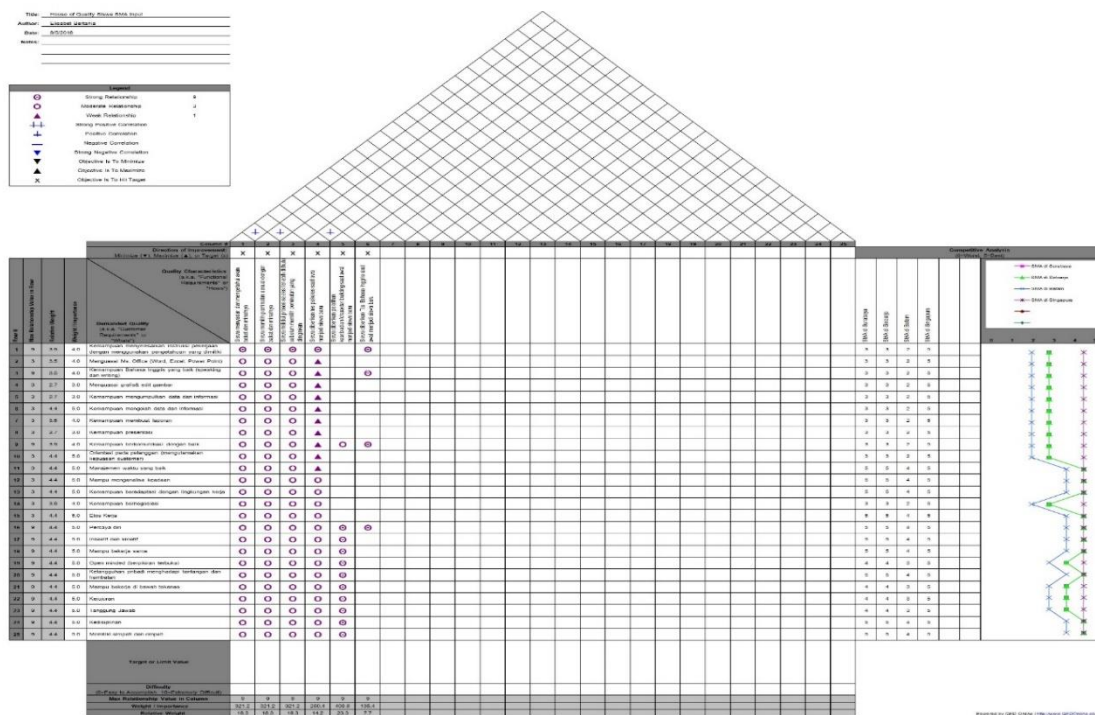


Figure 1 HOQ Input Senior High School

3.5 Result Analysis House of Quality

The following is a table that displays the highest technical response from a high school graduate HOQ.

Table 3 Table of High School Graduates Highest Technical Response

Stakeholder	Level	No	Technical Response	Weight	Competency
Students	Input	1	Students are given personality or character building when they first become new students	408,8	Softskill, Attitude
		2	Students are aware of their talents and interests	321,2	Hardskill, Softskill, Attitude
		3	Students choose specialization according to their talents and interests	321,2	Hardskill, Softskill, Attitude
		4	Students go through the selection process first before choosing the desired specialization	321,2	Hardskill, Softskill, Attitude
	Process	1	Students get entrepreneurship training or certain skills courses to equip them if after graduation do not continue to universities	617,7	Hardskill, Softskill, Attitude
		2	Students receive soft skills training	578,8	Softskill, Attitude

Table 3 Table of High School Graduates Highest Tecnical Response (Cont'd)

Output	1	Students write the desired job and upload the CV and competency certificate into the data center	900	<i>Hardskill, Softskill, Attitude</i>	
	2	Students take certain courses and entrepreneurship training to support their careers if they cannot continue their studies to college	617,7	<i>Hardskill, Softskill, Attitude</i>	
Tracer Study	1	Students are willing to provide career information after graduating into the tracking database of alumni tracks	100	<i>Hardskill, Softskill, Attitude</i>	
Teacher	Input	1	The teacher performs basic observations (classroom action research)	429,2	<i>Hardskill, Softskill, Attitude</i>
	Proses	1	Seminar on the importance of soft skills for the world of work	578,8	<i>Softskill, Attitude</i>
		2	Students are required to follow organizations or extracurricular activities to improve soft skills	391,2	<i>Softskill, Attitude</i>
	Output	1	The teacher supports the existence of a data center	900	<i>Hardskill, Softskill, Attitude</i>
		2	Career Workshop	716,8	<i>Hardskill, Softskill, Attitude</i>
	Tracer Study	1	The teacher instructs students to input their biographical data and career information or further study after graduating into a special database	900	<i>Hardskill, Softskill, Attitude</i>
1		The teacher supports the existence of an alumni organization	900	<i>Hardskill, Softskill, Attitude</i>	
School Management	Input	1	Wawancara	342,5	<i>Hardskill, Softskill, Attitude</i>
	Process	1	Job / career debriefing	716,8	<i>Hardskill, Softskill, Attitude</i>
		2	<i>Softskills training</i>	578,8	<i>Softskill, Attitude</i>
	Output	1	Career development seminar / workshop	439,8	<i>Hardskill, Softskill, Attitude</i>
		2	Career advisor supports and participates with the data center	300	<i>Hardskill, Softskill, Attitude</i>
	Tracer Study	1	The existence of data tracking system alumni	300	<i>Hardskill, Softskill, Attitude</i>
Parents	Input	1	Parents encourage their children to choose specialization according to their talents and interests	900	<i>Hardskill, Softskill, Attitude</i>
		1	Parents motivate their children to study hard during the desired high school selection process	900	<i>Hardskill, Softskill, Attitude</i>
Process	1	Parents tell children to join organizations or take extracurricular activities to improve soft skills	645,1	<i>Softskill, Attitude</i>	
	2	Parents finance children to attend certain courses and entrepreneurship training if they do not go to college in the future	617,7	<i>Hardskill, Softskill, Attitude</i>	

Table 3. Table of High School Graduates Highest Tecnical Response (Cont'd)

Output	1	Parents motivate children to entrepreneurship	533,6	<i>Softskill, Attitude</i>
<i>Tracer Study</i>	1	Parents want to provide information about their career or further study of their children who have graduated from school	900	<i>Hardskill, Softskill, Attitude</i>
Input	1	Engaged in the development and application of content standards and graduate competency standards	900	<i>Hardskill, Softskill, Attitude</i>
Process	1	Working closely with high schools to conduct curriculum renewal operations to suit industry needs	900	<i>Hardskill, Softskill, Attitude</i>
	1	Allocate special funds for education such as funding training for high school teachers	900	<i>Hardskill, Softskill, Attitude</i>
Industry	1	Become a partner in the search for workforce graduates from high school	900	<i>Hardskill, Softskill, Attitude</i>
Output	1	List job openings to data centers that accommodate job seekers and job seekers	900	<i>Hardskill, Softskill, Attitude</i>
	1	Hold a career market	900	<i>Hardskill, Softskill, Attitude</i>
<i>Tracer Study</i>	1	Provide information if any high school graduates work in their industry	900	<i>Hardskill, Softskill, Attitude</i>

To get a critical technical response, there is a selection of 1 or 2 technical responses from each level and stakeholders from the SHS object that has the greatest weight. Among the technical response, there is some of them that has only 1 technical response because the HOQ only has 1 technical response. From the table above, a slice of the technical response is found at the same HOQ level but different stakeholders. The technical slice response obtained is the soft skills training technical response, found at the HOQ level of the process, to the stakeholders of students, teachers, school management, parents, and the government. Then there is a data center technical response that is found at the HOQ output level for students, teachers, school management, industry, and government stakeholders. The last is a technical response to trace alumni traces found at the HOQ tracer study level to all existing stakeholders, namely students, teachers, school management, parents, industry, and government. So that from the various technical responses of the slices above, it can be concluded that the most critical technical response is the technical response found in all stakeholders and can answer the 3 competencies needed by the world of work (hardskill, soft skills, and attitude), namely the data center technical response.

The government must be an intermediary for job seekers and employers by creating a system that can directly link job seekers and employers. The data center must include job vacancies originating from industry that contain various details of job qualifications needed by various companies. In addition, job seekers can also enter their CV and write about the work they are interested in. Aside from being a website, data centers also need to be supported by online chat facilities that are almost the same function as call centers that connect job seekers and job seekers directly. So, the proposal to make a data center needs to be done by the government which is certainly supported by students, teachers & school management, and industry so that it can help the process of alignment between education and the world of work in the City.

4. Conclusion

Based on the finding in the result and the discussion above, the conclusion for this research are:

1. The government must be an intermediary for job seekers and employers by creating a system that can directly link job seekers and employers by creating data center to connect job seekers and employers.
2. Absorption of high school graduates over the past 3 years is 57% of high school graduates continuing their studies, 26% working, 6% entrepreneurship, 6% still unemployed and 5% unknown.
3. Absorption of vocational school graduates in the last 3 years is as much as 23% of vocational school graduates continue their studies, 55% work, 10% entrepreneurship, 6% still unemployed and 6% unknown.
4. Efforts to increase the absorptive capacity of high school and vocational high school graduates are made by making data centers created by the government that are supported and implemented by students, teachers, school management, parents, and industry.

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