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Study of Parameters for Improving Quality of Technical Education with Customer Satisfaction via Quality Function Deployment

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ABSTRACT : Quality is the link that attracts customers. The Technical Institutes are processor which introduces quality products (technocrats) in the market. Changing scenario has compelled for Quality improvement in the institutes and this can be achieved only by improving conditions prevailing in the institutes. Traditional methods of designing disregard the voice of customers as well as disregard the competition. Thus lacking in commitment of improvement. Improvement in the practical knowledge imparted through improving quality assurance of labs which satisfy the students. Improvement in teaching staff so that pure knowledge reaches to passing out generation. Quality of technical education is its ability to produce a steady flow of people with high intelligence and commitment to learning that will continue the process of transmission and advancement of knowledge. Quality Function Deployment (QFD) is one of the Total Quality Management (TQM) techniques which can be applied for process and design improvement. This study uses QFD as a tool for quality improvement and benchmarking in Technical Institutions. The study is based on primary data collected from students which are considered as customers and teachers, considered as technical describers from six different branches of a technical institute. A self designed questionnaire was used for data collection. The data was analyzed using the techniques of QFD on a technical institute. On the basis of these feedback, a house of quality is developed, which highlighted the major concerned areas of quality improvements in teaching and also highlighted some benchmarks where other institutions are more productive. Quality Function Deployment (QFD) is one of the Total Quality Management (TQM) techniques which can be applied for process and design improvement. This research develops a framework for quality in an educational institute on the basis of literature review. A relationship matrix is developed between set of identified groups of 'Dimensions of Quality' and sets of 'Enablers' in an educational institute. It further outlines a QFD model based on interrelationship and intra relationship among dimensions of Quality, Enablers and customers .The indices developed based on the QFD matrix are utilized for quality planning and monitoring. The procedure is equally important for different types of technical institutes for self analysis, enhancing effectiveness and generating competitiveness.To achieve the above tasks in the present work various quality tools such as QFD, POKA YOKE, CONCURRENT ENGINERRING, QUALITY CIRCLES, SMALL AUTONOMUS GROUP CONCEPT, KAIZEN APPROACH have been used which is integral part of TQM. Conversion of unspoken need of customer is the basic requirement. The work stresses on improvement of quality of institute through improving quality of labs, teaching staff especially use of POKA YOKE for mistake proofing .i.e. intake of students (high standard entrance examination).

KEY WORDS: Quality, QFD, CE, QC, KA, PY, CUSTOMER SATISFACTION

I.INTRODUCTION

A technical institute tries to fulfill demands of both internal customer (student) as well as external customer (industries).The internal customer are processed in the institute so that they fulfill demands of market .i.e. external customer (industries).Changing requirements of customer poses the need for renovation of practical knowledge being provided by the institute, thus it has become very essential to ensure and assure the quality of products which are being processed by the institute.

The quality of these products basically depends on conditions of our labs and theoretical knowledge imparted to them; this in turn depends upon how quality of knowledge is maintained by the institute. The present work enlightens same path, so as to fulfill the demands of market and to improve. Basic primary tool used is QFD which helps in converting demand of customer to action. It helps in understanding unspoken needs of customer which are desperately needed to be fulfilled. In this improvement work main focus was on improvement of labs and teaching staff, for maintenance of labs & improvement in teaching, use of quality

circle is stressed with concept of TPM and Kaizen approach. Most interesting thing of using these tools was that they helped in achievement of desired target without much added resource, only refinement of procedure; moreover maintenance helps in gaining knowledge with saving extra expenditure. This also helps in up gradation of quality of products which satisfies external customer.

Today main of every organization is to satisfy the customer. Customer is the most important avenue for maintaining an excellent business relationship. It is important to focus on customer satisfaction because it plays important role in the quest of any business to increase its market share and profitability. Attitudes and buying patterns of future customers can be affected by the degree of satisfaction of current customers. A dissatisfied customer stops buying any poor quality products; also discourage other customers from buying the same. This sets the negative image of organization in the market, effects profitability and competitiveness.

Following points are recommended for customer satisfaction

1) Exclusive Programs: In this a team of executive should be hired for periodic visit to customer to understand its needs.

2) Training Programs : In such programs proper training should be provided to the employer so that he may closely understand needs of customers, proper set up of channels, communication, product knowledge should be the of such programs.

Education: Customer awareness programs, product knowledge should be the part of this program.

2. REVIEW OF LITERATURE (Brief)

The concepts and principles of quality management, which are effectively used in today's competitive production and business environments, have become indispensable in today's business of higher education (Hwarng & Teo, 2001). There is a strong correlation between a country's competitiveness and the quality of higher education provided within that country (Borahan& Ziarati, 2002). Today's most advanced economies are based on the greatest availability of knowledge. Comparative advantage is increasingly determined by the competitive use of knowledge and of technological innovations. This centrality makes of knowledge a pillar of the wealth and power of the nations (Carlos & Chaui,2003). To improve service quality of education service sector is utmost important for theoverall development of an individual stakeholder, society and the nation. Various techniques like SERVQUAL (Anderson, 1995), TQM (Koch and Fisher, 1998), QFD (Hwarng & Teo, 2001), six sigma (Raifsnider & Kurt,2004), ISO (Storey, 1994), and Academic Quality Improvement Program (AQIP) (Edler, 2003) are used in higher education system for its quality improvement.

3. METHDOLOGY FLOW

"Quality in technical education is a complex concept that has eluded clear definition" (Marshall, 1998). There are a variety of stakeholders in higher education including students, employers, teaching and non-teaching staff government and its funding agencies, a creditors, validators, auditors, and assessors (including professional bodies) (Harvey and Burrows, 1992). Each of these stakeholders has a different view on quality, influenced by his or her own interest in higher education.

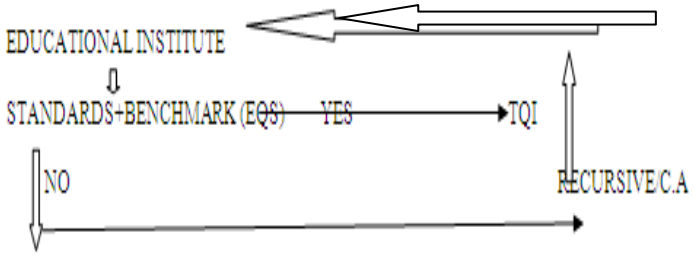


FIG 1 BASIC IDELOGY FOR IMPROVEMENT OF QUALITY IN TECHNICAL INSTITUTE

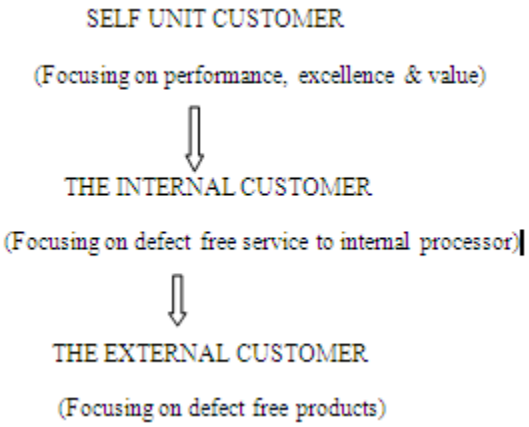


Fig 2 Levels of customer satisfaction

4. Collection of Data (voice of customer)

QUALITY IMPROVEMENT OF TECHANICAL INSTITUTE

Application of Quality Function Deployment

LOCATION: Hitkarini College of Engineering & Technology, JABALPUR (M.P) India

QUESTIONNAIRE (First phase inter college)

(1)What is the rate or percentage of placements?

(2)What is view regarding existing syllabus?

(3)Is facilities in colleges are competent? Are labs fully equipped, equipments working?

(4)Is shortage of faculty is prevailing?

(5)View regarding infrastructure?

(6)Are proper books are present in library, is library regularly updated?

(7)What is the condition of classrooms? What changes are required infrastructure ,classes are engaged regularly?

(8)What is type of teaching procedure is followed by teacher?

(9)Are modern teaching techniques encouraged?

(10)Is result satisfactory?

(11) What is the view regarding fees structure?

(12)What students think regarding their participation in social& cultural activities

STUDENTS REQUIREMENTS	IMPORTANCE	RATING	COMPLAINTS
Placement	7	3	MEDIUM
Faculty	7	2	HIGH
Course	7	3	MEDIUM
Lab	7	2	MEDIUM
Library	7	3	LOW
College fees	7	3	LOW
Exam fees	7	2	LOW
Sports cultural activities	4	2	MEDIUM
Infrastructure	6	3	LOW

TABLE 1: STUDENT RATING

TECHANICAL REQUIREMENTS	GOALS/TARGET	IMPOROVEMENT REQUIRED
PLACEMENT CELL	MAXIMUM PLACEMENT	HIGHER THE BETTER
CAMPUS	MAXIMUM INVITATION'S	HIGHER THE BETTER
COURSEDESIGN	REFINEMENT	HIGHER THE BETTER
FINANCE	MAXIMUM AID	HIGHER THE BETTER
T.P.O.	REGULAR INTERACTION	BETTER
DISCIPLANE	REGULAR ATTENATION	HIGHER THE BETTER
LIBRARY STAFF	-	-
SPORTS& CULTRAL ACTIVITES	ENCOURAGEMENT	HIGHER THE BETTER
COLLEGE STAFF	COLLEGE STAFF	COLLEGE STAFF
EXAM CELL	MORE POWER	LOWERTHE BETTER

TABLE 2: TECHANICAL REQUIREMENTS

Table 3 CAMPRATIVE STUDY OF FEATURES OF COLLEGES

FEATURES	C1	C2	C3	C4
INFRASTURCTURE	DEVELOPED	DEVELOPING	DEVELOPING	DEVELOPING
FACULTY	LACKING	LACKING	LACKING	LACKING
FINANCIAL STATUS	STRONG	NORMAL	NORMAL	NORMAL
ADMINSTRATION	WEAK	STRONG	STRONG	NORMAL
SOCIAL&CULTRAL ACTIVITES	NORMAL	WEAK	WEAK	WEAK
PLACEMENT	SATISFACTORY	STRONG	NORMAL	WORKING
STUDENT'S ATTITUDE	POOR	POOR	POOR	POOR
HOSTLE FACILITY	AVAILABLE	AVAILABLE	AVAILABLE	AVAILABLE

RELATIONSHIP MATRIX

9 Strong; 3 Medium; 1 Low; 0 No

STUDENT RATING

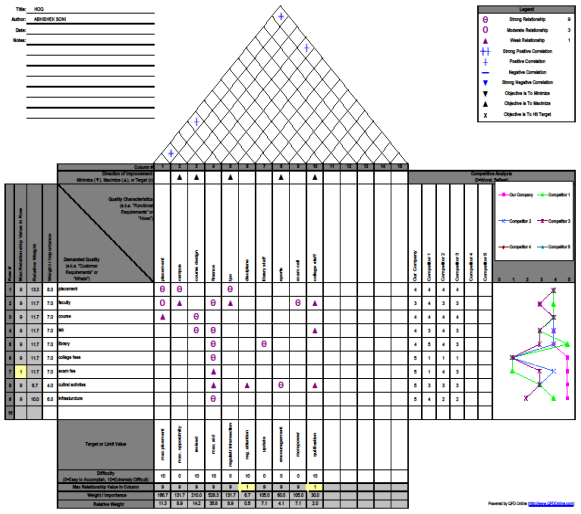
1LOW-5HIGH

STUDENT IMPORTANCE

1LOW-10 HIGH

TECHANICALLY ACHEVIMENT

1LOW-5HIGH



HOUSE OF QUALITY

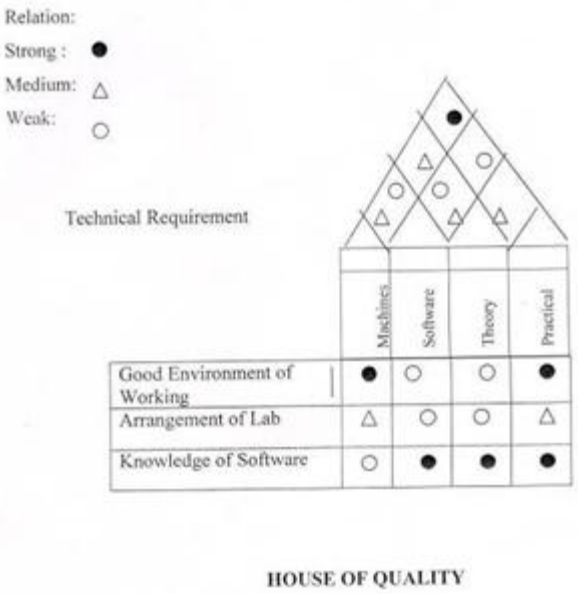
CONCLUSION (from phase 1)

The colleges must look after their improvement in TEACHING , CONDITION OF LABS, QUALITY OF INTAKE OF STUDENTS, FACILITT PROVISION TO TEACHING AS WELL AS STUDENTS.

PARAMETERS SELECTED FOR IMPROVEMENT IN INSTITUTE

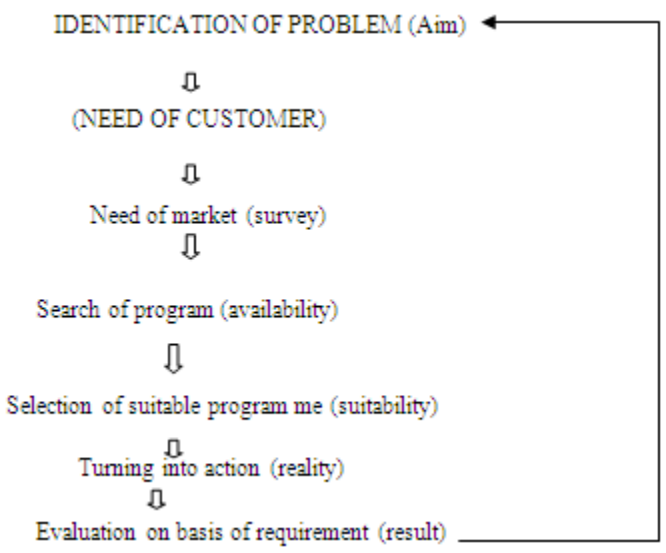
1) *QUALITY IMPROVEMENT OF LABS*
2) *IMPROVEMENT IN TEACHING STAFF*
3) *QUALITY OF STUDENT(POKA YOKE)*

1. HOUSE OF QUALITY FOR IMPROVEMENT OF LAB



HOUSE OF QUALITY

2.. STEPS OF IMPLEMENTATION for improvement of faculty(kaizen approach)



QUESTIONNIARE (phase 2 interdepartmental)

1. How is infrastructure of the college?

2. How is maintenance process of college?

3. How is the classroom facilities of college?

4. How is the working condition of laboratory?

5 How is the library facilities of the college?

6 How are the latest facilities of college?

7 How is the delivery of contents is good and clear?

8 How is the time management of class of college?

9 How are the management facilities of college?

10 How are the training and placement facilities of college?

11.How are cultural activities in college?

12.How are sports activities in college?

13.How are canteen facilities in college?

14.How is bus facility for college students ?

15.How is hostel facility of college for student?

16.How are light & water facilities in college?

17.How are industrial tour facilities in college?

18.How is interrelationship between students & teachers?

19.How are completeness learning device(white board ,marker)?

20.How is innovative learning & interesting especially to theory of material?

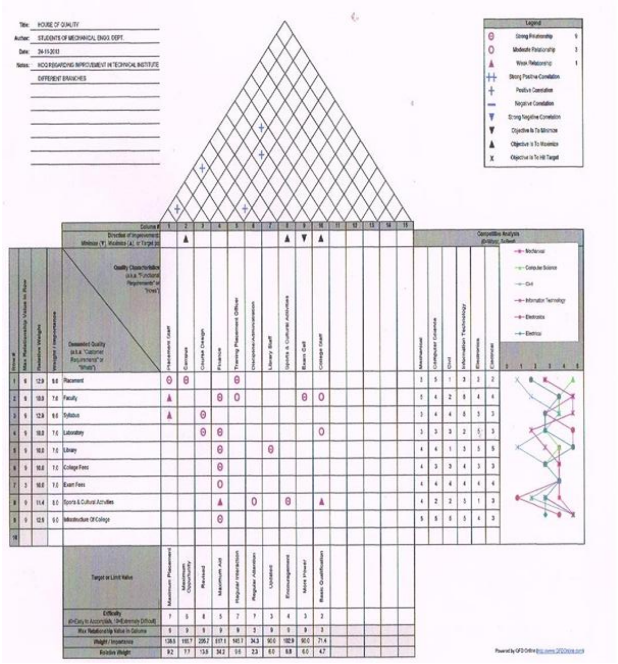
STUDENT REQUIREMENTS

Students reqirements	**Importance**	**Rating**	**Complaints**
Placement	9	4	Low
Faculty	9	5	Medium
Course	7	3	Low
Lab	8	7	Medium
Library	8	3	Low
College fees	5	3	Low
Exam fees	5	3	Low
Sports & cultural activities	7	8	High
Infrastructure	6	9	High

TECHNICAL REQUIREMENTS

Technical requirement	**Goals/Target**	**Improvement required**
Placement cell	Maximum placement	Need to improve
Campus	Maximum invitation's	Need to improve
Course design	Refinement	Higher
Finance	Maximum aid	Higher
T.P.O	Regular interaction	Better
Discipline	Regular attention	Need to improve
Library	Maximum books	A bit improvement
Sports & cultural activities	Encouragement	A bit improvement
Exam cell	More power	Better
College staff	Highly qualified	Better

Correlation Matrix **+ Positive**
- Negative
0 Nil
Relationship Matrix
9- Strong
3- Medium
1- Low
0- No
Student Rating
0 Low-9 High
Student Importance
0 Low-9 High
Technical Achievement
0 Low-9 High



Conclusion

This paper is an attempt of demonstrating the importance of QFD in education setting. The quality dimensions and enablers identified show the fundamental requirement and their relationship. The framework developed with the application of QFD in an educational institute will help in establishing the present improvement and set priorities for future scope of improvement. The utmost advantage of implementing the QFD approach in an educational institution is that it considers both tangible and intangibles aspects, and results can be utilized to have academic reforms in any educational institute. In the present work importance rating is calculated by pair wise comparison, on the basis of the literature review carried out from over 100 research paper, results of which are not discussed in this paper. This further opens the scope of future research by having a survey among the stakeholders and finding out the actual importance rating/ranking and validating those results with the present one. In the present work, concepts of service quality, and implementation of QFD for improving the service quality of education system are studied thoroughly.. Gathering voice of customer is a very important task in QFD implementations.. It is also found that QFD has played a vital role in identifying true customer requirements, prioritizing requirements and meeting the needs of all customers in order to achieve excellence in various fields and functions of businesses and also in different educational settings across the world.

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