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Quality Evaluation on Private Higher Education Institutions in Pekanbaru, Indonesia (Integrating Kano Model and Quality Function Deployment)

Evaluación de calidad en Instituciones privadas de educación superior, Pekanbaru -Indonesia (Integrando el Modelo Kano y el Despliegue de la Función de Calidad)

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ABSTRACT:

The era of ASEAN Economic Community (AEC) requires all higher education institutions in Asia should be ready to competence each other so the alumni can fulfill the requirements in ASEAN labor market. The purpose of this research is to evaluate the quality of Higher Education Institutions (HEI) in city of Pekanbaru, Indonesia based on student's perceptions and to provide some technical responses to result in quality improvement. Samples of this research are seven private Universities which were selected by using cluster sampling method with 379 students of the total respondents. This research also used Kano Model and Quality Function Deployment approach as the integration tools which can help to gather Voice of Customer (VoC) and generate a matrix of priority needs and technical responds in a form of House of Quality. The result of this research found nine priorities on need, they are student's achievement index which is more than 3.00, research supervising by the lecturer, lecturer's discipline, ability of the use of technology, lecturer's assessment method, academic staff's passion and patience in

RESUMEN:

La era de la Comunidad Económica de la ASEAN (AEC) exige que todas las instituciones de educación superior en Asia estén listas para competir entre sí, de modo que los ex alumnos puedan cumplir con los requisitos del mercado laboral de la ASEAN. El objetivo de esta investigación es evaluar la calidad de las Instituciones de Educación Superior (IES) en la ciudad de Pekanbaru, Indonesia, de acuerdo con las percepciones de los estudiantes y proporcionar algunas respuestas técnicas para mejorar la calidad. Las muestras de esta investigación son siete universidades privadas que se seleccionaron mediante el método de muestreo por conglomerados con 379 estudiantes del total de encuestados. Esta investigación también utilizó el Modelo Kano y el enfoque de Despliegue de Funciones de Calidad como las herramientas de integración que pueden ayudar a reunir voz de cliente (VoC) y generar una matriz de necesidades prioritarias y respuestas técnicas en una forma de Casa de Calidad. El resultado de esta investigación encontró nueve prioridades en la necesidad, el índice de logros del estudiante que es

delivering service, English proficiency, teaching and learning atmosphere, academic information effectiveness. Based on this research, HEI can conduct several steps to improve the quality such as lecturer and staff's training and development, monitoring of teaching and learning process, student's soft skill and practical ability improvement, and monitoring of academic's rules and procedures.

Keywords: Kano Model, Quality Function Deployment, House of Quality, Private Universities

más de 3.00, la supervisión de la investigación por el profesor, la disciplina del profesor, la capacidad del uso de la tecnología, el método de evaluación del profesor, la pasión y la paciencia del personal académico. Dominio del inglés, ambiente de enseñanza y aprendizaje, efectividad de la información académica. Con base en esta investigación, HEI puede realizar varios pasos para mejorar la calidad, como la capacitación y el desarrollo del profesor y el personal, el seguimiento del proceso de enseñanza y aprendizaje, las habilidades suaves del alumno y la mejora de la capacidad práctica, y el seguimiento de las reglas y procedimientos académicos.

Palabras clave: Modelo Kano, Despliegue de funciones de calidad, Casa de calidad, Universidades privadas

1. Introduction

Globalization in the era of today's technology demands every country increasingly to be able to deal with the tight competition. One way to overcome the competition is to manage the quality of human resources (Sawaji et al, 2011). Education is a factor which plays an important role in the development of science and create human resources who are able to compete with national and global markets. Regarding to the initiation of the ASEAN Economic Community (AEC) era, the institutional based National College should prepare to compete freely in generating alumni who are able to dominate the labor market in ASEAN.

Table 1
Global Competitiveness Index Year 2015-2016 in 5th Pillar Education and Training
(World Economic Forum, 2016)

Country	5th Pillar 2014-2015	5th Pillar 2015-2016
Singapore	2	1
Malaysia	46	36
Thailand	59	56
Indonesia	61	65
Philiphina	64	63
Vietnam	96	96
Kamboja	123	123

Table 1 shows the 5th pillar of education and training in global competitiveness index in education and training. Indonesia ranked 56 in the period 2015-2016 which is under Singapore, Malaysia and Thailand in ASEAN Competition. It means that Education and Training in Indonesia need to be organized well especially in improving education quality which can result in improved global competitiveness ranking. Higher Education Institutions (HEI) in Indonesia, especially private higher education currently shows a fairly rapid development. In 2015, the Ministry of research, technology and higher education did the deactivation to 197 Private Higher Education in Indonesia since they did not meet the quality standards of higher education. This action was caused by the presence of several problems including academic data reporting problems, ratio between lecturers and students and also

bad higher education management such as classes, facilities, documentation, etc. Another problem which also takes a part is there has been an imbalance between quality education in Java and outside of Java, both public and private education institution. In this case, Indonesian Government needs to create a policy related to centralized quality of higher education public or private higher education for the entire city of Indonesia.

According to (Qureshi et al, 2012), education institution is one of the services sector which is frequently difficult to measure the performance because of it is intangible, the outcome is the understanding of knowledge of individuals which can change their characteristics and behavior. In this context, every country, especially Indonesia has its own accreditation agency that assesses the quality of the higher education institutions by evaluating and accrediting the degree and educational work offered. One of the way in which educational systems at higher education institutions (HEI's) can be developed and improved is using and implementing of Total Quality Management (TQM) tools. TQM is an effort to achieve quality of wide-organization, refers to managing quality aspirations which involves every department to achieve excellence in business, by regarding to customers' satisfactions. The usage of such tools will give the higher education institution strong position among other education institutions since it will get a higher quality of education system which makes higher education institution becomes competent. In order to assure that the institution is competitive enough, total quality management tools allow the institutions to review and assess their performances to see whether they follow the required learning and teaching conditions (Al-Tarawneh & Mubaslat, 2011). The application of total quality management is done by using qualitative and quantitative tools which are useful for higher education institutions to assess their performances of the education institution, so they can find their strengths so they can enhance it and their weaknesses so they can eliminate it. Besides, the institution needs to considerate the improvement for the institution over the time.

In the (Abou Chahine, et. al. 2008) have showed that the effectiveness of the education quality will first depend on the proper identification of the clients of the HEI's. In this point, there are two primary clients: students and other stakeholders such as parents or guidance, business man or woman, society, etc. The students perform as dual role, which are as client and as the product of higher education. (Salameh et. al. 2011) have declared that the students' satisfactions is the crucial factor for the success of higher education and it is the main point of all TQM practices. One of the TQM tools is Quality Function Deployment (QFD) is a very well-known design method, developed in late 1960s in Japan, was used since the aim was translating CNs and the goal was technical design requirements and it means that is obligated to use of a series of matrix, called as House of Quality (HoQ), with the aim in satisfying the customers' expectations and improving the quality level of the product at the same time (Mukaddes et. al. 2010).

2. Methodology

This research was analyzed by using quantitative approach, the object of this research was students at private HEI in Pekanbaru. Sampling method used in this research was cluster sampling technique towards the selected in seven private HEI in Pekanbaru which consist of 379 students as the respondents. The data analysis technique used in this research was validity and reliability analysis to make sure whether every item in Kano and QFD questionnaires were valid or not.

Table 2
Kano's Evaluation for customer requirement

Customer Requirement		Dysfunctional (Negative) Question				
		1.Like	2. Must be	3. Neutral	4. Live with	5. Dislike
Functional (Positive) Question	1. Like	Q	A	A	A	O
	2. Must be	R	I	I	I	M
	3. Neutral	R	I	I	I	M
	4. Live with	R	I	I	I	M
	5. Dislike	R	R	R	R	Q

Furthermore, this research continued with an integrated analysis of Kano Model and Quality Function Deployment by doing these following steps:

- Gathering customer's requirements and making some questionnaires covered functional and dysfunctional questions. The first as functional questions were to determine how customer feels if the requirement was fulfilled and the second question (dis-function questions) was to determine how customer feels if the requirement were not fulfilled.
- Combining the functional and dis-function questions as this evaluation as shows in table 2.
- Determining of Kano's weight by using Blauth's formula (Walden, 1993) (Jayanti & Singgih, 2012).
- Creating House of Quality (HoQ), the first part of the HoQ is consumer needs matrix. The attribute contains the voice of consumers, level of importance and Kano's weight for each attribute (Jayanti & Singgih, 2012), to illustrate HoQ as shows in figure 1.

Figure 1
Scheme of the House of Quality (HoQ).
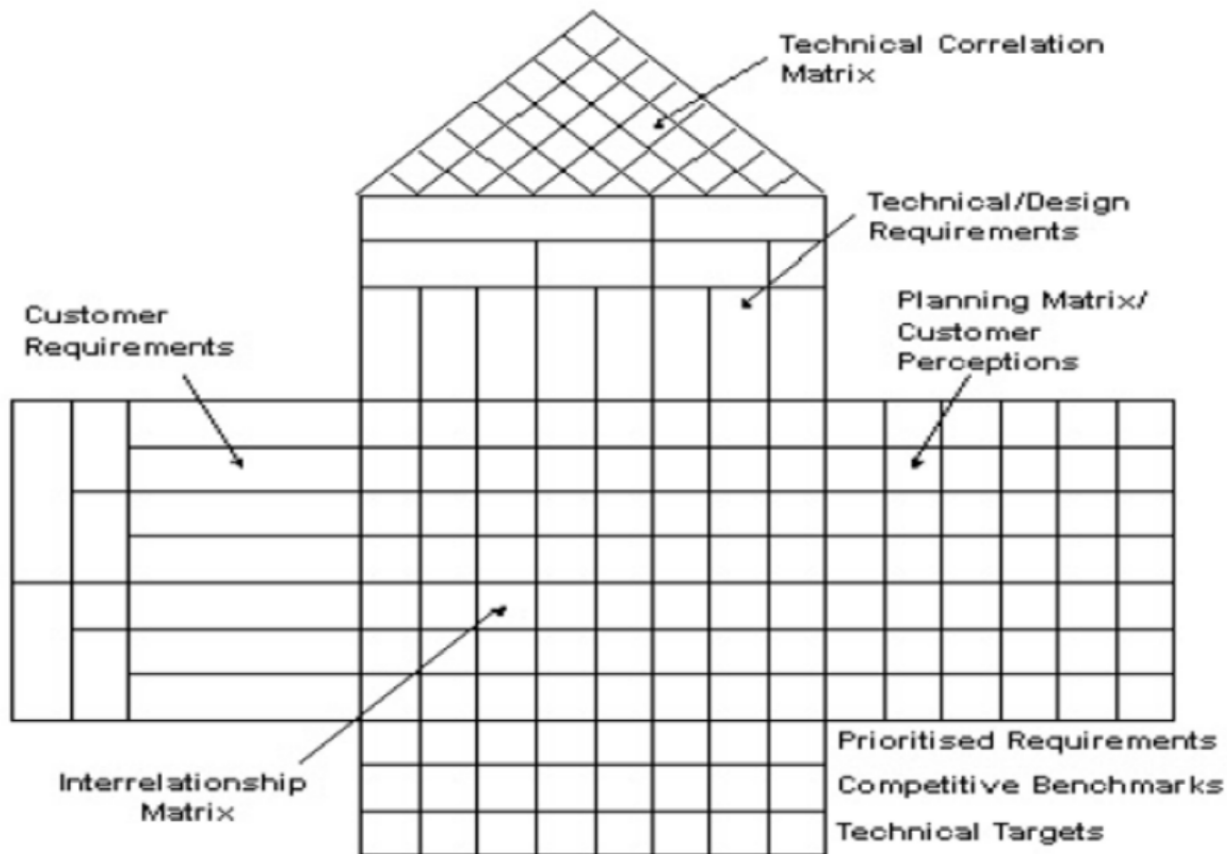
- Customers requirements, the initial steps in forming the HoQ were determining, clarifying and specifying the customers' needs.
- Technical requirements, the next step of the QFD process was identifying what the customer wants and what must be achieved to satisfy their wants. Regulatory standards and requirements administered by the management must be identified. Once all the requirements were identified, it was important to answer what must be done towards the product design to fulfill the requirements needed.
- Planning matrix, to compare how well the team fulfilled the customers' requirements compared to their competitors.
- Customer ratings, typically ranging from 1 to 5, were given to each company relevant to their own requirements.
- The customer ratings were combined with the weighted performances of each demand to result in measurement over all performances for all companies.

Interrelation matrix, to establish a connection between customers' requirement products and the performances, the design was measured to improve the product.

- To obtain the opinions of the consumers as far as what they needed and required from a specific product.
- By using these customers' perceptions, the company could begin to formulate a strategy to improve their products.
- To implement this step, the strengths and weaknesses of the company were weighted against the customer priorities to determine: a) what aspects needed to be changed to surpass the competition b) what aspects needed to change to equal the competition and c) what aspects will remain similar.
- The optimal combination was desired.

Technical correlation matrix

The more often called as the roof was used to help us in developing relationships between customers' requirements and product requirements, identifying whether these team must cooperate each other or they would be in a conflict.

The following symbols were used to represent what kind of impact of each requirement had:

✓ ● = very strong relationship
✓ O = strong relationship
✓ ▲ = weak relationship

3. Result and Discussion

Based on the result analysis of Kano model, the attribute of Quality (M) was the requirements for fulfilling customer expectation. When it was done, customers were neutral but when it was done badly, customers would be very disappointed. Regarding to the attribute in one dimensional quality (O), customers were satisfied if their expectations were fulfilled and they were dissatisfied when their expectations were not fulfilled. These are the attributes which were discussed and the things which every company competed for. Furthermore, for Attractive Quality (A), these attributes provided satisfactions when this point was achieved fully, but it didn't cause dissatisfaction when it was not fulfilled. These were the attributes which were not normally expected. In different Quality (I), this attribute referred to aspects which were neither good nor bad, and they did not result in either customer satisfaction or customer dissatisfaction.

3.1. Kano Model Analysis

The Kano model analysis as shows in the table 4, Kano model for analysis of quality evaluation in this research. There were 8 attributes were quality (M), 12 attributes were one-dimensional quality (O),11 attributes were attractive quality (A), and 1 attribute was Indifferent Quality (I).

Table 4
Kano Model for quality evaluation

No	Atribute	Category
1	Curriculum oriented in the diversity of science and technology, skills and the demand of profession	O
2	Lecturer provides syllabus	A
3	Lecture's Textbook, materials/handout	O
4	Lecturer's discipline	A
5	Lecturer's ability to delivering knowledge to students	M
6	Teaching and learning atmosfhere	O
7	Lecturer's assesment method	A
8	e-learning	M
9	Interaction between student and lecturer	O
10	Research supervising by the lecturer	A
11	Public services by the lecturer and students	I

12	Academic Information Effectiveness	O
13	Student's registration process	M
14	The selection of new students	O
15	Academic servicess effectiveness	O
16	Academic staffs are neatly dressed	A
17	[1] Academic staff's passion and patience in delivering service	A
18	Classroom facility	O
19	Facility of health and sport	M
20	Library Facility	A
21	E-Library	A
22	Campus environment	M
23	Internet access	O
24	Computer laboratory	A
25	Parking facility	O
26	Mastering of knowledge and skill	A
27	Level of achievement index more than 3.00	A
28	Field work experience	M
29	Organizational experience	M
30	Ability of the use of technology	O
31	English proficiency	O
32	Problem solving ability	M

3.2. The Analysis of Priority on Needs

The result of the importance of adjustment as shown in table 5, there were nine customer requirements which will be the priority. On the level of achievement index which was more than 3.00 covered Research supervising by the lecturer, Lecturer's discipline, ability of the use of technology, lecturer's assesment method, academic staff's passion and patience in delivering service, English proficiency, teaching and learning atmosphere, academic information effectiveness.

Table 5
Result of the importance of adjustments

No	Attribute	KW	I	GAP	AI
1	Lecturer's discipline	4	3,15	-0,57	7,18
2	Teaching and learning atmosfhere	2	3,15	-0,89	5,60
3	Lecturer's assesment method	4	3,26	-0,51	6,65
4	Research supervising by the lecturer	4	3,34	-0,67	8,95
5	Academic Information Effectiveness	2	3,27	-0,86	5,62
6	[1] Academic staff's passion and patience in delivering service	4	3,10	-0,52	6,44
7	Level of achievement index more than 3.00	4	3,28	-0,71	9,31
8	Ability of the use of technology	2	3,54	-0,99	7,00
9	English proficiency	2	3,48	-0,85	5,91

KW = Kano's Weight, I = Importance, IA = the Importance of Adjustment

3.3. Anaysis of Priority on Technical Responses

Table 6 shows technical responses that were prioritized were follows [1] Lecturer and staff's training and development, Monitoring teaching and learning process monitoring, student's softskill and practical ability improvement, and monitoring of academic's rules and procedures.

Table 6
Technical responses were prioritized

No	Technical Response	Priority	%
1	[1] Lecturer and staff's training and development	466.1	37.5
2	Monitoring of teaching and learning process	209.3	16.8
3	[1] Monitoring of academic's rules and procedures	124.8	10.0
4	student's softskill and practical ability improvement	205.6	16.5

The percentage of priority on technical responses was obtained through the relationship matrix between priority on needs and the priority on technical responses shown by HEI.

Figure 2 shows the relationship matrix that was mentioned before which the symbol l indicated very strong relationship with the number of value 9, symbol ¢ indicated strong relationship with the number of value 3 and symbol pindicated weak relationship with the number of value 1.

The structure of priority of customer needs was a key component of HoQ. The set of priority of customer needs would have a major impact on further product development activities. In HoQ matrix, the matrix explained some technical responses that could be used as improvement point which must be done by Private Higher Education Institutions (HEI), as follows:

1) Lecture's quality plays a crucial role for a student's education quality. Therefore, it was so important for private HEI to recruit highly qualified teachers based on the regulation and pay much attention in the ratio of lecturers and students.

2) Private HEI provides quality procedures to control the teaching and learning process such as subject design and objectives, course notes and books, assets, teacher-student communications, formative assessment and subject evaluation and also lecturer education background.

3) Motivation is the determination to achieve the success of the quality in teaching and learning process. Private HEI should provide lecturers the regular payment of salary and other. Remuneration and give them opportunities to develop their knowledge and skill through training or workshop.

4) Private HEI should encourage lecturer to be more creative and innovative and give them appreciation or award on their efforts and achievements.

5) Private HEI provides facilities to the lecturer in order to accelerate the teaching and learning process.

6) Private HEI has to develop an evaluation, appraisal or measurement towards lecturer performance in teaching and learning process, research and lecturer social relationship.

7) Managing academic staff performance such as assisting staff to develop the academic and professionality and to provide them with reliable information about institution and also to monitor and assess their performance based on academic rules, procedures and job descriptions.

8) Institutions of higher education responded to the technology changes, technology had made this application more possible in introducing teaching and learning and academic procedures that was less limited by time and place. Therefore, private HEI need to concern about technology usage in order to make an efficient and effective academic process.

9) Improve students' competency by investing and accelerating proviciency, students' motivation and encouragement, developing curriculum and lecturer's sillabus which was focused on academic only.

Figure 2
House of quality in student teaching

The improvement of students' softskills and practical ability making combination of competency-based and blended learning environment makes it possible to customize students' learning experiences.

No	Attribute	Kano's Weight	Importance	GAP	Adjusted Importance	Curriculum development	Lecturer and staff's training and development	Teaching and learning process monitoring	Academic's rules and procedures monitoring	Process improvement of academic services	Improvement of campus facility	Improvement of internet and technology facility	Increasing cooperation other company or institution	Improvement of student's softskill and practical
1	Lecturer's discipline	4	3,15	-0,57	7,18		●	○	○				○	
2	Teaching and learning atmosfhere (fun, creative, interractive and motivated)	2	3,15	-0,89	5,60		●	○						▲
3	Lecturer's assesment method	4	3,26	-0,51	6,65	○	●	○	○					
4	Research supervising by the lecturer	4	3,34	-0,67	8,95		●	○	○					
5	Academic staff's passion and patience in delivering service	2	3,27	-0,86	5,62		●			●	●			
6	Facility of health and sport	4	3,10	-0,52	6,44		●	○				●		▲
7	Level of achievement index more than 3.00	4	3,28	-0,71	9,31	○	○	●						●
8	Ability of the use of technology	2	3,54	-0,99	7,00	○	●	○					●	●
9	English proficiency	2	3,48	-0,85	5,91	○	●			▲				●
	Total Prioritas					86,6	466,1	209,3	124,8	50,6	9,0	63,0	28,0	205,6
	% Prioritas					7,0	37,5	16,8	10,0	4,1	0,7	5,1	2,3	16,5

4. Conclusion

Total Quality Management (TQM) is a development of management science [2] designed to improve the quality at every level to achieve their excellence. TQM has a remarkable application on HEI's which the adaption of TQM can help the higher education institution to maintain their competitive position, satisfy all stakeholders, focus on the market needs and achieve higher performances. Quality Function Deployment (QFD) by integrating Kano model is one of the quality tools that can be used in order to evaluate the current quality towards HEI which had applied this system. The HoQ matrix obtained some quality improvement points that could be implemented in Private HEI. By knowing this research analysis, HEI management could provide quality standard to make sure that all customers' requirements could be fulfilled to meet their satisfactions.

Acknowledgment

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