Study to Improve Diploma Level Technical Education Through Quality Function Development (QFD)

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Abstract

After 1991 whole world becoming in an single platform, free trade principle coming in world in every field like manufacturing sector, service sector, agricultural sector, planning sector etc. Service sector plays important role in growth of economy of our country. In service sector one of the major sector is school education, higher education and technical education. Technical education is providing scientist, engineer, technician, skilled man power, those people are running the industries and boosting the economy of country. Quality Function Deployment (QFD) is the method to transform user demand into design quality. QFD helps transfer customer needs into engineering characteristics for a product or service. The customer need is summarized in a product planning matrix called house of quality. These matrixes are used to translate customer needs WHATs into technical characteristics HOWs to satisfy the needs. Quality function deployment is the one of the quality improvement tool of the total quality management (TQM). This thesis is concern to the study to improve diploma level technical education through quality function deployment (QFD). Technical education plays a vital role in progress of any contrary. Diploma education and engineering education are provided industrial growth; economical growth of country, this thesis is survey based survey of student /parents, faculty of institute and neighbouring industry and taken feedback from them. After data collection applied (QFD) tool and identified those factor which are direct or indirect involved to improve quality of diploma level technical education and identify the gap between them. Quality of house is indicates the priority of enabler (technical requirement) to fulfil stockholder needs or customer needs.

KEY WORD: Quality function deployment. House of quality, voice of customer, total quality management (TQM).

Introduction:

Education is the backbone of the world. Education is the basic human right and considered as one of the best tools for development of any country. Now our central government (MHRD) Ministry of Human Resources and development, introducing new education policy. New education policy is based on Skill, Knowledge, and Research based .Education is bench mark to gauge the socio- economic development of a society.

Technical education is the wheel of growth for nation. Technical education covers courses and programs in engineering, technology, management, architecture, town planning, pharmacy, applied art & craft and many more. Manpower of well education, well trained and technically oriented are very important pillar of development of country.

Today every country wants economically growth, economically growth achieved to skilled manpower, technician, engineer, research professionals and innovative scientist trained in the areas linked with national development and need of the industries.

Objectives of study

The specific objectives of this paper work are:

- To enlist potential factors that affects the Diploma level technical education.
- To translate the student requirement into teaching techniques using QFD
- To rank the techniques concerning the students requirements.
- To enlist potential factors that affects the faculty requirement
- To enlist potential factor that affect the industry requirement

Literature review

History of Quality Development

QFD was developed in Japan in the late 1960s by professors SHIGERU MIZUNO and YOJI AKAO at the time, SQC, which was introduced after World War 2

The purpose of professor's Mizuno and Akao was to develop a quality assurance method that would design customer satisfaction into a product before it was manufactured.

QFD was first time practically in introduced in 1966 by KIYOTAKA OSHIUMI OF BRIDGESTONE TIRE IN JAPAN

In 1972, with the application of QFD to the design of an the Kobe shipyards of Mitsubishi heavy industry,

In June 2016, ISO 16355, The first ISO slandered for, QFD, was approval.

The impact of ISO 16355 obsoletes the traditional house of quality practice. To achieve 21st century innovation, competitiveness, and quality, QFD green belt and QFD black belt certificate courses are strongly recommended for all practitioners and researchers.

Methodology

Quality function deployment starts with a list of requirement of the student from institute, requirement of faculty from student, requirement of industry from diploma holder candidate. This list is often referred as the WHATS that a student needs ,faculty and industry expect from institute, student and candidate respectively. we prepared three type of questionnaire for student, faculty and industry.

In the left are factors and in the right side of the questionnaire there are two column questionnaire Consisting importance to students and performance of institute. The values are given from very poor to very high (1-5). If it is not applicable the value is 0

Result for the major Students needs, Faculty needs, Industry needs and technical descriptor

This result identifies technical descriptors that are most needed to fulfil student requirements and need further improvement are as follows.

S. No.	Technical Requirements	Absolute weight
01.	Infrastructure	270
02.	Efficient faculties	140
03.	Teachers technique	134
04.	Amount of non-technical assignment	113
05.	Lab & m/c equipment	93
06.	Industrial work	88
07.	Teacher student interaction	84
08.	Curriculum	72
09.	Student evolution	52
10	Response of student	52
11	Technical load distribution	50
12	Supporting staff	47

Table Results for major Students needs, Faculty needs, Industry needs
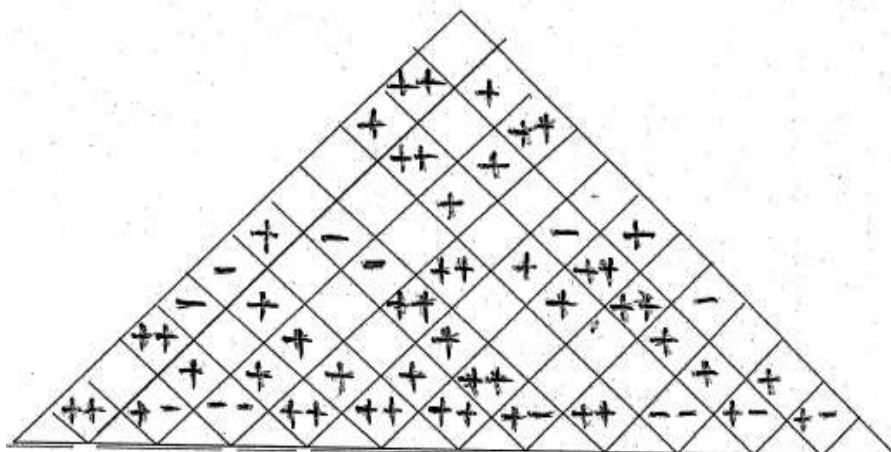
| Relationship how's Strong (9) ● Medium(5) ○ Weak (1) ◊ What's	Performance of institute	Importance to students	Infrastructure of institute	LAB&M/C M/C EQUIPMEN	Amount of non-technical work assigned	Teaching techniques	Teaching load distribution	curriculum	Student evolution	Response of students	Teacher-student Infrastructure	Supporting staff availability	Efficient faculty	Industries works
Infrastructure	3.25	3.41	●	●		○			◊	○				
Academic facility	3.36	3.47	●	●	●	○			◊					
Administration	3.21	3.31	0		0		○	○	○			◊		○
Training & placement cell	3.22	3.43			○	◊						○		◊	●
Faculty	3.6	3.66	●	●		○	●	●	○	○	●	●	●	
Games sports/cultural activity	3.29	3.49	○		◊				◊	◊				○	◊
Hostel facility	2.78	3.1	●		○				◊	◊				◊	
Library	3.31	3.5	●		●			◊	◊	◊	○		◊	○	◊
Digital communication technology	3.16	3.34	○			●			◊				◊	○	◊
Faculty of institute*	3.31	3.85	●	●		●		○	◊				◊	○	
Industries requirement	2.65	3.37		●	●					◊	◊	○			●
Target Value			5	5	3	4	5	5	4	4	4	5	5	4
Absolute Weight			240	160	146	121	50	73	87	53	71	64	110	88
Relative Weight			1	2	3	4	12	8	7	11	9	10	5	6

Table No. 01 Relation Matrix between WHATs and WOHs (For Requirement of Student/Parents, Faculty and Industry)
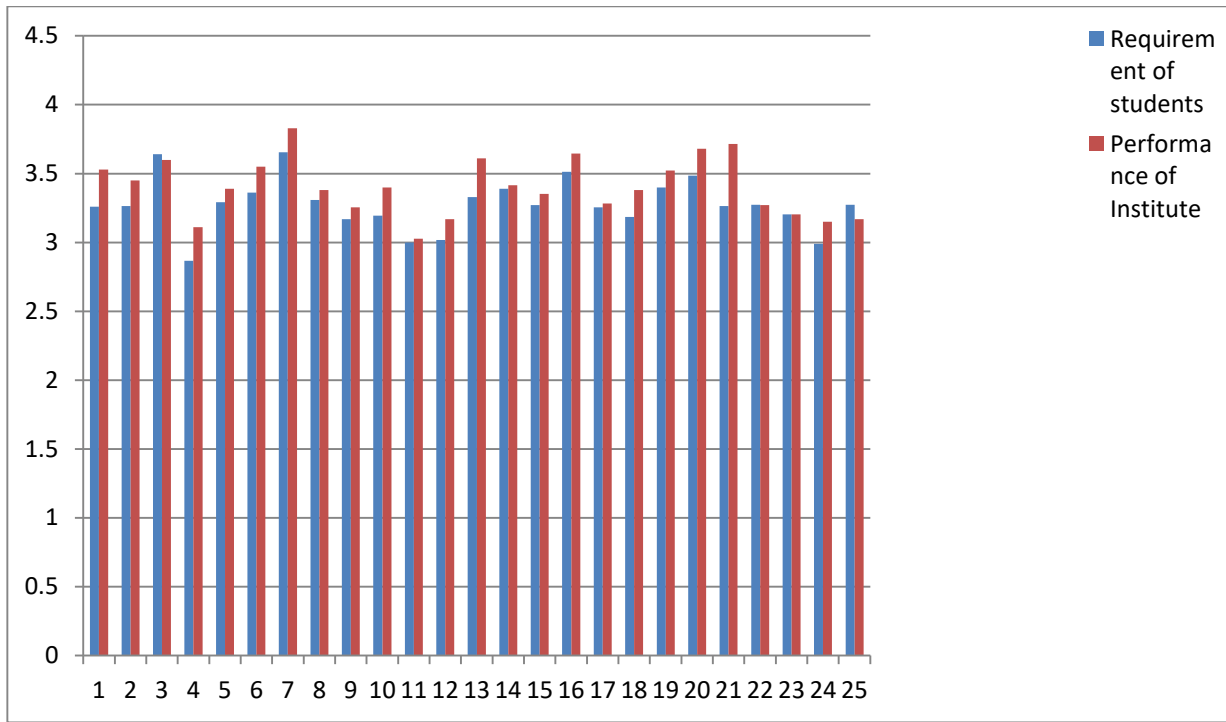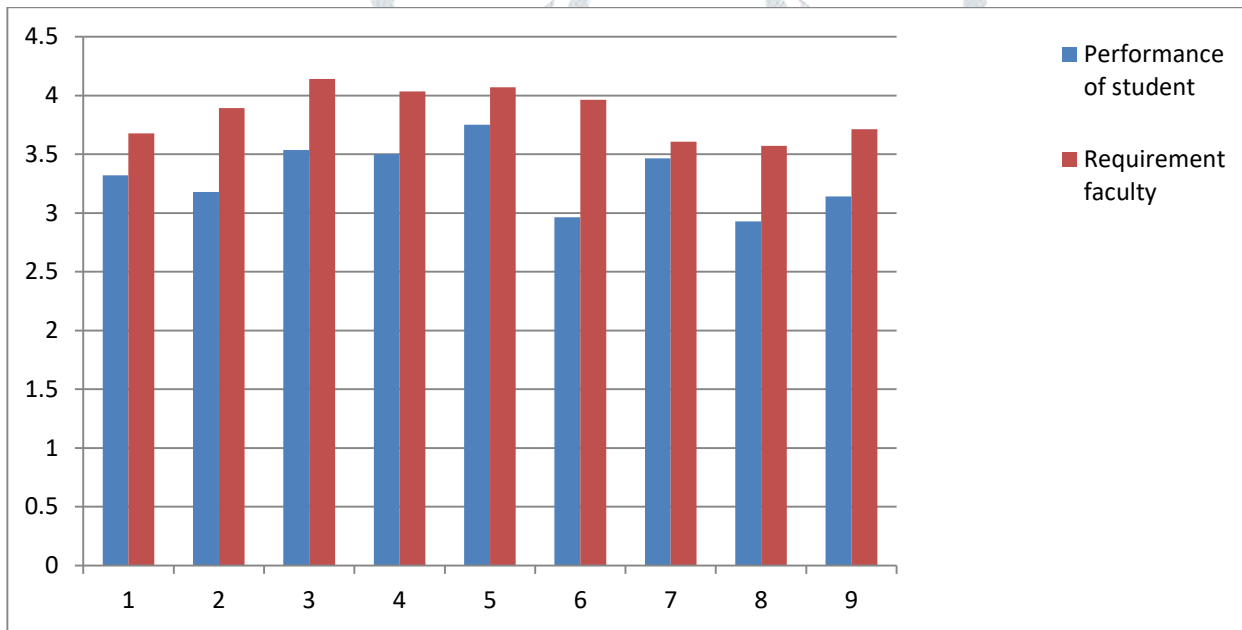
BAR CHART:01(a) GAP BETWEEN STUDENT REQUIREMENT AND PERFORMANCE OF INSTITUTE
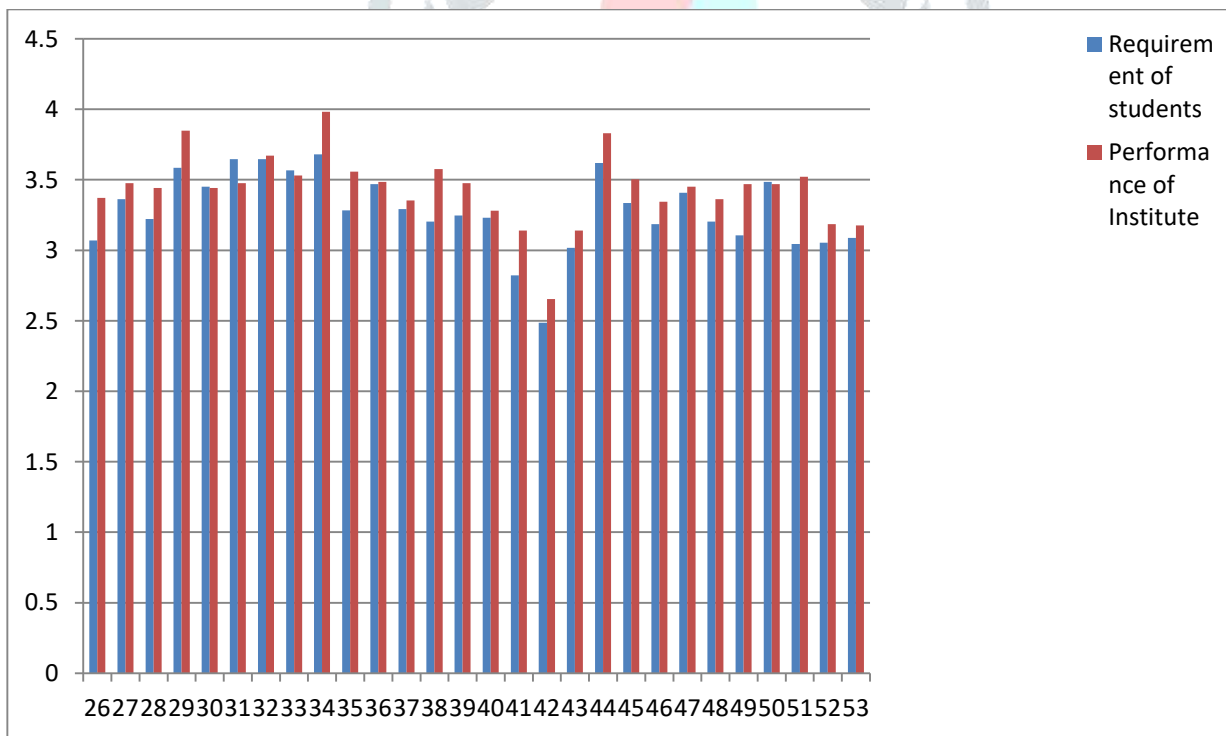
BAR CHART:01(b) GAP BETWEEN STUDENT REQUIREMENT AND FERFORMANCE OF INSTITUTE
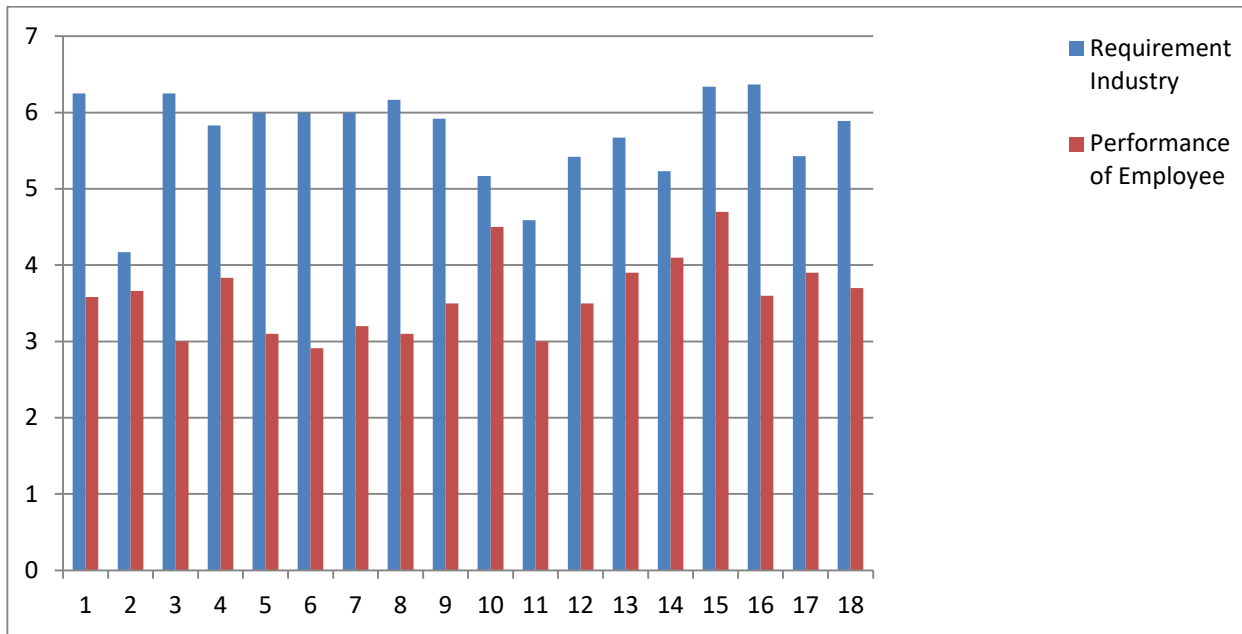
BAR CHART: 02   GAP BETWEEN INDUSTRY REQUIREMENT AND FERFORMANCE OF . EMPLOYEE

BAR CHART:03 GAP BETWEEN FACULTY REQUIREMENT AND FERFORMANCE OF STUDENT

Result:

From the bar chart we finds the gap between the various factors of Requirement of student   v/s performance of institute, requirement of Industry v/s performance of Employee, by observing the bar chart we finds that gap varies from 0.00 to 0.499. This
range of gap categorised in to five categories range from 0.00- 0.01, 0.01-0.199, 0.199-0.299, 0.299-0.399, 0.399-0.499.Requirement of faculty v/s performance of student having range of gap between 0.1-2.0, these range are categorized in to three categories 0.1-0.5,0.51-1.0,1.1-2.0. Factors which are under the above categories are as follows.

Requirement of student v/s performance of institute

0.00- 0.01 - (upward communication, sc/st special classes, continuous assessment, course duration, girls common room, conference hall, smart class available, seminar hall, regularity, student council, indoor games, sport teacher, library staff, institutional channel) are in this category having very less are no gap between requirement and performance. So these factors do not require too much improvement in them.

0.01-0.199- (workshop facility, laboratory, hostel facility, classroom available, boys common room ,exam system, remedial class, for week student, group discussion, technical news(grievance cell, company visit in college, girls hostel, mess facility, news paper /employment paper, magazine available, e-library, wifi available,)) are in this category with small gap between requirement and performance, so these factors required slight improvement in them.

0.200-0.299- (hostel facility, drinking water facility, playground, industry visit, sufficient faculty available, outdoor games, sufficient available book,) are in this category with slight or moderate gap between requirement and performance, so these factor required moderate improvement in them.

0.300-0.399- (trainee and placement officer, sincerity, availability of sports kit, ex poser to student to new technology) are in this category of gap between requirement and performance, so these factor required improvement in them.

0.400-0.499- (availability of scholarship, institute website) are in this category of gap between requirement and performance, so these factor required improvement in them.

Requirement of Industry v/s performance of Employee

0.01-0.199- (practical knowledge, passion) are in this category of gap between requirement and performance, so these factor does not require too much improvement in them.

0.200-0.299- (regularity, quality control ability, idea generation ability, willingness to work, decision making, leadership) are in this category with small gap between requirement and performance, so these factors required slight improvement in them.

0.300-0.399- (facility requirement for employee, punctuality, managerial ability, manpower control ability, self learning, specific course) are in this category with slight or moderate gap between requirement and performance, So these factor required moderate improvement in them.

0.400-0.499- (theory knowledge, sincerity, communication skill) are in this category of gap between requirement and performance, so these factor required improvement in them.

Requirement of faculty v/s performance of student

0.1 to 0.5 - (facility requirement for student, discipline, and willingness to diploma eng) are in this category of gap between requirement and performance, so this factor does not require too much improvement in them.

0.51 to 1.00 - (regularity/punctuality, sincerity, problem solving capacity, and outcome) are in this category with small gap between requirement and performance, so these factors required slight improvement in them.

1.0 to 2.0- (communication skill) is in this category of gap between requirement and performance, so this factor required improvement in them.

Conclusion and future scope of work:-

Conclusion of this thesis is to fulfil the objective of this thesis by survey in student/parents, faculty of institute and industry, by preparing questionnaire separately and distributed in student, faculty of institute and industry persons. Questionnaire preparing in Google form and distributed in group of 300 students, out of which 113 student response. Questionnaire prepared in Google form and distributed in group of 50 faculty out of which 26 faculty respond. Questionnaire prepared for industry manually and distributed in group of 25 small scale industries out of which 15 industries respond. Questionnaire are listed in table no 01, 02, 03.

Feedback received from student, faculty and industry and compiling this feedback data and applying QFD TOOLS technique, making house of quality, and find out priority of those factors which improves quality of institute, quality of student and performance of candidate. Show in house of quality fig. And relationship matrix table.

And separately making matrix of student requirement and technical descriptor and making result of relation matrix and find out priority factor, and making relationship matrix between faculty requirement and technical descriptor and find out priority factor same as making result of relation matrix and find out priority factor and making relationship matrix between industry requirement and technical descriptor and find out priority factor show in table no. 01, 02, and03. By relation matrix find out absolute weight

of requirement of student requirement of faculty and requirement industry to find out the ranking of which factor those are priority based rank, then by bar chart find out the gap between the importance to institute and performance of student, requirement of faculty and importance to student, and importance to industry and performance of employee , and find out the gap between minimum gap means not too much improvement and satisfied gap means slightly improve means in factor, moderate gap means moderate improvement in these factor, dissatisfied gap in more improve means, highly dissatisfied gap means highly improvement change in factor. Finally this project is fulfilling the objective of this thesis.

Future scope:-

- This survey is limited to only G.T. Polytechnic College, Jaora. This type of survey may be done in higher education, all over the State and Country.
- Some tools or methodology may apply to improve quality of technical education.
- Gap may be minimised with the help of some instrument or methodology.
- This type of survey may also be done in manufacturing and service industry.

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