

# A Quality Function Deployment (QFD) Approach in Determining the Employer's Selection in KAMCO

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**Abstract:**The industrial training program is part of the academic curriculum at the tertiary level. It plays an important role in providing students with the exposure to a real working environment in the industry. Through this program, the higher education institutions could identify the gaps in the curriculum based on the requirements from the industry. In addition, the feedback from the industry will help the higher education institutions to equip students with relevant skills according to the demands from the industry. Indirectly, it can help to address the issue of unemployed graduates of which the number seems to increase from time to time. Therefore, this analysis aims to obtain the feedback from the employers out there in order to determine the most preferred criteria in selecting students for the industrial training placement by using Quality Function Deployment (QFD) approach .The findings, through the development of house of quality based on the QFD approach, show that communication skills and students' participations. Therefore, the QFD approach can be used to translate the employers' feedback in improving the marketability of the students in the industry

## I. INTRODUCTION

Kerala Agro Machinery Corporation Limited, a Government of Kerala undertaking was formed with the intension of manufacturing power tiller operated by diesel engine. The company came into existence in Athani in Ernakulum district in 1973 when it started assembling power tillers under technical collaboration from M/S Kubota Limited, Japan. The product is now made in India and is suitably designed to meet the Indian conditions. There are more than 1.5 lacks of KAMCO power tillers operating in various states in India. Transport Corporation of India Ltd. has been associated with KAMCO for about 25 years and transports material to all parts of the country. It is here that TCI plays a major role in the movement of the machine and also ensures availability of spare parts with all the dealers. KAMCO's human resource department plays a vital role in overall productivity and efficiency of its workforce. The main objective is to meet the organizational needs of the company and the needs of the

people hired by the company. Human resource department provides expert advice and assistance concerning personal matters. HR department helps to maintain better relation between management and employees. It includes joint consultation, collective bargaining, grievance handling, disciplinary actions, and settlement of industrial disputes, etc. In KAMCO there is a specific recruitment and selection procedure. Recruitment focuses on identifying the right people for the right job. It starts with drawing up the profile of ideal employees after determining the competencies, structuring the very form of selection process in such a way that it helps in checking the fitness. Recruitment occurs in two types, PSC recruitment and company recruitment. For the post like Assistant Accountant, office staffs, Typists, stenographer etc, the people are hired through PSC Recruitment. Executive and Technical post are filled through Company Recruitment. Employment exchange forwards a list of candidates for the required posts in the unit on their notification to the District Employment officer, Ernankulam. Vacancies are advertised in major newspapers or notified to the Employment Exchange in accordance with the Government rules. No discrimination or religion, color, race etc is made .Appointments are purely based on merit. Normal age limit for fresh recruitment will be 35 years in case for posts in G-8 and 40 years in all other cases, relaxable at the discretion of the Managing Director, wherever necessary. Departmental candidates will be considered for posts to be filled up by open selection along with outside candidates and a common merit list will be prepared. The company may fill up vacancies by obtaining employees on deputation from government department or other public sector undertakings whenever necessary, incase suitable internal candidates are not available. No person shall on his first appointment be allowed to join duty unless he has submitted a certificate of fitness in the prescribed form signed by an authorized medical officer of the company or a civil surgeon of the State Government.

Human capital is an important asset in the process of developing a country. Countries with high-skilled human capital are able to generate economic activities to a more dynamic par with developed countries like the United States or Japan. Therefore, various approaches have been initiated, especially in the higher education system, in order to produce

human capital with high skills and competency by requiring students to undergo the industrial training program before being awarded with certificates, diplomas, or degrees. The industrial training program exposes students to the real working environment and enables them to apply the theoretical and practical knowledge that they have learned by performing the tasks assigned by their current organization. The industrial training program is also the best mechanism for the to evaluate the effectiveness of their programs or courses that they have been offering to the students. In addition, the program also helps the university to foster a good relationship with various organizations in the industry. The relationship is beneficial to both parties in an effort to develop and produce a first class human capital which is highly required by the country.

Higher education institutions providing opportunities for their students to be exposed to the real work situations. Various courses and programs have been taught in the university as to improve students' skills and knowledge and applying during their works or during their industrial training. However, the requirements and expectations of the industry are constantly changing as the economics and industries keep changing. Therefore, it is an obligation to the university to assess the ability of their students, whether they meet the demands of the industry, and what criteria and skills that the industry needs from graduate students. For that reason, the feedback from the employers regarding the selection of students to join their organization is very important to assist the university in preparing and providing a better service in the future. In an effort to improve and enhance the quality of service, in preparing graduates who are skilled and competent to the industry, the survey was conducted to get feedbacks from employers to assess the effectiveness of the courses offered and the skills acquired by students. Thus, with the approach of Quality Function Deployment (QFD) analysis, the absolute weights for technical requirement (outcomes of the program) based on the development of house of quality from the employer's perspective were studied and investigated for identifying the program learning outcomes (HPP) and program outcomes (OP) which need to be emphasized or improvement in meeting current industry needs. This allows improving the existing programs so that graduates are more competitive and more marketable, thereby reducing the number of graduates who are unemployed. For the final year students of the industrial training program is a compulsory since it was stopped and was not compulsory to the students on last 1995 session. Therefore, the feedback from the industries and the students is needed and important as to find out the effect of the IT on the students. The most important is to find out the marketability of the students to be hired by the industries after the IT program. There were various studies on the industrial training that have been done in some higher institutions, namely, by Goi and Lau , Ng et al. , Abdul-Karim , Shahrir et al. , Omar et al. , Lai et al. and Awang .Human capital that has been equipped with skills such as communication skills, ability to work in teams, ability to think creatively, and ability

to make decisions and has both good leadership skills and academic excellence will be more competitive in the industry. According to Madar et al. , the ability of employees to handle highly skilled tasks will benefit the company by improving the quality of production and becoming more competitive in local and international markets. Moreover, Rasul et al. found that employers are more in favour of employees with basic, critical thinking, resource, and interpersonal skills as well as being knowledgeable in systems and technologies and qualified personnel in improving the marketability in the industry. Therefore, this study was conducted by using the Quality Function Deployment (QFD) approach to determine the selection criteria of industrial training students at the agencies and, thus, giving a first-hand overview to the university in dealing with the demand from the industry in future. In this study, the feedback from the employers and the students who undergo the IT is needed to determine the effectiveness and the marketability of the PPSM student in getting a job. This investigation on the IT program is important and will be beneficial to the as it will enhance the effectiveness of the IT program and beneficial to the students as it will increase the marketability of the students in finding the jobs as it was conducted during the final year after students have completed all the units needed before finishing their study and graduated, compared to before which was on the second year of study.

## II. LITERATURE REVIEW

The concept of Quality Function Deployment (QFD) has been introduced by Akao and Katsuyo in 1966 at Matsushita Electric. The QFD can be used in various sectors such as services, automotive, hospitality, and manufacturing. Nevertheless, the first application was in the manufacturing sector by Toyota. Having proven its effectiveness by Toyota, the quality practitioners have expanded the use of QFD in the service sector . Therefore, Mazur defines the QFD as an approach to satisfy the customers (Quality) by translating their needs into the design and ensuring all the organizational units (Function) are working together to identify the design features systematically to have more detailed information that can be disclosed and controlled (Deployment). The QFD is a method of developing a design quality which aims to satisfy the customers by translating their demands and designs for a certain product or service. The QFD can also be used in education sector by assisting the HEI to form the subjects or topics of specific courses for each subject and restructure the university curriculum. For example, Mazur and Gonzalez et al. have applied the concept of QFD in forming the subject of Total Quality Management (TQM) and International Business based on the feedback from the students, university staff, and employers in the industry. Kauffmann et al. have applied QFD to develop decision model to prioritized course contents based on degree of impact on program objectives. The model was developed to quantify curricular decisions involved in restructuring a Masters of Engineering Management degree

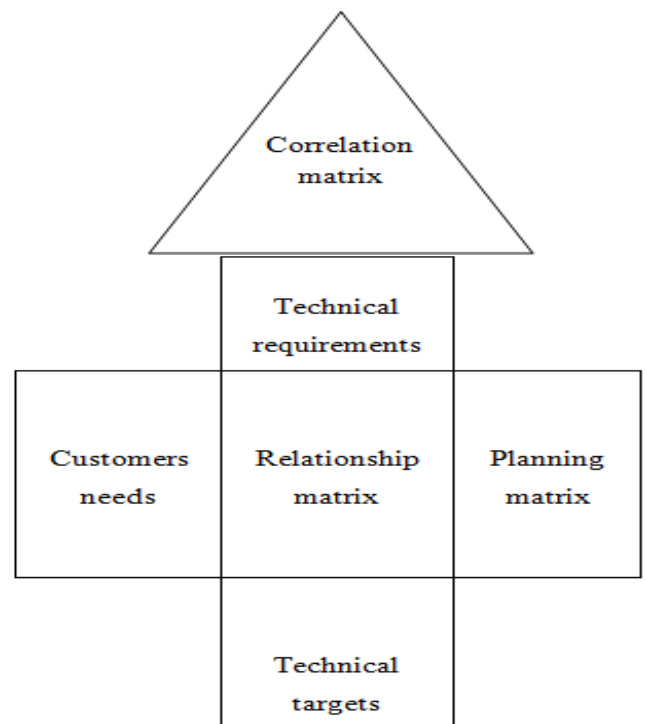
program. Based on QFD model, it provides a practical and quantitative methodology for developing faculty consensus in the selection of curricular topics based on a strategic program focus. While Singh et al. used QFD to revamp existing industrial engineering curriculum by reassessing it with outcome based accreditation, based on output from roof matrix in the house of quality, they identified the overlapping and prerequisite relations among courses. Therefore, they can remove any overlapping courses and identify newly required courses. Aytac, and Deniz have applied QFD method to review curriculum of the Tyre Technology Department at the Kocaeli University Kosekoy Vocational School of Higher Education (KU-KVSHE), Turkey. They have conducted direct interview with the stakeholder of local tyre companies in Turkey and get the feedback regarding the expectation from the stakeholder on the graduates and the curriculum. The interview was also conducted by the lecturer of that department so that they can get feedback from both sides, stakeholders and the school management, and finally proposed new module of IT program which includes the industry demand, preparing the students which are skilled as per employers' demand. Quinn et al. studied identifying and evaluating techniques that were used to improve the quality in higher education. They examined customer and measured customer quality perceptions to identify the differences and similarities surrounding quality improvement efforts in each of three service areas that were typically found in higher education: academic, administrative, and auxiliary functions. While Singh et al. evaluate the quality of educational institute based on five identified groups of "dimensions of quality" and twelve sets of "enablers" in an educational institute, then, they outline a QFD model based on interrelationship and interrelationship among the dimensions of quality, enablers, and customers. Finally, the indices that they developed are then utilized for quality planning and monitoring in educational institute. Qureshi et al. also studied the quality of Higher Educational Institute in Pakistan where, from the QFD model, they highlighted the major concerned areas of quality improvements in teaching and also highlighted some benchmarks where other institutions are more productive. All the studies reported using QFD to restructure and enhance the curriculum for their university program in line with the current industry demand. The QFD approach also requires the development of house of quality in integrating customers' feedback for the technical requirements of the organization and analyzing problems or enhancements that should be given priority in improving the quality of their services. Akao et al. define employers as an external client to the university. Feedbacks from employers are beneficial to the university in helping them to evaluate the effectiveness of the university programs or courses offered. In addition, this feedback can be used to enhance the students' skills in line with the needs of employers and, thus, reduce the unemployment rate among the graduates.

**III. MATERIALS AND METHODS**

A survey has been conducted on the industries which are involved in the student's industrial training program of students to investigate the marketability of the students. The questionnaires that can be referred to in the Appendix were distributed to the employers during the assessment visit by the supervisor. The survey on the employers involved 60 respondents. There were 2 parts in the employer questionnaires to be answered. In order to determine the feedback from the employers regarding their selection of students who undergo industrial training at their agencies, Likert's scale ranging from 1 to 5 was also used to measure. The scale range of 1 represents excellent while 5 represents poor. Descriptive analysis was done to look at respondents' profiles based on demographic factors while the hypothesis testing was done to compare the criteria of selection of industrial training students. The hypothesis that was tested is as follows:  $H_0$ : there is no difference between criteria of selection of industrial training students from the employers Feedback. The analysis of variance (SPSS) was used to get the conclusions on the hypothesis stated above.

*A. Quality Function Deployment for Employer's Criteria of Selection.*

In this section, we propose an assessment of student's skill based on the program and courses that they have taken during their studies in via QFD methodology. The voice of employers was taken as their feedback on how they select the students to join their to undergo industrial training.



**B. House of Quality**

The QFD approach requires the development of house of quality in connecting the customers’ voice with the specified products or services, technical requirements, process of planning control, and manufacturing operations. In this study, the customer’s voice is the voices of employers of the students undergo their industrial training. There are six steps in building a house of quality; namely, the customers’ needs, technical requirements, relationship matrix, planning matrix, correlation matrix, and technical targets Figure. Therefore, in this study, the employers are the external customers. The employers’ feedback of satisfaction on student’s skills and abilities is categorized according to the domain: the affective domain, psychomotor domain, cognitive domain, and psychomotor and cognitive domain, based on course learning outcomes of Industrial Training course by referring to as guidelines to good practices in assessment to students as shown in Table 1. In addition, the technical requirements describe the model of “how” the organization responds to “what” the customer needs for a certain product or service. The selection criteria of industrial training students are the technical requirements which describe the criteria required by employers in selecting students to undergo the training at their organizations based on the previous research. The relationship matrix ( $R_{ij}$ ) is the “heart” of the QFD. The purpose of this communication matrix is to indicate whether the technical requirements are fulfilled. This matrix connects the employee response to the selection criteria of student by using a specific symbol that reflects the degree of relationship. The planning matrix is part of the house of quality as a marketing strategy and planning decision

Number	ITEMS
B1	English proficiency
B2	Malayalam proficiency
B3	Proficiency in other languages
B4	Communication skills
B5	Working experience
B6	Duration of industrial training
B7	Academic qualifications
B8	Impressive resume
B9	Company/organization policy
B10	Amount of students’ intake for industrial training for a particular period
B11	Students’ involvement in extracurricular activities
B12	Students’ involvement in sport activities

Table 1: Employer’s Feedback on the Satisfaction Level of Student Skills

the important requirement for the employee (s), which is a scale of 1–5, performance of the employee’s voice ( $t$ ), target of employee’s voice ( $u$ ), and ratio of improvement ( $V$ ), where

$$t_i = b_i / c \quad \dots\dots (1)$$

in which  $b = (\sum_i i$  number of employer at value  $i$ ) .  $i$ . (1)  $c$  is a total number of employ

$$V_i = u / t, \quad \dots\dots (2)$$

$u$  = target and  $t$  = performance of employers’ feedback. Besides that, the point of services/sales ( $w$ ) and the absolute weight of student’s voice ( $z$ ) were also considered in the house of quality, where  $\square_i = s_i$ .

$$V \cdot w_i \quad \dots\dots\dots (3)$$

The correlation matrix is a correlation or “roof” of the house of quality. This “roof” can be seen in Figure1 as correlation matrix at the top of the figure. This roof shows the relationship of each indicator of criteria of selection by employer. This relationship is used to determine whether the indicators support or hinder each other. The technical target is the last matrix in the house of quality. It is determined as an absolute weight of selection criteria indicator ( $x$ ) and calculated by

$$x = \sum R_{ij} S_j ; i = 1, 2, \dots, n; \quad j = 1, 2, \dots, k, \quad \dots\dots\dots (4)$$

Where  $n$  is the number of employee’s voices and  $k$  is the number of indicators of all criteria of selection,  $x$  is an absolute weight,  $R_{ij}$  is a relationship matrix, and  $S_j$  is a “degree of importance” to customer with value ranges from 3 to 5. Normally, information found in the technical target is our priority and benchmark for criteria of selection. Therefore, the indicator of the criteria of selection which has a high absolute weight value should be given a priority in the process of maintaining the services and meeting the employees’ needs.

**IV. QUESTIONNAIRE DESIGN**

For each decision make when designing a questionnaire there is likely to be a list of points for and against just as there is for deciding on a questionnaire as the data gathering vehicle in the first place. Before designing the questionnaire the initial driver for its design has to be the research question, what are we trying to find out. After that is established we can address the issues of how best to do it.

An early decision will be to choose the method that our survey will be administered by, how it will inflict it on your subjects. There are typically two underlying methods for conducting



our survey; self-administered and interviewer administered. A self-administered survey is more adaptable in some respects, it can be written e.g. a paper questionnaire or sent by mail, email, or conducted electronically on the internet.

Surveys administered by an interviewer can be done in person or over the phone, with the interviewer recording results on paper or directly onto a PC. Deciding on which is the best for you will depend upon our question and the target population. For example, if questions are personal then self-administered surveys can be a good choice. Self-administered surveys reduce the chance of bias sneaking in via the interviewer but at the expense of having the interviewer available to explain the questions. The hints and tips below about questionnaire design draw heavily on excellent resources. SPSS Survey Tips

#### A. *The Format of Questions Will Affect the Answers*

Keep your questions short, less than twenty five words if possible. Keep questions Understandable make sure the subject understands the terms used and importantly how the format of the questionnaire works. Don't use "double negatives," they can be confusing.

#### B. Choose Appropriate Question Formats

So they are understandable to the person answering and that enable you to analyse the resultant data. Some questions can be easily answered with a simple single answer (e.g. do you smoke (y/n); what gender are you? (m/f), but others may require multiple choices a scale or, perhaps even a grid. Do make sure you know how to analyse the data you get, if you can't analyse the resulting data there was little point in collecting it. A research proposal should address analysis, a simple sentence "data will be analysed using SPSS" may pass the buck to SPSS but won't help much when you refer back to our plan. We should have an eye on the analysis when designing the questionnaire. Checking this is feasible should be part of the piloting; this will check that the data are arrange able in the formats needed for analysis and that we have the resources to do it we might include open ended questions in the questionnaire, do though be aware that they will be "tainted" by the context of being in with strictly quantitative questions. The pilot is a good time to use more open questions to check there are sufficient options on multi choice answers and that there is sufficient discrimination in the questions, so not all the answers are the same when there is likely to be a range of views.

#### C. *Ambiguous Questions*

Check for ambiguity in our questions, make sure what we asking is obvious. Ambiguous questions not only yield no useful data but can frustrate the respondent and encourage them to give up Avoid asking two questions at once. For

example, "Are you happy with the amount and timeliness of feedback you receive from your tutors?" Analyzing the responses to such a question would be made practically impossible because we won't be able to tell which part of the question is respondent was answering.

## V. TESTING OF HYPOTHESIS

A hypothesis is either true or false in the real world. Few Researchers understand what statistical hypothesis testing does and doesn't and consequently their result are misinterpreted. Even more commonly researchers element of statistical hypothesis testing, the concept is not integrated into their research. Hypothesis testing mainly involves the careful construction of two statements: the null hypothesis and alternate hypothesis. Theses hypothesis can looks very similar but they are actually different. Hypothesis can helps to make the quantitative and objective conclusions based on the survey results. Hypothesis Tests are part of the inferential statistics. Inferential statistics are used to draw inferences about a population from a sample. There are two main methods are used in the inferential statistics and they are Estimation and hypothesis testing. In estimation, a sample is used in estimate a parameter and a confidence interval. A hypothesis is a specific statement of prediction.

#### A. *Null Hypothesis*

The null hypothesis reflects that there will be no observed effect for our statement which made. In a mathematical formulation of the null hypothesis there will typically be an equal sign. The null hypothesis means that there will be no statistical difference between two variables. If the null hypothesis is not rejected, then we need to be careful to say what this means. The thinking on this is similar to a legal verdict. Just because a person has been declared "not guilty", it does not mean that he is innocent. In the same way, just because we failed to reject a null hypothesis it does not mean that the statement is true. The null hypothesis for the thesis to investigate this is The Occupation health and safety management system is not positively related to the policies developed by the company. When there any negation for our statement then that become alternative hypothesis.

#### B. *Alternative Hypothesis*

The alternative or experimental hypothesis reflects that there will be an observed effect for the statement. In a mathematical formulation of the alternative hypothesis there will typically be an inequality, or not equal to symbol. The alternative Hypothesis is what we are attempting to demonstrate in an indirect way by the use of our hypothesis test. If the null hypothesis is rejected, then we accept the alternative hypothesis. If the null hypothesis is not rejected, then we do not accept the alternative hypothesis. Going back to the above

example of Safety policy of the company, the alternative hypothesis is The Occupational Health and safety management systems is positively related to the policies developed by the company.

### C. Negations

The following set of negations help when forming the null and alternative hypotheses. Most Of them rely on the formulation, even though there may see some of the others in a statistics textbook. • Null hypothesis:  $x$  is equal to  $y$ . Alternative hypothesis  $x$  is not equal to  $y$ . • Null hypothesis:  $x$  is at least  $y$ . Alternative hypothesis  $x$  is less than  $y$ . • Null hypothesis:  $x$  is at most  $y$ . Alternative hypothesis  $x$  is greater than  $y$ .

### D. Types of Errors

There are two types of errors. They are Type 1 Error and Type 2 Error. The type 1 error occurs when the null hypothesis that is absent, a false hit the type 1 error rate or significance level is the probability of rejecting the null hypothesis given that it is true. It is denoted by alpha level. Often the significance level is set to be 0.05 (5%), implying that it is acceptable to have 5% probability of in correctively rejecting the null hypothesis. While the type 2 error is denoted by the Greek letter beta. When we can actually call type 1 error or type 2 errors depends directly on the null hypothesis. Negation of the null hypothesis causes the type 1 error and type 2 errors to switch roles. The test statistics is a metric that is been required to decide about the hypothesis. Fortunately there are lots of statistics tools to calculate the test statistic. Most tools offer two different way of input either enter the complete sample data or describe the sample data by naming mean, variance and sample size. As an output almost every statistical tool will return a so called  $p$  value that can be easily been used to decide in favour of one of the two hypothesis. No matter which type of test parametric or nonparametric one conducts it all comes down to interpretation the  $p$ -value. The  $p$ -value is the probability of the sample could have been drawn from the population being tested (or that a more improbable sample could be drawn) given the assumption that the null hypothesis is true. In order to decide for one of the two hypotheses one has to compare the calculated  $p$  value to the pre-specified alpha.

## VI. RESULTS AND DISCUSSION

Based on the survey conducted, there were respondents among the employers of which were from sectors followed by from government sectors and were from contracts only 2.2% were from other sectors. There were a total of 60 employers that provided feedback on the satisfaction level of students' skills as well as the criteria of selection of industrial trainings' students. There are four types of organization involved in the study: from government, from contract, apprentice such as, and 2% from other organizations. The 12 criteria that were

asked are communication skills, languages (English, Malayalam, and other languages), working experience, IT duration, academic qualification, the impressive resume, company policy, quota of IT, and student's involvement in cocurriculum and sports. Employers who provided their feedback as shown in Table 2 are the field supervisors from various sectors such as finance, manufacturing, services, industry, real estate development and construction, education, consulting, transportation, agriculture and food, defence, and security as well as communication and IT. They were asked to give a scale of whether the twelve items of criteria of selection are important or not ranging from 1 to 5. Based on the twelve items of criteria of selection, the mean for each item from the scale of 5 is calculated. We found that the highest mean value according to the criteria of selection is the criteria of communication skills (4.5 from scale 5), followed by the criteria of mastery in English and Malayalam languages (4.29 and 4.13), the criteria of academic qualification (4.07), and the criteria of company policy (4.02). From the feedback of employers regarding the criteria of selection, the findings show that the overall mean is 3.76 from scale 5.0. It has been shown that the employers could say that all criteria of selection that have been asked are more likely important to them in selecting the students to undergo industrial training at their agencies. Then, analysis of variance (spss) was conducted to test whether there are significant differences between the criteria of selection. Any criteria which give a  $p$  value less than 0.05 are considered significant. From her, there are significant differences according to the criteria of selection in the communication skills, mastery in English and Malayalam languages, and the duration of industrial training as shown in Table, Therefore, the analysis is extended by developing the house of quality in order to obtain the most preferred selection criteria by employers in selecting students to undergo the industrial training at their organization.

The relationships between the employers' satisfaction level on student skills and each selection criteria were categorized by specific symbols depending on correlation and while the relationships in the "roof" of house of quality were determined also based on the correlation. The planning matrix values were produced by (1) to (3), while the level of difficulty and targets for each of the criteria were set. However, (4) has been used to obtain absolute values for each criterion. A combination of all information would then form a house of quality as shown in Figure 2. From the development of house of quality, the most preferred selection criteria by employers can be determined based on the high absolute weight value as in the technical target of house of quality. However, the high absolute weight value that should be given priority cannot be determined by its value, because the absolute weight value depends on the scale that has been used in obtaining feedback from the employers and the scale of the relationship in the relationship matrix. The greater the interval is, the higher the scale will be used in absolute weight value for the technical requirements. Therefore, this study uses a scale of 1–5 in which 1 represent

“excellent” and 5 represents “poor” for the preferred criteria being used. To evaluate the relationship in the relationship matrix, the scale of 0, 3, and 9 was used in which the scale of 9 refers to significant at 0.01 level, 3 refers to significant at 0.05 level, and 0 refers to not significant. Based on the findings from the house of quality as shown in Figure 2, the list of preferred selection criteria by the employers are illustrated in Table 4. From Table, we can conclude that the five most preferred criteria by employers in selecting the students to undergo the industrial training at their organizations are communication skills, students’ participation in sports and co curricular activities, working experience, and mastery in English language. All the 5 highest absolute weight values have relationship with academic qualification. Therefore, the students’ academic qualification also indirectly became one of the most preferred selection criteria for company to select student to undergo industrial training in

their organization. The participation of students in sports and cocurricular activities has been proven by many previous studies such as Ahmad et al. and Suhana and Ahmad. which explains that both activities provide a good impact on enhancing job’s skills such as leadership, communication, decision making, competing, interaction with peers, and thinking creatively. These criteria give an early impression that employers require students to have good job employability skills in order to be more competitive in the industry besides being academically excellent. Based on the results obtained, would also have a role in providing their students with skills and criteria as required by the industries .The courses offered should include the skills needed by students such as communication skills. Students should be exposed to a variety of tasks or skills that enable students to practice their.

Dependent Variable	Independent Variable	Standard deviation error	T Value	Significance level	Hypothesis
English Proficiency	Constant	0.404	4.231	0.000	Supported
	Malayalam Proficiency	0.118	-4.36	.665	Not supported
	Proficiency in other Language	0.090	-.548	.586	Not supported
	Communication Skills	0.084	3.732	0.001	Supported
	Work experience	0.101	1.196	.238	Not supported
	Duration of industrial training	0.111	0.794	0.431	Not supported
	Academic qualification	0.089	-2.224	0.031	Supported
	Impressive resume	0.098	-0.004	0.996	Not supported
	Company Policy	0.084	2.064	0.044	Supported
	Amount of students for industrial training	0.074	-0.199	0.843	Not supported
	Students involvement in extra curricular activities	0.093	-1.161	.251	Not supported
	Students involvement in sports activities	0.095	0.917	0.364	Not supported

Table 2; SPSS RESULT 1

Dependent Variable	Independent Variable	Standard deviation error	T Value	Significance level	Hypothesis
Malayalam Proficiency	Constant	.550	2.333	0.024	supported
	Proficiency in other Language	-0.110	-0.989	0.328	Not supported
	Communication Skills	.361	3.449	0.001	supported
	Work experience	0.265	2.220	0.031	supported
	Duration of industrial training	-0.050	-0.364	0.718	Not supported
	Academic qualification	-0.131	-1.158	0.252	Not supported
	Impressive resume	-0.101	-0.846	0.402	Not supported
	Company Policy	0.091	0.855	0.397	Not supported
	Amount of students for industrial training	0.011	0.117	0.907	Not supported
	Students involvement in extra curricular activities	0.078	0.676	0.502	Not supported
	Students involvement in sports activities	0.073	0.662	0.537	Not supported
	English Proficiency	-0.077	-0.436	0.665	Not supported

Table 3: SPSS RESULT 2



Dependent Variable	Independent Variable	Standard deviation error	T Value	Significance level	Hypothesis
Proficiency in other Language	Constant	0.751	0.856	0.396	Not supported
	Communication Skills	0.150	1.316	0.195	Not supported
	Work experience	0.162	0.815	0.419	Not supported
	Duration of industrial training	0.176	0.999	0.323	Not supported
	Academic qualification	0.149	-0.134	0.894	Not supported
	Impressive resume	0.157	-0.066	0.948	Not supported
	Company Policy	0.138	0.918	0.363	Not supported
	Amount of students for industrial training	0.116	1.185	0.242	Not supported
	Students involvement in extra curricular activities	0.151	0.537	0.594	Not supported
	Students involvement in sports activities	0.151	1.009	0.318	Not supported
	English Proficiency	-0.126	-0.548	0.586	Not supported
	Malayalam Proficiency	-0.184	-0.989	0.328	Not supported

Table 4: SPSS RESULT 3

Dependent Variable	Independent Variable	Standard deviation error	T Value	Significance level	Hypothesis
Communication Skills	Constant	0.711	-0.909	0.368	Not supported
	Work experience	0.150	-1.624	0.111	s Not supported
	Duration of industrial training	0.169	-0.114	0.909	Not supported
	Academic qualification	0.137	1.725	0.091	Not supported
	Impressive resume	0.149	-0.094	0.926	Not supported
	Company Policy	0.131	-0.832	0.409	Not supported
	Amount of students for industrial training	0.110	1.029	0.309	Not supported
	Students involvement in extra curricular activities	0.140	1.490	0.143	Not supported
	Students involvement in sports activities	0.138	-2.230	0.030	supported
	English Proficiency	0.192	3.732	0.001	supported
	Malayalam Proficiency	0.160	3.449	0.001	supported
	Proficiency in other Language	0.134	1.316	0.195	Not supported

Table 5: SPSS RESULT 4

Dependent Variable	Independent Variable	Standard deviation error	T Value	Significance level	Hypothesis
Work experience	Constant	0.670	-0.020	0.984	Not supported
	Duration of industrial training	0.154	1.460	0.151	Not supported
	Academic qualification	0.131	0.698	0.488	Not supported
	Impressive resume	0.138	0.963	0.340	Not supported
	Company Policy	0.116	-2.457	0.018	
	Amount of students for industrial training	0.104	0.440	0.662	Not supported
	Students involvement in extra curricular activities	0.129	1.950	0.057	Not supported
	Students involvement in sports activities	0.135	0.568	0.573	Not supported
	English Proficiency	0.201	1.196	0.238	Not supported
	Malayalam Proficiency	0.159	2.220	0.031	supported
	Proficiency in other Language	0.127	0.815	0.419	Not supported
	Communication Skills	0.131	-1.624	.111	Not supported

Table 6: SPSS RESULT 5

Dependent Variable	Independent Variable	Standard deviation error	T Value	Significance level	Hypothesis
Duration of industrial training	Constant	0.604	1.231	0.224	Not supported
	Academic qualification	0.119	1.097	0.278	Not supported
	Impressive resume	0.127	0.374	0.710	Not supported
	Company Policy	0.113	0.302	0.764	Not supported
	Amount of students for industrial training	0.095	0.449	0.620	Not supported
	Students involvement in extra curricular activities	0.122	0.388	0.700	Not supported
	Students involvement in sports activities	0.122	-1.222	0.228	Not supported
	English Proficiency	0.186	0.794	0.431	Not supported
	Malayalam Proficiency	0.152	-0.364	0.718	Not supported
	Proficiency in other Language	0.116	0.999	0.323	Not supported
	Communication Skills	0.124	-0.114	0.909	Not supported
Work experience	0.129	1.460	0.151	Not supported	

Table 7: SPSS RESULT 6

Dependent Variable	Independent Variable	Standard deviation error	T Value	Significance level	Hypothesis
Academic qualification	Constant	0.667	3.184	0.003	
	Impressive resume	0.152	-0.681	0.499	Not supported
	Company Policy	0.131	1.811	0.076	Not supported
	Amount of students for industrial training	0.113	0.903	0.371	Not supported
	Students involvement in extra curricular activities	0.146	-0.314	0.755	Not supported
	Students involvement in sports activities	0.148	0.508	0.613	Not supported
	English Proficiency	0.213	-2.224	0.032	supported
	Malayalam Proficiency	0.180	-1.158	0.252	Not supported
	Proficiency in other Language	0.140	-0.134	0.894	Not supported
	Communication Skills	0.143	1.725	0.091	Not supported
	Work experience	0.157	0.698	0.488	Not supported
	Duration of industrial training	0.170	1.097	0.278	Not supported

Table 8: SPSS RESULT 7



Dependent Variable	Independent Variable	Standard deviation error	T Value	Significance level	Hypothesis
Impressive resume	Constant	0.677	1.593	0.118	Not supported
	Company Policy	0.124	1.640	0.108	Not supported
	Amount of students for industrial training	0.107	1.074	0.288	Not supported
	Students involvement in extra curricular activities	0.135	1.729	0.090	Not supported
	Students involvement in sports activities	0.140	0.369	0.713	Not supported
	English Proficiency	0.212	-0.004	0.996	Not supported
	Malayalam Proficiency	0.171	-0.846	0.402	Not supported
	Proficiency in other Language	0.133	-0.066	0.948	Not supported
	Communication Skills	0.140	-0.094	0.926	Not supported
	Work experience	0.148	0.963	0.340	Not supported
	Duration of industrial training	0.163	0.374	0.710	Not supported
	Academic qualification	0.136	-0.681	0.499	Not supported

Table 9: SPSS RESULT 8

Dependent Variable	Independent Variable	Standard deviation error	T Value	Significance level	Hypothesis
Company Policy	Constant	0.776	-1.037	0.305	Not supported
	Amount of students for industrial training	0.119	1.596	0.117	Not supported
	Students involvement in extra curricular activities	0.146	2.750	0.008	supported
	Students involvement in sports activities	0.158	-0.568	0.573	Not supported
	English Proficiency	0.229	2.064	0.044	Not supported
	Malayalam Proficiency	0.193	0.855	0.397	Not supported
	Proficiency in other Language	0.148	0.918	0.363	Not supported
	Communication Skills	0.157	-0.832	0.409	Not supported
	Work experience	0.159	-2.457	0.018	supported
	Duration of industrial training	0.184	0.302	0.764	Not supported
	Academic qualification	0.149	1.811	0.076	Not supported
	Impressive resume	0.159	1.640	0.108	Not supported

Table 10: SPSS RESULT 9

Dependent Variable	Independent Variable	Standard deviation error	T Value	Significance level	Hypothesis
Amount of students for industrial training	Constant	0.925	-0.655	0.516	Not supported
	Students involvement in extra curricular activities	0.185	-0.516	0.608	Not supported
	Students involvement in sports activities	0.185	1.057	0.296	Not supported
	English Proficiency	0.283	-0.199	0.843	Not supported
	Malayalam Proficiency	0.231	0.177	0.907	Not supported
	Proficiency in other Language	0.175	1.185	0.242	Not supported
	Communication Skills	0.185	1.029	0.309	Not supported
	Work experience	0.200	0.440	0.662	Not supported
	Duration of industrial training	0.218	0.499	0.620	Not supported
	Academic qualification	0.181	0.903	0.371	Not supported
	Impressive resume	0.191	1.074	0.288	Not supported
	Company Policy	0.167	1.596	0.117	Not supported

Table 11: SPSS RESULT 10

Dependent Variable	Independent Variable	Standard deviation error	T Value	Significance level	Hypothesis
Students involvement in extra curricular activities	Constant	0.722	-0.282	0.779	Not supported
	Students involvement in sports activities	0.145	0.709	0.482	Not supported
	English Proficiency	0.217	-1.161	0.251	Not supported
	Malayalam Proficiency	0.179	0.676	0.502	Not supported
	Proficiency in other Language	0.137	0.537	0.594	Not supported
	Communication Skills	0.142	1.490	0.143	Not supported
	Work experience	0.150	1.950	0.057	Not supported
	Duration of industrial training	0.170	0.388	0.700	Not supported
	Academic qualification	0.142	-0.314	0.755	Not supported
	Impressive resume	0.146	1.729	0.090	Not supported
	Company Policy	0.124	2.750	0.008	Not supported
	Amount of students for industrial training	0.112	-0.516	0.608	Not supported

Table 12: SPSS RESULT 11

Dependent Variable	Independent Variable	Standard deviation error	T Value	Significance level	Hypothesis
Students involvement in sports activities	Constant	0.680	2.272	0.028	supported
	English Proficiency	0.216	0.917	0.364	Not supported
	Malayalam Proficiency	0.177	0.622	0.237	Not supported
	Proficiency in other Language	0.135	1.009	0.318	Not supported
	Communication Skills	0.137	-2.230	0.030	supported
	Work experience	0.154	0.568	0.573	Not supported
	Duration of industrial training	0.166	-1.222	0.228	Not supported
	Academic qualification	0.140	0.508	0.613	Not supported
	Impressive resume	0.148	0.369	0.713	Not supported
	Company Policy	0.131	-0.568	0.573	Not supported
	Amount of students for industrial training	0.110	1.057	0.296	Not supported
	Students involvement in extra curricular activities	0.142	0.709	0.482	Not supported

Table 13: SPSS RESULT 12



student assignment, visits to industry for an interview, which directly emphasizes and strengths their English language. Besides that, encouraging students to actively participate in cocurricular activities and sports is a must. All the necessary criteria should also be taken into account by the university in order to prepare all their graduates that can fulfill the industries demand. This QFD method which was applied in this study assessed the customer satisfaction, the industries (customer) on the student’s performance during their industrial training. The criteria of selection that we get are the voice of customer (employers) that should be translated by the produce

graduates that have skills as what industries demand. This is important to enhance the marketability of the students.

Cronbach's Alpha Reliability Analysis

Testing for reliability of questionnaire using SPSS Statistics and finding the Cronbach's alpha. Cronbach's alpha is the common concept which is mainly used to measure of the internal consistency. It is mainly used when having the Likert type scale questions in a questionnaire that form a scale and wish to determine if the scale is reliable (Joseph A Gliem & et.al, 2003).

Cronbach's alpha	Internal Consistency
$\alpha > 0.9$	Excellent
$0.9 > \alpha > 0.8$	Good
$0.8 > \alpha > 0.7$	Acceptable
$0.7 > \alpha > 0.6$	Questionable
$0.6 > \alpha > 0.5$	Poor
$0.5 > \alpha$	Unacceptable

In this work the no of items in the questionnaire is 11 and Cronbach's alpha 40 value is shown in a table below. The Cronbach's alpha value for this thesis work is 0.785 for the 11

item which is conducted. As per the value by referring from the above table it can be concluded that the questionnaire is "acceptable" and it is reliable for use.

Cronbach's alpha	Cronbach's alpha based on standardized items	No. of items
<b>.785</b>	<b>.780</b>	<b>12</b>

Table: Cronbach's alpha Experimental Value

	EP	MP	PIOL	CS	WE	DIT	AQ	IR	OP	AOS	SIEA	SISA
English proficiency (EP)		0.665	0.586	<b>0.001</b>	0.238	0.431	<b>0.034</b>	0.996	<b>0.044</b>	0.843	0.251	0.364
Malayalam proficiency(MP)	0.665	<b>0.024</b>	0.324	<b>0.001</b>	<b>0.031</b>	0.718	0.252	0.402	0.397	0.907	0.502	0.537
Proficiency in other languages(PIOL)	0.586	0.324	0.396	0.195	0.419	0.323	0.894	0.948	0.363	0.242	0.594	0.318
Communication skills(CS)	<b>0.001</b>	<b>0.001</b>	0.195	0.368	0.111	0.909	0.091	0.926	0.409	0.309	0.143	<b>0.03</b>
Working experience(WE)	0.238	<b>0.031</b>	0.419	0.111	0.984	0.151	0.488	0.34	<b>0.018</b>	0.662	0.057	0.057
Duration of industrial training(DIT)	0.431	0.718	0.323	0.909	0.151	0.224	0.278	0.71	0.764	0.62	0.7	0.228
Academic qualifications(AQ)	<b>0.034</b>	0.252	0.894	0.091	0.488	0.278	<b>0.003</b>	0.499	0.076	0.371	0.755	0.613
Impressive resume(IR)	0.996	0.402	0.948	0.926	0.34	0.71	0.499	0.118	0.108	0.288	0.09	0.713
Company/organization policy(OP)	<b>0.044</b>	0.397	0.363	0.409	<b>0.018</b>	0.764	0.076	0.108	0.305	0.117	0.008	0.573
Amount of students' intake for industrial training for a particular period(AOS)	0.843	0.907	0.242	0.309	0.662	0.62	0.371	0.288	0.117	0.516	0.608	0.296
Students' involvement in extracurricular activities (SIEA)	0.251	0.502	0.594	0.143	0.057	0.7	0.755	0.09	0.008	0.608	0.779	0.482
Students' involvement in sport activities(SISA)	0.364	0.537	0.318	<b>0.03</b>	0.057	0.228	0.613	0.713	0.573	0.296	0.482	<b>0.028</b>

Table 14: Matrix Formation of Qfd

The above shown table has marked the supported in bold mark as done in the spss details .so it is conformed with matrix through QFD as per the data variation taken from the company .From this it is very important to identified . The most preferred criteria by employers are communication skills, students' participation in sports and cocurricular activities, working experience, mastery in English language, and academic qualification. Therefore, a thorough and systematic planning should be done by to ensure that these skills are developed and integrated into the curriculum of teaching and learning.

## VII. CONCLUSION

This study has applied QFD approach in translating the employer's voice in the industrial training program through the formation of house of quality. The program is used to evaluate the effectiveness of the programs or courses offered by the university .Thus, through the formation of the house of quality, the most preferred selection criteria from the house of quality enable to identify the necessary skills that students should have in order for employers to select them to 18

undergo industrial training at their organizations. The most preferred criteria by employers are communication skills, students' participation in sports and cocurricular activities, working experience, mastery in English language, and academic qualification. Therefore, a thorough and systematic planning should be done by to ensure that these skills are developed and integrated into the curriculum of teaching and learning. The findings of this study may indirectly improve the existing courses in by ensuring that the courses offered can provide students with good communication skills and enhance the English language skills among students. In addition, they will enhance the interests of the students to participate more in extracurricular activities and sports at the university. The feedbacks from the industry are their voice that needs students, students to have criteria that they need to become their employees. These findings are really useful as it will help university to prepare their students with skills needed by the industries and increase the marketability of the students in finding job after graduation.

## Appendix

### A. Questionnaires

#### A.1. Part A: Employer's Background Information

(A1) Name:

(A2) Address:

(A3) Employer type:

- ❖ Government
- ❖ Contract
- ❖ Apprentice
- ❖ Others. Please state

(A4) Organization's sector:

- ❖ Financial
- ❖ Manufacturing
- ❖ Services
- ❖ Industrial
- ❖ Property and development
- ❖ Education
- ❖ Consultation
- ❖ Transportation
- ❖ Food and agriculture
- ❖ Security and defense
- ❖ IT and communication
- ❖ Others. Please state:

(A5) Employers Experience

- ❖ 1 Year
- ❖ 2Year
- ❖ 3Year
- ❖ 4Year and above

(A5) How many students per intake for industrial training purposes for a particular period in your organization?

A.2. Part B: Student's Selection Criteria for Industrial Training. See Table 15

Number	ITEMS	scale				
		1	2	3	4	5
B1	English proficiency	1	2	3	4	5
B2	Malayalam proficiency	1	2	3	4	5
B3	Proficiency in other languages	1	2	3	4	5
B4	Communication skills	1	2	3	4	5
B5	Working experience	1	2	3	4	5
B6	Duration of industrial training	1	2	3	4	5
B7	Academic qualifications	1	2	3	4	5
B8	Impressive resume	1	2	3	4	5
B9	Company/organization policy	1	2	3	4	5
B10	Amount of students' intake for industrial training for a particular period	1	2	3	4	5
B11	Students' involvement in extracurricular activities	1	2	3	4	5
B12	Students' involvement in sport activities	1	2	3	4	5

Table 15: Student's Selection Criteria for Industrial Training,

Circle answer based on the scale given. 1 = excellent, 2 = very good, 3 = good, 4 = average, and 5 = poor.

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