AN ASSESSMENT OF UNDERGRADUATE ENGINEERING STUDENTS SATISFACTION USING 5C TQM MODEL (WITH SPECIAL REFERENCE TO KARNATAKA)

Anitha G H*

Abstract:

Institutes offering engineering educations are increasing at a very fast rate to meet the ever increasing global demand for engineering graduates. A significant raise in the enrolment level of engineering institute is seen since the year 2006. The AICTE report (2013) on the growth of students' intake stresses on over three times increase in the last seven years. It is a matter of greatest concern for all stakeholders whether education provided by these engineering institutes is of a quality that is acceptable to the industry and whether the graduate engineers have acquired the necessity skill set to be employable in the job market. There are reports of graduate engineers struggling for the employment in the global workforce market. Hence there is an urgent need for addressing the issue of quality in higher education. The NASSCOM (National Association of Software and Services Companies) in its perspective 2020 report (2008) stressed on the four major challenges such as employability, infrastructure, favorable policies, and competition from other low cost countries. "There is a strong correlation between a country's competitiveness and quality of higher education provided within the country" says Borahan and Ziarati (2002).

Key Word: *Economic Development, Commitment, Course delivery, Campus facilities, Customer feedback*

INTRODUCTION

Institutes offering engineering educations are increasing at a very fast rate to meet the ever increasing global demand for engineering graduates. A significant raise in the enrolment level of engineering institute is seen since the year 2006. The AICTE report (2013) on the growth of students' intake stresses on over three times increase in the last seven years. It is a matter of greatest concern for all stakeholders whether education provided by these engineering institutes is of a quality that is acceptable to the industry and whether the graduate engineers have acquired the necessity skill set to be employable in the job market. There are reports of graduate engineers struggling for the employment in the global workforce market. Hence there is an urgent need for addressing the issue of quality in higher education.

The NASSCOM (National Association of Software and Services Companies) in its perspective 2020 report (2008) stressed on the four major challenges such as employability, infrastructure, favorable policies, and competition from other low cost countries. "There is a strong correlation between a country's competitiveness and quality of higher education provided within the country" says Borahan and Ziarati (2002).

LITERATURE SURVEY

Research studies undertaken in the disciplines of Quality management and service quality by researcher and practitioners have brought out several conceptual and empirical findings and frameworks on total quality in the context of educational institutions with the aim of improving their quality standards.

Sakthievel et al (2005), conceptualized five TQM variables such as the commitment of top management, course delivery, campus facilities, courtesy and customer feedback and improvement and developed a 5-C TQM model

Anitha G H*, Asst. Professor, MBA Department, Global Academy of Technology, Bengaluru,
E-mail : anisrithu@gmail.com

of academic excellence in the technical institutions of India. According to Telford and Messon, (2005)course design, course marketing, students recruitment, induction, course delivery, course content, assessment monitoring, miscellaneous and tangibles are considered as variable for an framework of quality values in higher education.

Sohail and Shaikh, (2004) identified six factors, such as contact with personal, physical environment and reputations and responsiveness, excess of facilities and curriculum, which contributed to their expectations towards quality business educations while exploring Students expectations of quality in Business Education.

Sahney et al (2004), asserted that TQM is all in fussed covering the various aspects (ex: Quality of inputs in the form of students, faculty, staff and infrastructure) of academic life. Jenssen et al (2002), affirmed the role of students satisfactions approaches that could prove to be a tool for bridging traditional and academic views on how to improve higher education. Mergen et al (2000), proposed a three components model of Quality Management; quality of design (QD), Quality of Conformance (QC) and Quality of Performance (QP) to identify the opportunities for improvement in research, teaching and operations.

Literature on the five constructs

Commitment of Top Management: Rodgers et al,(1993), say that strong commitment of top management is the key any successful program implementation. According to Daellenbach et al,(1999),a firm's commitment to innovation is strongly influenced by the top management team. According to Sakthivel, (2007), top management commitment and leadership is an important factor for overall engineering education excellence. Chowdhury et al,(2007), say that high top management commitment drives the other TQM factors. Brah et al, (2000), say that successful implementation of TQM lies with a strong top management support.

Course Delivery: McFarland etal, (2005), in their research have discussed on traditional and online course delivery methods and studied the impact of this method on student's satisfaction. The study also suggested possible ways to increase student's performance and satisfaction. Manson et al,(2000), suggests that the quality of printed course materials enhance the approach of students. Drennan et al,(2005), discussed the use of flexible web based learning material would improve the students satisfaction with the course. Carey, (2001), discussed the relationship between the course delivery mode and the course outcomes. Lim et al (2008), investigated the effects of different methods of instructional delivery on student achievement and satisfaction levels.

Campus Facilities: Altbach, (1998),in his book on comparative higher education: Knowledge, the University, the development, discussed about campus working conditions and impressive academic infrastructures will aid in the establishment of an independent academic culture. Thomas et,al,(2004), discussed about the services and facilities provided within the campus and its effects on students satisfaction. Jauch et,al,(1997),discussed the application of total quality management for improving the campus facilities. Oshagbemi, (1997), discussed that "beautiful campus" was a stimulating factor for job satisfaction. Tolley, (1996), discussed the concept of "Green Campus".

Courtesy: Lagrosen et,al,(2004),identified courtesy as on of the dimensions of quality in higher education. Owlia et,(1996),say that a positive and warm attitude from lectures towards students is an important factor for student performance and satisfaction. Hill, (1995), discussed responsiveness, reliability and courtesy of the service providers as important in measuring service quality in higher education. Chua, (2004), identified

concern for students as one of the quality attributes of higher education. Clewes, (2003), discussed about the knowledge and courtesy of employees in his students centered conceptual model of service quality in higher education.

Customer Feedback and Improvement: Fundin, et al.(2003),say that gathering available information and feedback from customers will help the organization to meet present and future customer expectations. Rowley,(1996),discussed about quality measurement and continuous quality improvement in measuring quality in higher education. O'Neill et all,(2004),developed a tool for continuous quality improvement higher education. Continuous quality improvements can be enhanced through the study of students' perceptions of quality using importance-performance analysis.

RESEARCH METHODOLOGY

Statement of the problem

It is a matter of greatest concern for all stakeholders whether education provided by these engineering institutes is of a quality that is acceptable to the industry and whether the graduate engineers have acquired the necessity skill set to be employable in the job market. There are reports of graduate engineers struggling for the employment in the global workforce market. Hence there is an urgent need for addressing the issue of quality in higher education. Hence there is a need to make an assessment of student satisfaction of all undergraduate engineering students in Karnataka.

RESEARCH OBECTIVES

1. To determine the influence of five constructs of TQM on students satisfaction.
2. Comparing the students satisfaction between Rural and Urban Institutes.
3. Comparing the satisfaction between male and female students.

METHODOLOGY:

Research methodology includes the methods used by the researcher for collecting information and data of the study. Knowledge about the systematic way in which a research is conducted is essential for scientific analysis and interpretation of the data as the success of the research depends on the methodology used by the researcher.

With the view of improving the quality of education in engineering colleges a TQM model of academic excellence was used to assess the satisfaction of students. This research used a standard questionnaire based on the five constructs in the TQM model of academic excellence which are commitment of top management, course delivery, campus facilities, courtesy and customer feedback and improvement. Based on the model these constructs are the indicators of students satisfaction. Primary data will be collected from the sample students of engineering colleges of Bangalore region which are affiliated to VTU. Convenience sampling method will be used in this survey for analyzing the data through statistical package for social sciences (SPSS) is used.

Total Quality Management Model of Academic Excellence:

Researchers Sakthiven et al (2005) developed the 5-C TQM model of academic excellence. The model establishes a link between the five TQM variables the commitment of top management, course delivery, campus facility, and courtesy and customer feedback and improvement and students satisfactions of academic performance.

Sampling Design:

Sample unit:

All final year students of engineering institutes of Bangalore region, which were started in or after the year 2001 and affiliated to VTU constituted and defined population for this study.

Sample size :

For finding the sample size an online statistical sample size calculator (www.mccallum-layton.co.uk) will be used with an aim to test the results at the 95% confidence level and a n acceptable margin of error of ±5%..

The online sample size calculator showed required sample size of 377 for the study.Online survey tool was used(www.kwiksurveys.com) and the questionnarire link was emailed to the sample respondents.A total of 380 questionnaries were found complete in all aspects and valid for the analysis.Out of 380 respondents 219 were male respondents and 161 were female respondents.183 respondents were from Bangalore rural engineering institutes and 197 respondents were from Bangalore urban engineering institutes.Among the 380 respondents,53 respondents were from the age group of 19-20 years and 327 respondents were from the age group of 21-22 years.

Sampling Type

Population sampling is the process of taking a subset of subjects that is representative of the entire population. The sampling type selected for the study is non probabilistic convenience sampling. The institutes and respondents will be selected through non probabilistic convenience sampling techniques. Non-probability sampling is a sampling technique where the samples are gathered in a process that does not give all the individuals in the population equal chances of being selected. Convenience sampling is a non-probability sampling technique where subjects are selected because of their convenient accessibility and proximity to the researcher.

Data Collection

Primary data:

Questionnaire will be used to obtain the quantitative data needed. The questionnaire will be focused on

i) Measurement of student satisfaction against the 5 TQM constructs which have been adapted from Shaktivel et al., (2005). Five point Likert scale will be used which is the common rating format for the survey.

ii) The importance of 5-C constructs to students and

iii) Demographic questions covering the respondent's gender, region and age.

Secondary data:

Secondary data will be collected from educational website, AICTE, UGC, journals, magazines and reports etc.

HYPOTHESIS BUILDING

The following hypotheses have been tentatively formulated for the purpose of study:

Hypothesis 1

Ho 1: Null Hypothesis

Ho : Commitment of top management has no significant influence on students' satisfaction

Ha 1: Alternate Hypothesis

Ha : Commitment of top management has a significant influence on students satisfaction.

Hypothesis 2

Ho 2: Null Hypothesis

Ho: Course delivery has no significant influence on students satisfaction.

Ha 2: Alternate Hypothesis

Ha : Course delivery has a significant influence on students satisfaction.

Hypothesis 3

H_0 3: Null Hypothesis

Ho : Campus facilities have no significant influence on students satisfaction.

Ha 3: Alternate Hypothesis

Ha : Campus facilities have a significant influence on students satisfaction.

Hypothesis 4

Ho 4: Null Hypothesis

Ho : Courtesy has no significant influence on students satisfaction.

Ha 4: Alternate Hypothesis

Ha : Courtesy has a significant influence on students satisfaction.

Hypothesis 5

Ho 5: Null Hypothesis

Ho : Customer feedback and improvement has no significant influence on students satisfaction.

Ha 5: Alternate Hypothesis

Ha : Customer feedback and improvement has a significant influence on students satisfaction.

Hypothesis 6

Ho 6: Null Hypothesis

Ho : There is no significant difference in students satisfaction between rural and urban engineering students.

Ha 6: Alternate Hypothesis

Ha : There is a significant difference in students satisfaction between rural and urban engineering institutes.

DATA ANALYSIS

This research used quantitative data and quantitative analysis have been carried out using the Statistical Package for social Sciences(SPSS) software version 2.0.The study also tested the reliability of the survey instrument so that valid results are obtained.For this the Cronbach's Alpha(Nunnally,1978) has been used.Descriptive statistics like mean and standard deviation have been used for the analyses.To test the hypotheses paired t-tests and Mannwhitney tests are used

RESULTS AND ANALYSIS

Descriptive statistics

A total of 380 questionnaires were found complete in all aspects and valid for analysis.Out of 380 respondents 219 were male respondents and 161 were female respondents.183 respondents were from Bangalore rural engineering institutes and 197 respondents were from Bangalore urban engineering institutes. Among the 380 respondents, 53 respondents were from the age group of 19-20 years and 327 respondents were from the age group of 21-22 years.

Hypothesis I

Ho : Commitment of top management has no significant influence on students satisfaction

Ha : Commitment of top management has significant influence on students satisfaction

Paired samples t-test: commitment of top management students satisfaction.

		Paired Differences				T test	df	Sig(2tailed)
	Mean	Std Deviation	Std Error Mean	95% confidence Interval of the difference				
				Lower	Upper			
Commitment of top management students satisfaction	.5088	.47832	.02454	.00263	.09912	2.073	379	.039**

Hypothesis 2

Ho : Course delivery has no significant influence on students satisfaction.

Ha : Course delivery has a significant influence on students satisfaction.

		Paired Differences				T test	df	Sig(2tailed)
	Mean	Std Deviation	Std Error Mean	95% confidence Interval of the difference				
				Lower	Upper			
Course delivery-student satisfaction	.04561	.44360	.02276	.09036	.00087	2.004	379	.046**

Hypothesis 3

Ho: campus facilities have no significant influence on students satisfaction.

Ha: campus facilities have a significant influence on students satisfaction.

		Paired Differences				T test	df	Sig(2tailed)
	Mean	Std Deviation	Std Error Mean	95% confidence Interval of the difference				
				Lower	Upper			
Campus facility - student satisfaction	.06667	.51165	.02625	.11827	.01506	2.540	379	.011**

The above table shows the results of paired sample T test between campus facilities and students satisfaction.The significance(2-tailed) value is 0.011<(p=0.05).Hence Ha is accepted .hence it is concluded that there is a significant influence of campus facilities on students satisfaction.

Hypothesis 4

Ho: Coutesy has no significant influence on students satisfaction.

Ha: Courtesy has a significant influence on students satisfaction.

Paired sample t-test Courtesy -Students satisfaction.

		Paired Differences				T test	df	Sig(2tailed)
	Mean	Std Deviation	Std Error Mean	95% confidence Interval of the difference				
				Lower	Upper			
Coutesy -- students satisfaction	.09430	0.39596	0.02031	0.5436	0.13424	4.642	379	0.000**

The above table shows the results of a paired sample t-test between courtesy and students satisfaction. The significance (2-tailed) value is 0.000< (p=0.01).Hence Ha is accepted .Hence it is concluded that there is a significant influence of courtesy on students satisfaction.

Hypothesis 5

Ho: Customer feedback and improvement has no significant influence on students satisfaction.

Ha: Customer feedback and improvement has a significant influence on students satisfaction.

Paired samples t-test : Customer feedback and improvement ---- Students satisfaction

		Paired Differences				T test	df	Sig(2tailed)
	Mean	Std Deviation	Std Error Mean	95% confidence Interval of the difference				
				Lower	Upper			
Customer feedback & improvement	.03289	0.39777	0.02041	- 0.07302	0.00723	1.612	379	.108**

The above table shows the results of paired sample T test between customer feedback and improvement and students satisfaction. The significance (2-tailed) value is 0.108>(p=0.05).Hence it is concluded that there is no significant influence of customer feedback and improvement on student satisfaction.

Hypothesis 6

Ho: There is no significant difference in students satisfaction between rural and urban engineering institutes..

Ha:There is significant difference in students satisfaction between rural and urban engineering institutes

Mann-Whitney Test: Comparison of satisfaction between rural & urban regions.

	Students satisfaction
Mann-Whitney U	17837.500
Wilcoxon W	37340.500
Z	-176
Asymp.Sig(2-tailed)	0.860**

The above table shows the results of Mann- Whitney test for comparison of satisfaction between regions. The significance (2-tailed) value is 0.860 > (p=0.05).Hence Ho is accepted.hence it is concluded that there is no significant difference in students satisfaction between rural and urban institutes.

Hypothesis 7

Ho: There is no significant difference in students satisfaction between male and female students.

Ha:There is significant difference in students satisfaction between male and female students

Mann-Whitney Test: Comparison of satisfaction between genders

	Students satisfaction
Mann-Whitney U	17457.000
Wilcoxon W	41547.000
Z	-163
Asymp.Sig(2-tailed)	0.870**

The above table shows the results of Mann-Whitney test for comparison of satisfaction between genders.The significance (2-tailed) value is 0.870 > (p=0.05).Hence Ho is accepted.Hence it is concluded that there is no significant difference in students satisfaction between male and female students.

CONCLUSIONS

The aim of the study was to find the impact of the indicators of TQM on the students satisfaction of higher Engineering institutes. The goal of TQM in higher education is imparting quality education to students to ensure their satisfaction with the institute and to imparting quality education to students to ensure their satisfaction with the institute and to improve the academic performance.

The present study indicates that of the five factors of TQM " course delivery" & campus faculties" a re most important to students. Hence efforts to continuous improvements in these areas would help the institutes attain greater students satisfaction. Students satisfaction surveys could serve two purposes,first being a robust tool for improving higher education quality by enhancing skill and knowledge of students and second, as a managerial instrument to the higher education institutions to adjust and adapt to the changing and tougher economic reality(Wiers-enssen et al 2002).The study also concluded that there was no significant difference in the satisfaction of students between the rural engineering institutes and urban engineering institutes.Also it was found that there was no significant difference in the

satisfaction between male students and female students.Commitment of top management being the most important factor affecting TQM implementation was seen to have a significant influence on students satisfaction.Waller and Ahire(1996),Course delivery,Campus facilities

REFERENCES:

1. AICTE, 2013, Growth of students' intake in India in the last six years, retrieved from www.aicte-india.org

2. Altbach, P. G. (1998). Comparative higher education: Knowledge, the university and development. Greenwood publishing group

3. Carey, J. M. (2001) effective students outcomes: a comparison of online and face to face delivery modes, retrieved from www.learning design.psu.edu

4. Chowdhury, M., Paul, H., & Das, A. (2007) the impact of top management commitment on the total quality management practice

5. Chua, (2004), perception of quality in higher education. In proceeding of the Australian University quality forum.

6. Clewes, (2003), A student centric conceptual model of service quality in higher education.

7. NASSCOM, (2008), the NASSCOM Perspective - 2020 retrieved from www.nasscom.in

8. O'Neill et all,(2004),Importance – Performance analysis: A useful tool for directing continous quality improvement in higher education, Quality assurance in education

9. Walsh , A., & Ahirel 2002 total quality management continuous improvement: is the philosophy or reality?. Journal of European Industrial training.

10. Viswanadhan, K. G., Rao N. J. (2005) impact of privatization of engineering education- A study through analysis performance of self financing engineering programs in India, Journal of Service Research.