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Developing a Total Quality Management in Technical Education and Vocational Training Institutions in Yemen



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ABSTRACT

The main aim of this research is the Total Quality Management practices in Technical Education and Vocational Training Institutions in Yemen overall from the viewpoint of the students. Moreover, know the effect of variables (gender, specialization and governorate) in the responses of the students. This research used a survey (questionnaire) for collecting the data. The suitable sample size for the total population of the students in Technical Education and Vocational Training Institutions in Yemen was (370). Data analyzed by statistical method of analysis used SPSS 17 and the researcher used the statistical tools such as frequencies, standard deviation, the arithmetic average and percentage, T-tests for independent samples, One Way ANOVA. This research defined whether the Technical Education and Vocational Training Institutions in Yemen applied the total quality concepts or not. And to what range the Technical Education and Vocational Training Institutions in Yemen are embraced by these concept. Through this research, we can know how the institutions can outdo the difficulties from the opinion of the students.



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INTRODUCTION

Total quality management is a philosophy that was started in 1951 and was designated after W. Edwards Deming; the Deming Prize has long been known as an indicator of excellence in business (Walton, 1986). Depending on Sagar, (2007) the essential objective of total quality management is to culminate (if not advancement) customer satisfaction by continuous amelioration, which is achieved by systematic process for problem solving, breakthrough realization and livelihood of good results (standardization). Izadi et al., (1996) showed that increased price to producers, customers, and countries due to poor quality have promoted renewed estimate of the quality confirmation function. They further stated that educational program such as vocational and technical education can be improved by implementing the quality criteria. In corroboration to this position, Sagar added that with little modifications, the total quality management principles which can be applied to education.

The technical education and vocational training sector in the developing countries, especially the modern developing countries, faces many challenges. The most notable challenge is the acute shortage of well qualified human resources to lead and manage this vital sector, which forms the cornerstone of the foundation of the development process. Such shortage leads to the inability of the sector to help in graduating technical and professional cadres with the specifications and quality required by the development plans of many of these countries or to perform various professions needed by the labor market and the various institutions of society. Despite the significant fiscal spending allocated by the governments and unlike what has been achieved by other educational institutions of the relative success in regard to securing the needs of their countries of functional cadres, the technical education and vocational training sector in developing countries are still unable to meet the desired requirement (Bartel and Lichtenberg, 1987).

In the past, little try were made to improve the quality of management in higher education, and aims were scarcely identified (Kerr, 1991). Recently, there is so much concern among managers of vocational and technical education over the need for accountability, high cost of running the program in the face of dwindling economy, shortage of qualified personnel, decreased revenue allocation to education, high rate of unemployment amongst graduates, and the need to

embankment the blank between aims and employment necessarily in the country. Similarly, Ojo, (2008) supported that it has become highly needful that vocational and technical education administrators heading themselves to those management performance that would lead to improvement of activities, thereby leading to academic excellence in the program. Okunamiri, (2002) had the view that the situation tends to explain the current trend of using various management techniques and the adoption of various planning design and models such as total quality management which before were the monopoly of the business industries in vocational and technical education planning and administration.

NEED FOR QUALITY MANAGEMENT IN VOCATIONAL AND TECHNICAL EDUCATION

Vocational education cannot function properly unless there is high quality in the standard of teaching, materials available, teaching methods and proper evaluation of students in the program. The assessment of quality teaching is an ongoing, multi-dimensional process which should be based on process and product. Events have shown that countries and individuals are not able to harness human and non-human resources efficiently towards the realization of specific socio-economic and technological goals which bring us to the fact that there is need for ensuring quality vocational education program. Successful implementation of any education program and the effectiveness in achievement of set goals depend very much on adequate materials and resources available. Input on individuals and institutions of learning can determine to a large extent the realization of the philosophy of vocational education.

Quality can be described as standards of something as compared to other things that is the degree of excellence. High quality teaching/instruction can be regarded as the goodness or effectiveness in teaching/instruction which can result in student learning and satisfaction. Quality teaching and learning in vocational education, therefore, ensures that students acquire the knowledge, skills and competencies that are appropriate for their area of responsibility. There is the need to have teaching standards and develop challenging examinations to document and recognize accomplished teaching. Quality assurance is an essential tool required to ensure efficient vocational educational programs in our schools for the achievement of manpower development and skill acquisition in our societies Amadik, (2007). TQM implementation in education has

been useful both on administrative as well as academic side. Wild, (1995) has reported that the implementation of TQM at the institution has resulted in debugged administration, motivated staff to take responsibility for innovation, sharing of ideas regarding teaching, mutual problem solving approach, customer focused course contents, increased student's enrollment and marked overall performance improvement.

RESEARCH PROBLEM

It could be said that the achievement of total quality management in technical education and vocational training institutions means the ability of such institutions to provide a service with an outstanding level of quality, with which they can meet the needs of students, faculty members, parents, employers, the community and others, and in a way that is consistent with their expectations as well as the requirements of the modern age and the scientific and technological environment, and in a way that can achieve their satisfaction and happiness. This can be achieved through measures already in place to assess the outputs and to check their excellence status. The application of total quality in education has become an urgent requirement for interacting with the variables of an age that is characterized by acceleration of knowledge and technology and increasing competition and conflict between individuals, groups and institutions. There is no doubt that the introduction of total quality in education is an urgent requirement to enable us to achieve the quality of education as a way to development and progress as well as a way to meet the community needs of cadre and competent manpower (Diab, 2006). Total quality management is one of the modern trends in management. Its philosophy is based on a set of principles that can be adopted in order to reach the best possible performance. It is a management philosophy, a strategic entry and a means to manage change that aims to transfer contemporary organizations from traditional patterns of thinking to patterns of thinking and practice which fit in with the environment and contemporary requirements through the participation of the human factor and by motivating their talents and abilities in order to achieve continuous improvement (Abdul Wahab, 1998).

The study problem can be stated in the following main question.

What are the quality management standards in technical education and vocational training institutions in Yemen from the standpoint of the students?

The main question diverges into the following questions

1. To what extent are quality management standards applied in technical education and vocational training institutions in Yemen through fields of study?
2. Are there any significant differences at the significance level ($\alpha \leq 0.05$) in the responses of the study participants from the perspective of the students attributable to the gender and according to the following areas (management quality, student quality, teacher quality and infrastructure)?
3. Are there any significant differences at the significance level ($\alpha \leq 0.05$) between the means of study participants' responses from the perspective of the students attributable to specialization and according to the following fields (management quality, student quality, teacher quality and infrastructure)?
4. Are there any significant differences at the level of significance ($\alpha \leq 0.05$) between the means in the study participants responses from the standpoint of the students that are attributable to governorate and according to the fields: management quality, student quality, teacher quality and infrastructure?

RESEARCH OBJECTIVES

The objectives of this study are as follows:

1. Shedding light on the concept of total quality management and the possibility of its application in technical education and vocational training institutions in Yemen.
2. Identifying the importance of the application of total quality management in technical education and vocational training institutions.
3. Investigating the reality of applying total quality management in technical education and vocational training institutions in Yemen.
4. Identifying the problems facing institutes of technical education and vocational training in Yemen.
5. Reaching some conclusions and recommendations that will contribute to achieve the desired educational quality.

SIGNIFICANCE OF THE RESEARCH

The significance of the study can be exhibited through the following points:

1. It deals with the latest development entries which are the total quality management and its applications in technical education and vocational training institutions in Yemen.
2. The obvious delay in the application of the techniques of total quality management in technical education and vocational training institutions in Yemen.
3. The lack of sufficient awareness of the culture of total quality management among those in charge of technical education and vocational training institutions in Yemen.
4. Notifying the educational leaders in technical institutes in Yemen with the importance of the application of total quality management in educational institutions.
5. This study may open new fields to researchers in the field of technical education and vocational training.

METHODOLOGY OF THE STUDY

The present study used a descriptive way during field survey goals to describe the reality of applying the rules of total quality management from the viewpoint of the students and data analyzed, then explained and written the conclusions and recommendations. This study followed the exploratory way that joins theoretical study office and survey of the literature in the area of research, moreover the method of field survey which it was studied the literature in the field of Total Quality Management. It is then the process of collecting information from the students in the various technical education and vocational training institutions in Yemen. A questionnaire was destined and developed for this aim by where the researchers reviewed, audited, and presented to a number of specialists to arbitration and to comment upon, where they were taken into account before the final form of the questionnaire.

SAMPLE OF THE STUDY

This study was conducted on a sample of (370) of the students, i.e., at a rate of 100% of the study population that was chosen by a stratified random way.

Table 1: Distribution of Study Sample According to Various Independent Variables

Independent Variables		Frequency	Percent %
Gender	Male	241	64.1%
	Female	129	34.9%
	Total	370	99%
The Specialization	Manufacture	62	16.8%
	Commerce	131	35.4%
	Construction	162	43.8%
	Agriculture	15	4.05%
	Total	370	100.0%
Governorate	Sanaa	235	63.5%
	Ibb	90	24.3%
	Taiz	45	12.2%
	Total	370	100.0%

STATISTICAL TOOLS

Data will be analyzed by statistical method of analysis applying SPSS 17 and the researcher used the following

Statistical tools:

- 1- Frequencies, standard deviation, the arithmetic average and percentage.
- 2- T-tests for independent samples.
- 3- One Way ANOVA.

The term has been calculated (4) degrees which is the difference between the highest degree (5) and lowest (1) in the Likert scale used in the study (5-1), comprise of five degrees, and dividing it along the cell ($4 \div 5 = 0.80$). It was subsequently added this value to the lowest in the class scale, namely (1) to determine the upper limit of the cell. This brings the length of the cells as follows:

- a. The degree less than 1.79 degree that the measurement of total quality management system is very weak degree.
- b. The degree of 1.80 degrees to 2.59 degrees less than that the measurement of total quality management system is a weak degree.
- c. The degree of 2.60 degrees to 3.39 degrees less than that the measurement of total quality management system is a medium degree.
- d. The degree of 3.4 degrees to 4.19 degrees less than that the measurement of total quality management system is a high degree.
- e. The degree of 4.2 degrees to 5 degrees that the measurement of total quality management system is very high degree.

HYPOTHESES OF THE STUDY

The current study seeks to test the following hypotheses:

1. There are no statistically significant differences at the level of significance ($\alpha \leq 0.05$) between the means of the responses of the study samples from the perspective of the students attributable to the variable of gender.
2. There are no statistically significant differences at the level of significance ($\alpha \leq 0.05$) between the means of the responses of the study samples from the perspective of the students attributable to the variable of specialization.
3. There are no statistically significant differences at the level of significance ($\alpha \leq 0.05$) between the means of the responses of the study samples from the perspective of the students attributable to the variable of governorate.

Analyzing and Interpreting the Study Axes

Measuring Reliability

Cronbach's alpha is used for the coefficient of reliability; calculating the reliability of the Questionnaire.

Table 2: Reliability

	Axis	Number of Paragraphs	Alpha Cronbach
1	The quality of administration	13	0.69
2	The quality of Students	10	0.78
3	The quality of the teacher	8	0.66
4	Infrastructure	11	0.68
The total		42	0.92

The results, in the above table, show that the value of the Cronbach's alpha coefficients shows the four axes as the followings:

(0.69) for the specific sections of the questionnaire concerning the quality of administration; (0.78) for the specific sections of the questionnaire concerning the quality of the students; (0.66) for the specific sections of the questionnaire concerning the quality of the teacher; and (0.68) for the specific sections of the questionnaire concerning the infrastructure quality.

The value of Cronbach's alpha coefficient for the questionnaire as a whole reaches (0.92) which is the ratio of high firming

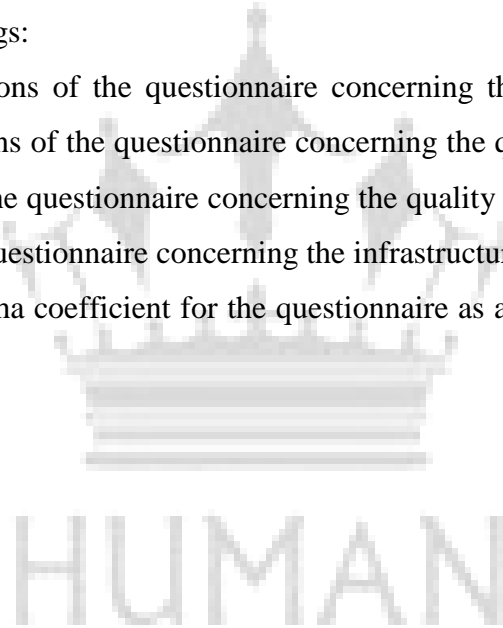


Table 3: Showing the Correlation Coefficients between the Axis of the Study and Total Quality Management

	Axis		The quality of management	The quality of the students	The quality of the teacher	Infrastructure	Total
1	The quality of management	Pearson Correlation	1	0.309**	0.542**	0.547**	0.777**
		Sig. (2-tailed)		0.000	0.000	0.000	0.000
		N	370	370	370	370	370
2	The quality of the students	Pearson Correlation	0.309**	1	0.387**	0.314**	0.626**
		Sig. (2-tailed)	0.000		0.000	0.000	0.000
		N	370	370	370	370	370
3	The quality of the teacher	Pearson Correlation	0.542**	0.387**	1	0.573**	0.846**
		Sig. (2-tailed)	0.000		0.000	0.000	0.00
		N	370	370	370	370	370
4	Infrastructure	Pearson Correlation	0.547**	0.316**	0.573**	1	0.803**
		Sig. (2-tailed)	0.000	0.000	0.00		0.00
		N	370	370	370	370	370
5	Total	Pearson Correlation	0.777**	0.626**	0.846**	0.803**	1
		Sig. (2-tailed)	0.00	0.00	0.00	0.00	
		N	370	370	370	370	370

Is that the degree of stability in accordance with acceptable statistical standards? It was also not bound together, account (Pearson) to assure the internal consistency of the questionnaire, exhibiting the presence of contact relationships are powerful and statistically significant at the abstract level (0.01).

Table 4: Showing the Axes Achievement of the Total Quality Management Standards in the Educational Institutes of the Technical Education and Vocational Training in Yemen, as Seen by the Students

Axes	Mean	SD	Percentage	The Score
The quality of administration	2.53	0.78	50.6	Low
The quality of students	3.45	0.72	69	High
The quality of the teacher	2.96	0.99	59.2	Average
The quality of Infrastructure	2.27	0.85	45.4	Low
All items of the TQM	2.80	0.64	56	Average

Observing the table (4), the results obtained and the mean of the total measurement of the degree of the achievement of the total quality management standards in the educational institutes of the Technical Education and Vocational Training in Yemen, as seen by the students come out with an average degree, with the mean of (2.80), and a percentage of (56%), for the degree of standard achievement is ranging between (2.27%) and (3.45%).

Concerning the sequence of the axes, the axis of the quality of the students came first, obtaining the mean 3.45, with the percentage of 69% and with a high degree of application. Then, the axis of the quality of the teacher came in the second position, obtaining the mean 2.96, with the percentage of 59.2% and with an average degree of application. After that, the axis of the quality of the administration came in the third place, obtaining the mean 2.53, with the percentage of 50.6% and with an average degree of application. Finally, the axis of the quality of the infrastructure came in the last place, obtaining the mean 2.27, with the percentage of 45.4% and with a low degree of application.

Discussion Questions Study

Evaluate the impact of variables (gender, the specialization and governorate).

a. The results relating to the first hypothesis

There are no statistically significant differences at the level of significance ($\alpha \leq 0.05$) between the means of the responses of the study samples from the perspective of the Students attributable to the variable of gender

Table 5: T-test Results According to the Gender Variable

Axis	Male (241)		Female (129)		t-test	Sig.
	Mean	SD	Mean	SD		
The quality of administration	2.55	0.73	2.48	0.85	2.52	0.02*
The quality of students	3.43	0.73	3.49	0.70	1.75	0.19
The quality of the teacher	2.97	0.95	2.95	1.07	2.88	0.09
The quality of the Infrastructure	2.14	0.78	2.52	0.90	6.04	0.01*
All items of the TQM	2.77	0.59	2.86	0.72	10.9	0.001

** The abstract level (0.01) * abstract level (0.05).

Table (5) highlighted that there is no statistically significant differences at the level of significance ($\alpha \leq 0.05$) in the degree of applying the standards of the total quality management in the educational institutes of the Technical Education and Vocational Training, as seen by the students, for it is due to the variable of gender in the axes of the quality of students and the quality of teachers standards.

b. The results for the second hypothesis

There is no statistically significant difference on the level of significance ($\alpha \leq 0.05$) in the mean of responses of the study sample, as seen by the students, due to the variable of specialization in the application of quality management in the educational institutes of the Technical Education and Vocational Training in Yemen. To test this hypothesis, ANOVA One Way has been used.

Table (6): Showing the Mean, the Standard Deviations According to the Variable of Specialization

Items	Manufacture (62)		Commerce (131)		Construction (162)		Agriculture (15)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
The quality of administration	2.63	0.69	2.61	0.79	2.45	0.80	2.25	0.49
The quality of students	3.38	0.94	3.52	0.65	3.41	0.69	3.55	0.40
The quality of teacher	3.05	0.99	3.14	0.93	2.78	1.03	3.03	0.89
The Infrastructure	2.10	0.79	2.44	0.86	2.19	0.87	2.27	0.57
Total TQM	2.79	0.67	2.93	0.63	2.70	0.66	2.77	0.38

Table (6) highlights the results obtained by ANOVA One Way for testing the significance of differences in applying the total quality management in the educational institutes of the Technical Education and Vocational Training according to the variable of specialization, and as seen by the students.

Table 7: One Way ANOVA Results According to Specialization Variable

Axis	Source of variation	Sum of quares	df	Mean Square	F	Sig.
The quality of administration	Between Groups	3.679	3	1.226	2.052	0.10
	Within Groups	218.662	366	0.597		
	Total	222.340	369			
The quality of students	Between Groups	1.220	3	0.407	0.786	0.50
	Within Groups	189.365	366	0.517		
	Total	190.585	369			
The quality of teacher	Between Groups	10.110	3	3.370	3.493	0.01*
	Within Groups	353.048	366	0.965		
	Total	363.158	369			
Infrastructure	Between Groups	6.285	3	2.095	2.975	0.03
	Within Groups	257.714	366	0.704		
	Total	263.999	369			
Total TQM	Between Groups	3.419	3	1.140	2.797	0.04*
	Within Groups	149.131	366	0.407		
	Total	152.550	369			

The results highlighted in Table (7) shows no statistically significant differences at the level of sig ($\alpha \leq 0.05$) in applying the total quality management in the educational institutes of the Technical Education and Vocational Training according to the variable of specialization and as seen by the students. The results also show that there is no statistically significant difference in the responses of the participants of the study (the sample of study) in applying the total quality management in the axes of the quality of the teacher, the quality of infrastructure and the total degree.

c. The results for the third hypothesis

There is no statistically significant difference on the level of significance ($\alpha \leq 0.05$) in the mean of responses by the students' sample, for it is due to the variable of **governorate** in the application of quality management in the educational institutes of the Technical Education and Vocational Training in Yemen.

Using ANOVA One Way to test this hypothesis, Table (8) highlights the mean, the standard deviations in applying the total quality management according to the variable of governorate, and as seen by the students.

Table (8): Showing the Mean, the Standard Deviations According to the Variable of Governorate

Axis	Sana'a (235)		Ibb (90)		Taiz (45)	
	Mean	SD	Mean	SD	Mean	SD
The quality of administration	2.58	0.77	2.25	0.79	2.29	0.70
The quality of students	3.45	0.74	3.53	0.62	3.26	0.74
The quality of the teacher	2.98	0.99	2.95	1.06	2.91	0.88
Infrastructure	2.28	0.83	2.44	0.88	1.90	0.74
Total TQM	2.82	0.63	2.86	0.67	2.59	0.59

Table (8) highlights the results obtained by ANOVA One Way for testing the differences in applying the total quality management in the educational institutes of the Technical Education and Vocational Training according to the variable of **governorate**.

Table 9: One Way ANOVA Results According to the Governorate Variable

Axis	Source of variation	Sum of Squares	df	Mean Square	F	Sig.
The quality of administration	Between Groups	3.26	2	1.63	2.73	0.06
	Within Groups	219.07	367	0.597		
	Total	222.340	369			
The quality of students	Between Groups	2.19	2	1.09	2.13	0.12
	Within Groups	188.39	367	0.513		
	Total	190.58	369			
The quality of the teacher	Between Groups	0.164	2	0.082	0.08	0.92
	Within Groups	362.99	367	0.989		
	Total	363.15	369			
Infrastructure	Between Groups	8.78	2	4.39	6.30	0.00*
	Within Groups	255.23	367	0.695		
	Total	263.99	369			
Total TQM	Between Groups	2.303	2	1.152	2.813	0.061
	Within Groups	152.247	367	0.409		
	Total	152.550	369			

The results highlighted in Table (9) show no statistically significant differences at the level of sig. ($\alpha \leq 0.05$) in applying the total quality management in the educational institutes of the Technical Education and Vocational Training according to the variable of **governorate** and as seen by the students in the axes of quality management standards, the quality of the students and the quality of the teacher. However, the results show a significant difference in the axis of infrastructure.

CONCLUSION

Introducing the phenomenon of total quality management is relatively new, especially in the field of technical education and vocational training in Yemen. Taking it for granted, achieving the principles of total quality management does not come suddenly, but takes time and more effort. It also requires the full commitment of all members of the institution. The total quality

management does not mean quick remedies and changes that can be easily done in the organization on a day, but the process takes a long time.

Observing the table (4), the results obtained and the mean of the total measurement of the degree of the achievement of the total quality management standards in the educational institutes of the Technical Education and Vocational Training in Yemen, as seen by the students come out with an average degree, with the mean of (2.80) and a percentage of (56%) for the degree of standard achievement is ranging between (2.27%) and (3.45%).

Concerning the sequence of the axes, the axis of the quality of the students came first, obtaining the mean 3.45, with the percentage of 69% and with a high degree of application. Then, the axis of the quality of the teacher came in the second position, obtaining the mean 2.96, with the percentage of 59.2% and with an average degree of application. After that, the axis of the quality of the administration came in the third place, obtaining the mean 2.53, with the percentage of 50.6% and with an average degree of application. Finally, the axis of the quality of the infrastructure came in the last place, obtaining the mean 2.27, with the percentage of 45.4% and with a low degree of application.

The result of this study comes to confirm some previous field studies addressed by the some researchers such as Ghaithi, 2007 on the application of standards of total quality management in a medium degree and agrees with the study of Lewis, 2003, to know the reality of the application of TQM in a medium degree. As well as, the results similar to the results of khan, 2010 whose study the developing a total quality management framework for public sector Universities in Pakistan.

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