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Implementing TQM practices in Pakistani Higher Education Institutions

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ABSTRACT

Implementing TQM practices at the Higher Educational Institutions of Pakistan, especially at the business schools, is relatively a new concept and it is in its initial stages. The theoretical framework of this study is based upon the instrument that measures the extent of TQM implementation in Higher Education Institutions. Based upon literature review, the framework having 14 dimensions is used in this study. Exploratory Factor Analysis (EFA) extracted 13 factors as the determinants of TQM Implementation in business schools of Pakistan such as Stakeholders' Focus, Recognition and Reward, Measurement and Evaluation, Process Control and Improvement, Resources, Leadership, Empowerment are some of the main factors as each of these factors are explaining more than 5% of the variation in the data.

Keywords:
Total Quality Management (TQM), Higher Education Institutions (HEIs), Exploratory Factor Analysis (EFA),

JEL Classification: M10, M19

1. INTRODUCTION

First decade of the new millennium has observed the emergence and notable increase in higher education institutions in private sector of Pakistan has. Statistics from HEC website indicates that there were 32 universities and 13 degree awarding institutions in Pakistan in the year 2000 out of which 14 universities and 8 degree awarding institutions were operating in the private sector. Due to the policies to promote higher education and encouraging private sector investment in this sector, the number of universities increased to 60 and the degree awarding institutions to 30 in the year 2009-2010, out of which, 42 universities and 17 degree awarding institutions were from the private sector. According to the data updated in September 2011, the number of public and private sector universities and degree awarding institutions in Pakistan are 84 and 62 respectively. This growth in a decade aroused the need for close monitoring and evaluation to impart quality education. For this purpose, we had seen the transformation of University Grants Commission to the Higher Education Commission (HEC) of Pakistan in the year 2002. Besides monitoring the quality of higher education, the HEC was established with the purpose of having a greater degree of integration with the international institutions so that our graduates would not face difficulties while seeking admissions at foreign universities. To increase the acceptability of Pakistani institutes of higher education, HEC of Pakistan has started monitoring the higher educational institutions to implement the norms of quality control such as Total Quality Management (TQM) practices to gauge the quality of higher education and HEC rates the institutions of higher education every year on the basis of these quality standards.

2. LITERATURE REVIEW

The TQM practices are divided into various approaches that make it conceptualized. According to Mandru (2011)

- Deming Wheel approach-It is a four step (Plan, Do, Check & Act) approach that is based upon Deming's 14 points.

- Juran's Quality Triology- It is based upon his famous Universal Breakthrough Sequence Philosophy (Quality Planning, Quality Control, and Quality Improvement). In this sequence the elements are arranged in the following hierarchical order:
    - Proof of need
    - Project Identification
    - Organization with top management's commitment
    - Diagnostic Journey- Identifying systematic or random causes
    - Remedial Action
    - Holding on to the gains
- Crosby's absolutes of Quality is based upon the following principles
    - Quality is conformance to requirements
    - Prevention, not appraisal, is the path to quality
    - Quality is measured as the price paid for non-conformance and as indexes
    - Quality originates in all factions. There are no quality problems and it is people, design or process that creates problems.
- Taguchi's Quality Loss function – based on the application of design of experiment on variables that are critical to quality as Taguchi's contention is that quality comes from design.

Besides the general approaches to quality, researchers have developed different frameworks to ensure quality in specific sectors according to their requirements. For higher education institutions, several studies such as (Winn and Green, 1998; Malek and Kanji, 2000; Lawrence and Mc Collough 2001; Rosa and Amaral, 2007; Jusoh, 2008; Bayraktar, 2008; Pandi, 2009; Jalahma and Gallier, 2010) focused on identifying dimensions that are critical to determine the extent of TQM implementation in an educational set up. The most common dimensions that have been emerged are:

- Leadership and Vision
- Strategic planning, measurement and evaluation
- Customer or students focus & other stakeholders' focus
- People management
- Process and system management, control and improvement

- Program Design
- Partnership and resources management
- Training and Development
- Continuous improvement
- Teamwork

Leadership and Vision are ranked as the most important ingredients for the TQM implementation. Bayraktar et. al. (2008) emphasized that "Top management should be aware of the needs of TQM: understand the importance of employee involvement; and concentrate on long term stable performance measures while actively showing their support to TQM practices through their actions". To achieve significant results, senior management has to visibly and actively engage themselves in the quality effort and initiative (Baldrige, 2006; ISO 9000, 2006). Previous research has also confirmed a positive correlation between leadership and other quality management factors (Meyer and Collier 2001).

"The gurus of quality considered the strategic planning as important in quality improvement" (Deming 1982). A review of the quality model or framework (Baldrige, 2006; EFQM, 2006) revealed that strategic planning is critical in quality management practices. In any implementation, the measurement of degree of success is absolute necessity to identify the area of improvements. Measurement and then evaluation are nearly impossible without clearly defining performance measures, even though it is difficult to identify the ones universally accepted for all HEIs (Bayraktar et.al., 2008).

The aim of this study is to assess the extent to which HEC is successful in implementing the TQM practices in higher education institution (HEI) in Pakistan especially in the business schools. The study is considering the TQM practices that the international institutions of higher education are following worldwide and then analyze the extent to which Pakistani HEIs have implemented those in their functional framework.

HEIs customers are the students and other stakeholders such as intrepreneurs, families, business/industry, society and employees of HEIs (Kanji & Malek, 1999; Bayraktar, 2006) that will be taking advantage of knowledge and skills of the students and the needs of these two factors are the important determinants of quality. Deming (1982) identified the importance of customers' needs as "In total quality setting, customers define quality and employees strive to produce it". A close relationship with students within the academic ethics is a key to recognizing their needs. Collection and evaluation of students' complaints, careful consideration of course evaluations, the support of student club activities, and the follow-ups of the alumni are some of the key concerns of a successful TQM program to be considered as being student-focused. (Bayraktar et. al., 2008).

Several studies (Josuh, 2008; Bayraktar, 2008; Kanji and Malek, 2000; Rosa et. al., 2007) have emphasized on the need of effective and efficient people management as a key tool of TQM implementation. Among the issues that were stressed by quality gurus are employee involvement, reward and recognition, training and development, and team work. In the university context, these factors are crucial either in teaching and learning, or research activities (Jusoh, 2008). Without clear support and contribution of the employees, a successful TQM implementation cannot be accomplished.

Process and system management and control is important for inducing the culture of continuous improvement in service quality in HEIs. Bayraktar (2008) emphasized the need of improvement and control as "administrative and academic processes for HEIs should be measured, evaluated, controlled and improved regularly".

Academic programs are the main products of HEIs to attract and satisfy the needs of the stake holders such as students, industry, academy and community at large. Bayraktar (et al., 2006) highlighted the importance as "the program that HEIs are offering to the students must be designed in collaboration with the different entities which are functioning in the economy. These programs should be reviewed regularly considering the needs of the stakeholders and technological advances, and should be updated if necessary."

Developing partnership and resource management makes the role of HEIs more diversified and constructive for the environment in which they are functioning. It integrates the knowledge and skills with the society and industry. In university R & D practices, the issues related to partnership, such as collaboration and funding, have been discussed seriously in previous studies.

3. RESEARCH METHODOLOGY

Research Instrument

The research instrument, developed and used in this study, is a questionnaire having five point likert rating scale (1-strongly agree through 5-strongly disagree). The questionnaire was developed on the basis of literature (Bayraktar et.al., 2008; Rosa and Amaral,2007; Jusoh et.al., 2008; Pandi et.al., 2009; Jager and Gbadamosi, 2010) which identified critical TQM areas for HEIs. Some studies have assessed the extent of TQM implementation according to the perceptions of students, while other studies have considered the perceptions of management and faculty of HEIs.

Table 1 summarizes the dimensions and related questions that were included in this study.

TABLE – 1

DIMENSIONS AND QUESTIONS INCLUDED IN THE STUDY

DIMENSION	QUESTIONS	REFERENCES
Leadership (L)	**L1**-Top management is knowledgeable about TQM practices **L2**-Top management actively participates and support TQM practices **L3**-Top management strongly encourages employees involvement in TQM **L4**-Top management allocates adequate resources for education and training of employees **L5**-Top management focuses on how to improve performance of students and employees. **L6**-Top management discusses many quality related issues on TQM in their meetings.	Rosa et. al (2007) Bayraktar et. al. (2008) Pandi et. al. (2009)
Leadership (L)	**L7**-Top management empowers employees to solve quality problems **L8**-Top management pursues long term stable performance instead of short term solutions.	
Vision (V)	**V1**-University has a clearly written vision statement **V2**-University's vision is widely known and shared by staff **V3**-Vision effectively encourages staff to improve the performance of students and institutions **V4**-Academic processes are well aligned with the vision **V5**-Administrative processes are well aligned with the vision	Bayraktar et. al. (2008)

DIMENSION	QUESTIONS	REFERENCES
Actors (A)	**A1**-Appointments to the academic positions are based on the necessary skills required by the positions **A2**-Appointments to the administrative positions are based on the necessary skills required by the positions **A3**-Selection process for the students is based upon merit. **A4**-Working conditions are helpful in achieving quality related objectives	Rosa et.al. (2007) Bayraktar et. al. (2008)
Resources (R)	**R1**-Sufficient financial resources are available for TQM implementation. **R2**-Facilities, equipment and materials are appropriately and frequently available **R3**-Library is well-equipped with books and other resources **R4**-Electronic communication system is well-established. **R5**-IT department resolves related problems efficiently	Rosa et.al. (2007)
Employee Involvement (E)	**E1**-University has cross functional teams and supports team work **E2**-As a result of quality effort, coordination and collaboration among employees have been enhanced	Rosa et. al (2007) Bayraktar et. al. (2008)

DIMENSION	QUESTIONS	REFERENCES
	E3-University has an established suggestion system to improve the processes by the employees **E4**-Employees are very committed to the success of university and its quality	Pandi et. al. (2009)
Policy, Strategy and Culture (PSC)	**PSC1**-University has a policy, strategy and culture to promote research. **PSC2**-University has a policy, strategy and culture to encourage students for community services **PSC3**-University has a policy, strategy and culture to encourage staff for community services	Rosa et. al (2007) Bayraktar et. al. (2008) Pandi et. al. (2009)
Process Control and Improvement (PCI)	**PCI1**-University is kept neat and clean at all times **PCI2**-University meets the expectations of students **PCI3**-University meets the expectations of employees **PCI4**-University has modern facilities to enhance the effectiveness of education **PCI5**-Facilities at universities are maintained in good condition from time to time **PCI6**-Processes are designed to be full proof **PCI7**-University collects statistical data and evaluates them to control and improve the process	Rosa et. al (2007) Bayraktar et. al. (2008) Pandi et. al. (2009)
Continuous Improvement (CI)	**CI1**-Suggestions are carried out based on stakeholders' feedback/audits on academic affairs **CI2**-The institution is striving to maintain high standards of quality in education through effective utilization of resource	Bayraktar et. al. (2008) Pandi et. al. (2009)

DIMENSION	QUESTIONS	REFERENCES
	CI3-The complaints from staff, students and stakeholders are immediately looking into	
Measurement and Evaluation (ME)	**ME1**-University regularly audits practices according to policies and strategies. **ME2**-University benchmarks academic and administrative processes with other institutions **ME3**-University has standard performance measures to evaluate the performance **ME4**-Standard performance measures are used to evaluate academics units	Bayraktar et. al. (2008)
Measurement and Evaluation (ME)	**ME5**-Standard performance measures are used to evaluate performance of staff **ME6**-The aim of the evaluation is for improvement and not for criticism.	
Education and Training (ET)	**ET1**-University encourages education and training activities of employees for academic excellence **ET2**-Special training for work related skills is provided to all employees **ET3**-University organizes training on TQM for employees and encourages them to participate **ET4**-Financial resources are available for employees education and training	Bayraktar et. al. (2008)
Recognition and Reward (RR)	**RR1**-University has a reward program to recognize employees' TQM efforts **RR2**-University has clear procedures for employees' rewards and penalties and applies them transparently **RR3**-Recognition and reward activities effectively stimulate employee commitment to TQM efforts	Bayraktar et. al. (2008)

DIMENSION	QUESTIONS	REFERENCES
Program Design (PD)	**PD1**-Students' requirements are thoroughly considered in the design of curriculum **PD2**-The experienced academicians' suggestions are thoroughly considered in the design of curriculum	Bayraktar et. al. (2008)
Program Design (PD)	**PD3**-The needs and suggestions from the business world are thoroughly considered in the design of curriculum **PD4**-Curriculum and academic programs are evaluated and updated every year **PD5**-University facilities are considered in the development and improvement of the curriculum and programs	
Students Focus (SF)	**SF1**-University collects student's complains and evaluates them carefully **SF2**-University conducts a course evaluation survey for every course taught in each semester regularly **SF3**-University supports students' clubs and their activities **SF4**-University has some organized efforts on continuous education of students for their business life and personal development **SF5**-University guides students for career counseling and has a Job Placement Cell	
Other Stakeholders Focus (OSF)	**OSF1**-University takes into consideration the changing needs of the business world **OSF2**-University regularly conducts surveys on job satisfaction of the employees **OSF3**-University has some organized efforts to	

	understand the expectations of industry regarding graduates **OSF4**-University has some organized efforts to identify the academic and administrative needs of the employees	

4. DATA COLLECTION

The sample was the respondents from six (6) leading institutes[1] of higher education in Pakistan ranked by the HEC in 2010. These institutions were Lahore University of Management Sciences, Institute of Business Administration, SZABIST, IQRA University, Lahore School of Economics and Institute of Business Management. The questionnaire was sent to the respondents via email and they were requested to complete the entire survey online. Data was collected from July 25, 2011 to Sept 10, 2011 and 120 valid responses were received. Of which 87 respondents were males and 33 were females. Regarding appropriate sample size for factor analysis, we find different rules in the literature.

"Gorsuch (1983) and Kline (1979) recommended that least sample size should be 100. Hatcher (1994) recommended that the number of subjects should be the larger of 5 times the number of variables, or 100. Comrey and Lee (1992) considered the sample size of 100 as poor, 200 as fair, 300 as good, 500 as very good and 1000 or more as excellent. Another criterion is based upon subjects to variable ratio and most of the studies agreed on the fact that this ratio is considered as acceptable if it is greater than 3. The third criterion is based upon the communalities that are linked with the items and factors. MacCallum, Widaman, Zhang, and Hong (1999) suggested communalities should all greater than 0.6, or the mean level of communality to be at least 0.7.(p.96)"[2]

[1] As per the rating given by the Higher Education Commission of Pakistan in 2010 (www.hec.gov.pk)

[2] http://www.encorewiki.org/display/~nzhao/The+Minimum+Sample+Size+in+Factor+Analysis

5. DATA ANALYSIS

For data reduction and factor extraction, Exploratory Factor Analysis (EFA) was performed by using Principal Component Method with varimax rotation. It can be observed for the samples (Figure 1) that after the 13th component scree plot shows no variation but it has become consistent.

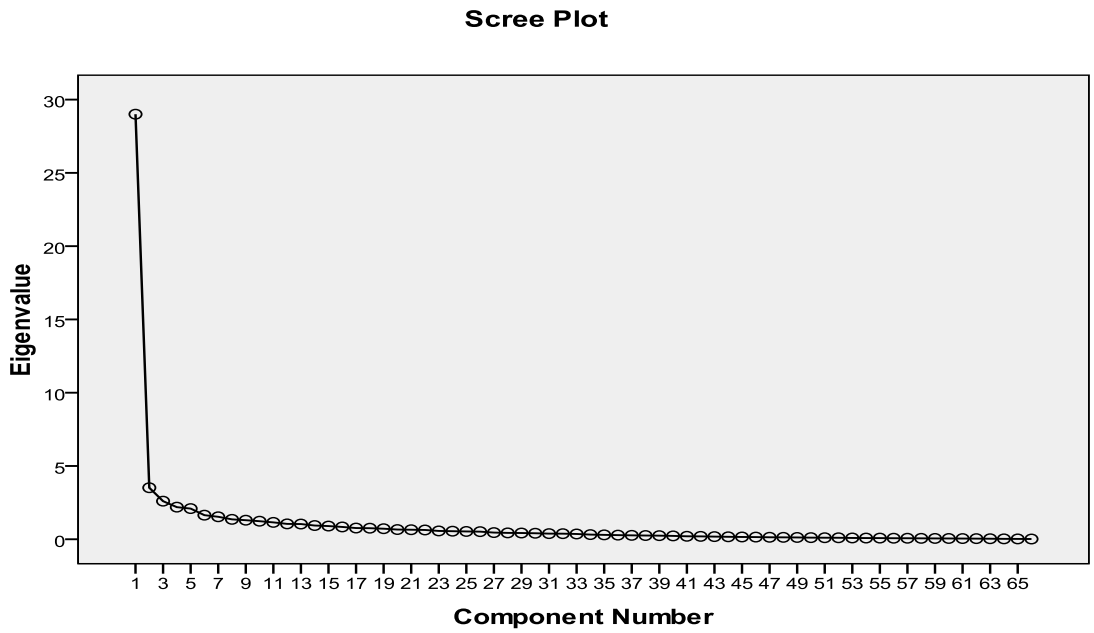

Figure 1- Scree Plot

6. FINDINGS & DISCUSSIONS

Exploratory Factor Analysis (EFA) extracted 13 factors that measured the existence and implementation of TQM practices in Pakistani HEIs. In the extracted factors 47 out of 66 items were converged in 13 extracted factors, while 19 items did not converged in any of the factors, hence they were not extracted. The Kaiser-Meyer-Olkin measure of Sampling Adequacy has a value 0.874, which is considered as desirable for factor analysis (Kaiser, 1970). The entire set of extracted factors explains 75.315% variation in the data. Communalities of individual factors are all greater than 0.6.

7. DESCRIPTIVE STATISTICS

Table 2 summarizes the descriptive statistics while Table 3 summarizes the factor-wise descriptive statistics obtained on the basis of the mean ratings of all the items converged in a factor. The mean and the standard deviations that are marked with asterisks (*), represents the descriptive statistics for the items that did not converge in any of the 13 factors.

TABLE 2- DESCRIPTIVE STATISTICS (ALL ITEMS)

Dimension	Items	Mean	Std. Deviation	Dimension	Items	Mean	Std. Deviation
Leadership	L1	2.0333	.88814	Continuous Improvement	CI1 *	2.3833	.91838
	L2	2.3000	.96667		CI2 *	2.1833	.77766
	L3	2.3583	.96837		CI3	2.4167	.94008
	L4 *	2.4750	.99547	Measurement and Evaluation	ME1	2.2917	.79278
	L5	2.3000	.96667		ME2	2.3083	.93302
	L6	2.4083	.99153		ME3	2.3750	.87026
	L7	2.6167	1.00573		ME4	2.4583	.90652
	L8*	2.5833	.95779		ME5 *	2.3750	.85073
Vision	V1	1.9083	.80956		ME6	2.3250	.85172
	V2	2.5000	1.05321	Education & Training	ET1	2.1167	.80108
	V3	2.3667	.86901		ET2 *	2.4417	.92397
	V4 *	2.5750	.97586		ET3	2.6083	1.03952
	V5	2.7250	1.07658		ET4	2.3333	.95560
Actors	A1 *	2.0250	.83477	Recognition & Reward	RR1	2.7083	1.08771
	A2 *	2.3167	.95251		RR2	2.6417	1.02732
	A3	2.1917	.98130		RR3	2.4500	.88735
	A4	2.2917	.95615	Program Design	PD1	2.3417	.94820
Resources	R1 *	2.4417	.95086		PD2 *	2.2167	.82180
	R2	2.3417	.86477		PD3	2.3417	.91207

	R3	2.2333	.95031		PD4 *	2.4833	.98717
	R4	2.1917	.88209		PD5 *	2.1917	.85303
	R5	2.5750	.98444	Student Focus	SF1	2.4167	.92203
Employee Involvement	E1 *	2.3750	.88936		SF2	1.9167	.83599
	E2 *	2.4583	.92487		SF3	1.8917	.71943
	E3 *	2.6917	1.04355		SF4	2.1750	.87603
	E4	2.3750	.93541		SF5	2.0000	.90749
Policy, Strategy & Culture	PSC1	2.1083	.83812	Other Stakeholders' Focus	OSF1	2.1750	.85664
	PSC2	2.3917	.95527		OSF2 *	2.6917	1.09848
	PSC3	2.2583	.83511		OSF3	2.3500	.94068
Process Control and Improvement	PCI1	1.7250	.77744		OSF4	2.5500	1.03591
	PCI2 *	2.2250	.82465				
	PCI3	2.3750	.88936				
	PCI4	1.9833	.75574				
	PCI5	2.0833	.76239				
	PCI6	2.4917	.95262				
	PCI7*	2.4833	.90733				

TABLE 3-DESCRIPTIVE STATISTICS (FACTOR WISE)

Descriptive Statistics

Dimension	N	Mean	Std. Deviation
F1	120	2.2653	.74957
F2	120	2.5500	.81261
F3	120	2.3345	.71476
F4	120	2.2450	.71124
F5	120	2.3333	.79212
F6	120	2.2750	.82719
F7	120	2.4528	.83660
F8	120	2.3750	.80309
F9	120	2.3792	.85257
F10	120	2.1208	.65784
F11	120	2.2583	.79648
F12	120	1.9167	.83599
F13	120	1.8917	.71943
Valid N (listwise)	120		

Exploratory Factor Analysis

Table-4 summarizes the results of factor analysis indicating the factors/dimensions along with the items that are converged in the factors. The first factor that explains the maximum variance of 10.312% contains six items out of which three items are related to the dimension 'Other Stakeholders' Focus (OSF), two items of Students' Focus (SF) and one item from the dimension of Program Design (PD), in the theoretical framework used in this study. The second factor named as Recognition and Reward because it contains most of the items from this factor discussed in the theoretical framework for this study. It explains 9.803% variation and having the Cronbach α value of 0.882. It contains three times from Recognition and Reward (RR) and one item each from Resources (R) and

Education & Training (ET). Out of these five items, only three were found statistically significant and these items were all related to Recognition and Reward (RR).

TABLE 4-Explortory Factor Analysis

FACTORS	ITEMS	Factor Loadings	p - value	Variance Explained	Cronbach α
F1 Stakeholders' Focus	PD 3	0.674	0.027**	10.312%	0.897
	SF4	0.676	0.000**		
	SF5	0.720	0.000**		
	OSF1	0.754	0.000**		
	OSF3	0.688	0.084		
	OSF4	0.588	0.797		
F2 Recognition & Reward	R2	0.516	0.182	9.803%	0.882
	ET3	0.644	0.924		
	RR1	0.760	0.000**		
	RR2	0.734	0.038**		
	RR3	0.781	0.000**		
F3 Measurement & Evaluation	E4	0.502	0.599	8.444%	0.911
	CI3	0.526	0.945		
	ME1	0.638	0.005**		
	ME2	0.573	0.540		
	ME3	0.684	0.002**		
	ME4	0.672	0.009**		
	ET1	0.544	0.429		
F4 Process Control and Improvement	A4	0.564	0.034**	6.809%	0.878
	PCI3	0.640	0.008**		
	PCI4	0.616	0.716		
	PCI5	0.805	0.000**		
	PCI6	0.646	0.280		
F5	R3	0.761	0.000**	6.542%	0.796

Resources	R4	0.705	0.000**		
	R5	0.728	0.000**		
F6 Leadership	L1	0.692	0.000**	5.908%	0.890
	L2	0.693	0.099		
	L3	0.679	0.000**		
	L6	0.598	0.611		
F7 Empowerment	L5	0.639	0.006**	5.392%	0.821
	L7	0.671	0.000**		
	R1	0.579	0.005**		
F8 Vision	V1	0.580	0.001**	4.883%	0.858
	V2	0.548	0.124		
	V3	0.532	0.335		
	V5	0.513	0.144		
F9 Program Design	PD1	0.577	0.000**	4.388%	0.797
	SF1	0.514	0.018**		
F10 Policy, Strategy & Culture	PSC1	0.633	0.000**	3.880%	0.772
	PSC2	0.575	0.074		
	PSC3	0.529	0.116		
	PCI1	0.510	0.000**		
F11 Selection	A3	0.713	0.000**	3.382%	0.669
	ME6	0.535	0.002**		
F12 Course Evaluation	SF2	0.742	0.000**	3.324%	-
F13 Clubs & Societies	SF3	0.743	0.000**	2.333%	-

*** statistically significant at 5%*

Four items related to Measurement and Evaluation (ME), and one item each from Employee Involvement (E), Continuous Improvement (CI) and Education and Training (ET) were converged as the third factor which is explaining 8.444% of the variation with Cronbach Alpha value of 0.911. Three items that are linked with Measurement and Evaluation (ME) are found statistically significant.

Fourth factor was formulated when four items from the dimension of Process Control and Improvement (PCI) and one item from Actors (A) converged with Cronbach Alpha value of 0.878. Only three items that are related to Process Control and Improvement are found statistically significant.

Items related to the dimension Resources (R) appeared as a fifth factor, explaining 6.542% variation and consisting of all the items are found statistically significant. The Cronbach Alpha value is 0.796.

Four items which were related to the dimension Leadership (L) appeared as the sixth factor but only two out the four converged items are found statistically significant. This factor explains 5.908% variation with Cronbach Alpha value of 0.89.

In the seventh factor named as Empowerment, two items that were related to Leadership (L) and one items from Resources (R) explains 5.392% variation with both the items statistically significant and having Cronbach Alpha value of 0.821.

As the Eighth factor, five items from the dimension Vision (V) were converged with the explained variance of 4.883% variation but only one item is found statistically significant. Cronbach Alpha for the factor is 0.858.

The Ninth factor appeared as the combination of one item from Program Design (PD) and one item from Students Focus (SF). Both the items are found statistically significant and explaining 4.388% variation. Cronbach Alpha for this factor is 0.797.

In the tenth factor, three items from Policy, Strategy and Culture (PCI) and one item from Process Control and Improvement (PCI) are converged with 0.772 Cronbach Alpha value and it is explaining 3.88% variation. As the Eleventh factor, one item from Actors (A) and one item from Measurement and Evaluation (ME) have converged with Cronbach Alpha value of 0.669 and this factor explains 3.382% variation. In the last two factors one item each from Students Focus (SF2) and another item related to the Student Societies and Activities (SF3, is loaded on the twelfth and thirteenth factor. Since on ly

one item each is loaded in the 12th and 13th factor, therefore Cronbach Alpha values are not obtained for these factors.

8. CONCLUSION

The implementation of TQM practices at the Higher Educational Institutions of Pakistan, especially in the business school is relatively a new concept and it is in its initial stages. The Higher Education Commission of Pakistan started implementing the norms of TQM related practices two years back. The theoretical framework or the instrument measures the degree of TQM implementation on the basis of various factors. In this study, based upon literature review, the framework having 14 dimensions is applied. These 14 dimensions can be measured with the help of 66 items.

On the basis of Exploratory Factor Analysis (EFA), 47 items have constituted 13 factors and 19 items were not converged in any of the 13 extracted factors. Table 5 summarizes the list of these non-converging items.

Table 5-List of Non-Converging Items

Dimension	Description
Leadership	L4-Top management allocates adequate resources for education & training of employees
Vision	V4-Academic processes are well aligned with the vision
Actors	A1-Appointments to the academic positions are based on the necessary skills required by the positions A2-Appointments to the administrative positions are based on the necessary skills required by the positions
Resources	R1-Sufficient financial resources are available for TQM implementation.
Employee Involvement	E1-University has cross functional teams and supports team work E2-As a result of quality effort, coordination and collaboration among

	employees have been enhanced E3-University has an established suggestion system to improve the processes by the employees
Policy, Strategy & Culture	None
Process Control & Improvement	PCI2-University meets the expectations of students PCI7-University collects statistical data and evaluates them to control and improve the process
Continuous Improvement	CI1-Suggestions are carried out based on stakeholders' feedback/audits on academic affairs CI2-The institution is striving to maintain high standards of quality in education through effective utilization of resources
Measurement & Evaluation	ME5-Standard performance measures are used to evaluate performance of staff
Education & Training	ET2-Special training for work related skills is provided to all employees ET4-Financial resources are available for employees education and training
Recognition & Reward	None
Program Design	PD2-The experienced academicians' suggestions are thoroughly considered in the design of curriculum PD4-Curriculum and academic programs are evaluated and updated every year PD5-University facilities are considered in the development and improvement of the curriculum and programs
Student Focus	None
Other Stakeholders' Focus	OSF2-University regularly conducts surveys on job satisfaction of the employees

Items obtained on the basis of EFA were checked and 30 out of 49 converged items were found statistically significant. It was observed that statistically insignificant item had loadings less than 0.65. Since the purpose of the study was to identify the areas where

lack of implementation TQM practices are found, the data analysis identified the following areas where more attention is to be paid:

- Proper allocation of financial and other resources for the training of employees
- Academic and Administrative staff have to be equipped with the necessary skills required for implementing TQM procedures
- There should be a greater degree of coordination and collaboration among employees so that the employee participation in implementing TQM practices could be enhanced.
- Training needs of employees should be identified and the obstacles in the way of this important area of Human Resource Development should be removed.
- The suggestions of academic staff, industry and other stakeholders should be incorporated to a greater extent in designing and updating the curriculum.
- Job satisfaction surveys should be carried out regularly and with complete confidentiality
- Statistical methods should be used to monitor and improve the TQM practices.
- Academic and administrative processes should be well aligned with the vision

If the shortcomings discussed above are overcome, it will increase the extent of TQM implementation in Pakistani HEIs and it will also increase the global acceptance of the degrees awarded by our institutions.

9. LIMITATIONS OF THE STUDY

The findings of this study are limited to the institutions that are part of this study. Study based on a large sample size and extended over longer time period may come up with more representative results on the basis of which more realistic generalizations can be made. Due to the limited sample size, only exploratory factor analysis is performed. The extracted factors can be confirmed for their existence with the help of Confirmatory Factor Analysis on a different sample therefore it is strongly recommended that the study

should be replicated with the greater span of institutions and extended time frame and with greater sample so that the factors extracted on the basis of EFA can be checked or confirmed with CFA.

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References

Abdullah, F. (2006), "Measuring service quality in higher education: HEdPERF versus SERFPERF", Marketing Intelligence and Planning, 24(1), 31 – 47.

Al-Jalahma, R., Gallier, D.,"Exploring the relationships between the core elements of TQM implementation", European, Mediterranean and Middle Eastern Conference on Information Systems-April 12-13, 2010, Abu Dhabi, UAE.

Ashraf, M. A. & Ibrahim, Y. (2009)" Quality education management at private universities in Bangladesh: An exploratory study", Quality Education Management. Jurnal Pendidik dan Pendidikan, Jil, 24, 17-32.

Baldrige, (2006), Baldrige national quality program-criteria for performance excellence, Retrieved 20 Sept, 2006, from http//www.quality.nist.gov

Bayraktar E., Tatoglu E., & Zaim, S.(2008), " An instrument for measuring the critical factors of TQM in Turkish higher education", Total Quality Management, Vol. 19, No. 6, 551-574

Bimbaum, R. (2000)“Management Fads in Higher Education. Where They Come from, What They Do, Why They Fall”, San Francisco: Jossey-Bass.

BNQP (Baldrige National Quality Program), “Education Criteria for Performance Excellence”, Gaithersburg, MD: Baldrige National Quality Program, 2003, http//www.quality.nist.gov/Education_Criteria.htm.

Cornesky, R., MacCool, S., Byrnes, L., Weber, R., (1991) “ Implementing Total Quality Management in Higher Education”, Magna Publications Inc., 2718 Dryden Dr., Madison, WI 53704.

Deming, W. E., (1982), “Quality, productivity and competitive position”, Cambridge, Mass.: Massachusetts Institute of Technology.

EFQM. (2006), “The fundamental concepts of excellence”, Retrieved 24 Sept, 2006, from http://www.quality-foundation.co.uk

Harvey, Lee (1995) 'Beyond TQM', Quality in Higher Education, 1: 2, 123 — 146

Houghton, J.W., (2005), “Changing research practices and research infrastructure development”, Higher Education Management and Policy, 17(1): 1 – 19.

Houston, Don (2007) 'TQM and Higher Education: A Critical Systems Perspective on Fitness for Purpose', Quality in Higher Education, 13: 1, 3 — 17

Ishkawa, K. (1985), What is total quality control? Englewood Cliffs, New Jersey: Prentice Hall.

Jager, J. & Gbadamosi, G. (2010), “Specific remedy for specific problem: measuring service quality in South African higher education”, Higher Education, 60: 251-267.

Jusoh A., Yusoff R.Z., Mohtar S. (2008) “Determining TQM practices in university R & D activities using factor analysis: Research experience of Malaysian universities” Jurnal Kemanusiaan bil. 11.

Kaiser H. (1970) "A second generation little jiffy," Psychometrika, Springer, vol. 35(4), pages 401-415, December.

Malek A., Kanji G. (2000). “TQM in Malaysian Higher Education Institutions”, *Sinergie rapporti di ricerca n. 9/2000.*

Massy, W.F., “Honoring the Trust, Quality and Cost Containment in Higher Education”, Bolton: Anker Publishing, 2003

Pandi, A.P., Rao, U.S., Jeyathilagar, D. (2009),“A study on Integrated Total Quality Management Practices in Technical Institutions-Students’ Perspective”, International Journal of Educational Administration, Vol 1, No. 1.

Pereda, M., Airey, D., Bennett, M., (2007), “Service Quality in Higher Education: The Experience of Overseas Students”, Journal of Hospitality, Leisure, Sport & Tourism Education, Vol 6, No.2., pp 55-67.

Rosa, M.J. & Amaral, A. (2007), “A Self-Assessment of Higher Education Institutions from the Perspective of the EFQM Excellence Model”, Quality Assurance in Higher Education, Vol. 20 (III), pp 181-207.

Sohail, M. S., Rajadural, J. & Rahman, N.A.A. (2003) “Managing quality in higher education: a Malaysian case study”, The International Journal of Educational Management, 17/4, pp 141-146.

Sekaran, U. (2003), Research Methods for Business: A skill-building approach (4 ed.) New York: John Willey and Sons.

Thor, Linda M.(1994) “Introducing the Human Side of Total Quality Management into Educational Institutions”, Community College Journal of Research and Practice, 18: 4, 359 — 368

Youssef,M. P., Libby, A., Al-Khafaji, and G. Sawyer. “TQM Implementation Barriers in Acadame: A Framework for Further Investigation”, International Journal of Technology Management 16, 4/6 (1998): 584 – 593

www.wseas.us/e-library/conferences/2011/Brasov2/.../MEQAPS-24.pdf