QUALITY MANAGEMENT IN TECHNICAL EDUCATION: A CASE STUDY ON PERCEPTIONS OF STUDENTS

Dr. K.V.S.PRASAD1

1Senior Assistant Professor in Management Science,
G.M.R.Institute of Technology, Rajam – 532 127, Srikakulam District, Andhra Pradesh, India,
prasad.kvs@gmrit.org

Abstract--The aim of the present study is to investigate the perception of students towards quality in technical education in various aspects i.e. management and leadership, infrastructure and learning resources, and teaching learning process and evaluation. The study was conducted on 450 engineering students from seven engineering colleges in Srikakulam and Vizianagaram Districts of Coastal Andhra Pradesh, India and a questionnaire has designed by researcher as a study instrument. SPSS has used as a analyzing software for comparing and analyzing data. The findings of this study will not only enrich the data in this area but it may also stimulate further research studies.

Keywords -- Quality Management, Quality, Technical Education, Perception, Students.

I. Introduction

The great demand for engineering education has directed to the escalating of a huge number of private engineering colleges. The rise in number of engineering colleges increased the number of engineering students too. But, the quality of students graduating every year is being totally criticized as the quantity does not match with the quality. Professionals say that India produces millions of graduates every year but a very few in the count are actually employable in industries. Data from the statutory body like All India Council of Technical Education (AICTE) indicates that the annual intake in undergraduate engineering courses has gone up to 17.52 lakhs in 2016-17 from nearly 5.51 lakhs in 2006-07. The numbers of engineering colleges steeply increased to 10,356 in 2016-17 from 1,511 in 2006-07.

Currently there are 10,327 technical institutes with intake capacity of 38, 52,014 existing across India which include Engineering, Management, MCA, Pharmacy, Architecture, HMCT [1]. Among these institutes, IITs and IIMs are one of the best institutes according to NIRF, MHRD raking 2016. Globalization process has acted like catalyst in technical education of India and raised demand in information technology sector. As we all know, we need better sound, efficient, technical education system which should have best infrastructure to produce the best quality of technocrats. The initiative has been taken not only by government but also by private stake holders to form strong and sound technical institutes in India. As the quantity increases, we need to keep a sound track of quality as well. Dilution in quality of education is not a good sign for any country. One should not look at the technical education system as profit making business. Sometimes this kind of approach dilutes the quality of the institute which is harmful in longer run.

Quality

The definition of quality depends upon the role of the people defining it there are as many definitions as there are people writing about quality. The definition According to Garvin [2] a thing said to have the positive attribute of conformance to specified standards. Similarly quality has been defined as value for money [3], Fitness for use [4], conformance to requirements [5], delighting the customer [6] and the routine optimization of product and process prior to manufacture [7]. According to the International Organization for Standardization, (ISO9000) quality is the entirety of advantage and feature of a product that afford on its capacity to satisfy stated or implied needs [8].

Quality Management

Flynn et al., [9] defined Quality Management as "an integrated approach to achieving continuous improvement of procedures and disorder prevention at all levels of the organization, in order to meet or exceed customer expectation". It encompasses all activities and functions concerned with the attainment of quality [10].

Total Quality Management

Total Quality Management (TQM) consists of three terms: Total: meaning that every individual is involved including customer and suppliers, Quality: implying that customer requirements are met punctually and
Management pointing that senior manager is committed [11]. TQM is the operation of changing the essential education of an organization and redirecting it towards excellent product or service quality [12].

II. Need for the Study

The quality of engineering education has direct effect on progress of Indian economy. The growth in number of institutions cannot guarantee the quality in engineering education. There is a need for continuous improvement of institutional initiatives including practices of assessment of quality and quality assurance mechanisms. It is expected that the study will further enhance the concept of quality in technical education from stakeholders’ perspectives. A better understanding of definitions of quality in technical education will help shape quality assurance mechanisms in institutions offering technical education. The information to be of technical education generated from the proposed study will be significant for the administrators and policy makers. It shall enable them to understand the issues associated with the process and implementation of the system in general and in the implementation of a quality assurance system for the assessment process in particular. They would have more than raw data on which future policies and practices could be based and further improved because this data has been systematically collected and analyzed and its meaning extracted to make sense of the situation. The study brings to light the possible constraints to be faced by the stakeholders and regulatory bodies of technical institutions. It is anticipated that through the results and recommendations from the study, the relevant authorities will realize that there are a number of important practical considerations which can contribute to the success of the implementation of quality assurance measures. It might help increase the effectiveness of teaching learning process among administrators as well as other stakeholders involved. The findings of this study will not only enrich the data in this area but it may also stimulate further research studies in institutions located in Andhra Pradesh and India.

III. Objectives of the Study

- The main objective of the study is to know the perceptions of students towards quality in technical education.
- The following are the specific objectives of the study:
  - To conduct exhaustive Literature Review in the area of quality in higher education in general and quality in engineering institutions in particular.
  - To identify critical factors affecting the quality of technical institutions.

IV. Research Methodology

To achieve the above objectives of the study the following methodology has been adopted.

Sample Selection

The study has been conducted in seven technical (Engineering) educational institutions from Srikakulam and Vizianagaram Districts of Coastal Andhra Pradesh, India. The sample frame for the study included 450 students studying 3rd and 4th year engineering course was chosen from these selected institutions. Field survey collection was done with the help of structured questionnaire. This questionnaire based on some important critical factors such as Management and Leadership, Infrastructure and Learning Resources, Teaching Learning Process and Evaluation which are considered as the major indicators of total quality management in technical education. These indicators of quality are further subdivided and were distributed to 450 students from various streams (i.e. Civil Engineering/Electrical and Electronics Engineering/ Electronics and Communication Engineering/Computer Science and Engineering/Information Technology/Mechanical Engineering/Power Engineering) of the 07 selected engineering colleges in Srikakulam and Vizianagaram districts. All these 7 institutions are affiliated by JNTUK Kakinada, of which three are Autonomous and the remaining four are Non-autonomous status institutions. The respondents were randomly selected and were asked to rank the answers on a five point Likert scale (5- Very Good, 4- Good, 3- Average, 2- Poor and 1- Very Poor).

Sources of Data Collection

Data has been collected both from primary and secondary sources. To collect the primary data and information from the sample respondents’ comprehensive questionnaire is designed. The researcher conducted personal interviews with the respondents at the time convenient to them. Adequate care was taken to minimize field errors. Secondary data collected through a systematic review of research papers, journals (National, International), magazines, books, government reports, AICTE approval process handbooks, and official websites of All India
Council for Technical Education (AICTE), New Delhi, Ministry of Human Resource Development (MHRD), and visited Dr. V. S. Krishna Memorial Library, Andhra University, Visakhapatnam.

**Data Analysis**
Tabulation, Analysis and Interpretation of Data and Information. Collected data and information was collated, analyzed and interpreted using necessary Statistical and Mathematical tools. Tables and Diagrams have been made so as to make the study clear, logical and meaningful. Primary data were entered using the software called SPSS (Statistical Package for Social Sciences) and after processing of data the required tables were generated. f-test and t-tests were performed to test the results.

**V. Review of Literature**
Oliveira, Oliveira and Costa [13] conducted a study on Students’ and teachers’ perspectives about quality of engineering education in Portugal and their main conclusion is that both students and teachers refer to the same characteristics that must exist in the quality of education. Irfan A.Gulbarga, Soma.V.Chetty, J.P.Ganjigatti and Suniel Prakash [14] described that quality is vital important aspect in all institutions especially technical education. Nair, Patil and Mertova[15] conducted a study on enhancing the quality of engineering education by utilizing student feedback. R.Chakka and G.T.Kulkarni[16] expressed the stress on improvement of teaching quality and learning processes through total quality management and described the evaluation of teaching quality by peer reviewing, the methods to achieve teaching quality, student feedback and evaluation of learning process. Rao &Pandi[17] made important contributions through their study on the topic of ‘Quality Enhancement in Engineering Institutions through Knowledge Management and Total Quality Management’. Mitra[18] conducted a study on Graph Theory Approach for TQM Evaluation of Technical Institutions and said that Infrastructure, Faculty, curriculum, stakeholder and System and policies have an effect on quality education. Sakthivel et al., [19] have concluded from the perceptions of students’ that the ISO 9001:2000 certified engineering institutions are moving towards the path of TQM offering better quality of service than the non-ISO certified institutions.

**VI. Results of the Study**

| Table 1.Perceptive score differences of sample students by their gender |
|-----------------------------|-------------|-----------|-----------|-----------|-----------|-----------|
| Statement                         | Gender | N   | Mean | Std. Dev | Std. Error | t-value | p-value |
| Management and Leadership       | Male   | 263 | 55.45 | 8.61 | 0.53 | 2.674* | 0.008 |
|                               | Female | 187 | 57.35 | 6.42 | 0.47 |        |        |
| Infrastructure and Learning Resources | Male   | 263 | 57.27 | 10.75 | 0.66 | 2.483* | 0.013 |
|                               | Female | 187 | 59.67 | 9.58 | 0.70 |        |        |
| Teaching Learning Process and Evaluation | Male   | 263 | 69.83 | 12.75 | 0.79 | 3.069** | 0.002 |
|                               | Female | 187 | 73.05 | 9.56 | 0.70 |        |        |

**Significant @1% * Significant @ 5%**

The Table-1 describes the perceptive score differences of sample students by their gender. It is found that the average perceived score of female students (57.35) found higher than male students (55.45) with these differences in the mean values the calculated t-value 2.674 is found significant at one percent level because the p-value 0.008 which is less than 0.005. This indicates that female students are more positive towards the quality in ‘management and leadership’ aspects. Regarding the infrastructure and learning resources, it shows that the average score of female students (59.67) is found higher than male students (57.27) while the tested t-value 2.483 is found significant at five percent level because the p-value 0.013. Therefore, it infers that female students are more satisfied towards the quality in ‘infrastructure and learning resources’. The perceptive score of female students on ‘teaching learning process and evaluation’ 73.05 is found higher than male students (69.83) the calculated t-value 3.069 is found significant at one percent level due to p-value 0.002 which is less than 0.005. This indicates that female students are more satisfied towards the quality in ‘teaching learning process and evaluation’.

| Table 2.Perceptive score differences of sample students by their studying year |
|-----------------------------|-------------|-----------|-----------|-----------|-----------|-----------|
| Statement                         | Year | N   | Mean | Std. Dev | Std. Error | t-value | p-value |
| Management and Leadership       | 3rd year | 300 | 56.15 | 7.94 | 0.46 | 0.128 | 0.721 |

3
The Table-2 represents the average perceptive score differences of sample students by their studying year. It is noticed that the average perceptive score of 4th year and 3rd year students almost same i.e. 56.43 and 56.15 respectively on ‘management and leadership’ aspects. The tested t-value 0.128 is not found significant due to p-value 0.721. This indicates that the 3rd year and 4th year students are equally satisfied the quality in ‘management and leadership’ aspects.

It is also found that the ‘infrastructure and learning resources’ measures the average perceptive score of 3rd year 58.46 found higher than 4th year (57.89) with these differences in the mean values the calculated t-value 0.297 is not found significant due to the p-value 0.586 which is higher than 0.05. Therefore, it infers that 3rd years students are more positive towards the quality in ‘infrastructure and learning resources’ aspects.

The ‘teaching learning process and evaluation’ indicates that the average score of 3rd year students perceived with 71.57 is found higher than 4th year students (70.37) while the tested t-value 1.065 is not found significant due to the p-value 0.303 which is higher than 0.05. Hence, it indicates that 4th year students more satisfied towards the quality in ‘teaching learning process and evaluation’ aspects.

The average perceptive score differences of sample students by their studying branch details are presented in table-3. It is found that the mean score of ECE branch 57.96 found higher towards the management and leadership. The mean value of CSE and other branches also similar i.e. 56.56 and 56.48 respectively, ME (55.67), EEE (54.88) and CE (54.66) with these differences in the mean values the calculated t-value 2.446 is found significant at five percent level because the p-value 0.033. This indicates that the ECE branch students more satisfied towards the quality in management and leadership aspects. Regarding the infrastructure and learning resources measures that the mean value of others and ECE are almost similar i.e. 60.68 and 60.35 respectively, the
average perceived score of ME and CE almost similar i.e. 57.70 and 57.49 respectively, CSE (58.53) and EEE (55.46) while the calculated f-value 2.536 is found significant at five percent level due to the p-value 0.028. Hence, it infers that ECE and other branch of students are equally satisfied towards the quality in ‘infrastructure and learning resources’ aspects. The average perceptive score of ECE and other branches towards the teaching learning process and evaluation are similar i.e. 73.33 and 73.00 respectively, CSE (71.49), ME and CE mean values are similar i.e. 70.02 and 69.95 respectively, EEE (69.19) with these differences the calculated f-value 1.676 is not found significant due to the p-value 0.139 which is higher than 0.05. This indicates that ECE branch students are more positive towards the quality in ‘teaching learning process and evaluation’ aspects.

### VII. Findings & Conclusion

This paper outlines the findings and analysis of the study involving perception of students towards quality in technical education. The findings indicate that the level of quality services provided by engineering colleges is good. The main findings of this study are:

- There was significant difference between male and female students’ perception towards quality in ‘management and leadership’, ‘infrastructure and learning resources’, and ‘teaching learning process and evaluation’ aspects and it is found that female students are more satisfied towards the quality in all the services provided by the engineering colleges.
- The mean score differences of sample students by their studying branch is found significant as 3rd year and 4th year students are equally satisfied the quality in ‘management and leadership’ aspects. 3rd years students are more positive towards the quality in ‘infrastructure and learning resources’ aspects. 4th year students more satisfied towards the quality in ‘teaching learning process and evaluation’ aspects.
- The average perceptive score differences of sample students by their studying branch is found significant towards the quality in management and leadership aspects and ‘infrastructure and learning resources’ aspects and not significant in ‘teaching learning process and evaluation’ aspects. ECE branch students are more positive towards the quality in all the services.

### References

1. AICTE Handbook 2016-2017

Websites
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