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## A study on total quality management in higher education institutions

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### Abstract

The paper covers all aspects of the quality and total quality management (TQM) programme of the higher education institution. The article begins by reviewing the literature on TQM. In particular, it draws attention in some ways to make attention in the universities. This paper will argue that the most effective means of quality and the introduction of total quality management in higher education sector. TQM programmes have been popularized for changing the culture and performance of higher education institutions. Total Quality Management means to continuously strive to fulfill or exceed the needs and expectations of external and internal customers in all processes in which everyone is committed to their continuous improvement. TQM brings together the best aspects of organizational excellence by driving out fear, offering customer-driven services, doing it right the first time by eliminating error, and maintaining inventory control without waste. TQM was only articulated as a means of achieving a target, which has been set at strategic level. The paper outlines both the theoretical basis and the practical implementation of the approach. In last decade an increasing No. of higher education institutions have applied TQM concept for effective change and sustained competitive advantage. TQM is continual organizational improvement, small and large, is always possible and is necessary for long-term survival. Opportunities for improvement are recognized primarily by continuing re-examination of all existing constraints on the way that work is done. This paper focuses the advantages of TQM and how TQM can be effectively and efficiently applied in higher education institutions (Higher education institutions). Here, the roots of TQM are examined.

**Keywords:** higher education, total quality management, institutions

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### Introduction

TQM as 'a way of managing to improve the effectiveness, efficiency, cohesiveness, flexibility, and competitiveness of a business as a whole.' They further offered a list of principles required for successful TQM implementation, including leadership, commitment, total customer satisfaction, continuous improvement, total involvement, training and education, ownership of problems, reward and recognition, error prevention and teamwork.

As a modern management approach, TQM can be used successfully in education sector that are mainly focused on increasing the customer satisfaction (Munoz, 1999). Recent researches on TQM have brought a widely updated plan for educational reforms and modernization of educational organizations (Mutlu, 2001). The TQM principles have broad applications in educational organizations and have produced desirable outcomes. With these applications, educational institution's improvement has become a continual process. There is a considerable proximity between the principles of TQM and the principles of effective schools. The practice of TQM at schools has provided with a perspective to look at the handicaps facing effective schools and with a tool to remove the obstacles in the way of effective schools. In this aspect, the principles of TQM are appropriate for educational settings. "Rapid economic growth, global competition, downsizing, privatization, corporate mergers and the liberalization of global education have caused a surge in demand for TQM implementation in Indian higher learning institutions". It has become the most prestigious quality indicator for measuring the overall quality of an educational institution.

TQM will help to understand the implementation of quality in higher education at government agencies level as well as universities or higher education institutions level. Understanding of TQM also reveals the role of educational leaders in its implementation and opens the way for its successful implementation.

In India, the establishment of universities is regulated by law. Only the parliament of the Government of India (central/union government) and state legislation can establish a university. Various apex institutions have been entrusted, either by an Act of Parliament or by an Act of Legislative Assembly or by central or state governments, with the responsibility to regulate the standards of education. For example, the University Grants Commission (UGC) was established

by the UGC Act, 1956, to coordinate and maintain standards of university education. The NAAC was established in 1994 under 12cc of the UGC Act to assess the standards of quality. It assesses and accredits universities along with their constituent and affiliated colleges. Similarly, the AICTE was established under the AICTE Act 1987

to plan and coordinate the development of technical education system in the country. Under Section 10 (U) of the AICTE Act, the National Board of Accreditation (NBA) has been set up to assess and accredit the technical institutions in the country and to make recommendations to the relevant authorities for recognition and de-recognition of qualifications. Furthermore, the National Council of Teacher Education (NCTE) was established in 1995.

### Literature review

(Dr. Rajib Mukhopadhyay 2014) <sup>[21]</sup>, says that quality in teacher education is the area of focal interest of the present study. Conceptual framework of quality has been discussed in details. Various quality parameters in the field of teacher education have been identified and few major among them have been explained elaborately. The study has also discussed the important role of quality management in teacher education, which is a program to integrate all these quality components to ensure accountability, commitment and credibility of the institution enabling it to render a customer friendly service. (Vigna Oza, Swaty Parab 2011) <sup>[7, 28]</sup>, indicated that, If we yearn to enhance quality of management education, the first we need to do is to commit ourselves. It would require effort from one and all to achieve and maintain the desired standards in management education. As we know, the word improvement starts with 'I', so if everyone initiates self-improvement, there would definitely be quality improvement in management education. This article attempts to identify the characteristics, challenges and elements which are required to deliver the quality management education in India and to find out the ways for total quality management in the present management education system. (V.S. Mangnale 2011) <sup>[11, 22]</sup>, in his article he states that, the objective of research is to explore the perceptions of both the higher education institutions and students on the various quality deliverables in the Indian higher education system along with careful observation of the role of Internal Quality Assurance Cell (IQAC) in sustaining quality delivery of education service. The research study reviewed the germane literature on higher education and quality management in higher education. Then, the researchers used two separate questionnaires to gather the opinions of 10 higher education institutions and 250 students on quality of education service delivery in the first quarter of this year from the Pune district of Maharashtra state. (Falguni Satsangi 2016) <sup>[10, 24]</sup>, in his study, the research was conducted to assess the quality teaching in Indian higher education. The present paper based on Curriculum design and improvement; course and methodology development; promotion of social values; professional skills; knowledge and use of advance technology. To assess quality teaching in Indian higher education, the data was collected for the study from the graduate and post-graduate students of various colleges and institution of Agra. The questionnaire includes general and specific questions related to quality teaching in higher education. (Ashish Viswanath Prakash 2016) <sup>[11, 25]</sup>, explains that, the purpose of the current study is to empirically examine the critical service quality dimensions that contributes to student satisfaction in higher education and to analyze whether satisfaction with service delivery leads to behavioral intentions for recommendation. The study, descriptive and diagnostic in nature was conducted on postgraduates graduate management students from two leading universities in South India. Service quality was found to be a significant predictor of students' satisfaction which in turn was found to be a significant predictor of the behavioral intentions to recommend the institute to other prospective students. The regression analysis reveals that among the eight dimensions identified, the dimension of 'interaction quality' had the strongest impact on student satisfaction. (M.S. Farooq, M. S. Akhtar 2007), tells that, the purpose of his research is to analyzing thoughts of the modern management paradigm "Total Quality Management" (TQM), and its application in the field of education. The basic theme of TQM is participatory approach to address the question(s) of quality in business as well as in the field of education. Reviewing fresh literature from the internet and other sources, the works of W. Edward Deming's: fourteen principles for quality assurance, Philip Crosby's: fourteen points for quality management & the idea of zero defect, and J. Juran's three areas: quality planning, quality improvement and quality control are discussed. (Dr. M.M. Gandhi 2013) <sup>[14]</sup>, indicates that, this comprehensive paper is an attempt to provide an overview of the design, development and implementation of quality assurance mechanism set up to ensure the fulfillment of criteria, goals and objectives of higher education. This paper attempts to develop an overview of approaches to quality by higher educational institutions around the world, in general, and in India, in particular. This paper highlights very recent initiatives in India pertaining to the mandatory assessment and accreditation with specific and analytical references and overview from the pending The National Accreditation Regulatory Authority for Higher Educational Institutions Bill, 2010 as also the UGC Regulations, 2012, making 'Mandatory Assessment and Accreditation' for each Higher Educational Institution in India. (P N Pabrekar 2015) <sup>[17]</sup>, opines that, the Quality improvement in education system is mainly related to the teaching, evaluation techniques, results and placements of the institution. National Assessment and Accreditation Council (NAAC), formed under the aegis of University Grants Commission (UGC) has implemented new methodology of evaluation of educational institutions in India. The new dimensions of "Quality Measure" as proposed by the NAAC involve continuous process of assessment of Higher education institutions. (Dr. Sarita and Sonia 2016) <sup>[18]</sup>, explains that, the teacher education plays vital role in reforming and strengthening the education system of any country. Training of teachers has emerging global trends in education and the overall needs and aspirations of the people in India. The concept of "quality in education" is an immensely significant concern for academicians and academia globally, and lately this notion has also treated the realm of Teacher Education in India. It is an accepted fact that there are a No. of factors responsible for assuring quality in education both internal and external to an institution. (Jashim Uddin Ahmed 2008) <sup>[16]</sup>, in his research article he explained that, the objective of this article is to investigate the

level of implication of quality in the university of east London and TQM in the Aston University. The elements of Quality and Accountability are the major driving forces in academic institutions in the UK, and in this respect, the total quality management (TQM) movement has exploded, capturing the attention of educators at all levels. Certainly, higher education embraces the concept of TQM as a set of tools for planning continuous improvement. (A. B. Angappillai 2012) <sup>[19]</sup>, indicated that, Most of the quality models that are commonly practiced in the business world have been adapted and used in the education sector. In this paper, it is proposed to look at the quality No. in higher education from the marketing perspective; that is, to first understand the customers' needs via their perception of quality. The aim of the paper is to assess the quality attributes of higher education from various perspectives; namely from parents, students, faculty members and employers. It is then classified these quality attributes using the Input–Process–Output framework. With the information obtained from the study, an integrated approach that will encompass a variety of quality practices to manage quality No.s in higher education is being suggested. The bottom line is to improve quality in education. (Dr. Rajib Mukhopadhyay 2014) <sup>[21]</sup>, examines that, the Education in general and teacher education particularly, is deliberate enterprise aiming to provide good quality service to its customers in order to enable them to contribute significantly for development of the nation. This quality service is essential in the modern context of globalization. Quality in teacher education is the area of focal interest of the present study. Conceptual framework of quality has been discussed in details. Various quality parameters in the field of teacher education have been identified and few major among them have been explained elaborately. (V.S. Mangnale and Rajasekhara 2011) <sup>[8, 22]</sup>, tells that, the primary objective of this research is to explore the perceptions of both the higher education institutions and students on the various quality deliverables in the Indian higher education system along with careful observation of the role of Internal Quality Assurance Cell (IQAC) in sustaining quality delivery of education service. The research study reviewed the germane literature on higher education and quality management in higher education. Then, the researchers used two separate questionnaires to gather the opinions of 10 higher education institutions and 250 students on quality of education service delivery in the first quarter of this year from the Pune district of Maharashtra state. (Nand Kishor Soni 2014) <sup>[9, 23]</sup>, examines that, The paper studies on Quality Teaching & Higher education system in India. The system aims to provide a theoretical background to the OECD-IMHE policy quality of teaching in higher education. It highlights the main debates on the topic to date, hoping to present the different perspectives that exist on the topic of quality in teaching. Quality teaching has become an No. of importance as the landscape of higher education has been facing continuous changes: increased international competition, increasing social and geographical diversity of the student body, increasing demands of value for money, introduction of information technologies, etc. 3. But quality teaching lacks a clear definition, because quality can be stakeholder relative. (Ashish Viswanath Prakash 2016) <sup>[11, 25]</sup>, explained that, the purpose of the current study is to empirically examine the critical service quality dimensions that contributes to student satisfaction in higher education and to analyze whether satisfaction with service delivery leads to behavioral intentions for recommendation. The study, descriptive and diagnostic in nature was conducted on postgraduates graduate management students from two leading universities in South India. (David Jimoh kayoed 2016), indicated that, his study attempts to validate process management scale using rigorous validation procedures. An adapted questionnaire comprising 77 items was administered to faculty members in two public universities in Nigeria. The data gathered were analyzed using exploratory factor analysis and confirmatory factor analysis with SPSS 20.0 and Smart PLS 3.1.2 respectively. The findings of this study shows that process management is a third order reflective model with multidimensional constructs. The two dimension of process management administrative process and academic process has four and five dimensions respectively. (Mohammed Hasan 2014) <sup>[27]</sup>, opines that opines that, total quality management (TQM) is a perception, which educational institutions can only attain through long period of planning, by the formulation and execution of annual quality program, which substantially moves towards the accomplishment of the vision. Application of TQM concepts is one of such degree, which will go a long way in reviving the higher education system. This study endeavors to analyze TQM in higher education and outline the literature on Critical Success Factors (CSF) and its execution in all areas. The study concludes the CSF and its execution in higher education institutions. Some institutions already enjoyed the advantages of TQM methods in their programs with determination and strict adoption of the system to achieve their goals. (Khalid A. Almurshidee 2017) <sup>[29]</sup>, This research aimed to reveal the extent of the implementation of total quality management (TQM) in higher education institutions in Saudi Arabia in light of the perceptions of the educational and administrative leaders. A questionnaire has been developed consisting of (70) items distributed in eight areas of TQM. The research applied to a sample of 135 leaders from the educational and administrative leaders in Qassim University. The results of the research showed that the application of the principles of total quality management in higher education institutions in Saudi Arabia was medium from the standpoint of administrative leaders with the exception of the area of Academic Affairs and the field of community service where its application was high.

## **Theoretical Framework**

### **Dimensions of Quality in Higher Education**

#### **Fitness of purpose**

Fulfilling a customer's requirements, needs or desires, evaluates whether the quality-related intentions of an organization are adequate. In education, fitness of purpose is usually based on the ability of an institution to fulfill its mission or a program of study to fulfill its aims.

**Value of money**

Return on investment. If the same outcome can be achieved at a lower cost, or a better outcome can be achieved at the same cost, then the customer has a quality product or service. The growing tendency for governments to require accountability from higher education reflects a value-for-money approach. Increasingly students require value-for-money for the increasing cost to them of higher education. The demand for higher education is also influenced by the ability of the customers in terms of their ability to pay.

**Transformation**

It is the process of changing from one qualitative state to another. In educational terms, it refers to the enhancement and empowerment of students or the development of new knowledge.

**Excellence**

The degree of excellence of the entire educational experience. The quality of student's life; the adequacy of university or college finances; the breadth and modes of learning offered; and student access to tenured faculty.

**Process control and improvement**

Higher education institutions are service organizations in which many processes are operative at a time that may require a multidimensional organizational structure to govern and monitor these processes. For this purpose, at every step process control and later on improvement are needed to reduce the tension on quality improvement system and will contribute in satisfying the demands of stakeholders (Zaynab Shukri Nadim 2016) <sup>[13]</sup>.

**Program design**

It is vital to review the Higher education institutions stakeholder needs before designing any academic program. In response to any internal or external force to change the designed programs are required to be regularly reviewed. There are two approaches which can be applied to follow TQM philosophy in academic program design, these are: SERVQUAL which is a service quality model developed by Zeithaml, *et al* and Quality Function Deployment (QFD) which is method to transform qualitative user demands into quantitative parameters, to deploy the functions forming quality, and to deploy methods for achieving the design quality into subsystems and component parts, and ultimately to specific elements of the manufacturing process (Zaynab Shukri Nadim 2016) <sup>[13]</sup>.

**Quality system improvement:** According (ISO) it is vital to establish and review periodically the quality systems in any organization. It was evident in Higher education institutions that there are two recommended tools which can be used to enhance the consistency of the quality systems; where the first is process flow charts and the second is quality criteria checklist (Zaynab Shukri Nadim 2016) <sup>[13]</sup>.

**Employee involvement**

To generate a quality culture, the employees must be involved at every step regarding their work places, environment, process, products, and management practice. The TQM practices emphasize teamwork and cross functional relationships that provide many opportunities for social interaction and social reinforcement (Zaynab Shukri Nadim 2016) <sup>[13]</sup>. Quality of the educational organization can be optimized by developing a sense of cooperation and collaboration among the members of the institutional groups. Therefore, Deming (1991) argued to break down barriers between departments. Strategies for the improvement of collaboration as a team work should be adopted. This dynamic can be ensured by time management (M.S. Farooq 2007).

**Quality councils**

Regular meetings of the heads of the schools and the quality consultants be over there. The members of this council will share ideas and experiences with each other's in the meetings. Meetings of the professionals and the heads will help to solve the problems and designs the ways how to create the quality culture in the educational institutes. These councils are the best source of information on the status of programs and ideas for action. They also bring the professionals together on a regular basis (M.S. Farooq 2007).

**Recognition and reward**

A regular and transparent procedure to evaluate the performance level of employees and selection criteria for reward is needed. Thus, it is recommended to make sure that the criteria of recognition and reward system were set to consider the Higher education institutions staff involvement in this process to create and enhance the staff level of organizational commitment (Zaynab Shukri Nadim 2016) <sup>[13]</sup>.

**Implement innovative ideas**

Adopt new philosophy of finding facts through data. Clinch new management ideas; awaken the leadership for their responsibilities and challenges for change. For the new economic age, management needs to take leadership for change into a learning organization. New methods like participation and discussion method, problem solving method, project method, and experimental work is used in teaching at all levels (M.S. Farooq 2007).

**Education and training**

Higher education institutions should make the necessary arrangement concerning the training and education of their staff to gain the implementation of the quality assurance programs. They should be trained and have the awareness of all the regarding fields and the compulsory financial arrangement should be available in this effort (Zaynab Shukri Nadim 2016) <sup>[13]</sup>. Members of the management should be trained for implementing their role for the quality enhancement program Crosby (1979). Conduct an orientation program formally before implementing the quality steps in the organization. All managers must understand each step well enough to explain it to their people. The proof of understanding is the ability to explain it. Eventually all supervisors will be tuned into the program and realize its value for themselves. Then they will concentrate their actions on the program (M.S. Farooq 2007).

**Student focus**

It is recommended to consider the students' needs, listen to students complains, establish a feedback system to the students complains, support student's social activities, and to establish alumni club (Zaynab Shukri Nadim 2016) <sup>[13]</sup>.

**Other stakeholders' focus**

For any HEI there are different stakeholders such as employees, students, society, governing bodies, etc. Accordingly, it is recommended to be aware about the needs of these different categories of stakeholders and to work hard to achieve these needs. In addition, identifying the stakeholders' needs should be reviewed and updated in regular bases whenever there is a force of change which may cause any change in the stakeholders' needs or expectations (Zaynab Shukri Nadim 2016) <sup>[13]</sup>.

**Curricular aspects**

Which includes goal orientation, curriculum development, programs options, academic flexibility and feedback mechanism. Curriculum in teacher education consists of two major components – theory and the practicum. Though teacher education is mostly a skill based program but conceptual understanding of those skills oriented activities might be a major concern of a teacher (teacher trainee). Therefore, theory and practicum should have a justified proportion in the curriculum. Historical, Philosophical, Psychological, and Sociological aspects of education are four essential theoretical components. In addition, various contemporary No.s and challenges emerging in the field of modern education should also be included there. The various concepts should be incorporated following the integrated approach in order to facilitate a comprehensive learning of the students. Various sociocultural ethos and traditional features of Indian society, along with the discussion on different aspects of modern pedagogical developments might also be included. Particularly, the present status of teacher education in the context of liberalization, globalization, privatization, WTO outsourcing will have to be considered essential also. Simulated lesson, field survey, case studies, community outreach activities etc. should be included in practicum. Teacher education program in India should be designed also with due concern to Indian traditional value system, as well. (Dr. Sarita and Sonia.2016) <sup>[18]</sup>

**Teaching, learning and evaluation**

Which includes admission process, catering to diverse needs, teaching-learning process, teacher quality, evaluation of teaching, evaluation of learning, and examination reforms. Evaluation of student teachers at this stage need to be comprehensive and continuous. Due importance should be given to the opinions of supervisors and school teachers who will maintain the record of the progress of student teachers. The capacity to organize thoughts and express them coherently, taking notes from reading materials and using teaching aids and ICT carefully at the appropriate moment need to be the major concerns of evaluation (Singh, 1990). Latest evaluation techniques as peer group evaluation of trainee teachers, self-assessment, evaluation in terms of teacher educators' opinion using rating scale etc. may be introduced. Formative as well as summative mode of evaluation both are essential. The semester-end examination should be accompanied by continuous evaluation also, on the basis of which feedback may be provided to the students. Continuous evaluation should be practiced throughout the entire course of the academic program. Evaluation should be made on the basis of grades and not on marks. Emphasis should be given on the internal examination, rather external one. That internal examination should also ensure its strong reliability minimizing the possibility of various malpractices. Highly credible Semester based credit system should also be encouraged to ensure a better student friendly and credible evaluation system in teacher education. Criterion referenced system of evaluation may also be introduced in order to ensure a quality evaluation (Dr. Sarita and Sonia.2016) <sup>[18]</sup>.

**Infrastructure**

The components of infrastructure which support quality of education are well equipped classrooms, health facility, water facility, guidance and counselling cell and ombudsman cell. The infrastructure in the form of well-equipped libraries, laboratories, playgrounds, well ventilated, well-furnished and well facilitated classrooms, reading rooms, internet facility, availability of scientific equipment's, drinking water facility etc. should be in an institution to fulfil quality criteria. The critical roles of infrastructure in establishing and enforcing standards, supporting quality, and ensuring quality and accountability. Progress in developing the mechanisms and systems

to support and ensure quality in several states is assessed, and the perils of expanding early childhood programs in the absence of such systems are examined. Also discussed are strategies for building capacity and strengthening the various functions of infrastructure in order to successfully support the expansion of universal pre-kindergarten and other early care and education initiatives. The article emphasizes the importance of being able to demonstrate that these initiatives truly benefit the children who participate in them.

### **Agencies of quality assurance**

Various agencies are involved for assuring in teacher education, the significant ones are as follows: - The professional accrediting agencies conduct assessment and accreditation of programmes or institutes within their respective domains. Many specialized institutes that the professional accreditation agencies have accredited, have also volunteered for institutional accreditation by the NAAC. Quite a few engineering, medical, fine arts, law and management institutes, for example, have been accredited by the NAAC (Nusrat- Jahan 2016). Accreditation for higher learning is overseen by autonomous institutions established by the University Grants Commission:

### **Infrastructure and learning resources**

Which includes physical facilities, maintenance of infrastructure, library as a learning resource, computers as learning resources and other facilities.

### **Student support and progression**

Which includes students profile, student's progression, student support and student activities.

### **Organization and management**

Which includes goal orientation and decision making, organization structure, powers and functions of functionaries, perspective planning, human power planning and recruitment, performance appraisal, staff development programmes, resources mobilization and financial management.

### **Healthy practices**

Which includes total quality management, innovations, value based education, social responsibilities and citizenship roles, overall development and institutional ambience and initiatives.

### **Appointment of quality assurance cells**

Teacher education institutions should have its own internal quality assurance cell to monitor various functions of the institution and suggest for the necessary.

### **Need for the Study**

Although the No. of quality has been given considerable attention in industry/commerce, quality in higher education is underdeveloped as a concept. This project offers an explanation which may help those with an interest in the management of quality systems and the evaluation of educational programs. There is still no consensus on how best to measure and manage quality within higher education institutions, in spite of many approaches and models have been adopted, because quality is dependent process and the success of any process is dependent on how others are working well, it's more effective to judge quality through a systematic assessment. Correctly managing and implementing the TQM concepts and indicators is one of such measures, which will go a long way in revolutionizing management education in India. A lot of literature available points to a growing interest in applying TQM in education for a wide variety of reasons, Thakkar et al. (2006). Some of the reasons include pressures from industry for continuous upgrading of academic standards with changing technology; government schemes with allocation of funds, which encourage research and teaching in the field of quality; increasing competition between various private and government academic institutions and reduction in the pool of funds for research and teaching, implying that only reputable institutions will have a likely chance of giving access to various funds. According to Crosby (1984) unless strategy is focused on the quality of the teaching system and improvement, goal of TQM cannot be fulfilled. TQM in education cannot be accomplished without everyone in the organization from top to bottom being committed to achieve results a passion for quality and decisions based on performance data. Unless an organization builds a customer driven, learning organization dedicated to total customer satisfaction TQM cannot be successful.

### **Research gap**

Decreasing quality in higher educational institution is a cause of concern for all those concerned with the field of education. Educational institutions without proper academic support and infrastructure quality produce low quality of students who will not be able to contribute to the nation in the long run. The problem is more pronounced as the No.s of educational institutions are increasing every year. Thus this article tries to focus on implementation of quality initiatives that should be given paramount importance, which will further help in strengthening the overall brand of the management institutions. It is evident now that we need to improve the quality in all dimensions of the institutions to completely overhaul the system. This will only help in providing better educational quality for student's and at the same time attract more students from home and abroad. The study uses analytical descriptive approach which is based on analysis of the literature and administrative thought

in the area of TQM for management education institutions and supports the implementation of TQM concepts as well. This research paper tries to focus on implementing Total Quality Management in a business management institute which can make it competitive in the long run.

### Objectives

1. To explore the TQM tools adopted in Higher education institutions
2. To understand the influence of student perception on quality outcomes of Higher education institutions
3. To study the faculties academic and non-academic commitment towards quality improvement in higher education institutions.

### Hypothesis

**H1:** Faculties teaching capabilities influences the quality outcome of the higher education institutions.

**H1(0):** Faculties teaching capabilities are not influences the quality outcome of the higher education institutions.

**H2:** Student satisfaction to quality outcome of higher education institutions.

**H2 (0):** Student satisfaction leading to quality outcome of higher education institutions.

**H3:** Supportive environment/facilities impact on quality outcome of higher education institutions.

**H3 (0):** Supportive environment/facilities are not impact on quality outcome of higher education institutions.

**H4:** Faculty administrative commitment leads to quality outcome of higher education institutions.

**H4 (0):** Faculty administrative commitment is not leading to quality outcome of higher education institutions.

**H5:** Faculty academic engagement affect quality outcome of higher education institutions.

**H5 (0):** Faculty academic engagement is not affecting quality outcome of higher education institutions.

**H6:** Faculty engagement beyond teaching having direct influence on of the higher education institutions.

**H6 (0):** Faculty engagement beyond teaching does not direct influence on of the higher education institutions.

### Research methodology

The research objective of the article and the relative paucity of previous empirical research suggest that a partly exploratory and a partly descriptive research design is best suited to the project. This study was conducted on a random sampling of 50 faculty members working at various government as well as private higher learning institutions of Karnataka and also 50 students of JNTUH and Karnataka. Total 100 (for both students and faculties) questionnaires were distributed out of which all questionnaires were returned which were valid and usable for further analysis. The rate of return was quite impressive (100%). This is understandable that their profession had played a significant role as they understand the requirement for the research project. The reliability of measures in this study was analyzed basing on the guidelines provided by UGC-HRDC, JNTU Hyderabad where only factors with Cronbach's alpha of 0.6 were considered as reliable. In this study, the Cronbach's alpha is 0.839 which is considered very reliable. Moreover, this study only addressed the content and construct validity as both were deemed to be sufficient in analyzing the validity of its measurements. The content validity in this study was assessed by thoroughly reviewing the available literature on TQM.

### Data collection technique

Surveys is carried out (Questionnaire for College Students) in technical-education courses at JNTUH and telephonic survey with Karnataka students who are studying in higher education institutions. The participants were informed about the research purpose and process by one to one interaction in the study. When feasible, the questionnaires were administered to groups of students in the presence of the researcher. 10 students from Karnataka completed questionnaire (Questionnaire related quality in higher education institutions) through telephonic survey, and the survey was done for both students and faculties perspective.

### Sample design

For the present study 50 students are selected from both JNTUH Campus and colleges located in Karnataka and 50 No. of faculties are selected (40 faculties participated in 51<sup>st</sup> orientation programme at JNTUH and the rest 10 from the colleges locating in Karnataka) to understand the quality related to faculties academic commitment and their commitment beyond the teaching.

### Sources data

#### Primary Data

The data to understand the quality outcome in higher education institutions is collected in a primary quantitative survey by means of questionnaire investigation. The survey was carried out among students and academic staff. The student dataset comprised in total 50 students and 50 teachers.

### Measurement of variables

Quality Out Comes is measured by making use of Likert scale such as 1 indicate strongly Disagree 2 is disagree 3 is neutral, 4 is agree and 5 is strongly agree. The measurement variables for quality outcome such as Brand equity, Industries and government agencies scholarships, Improved credibility, National image/ pride, Excellent quality award, Institution as a role model, well settled alumni, Increased pass ratio, Improved the No. of placements, Increased admissions, Produce qualified human resources etc.

**Table 1:** Analysis and Interpretation Faculties Teaching Capabilities (Students Perspective) on Quality Outcome Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.894 <sup>a</sup>	.799	.760	.49842		
ANOVA <sup>b</sup>						
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	40.535	8	5.067	20.396	.000 <sup>a</sup>
	Residual	10.185	41	.248		
	Total	50.720	49			

**Table 2:** Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.005	.432		.012	.991
	Relevance of curriculum to future needs	-.056	.077	-.062	-.722	.474
	Flexibility in knowledge & cross disciplinary	-.017	.048	-.027	-.362	.719
	Access to teachers and administrative staff	-.015	.038	-.029	-.399	.692
	Specified policies/guidelines	.313	.144	.312	2.173	.036
	Adherence to course objectives	.227	.097	.282	2.350	.024
	Practical knowledge, up to date, teaching expertise & communication.	.114	.154	.100	.739	.464
	Trustworthiness, keeping promises and match academic goals	.238	.102	.223	2.338	.024
	Handle complaints and solve problems	.209	.108	.204	1.928	.061

a. dependent variable: Uality\_Outcome

F statistics of the multiple regression model is highly significant (sig. 000) indicating good model fit. R-square 79.9% indicating good model fit. R-square value indicate variation in quality outcome can be explained by combined effect of Specified policies/guidelines, Adherence to course objectives, Trustworthiness, keeping promises and match academic goals, indicating good predictive power of the model. Specified policies/guidelines (t=2.173, sig.036), Adherence to course objectives (t=2.350, sig.024) and Trustworthiness, keeping promises and match academic goals (t=2.338, sig.024) are the significant variable contributing the model. At 0.05% level of significance, the result indicated that those variables having significant value less than 0.05 are having statistically significant relationship with quality outcome.

The predictive relationship can be expressed as a predictive model as follows.

$$Y = a + b_1 * X_1 + b_2 * X_2 + \dots + b_p * X_p$$

Quality outcome = .005 + (.313 × Specified policies/guidelines) + (.227 × Adherence to course objectives) + (.238 × Trustworthiness, keeping promises and match academic goals). Therefore, hypothesis H1: Faculties teaching capabilities influences the quality outcome of the higher education institutions is accepted.

**Table 3**

Student Satisfaction Impact On Quality Outcome of Higher Education Institutions Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.844 <sup>a</sup>	.712	.679	.57612		
ANOVA <sup>b</sup>						
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	36.116	5	7.223	21.762	000 <sup>a</sup>
	Residual	14.604	44	.332		
	Total	50.720	49			

a. Predictors: (Constant), Promoting us to use technology in learning, Relationship between teaching and course content, Quality information, Friendly and caring atmosphere, Inculcating value system in students

b. Dependent Variable: UALITY\_OUTCOME

**Table 4:** Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.493	.348		1.416	.164
	Inculcating value system in students	.278	.102	.293	2.731	.009
	Friendly and caring atmosphere	.300	.088	.346	3.417	.001
	Relationship between teaching and course content	.068	.078	.076	.866	.391
	Quality information	.082	.096	.085	.850	.400
	Promoting us to use technology in learning	.319	.117	.299	2.720	.009
a. Dependent Variable: QUALITY_OUTCOME						

F statistics of the multiple regression model is highly significant (sig. 000) indicating good model fit. R-square 71.2% indicating good model fit. R-square value indicate variation in quality outcome can be explained by combined effect of Inculcating value system in students, Friendly and caring atmosphere and Promoting us to use technology in learning; indicating good predictive power of the model. Inculcating value system in students (t=2.731, sig.009), Friendly and caring atmosphere (t=3.417, sig.001) and Inculcating value system in students (t=2.720, sig.009) are the significant variable contributing the model. At 0.05% level of significance, the result indicated that those variables having significant value less than 0.05 are having statistically significant relationship with quality outcome. The predictive relationship can be expressed as a predictive model as follows.

$$Y = a + b_1 \cdot X_1 + b_2 \cdot X_2 + \dots + b_p \cdot X_p$$

Quality Outcome = .493 + (.278 × Inculcating value system in students) + (300 × Friendly and caring atmosphere) + (.319 × Promoting us to use technology in learning)

Therefore, hypothesis H2: Student Student satisfaction to quality outcome of higher education institutions is accepted.

### Supportive Environment/Facilities Impact on Quality Outcome Model Summary

**Table 5**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.973 <sup>a</sup>	.946	.930	.26828

**Table 6**

ANOVA <sup>b</sup>					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	47.985	11	4.362	60.608	.000 <sup>a</sup>
Residual	2.735	38	.072		
Total	50.720	49			

a. Predictors: (Constant), Appropriate classrooms, Guest house/hostel facility, Health center, Have computer center and it support, Sufficient playground in our college, Library with online resources, Conference hall/seminar for organizing any academic events , Auditorium with sophisticated audio video facility, Cafeteria, Sophisticated R&D center in our college, Well-equipped laboratory for experiments and testing b. Dependent Variable: UALITY\_OUTCOME

**Table 7**

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.404	.216		1.869	.069
	Sufficient playground in our college	.043	.077	.040	.556	.581
	Auditorium with sophisticated audio video facility	.434	.077	.524	5.617	.000
	Sophisticated R&D center in our college	-.116	.088	-.148	-1.316	.196
	Library with online resources	.055	.073	.064	.743	.462
	Well-equipped laboratory for experiments and testing	.139	.086	.212	1.610	.116
	Conference hall/seminar for organizing any academic events	.114	.088	.124	1.303	.201

Health center	-.260	.103	-.227	-2.535	.015
computer center and it support	.144	.070	.140	2.069	.045
Cafeteria	.226	.101	.259	2.244	.031
Guest house/hostel facility	.215	.078	.217	2.757	.009
Appropriate classrooms	-.158	.056	-.196	-2.823	.008

a. Dependent Variable: Quality\_Outcome

F statistics of the multiple regression model is highly significant (sig. 000) indicating good model fit. R-square 94.6% indicating good model fit. R-square value indicate variation in quality outcome can be explained by combined effect of Auditorium with sophisticated audio video facility, Health center, computer center and it support, Cafeteria, Guest house/hostel facility, Appropriate classrooms, indicating good predictive power of the model. Auditorium with sophisticated audio video facility (t=5.617, sig.000), Health center (t=-2.535, sig.015) and computer center and IT support (t=2.338, sig.024), Cafeteria (t=2.350, sig.024), Guest house/hostel facility (t=2.069, sig.045) and Appropriate classrooms (t=-2.823, sig.008) are the significant variable contributing the model. At 0.05% level of significance, the result indicated that those variables having significant value less than 0.05 are having statistically significant relationship with quality outcome.

The predictive relationship can be expressed as a predictive model as follows.

$$Y = a + b_1 * X_1 + b_2 * X_2 + \dots + b_p * X_p$$

Quality outcome = .404 + (.434 × Auditorium with sophisticated audio video facility) + (-.260 × Health center) + (.144 × computer center and IT support) + (.226 × Cafeteria) + (.215 × Guest house/hostel facility) + (-.158 × Appropriate classrooms)

Therefore, Hypothesis H3: Supportive environment/facilities impact on quality outcome of higher education institutions is accepted.

**Table 8**

Faculty Administrative Commitment On Quality Outcome Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.955 <sup>a</sup>	.911	.891	.33525		
ANOVA <sup>b</sup>						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	46.224	9	5.136	45.697	.000 <sup>a</sup>
	Residual	4.496	40	.112		
	Total	50.720	49			

a. Predictors: (Constant), Staff and student consultation, Value added courses/short term courses, Curriculum according to industry requirement, Mechanism for assessment of teacher and student's performance, Blended learning methods, Advanced mechanism for student admission process, Qualified and rich experienced faculty team, Pre-placement training programme, Instructions to execute academic pedagogy

b. Dependent Variable: Quality\_Outcome

**Table 9: Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
(Constant)	.024	.236	.100	.921
Curriculum according to industry requirement	.095	.073	1.311	.197
Instructions to execute academic pedagogy	.150	.107	1.406	.167
Mechanism for assessment of teacher and student's performance	.120	.106	1.128	.266
Value added courses/short term courses	.212	.075	2.819	.007
Pre-placement training programme	.075	.117	.644	.524
Qualified and rich experienced faculty team	.209	.071	2.952	.005
Advanced mechanism for student admission process	-.101	.078	-1.308	.198
Blended learning methods	-.061	.080	-.759	.452
Staff and student consultation	.370	.103	3.572	.001
a. Dependent Variable: QUALITY_OUTCOME				

F statistics of the multiple regression model is highly significant (sig. 000) indicating good model fit. R-square 91.1% indicating good model fit. R-square value indicate variation in quality outcome can be explained by combined effect of Value added courses/short term courses, Qualified and rich experienced faculty team, Staff

and student consultation are indicating good predictive power of the model. Value added courses/short term courses ( $t=2.819$ ,  $\text{sig}.007$ ), Qualified and rich experienced faculty team ( $t=2.952$ ,  $\text{sig}.005$ ) and Staff and student consultation ( $t=3.572$ ,  $\text{sig}.001$ ) are the significant variable contributing the model. At 0.05% level of significance, the result indicated that those variables having significant value less than 0.05 are having statistically significant relationship with quality outcome. The predictive relationship can be expressed as a predictive model as follows.

$$Y = a + b_1 \cdot X_1 + b_2 \cdot X_2 + \dots + b_p \cdot X_p$$

Quality outcome =  $.024 + (.212 \times \text{Value added courses/short term courses}) + (.209 \times \text{Qualified and rich experienced faculty team}) + (.370 \times \text{Staff and student consultation})$

Therefore, hypothesis H4: Faculty administrative commitment leads to quality outcome of higher education institutions is accepted.

#### Faculty Academic Engagement Affect Quality Outcome

**Table 10**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.937 <sup>a</sup>	.877	.853	.38978

**Table 11**

ANOVA <sup>b</sup>						
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	44.491	8	5.561	36.605	.000 <sup>a</sup>
	Residual	6.229	41	.152		
	Total	50.720	49			

a. Predictors: (Constant), Encourage faculty-student interaction, Professionalism and inculcate life skills, Quality directed leadership, Continuous improvement, Productivity and research, Relevance of curriculum to the future jobs, Quest for academic excellence, Conformance to student's requirement

b. Dependent Variable: UALITY\_OUTCOME

**Table 12: Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.438	.445		-.984	.331
Productivity and research	.390	.108	.391	3.609	.001
Quality directed leadership	.079	.153	.071	.513	.611
Continuous improvement	-.068	.079	-.085	-.858	.396
Professionalism and inculcate life skills	.152	.060	.169	2.528	.015
Conformance to student's requirement	.288	.135	.393	2.137	.039
Relevance of curriculum to the future jobs	.127	.138	.107	.926	.360
Quest for academic excellence	.259	.136	.334	1.902	.064
Encourage faculty-student interaction	-.234	.115	-.307	-2.034	.049
a. Dependent Variable: QUALITY_OUTCOME					

F statistics of the multiple regression model is highly significant ( $\text{sig}.000$ ) indicating good model fit. R-square 87.7% indicating good model fit. R-square value indicate variation in quality outcome can be explained by combined effect of Productivity and research, Professionalism and inculcate life skills, Conformance to student's requirement are indicating good predictive power of the model. Productivity and research ( $t=3.609$ ,  $\text{sig}.001$ ), Professionalism and inculcate life skills ( $t=2.528$ ,  $\text{sig}.015$ ) Conformance to student's requirement ( $t=2.137$ ,  $\text{sig}.039$ ) and Encourage faculty-student interaction are ( $t=-2.034$ ,  $\text{sig}.049$ ) are the significant variable contributing the model. At 0.05% level of significance, the result indicated that those variables having significant value less than 0.05 are having statistically significant relationship with quality outcome.

The predictive relationship can be expressed as a predictive model as follows.

$$Y = a + b_1 \cdot X_1 + b_2 \cdot X_2 + \dots + b_p \cdot X_p$$

Quality outcome =  $-.438 + (.390 \times \text{Productivity and research}) + (.152 \times \text{Professionalism and inculcate life skills}) + (.288 \times \text{Conformance to student's requirement}) + (-.234 \times \text{Encourage faculty-student interaction})$

Therefore, hypothesis H5: Faculty academic engagement affect quality outcome of higher education institutions is accepted.

### Faculty engagement beyond teaching having direct influence quality outcome

**Table 13**

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.933 <sup>a</sup>	.871	.846	.39940

**Table 14**

ANOVA <sup>b</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	44.180	8	5.522	34.619	.000 <sup>a</sup>
	Residual	6.540	41	.160		
	Total	50.720	49			

a. Predictors: (Constant), Faculties membership in editorial board, National decision making, Registered good No. of patents, Professional and society activities, No. of MOUs with industries, Product and process improvement, Frequent international conferences, No. of books/research papers publications b. Dependent Variable: QUALITY\_OUTCOME

**Table 15: Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.006	.360		.017	.987
	No. of books/research papers publications	.048	.134	.067	.360	.721
	No. of MOUs with industries	.121	.128	.114	.944	.351
	Professional and society activities	-.160	.098	-.196	-1.636	.110
	Frequent international conferences	-.052	.142	-.054	-.366	.716
	National decision making	.121	.079	.123	1.534	.133
	Product and process improvement	.243	.115	.319	2.116	.040
	Registered good No. of patents	.278	.148	.318	1.875	.068
Faculties membership in editorial board	.315	.136	.368	2.309	.026	

a. Dependent Variable: QUALITY\_OUTCOME

F statistics of the multiple regression model is highly significant (sig. 000) indicating good model fit. R-square 87.1% indicating good model fit. R-square value indicate variation in quality outcome can be explained by combined effect of Product and process improvement, Faculties membership in editorial board indicating good predictive power of the model. Product and process improvement (t=2.116, sig.040), Faculties membership in editorial board (t=2.309, sig.026) are the significant variable contributing the model. At 0.05% level of significance, the result indicated that those variables having significant value less than 0.05 are having statistically significant relationship with quality outcome.

The predictive relationship can be expressed as a predictive model as follows.

$$Y = a + b_1 * X_1 + b_2 * X_2 + \dots + b_p * X_p$$

Quality outcome = .006+(.243×Product and process improvement) +( .315× Faculties membership in editorial board)

Therefore, H6: Faculty engagement beyond teaching having direct influence quality outcome of higher education institutions is accepted.

### Limitations of the study

The current study has collected the data from one JNTUH only due to financial and time constraints. It is recommended that the future researchers collect data from more than one Higher Education Institute for such studies. It will be helpful in doing comparative study. In addition, the present study has followed the cross sectional as a time horizon. So, it is recommended that future studies be carried out as longitudinal studies. It will be helpful in understanding the organizations to show the patterns of a variable over time. The current study has collected the data from one HEI only due to financial and time constraints. It is recommended that the future

researchers collect data from more than one Higher Education Institute for such studies. It will be helpful in doing comparative study. In addition, the present study has followed the cross sectional as a time horizon. So, it is recommended that future studies be carried out as longitudinal studies. It will be helpful in understanding the organizations to show the patterns of a variable over time. Duration of the project is too short. Respondent in some department gave biased respondent.

### Findings

Faculties teaching capabilities in the point of student perspective influences the quality outcome, which means, adherence to course objectives and trustworthiness of faculties, keeping promises and match academic goals are the significant variable contributing to the quality outcome of the higher education institutions. Student satisfaction to quality outcome, which means, inculcating value system in students, friendly and caring atmosphere and promoting us to use technology in learning; indicating good predictive power of the model. Supportive environment/facilities impact on quality outcome which means, effect of Auditorium with sophisticated audio video facility, Health center, computer center and it support, Cafeteria, Guest house/hostel facility, Appropriate classrooms, indicating good predictive power of the model. Faculty administrative commitment leads to quality outcome, which means, effect of value added courses/short term courses influences the quality outcome, which means, qualified and rich experienced faculty team, staff and student consultation are indicating good predictive power of the model. Faculty engagement beyond teaching having direct influence quality outcome, which means effect of Product and process improvement, Faculties membership in editorial board indicating good predictive power of the model.

### Suggestions

- Increasing the budgetary allocation for education, at least to 6 per cent of the DGP.
- Improving the basic infrastructural facilities in colleges and universities
- Improving the standards of school education
- Academic audit of the institutions of higher education
- Revising and updating the syllabus in all subjects

### Integrated model for Quality outcome of Higher Education Institutions

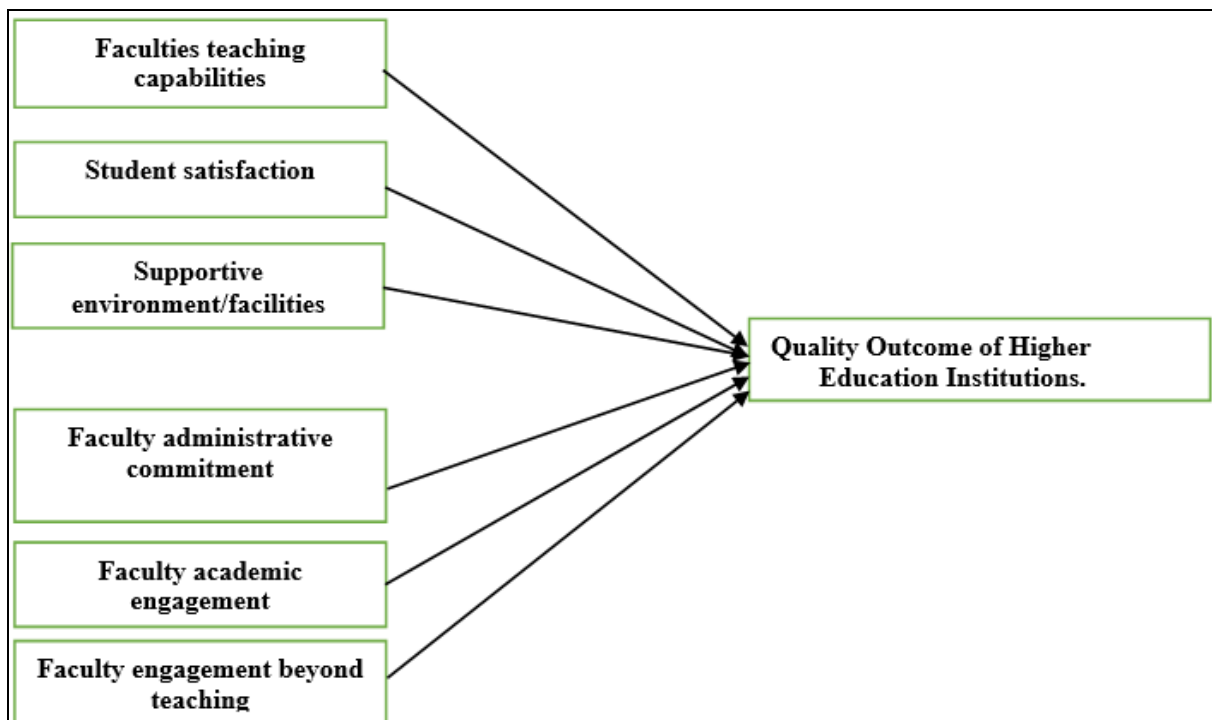


Fig 1

### Conclusions

Effective teaching matters as quality teaching produces quality learning that creates quality students and makes customers satisfied. As such, Total quality management is one of the useful tools in the teaching and learning used in the school / college even though it was developed initially for the manufacturing industries. For any continuous improvement effort to be effective, quality and reliable feedback information is essential and important in the evaluation procedure of learning with the output clearly defined and measured. TQM model adopt a view that quality in education actively involves interaction and the satisfaction of the stakeholders that can make a significant difference in academic environment. Also, the model adopts specific TQM principles to

enhance the academic quality that allows one to follow clear aims and objectives, to make continuous improvement in teaching, learning and assessment methods, and to be willing to be judged by others. TQM is a strategy that is very useful in the higher educational institutes because it involved all the stakeholders and brings out the best in them and enhances the quality of education.

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