

# Leadership and TQM Excellence: Empirical Study of ISO Certified Manufacturing Firms in Sri Lanka

**W.P Richard Wickramaratne**

Senior Lecturer, Department of Management Studies  
University of Peradeniya,  
Peradeniya, Sri Lanka

Correspondence with the author: [richardwickramaratne@yahoo.com.au](mailto:richardwickramaratne@yahoo.com.au)

## Abstract

*Leadership is a pre-requisite to all strategy and action plans. Accordingly the objective of the paper was to empirically investigate the impact of leadership behavior on the TQM excellence. This study was conducted based on a spectrum of manufacturing firms with ISO certification registered under the Board of Investment of Sri Lanka. The sampling frame covered a range of industries including apparels, chemicals, machinery, electronic and instruments. The sample of study comprised 150 executives and managers who are working under functional heads. The researcher used convenience sampling in selecting the subjects. The instrument used in the study was a survey questionnaire. The Correlation analysis explained a positive moderate relationship between leadership and TQM excellence ( $r=0.531$ ,  $p=0.000$ ). That is leadership behavior of an organization is positively related to the TQM excellence. According to the regression analysis, 28.2% of TQM excellence is accounted for by leadership behavior. Accordingly this study implies that, the functional level heads should serve as role models in planning, communication, coaching, review of performance, and employee recognition. As role models, they can reinforce values and expectations while building leadership, commitment, and initiative within their business functions. The implications of the study are also discussed.*

**Key words:** Total quality management, Leadership, TQM excellence, manufacturing firms, Sri Lanka.

## Introduction

Oakland (1989) argues that after the industrial revolution of the nineteenth century and the computing revolution of the early 1980s, “we are now without doubt in the midst of quality revolution” (Wilkinson, *et al*, 1998). Development in the product markets; technology, and legislation have led employers to search for new strategies and structures. Accordingly product and service quality are high on the agenda of both private and public sector organizations with quality certification and Total Quality Management emerging as key concerns (Wilkinson, 1996). TQM is a management approach of an organization centered on quality based on the participation of all of its members aiming at long term success through customer satisfaction and benefits to all members of the organization and to the society (ISO 8402). Accordingly TQM is an organization wide approach to continuously improving the quality of all the organizations, processes, products and services (Kotler, 2000). In sum, today, TQM systems are increasingly common in many organizations (Psychogios and Priporas, 2007; Brookes and Becket, 2008).



Alternate hypothesis (H1) - There is a positive relationship between functional level quality leadership behavior and TQM excellence.

## Methodology

### *The sample*

This study was conducted based on a spectrum of manufacturing firms with ISO certification registered under the Board of Investment of Sri Lanka. The basic assumption of selecting ISO certified firms was that employees of those firms are aware of quality concepts. The sampling frame covered a range of industries including apparels, chemicals, machinery, electronic and instruments. The sample of study comprised 150 executives and managers who are working under functional heads of operations, marketing, human resources, and finance departments. The researcher used random sampling in selecting the subjects. Responses for the survey were received from 79 respondents which accounted a 53% response rate.

### *Dimensions*

According to Schmidt and Finnigan (1992), there are twelve behaviors that successful quality leaders demonstrate. These behaviors were considered as the dimensions of leadership behavior. These dimensions are,

- D<sub>1</sub> - Giving priority attention to the needs of external and internal customers
- D<sub>2</sub> - They empower rather than control
- D<sub>3</sub> - They emphasize improvement rather than maintenance
- D<sub>4</sub> - They emphasize prevention rather than correction
- D<sub>5</sub> - They encourage collaboration rather than competition
- D<sub>6</sub> - They train and coach, rather than direct and supervise
- D<sub>7</sub> - They learn from problems
- D<sub>8</sub> - They continually try to improve communications
- D<sub>9</sub> - They continually demonstrate their commitment to quality
- D<sub>11</sub> - They establish organizational systems to support the quality effort.
- D<sub>12</sub> - They encourage and recognize team effort.

According to TQM theory, TQM excellence is measured in five main areas of effectiveness, efficiency, productivity, quality, and non quality related measures such defects, error rates, cost of poor quality and deliveries not on time etc(Oakland, 1995). For the purpose of the research the researcher has given his own operational definition for the TQM excellence. That is TQM excellence is measured in terms of employee perception of the quality. Accordingly TQM excellence is the perception of a person to see in the production of the final product that, he should be educated in the process and should be participated with full

authority and self control with the intention of being innovative, so that the ultimate product or service to be free of errors in accordance with the current prevailing quality concepts. There are seven dimensions identified for the measurement of TQM excellence. They are,

- D<sub>1</sub> - Educative process
- D<sub>2</sub> - Participative structures (quality circles, action teams etc.)
- D<sub>3</sub> - Greater autonomy and self control
- D<sub>4</sub> - Decreasing trend of errors towards zero defects
- D<sub>5</sub> - Adherence to quality concepts
- D<sub>6</sub> - Creativeness or innovativeness
- D<sub>7</sub> - Perception of customer satisfaction.

#### *Instrumentation*

The instrument used in the study was a questionnaire which comprised 49 questions. The leadership behavior was measured by a 27 item questionnaire which has been originally devised by the Xerox for its management performance survey. (Besterfield *et al*, 2005, P.51) The TQM excellence was measured by a 15 item questionnaire originally devised by the researcher. The TQM excellence questionnaire originally devised by the researcher (Wickramaratne, 1995) is exhibited in Appendix of this article. Out of 49 questions, seven were designed to gather background information of the respondents.

#### *Data collection and analysis*

One hundred and fifty questionnaires along with a covering letter were distributed among the selected sample of managers and executives. The distribution of questionnaires was coordinated by HR manager/head of HR of each firm. The questionnaire explained the purpose of the study and the importance of participation for the survey.

Data was analyzed using the SPSS (version-21) data analysis software. The first stage of data analysis involved computing descriptive statistics as frequencies and percentages for analyzing characteristics of the subjects. Second a reliability analysis was done to check whether the questionnaires measure the variables reliably. The Alpha values were calculated for the same purpose. If the Alpha values are greater than 0.5, the questionnaires measure the variables reliably. (leadership questionnaire and TQM excellence questionnaire) Third a factor analysis was performed to find out the dimensions of each variable, how questions are grouped to dimensions, to find out whether any unwanted questions can be eliminated from the questionnaire. Finally the simple correlation analysis was performed to identify the relationship between leadership and TQM excellence.

## **Results**

### *Questionnaire responses and the profile of employees*

There were 79 responses from the 150 questionnaires. It is a response rate of 53%, which is at a satisfactory level. It shows that 80% of the respondents were male employees while the rest were female employees. The majority of the employees appear to be within the age group of 36-50(60%).The highest number of respondents was with G C E (A/L) qualification (48%) while rest 30% and 22% of employees were degree qualifications and GCE (O/L) respectively. The majority of employees were within the job experience of 6-10 years. There were 85% of married and 15% unmarried employees in the sample.

### *Reliability analysis and factor analysis*

A reliability analysis was done to check whether each Questionnaire measure the variables reliably. The Chronbach's Alpha value was measured for this purpose. As exhibited in table-1, results reveal that the questionnaires measure the variables reliably.

Table-1: Summary of reliability analysis.

	Questionnaire	Alpha Value	Comment
01	Leadership behavior questionnaire	0.7646	acceptable
02	TQM excellence questionnaire	0.6831	acceptable

Source: Survey data

Factor analysis is a statistical procedure to take a large number of constructs and reduce them to a smaller number of factors that describe this measure. A 'factor' is a combination of questions where shared correlation explains a certain amount of total variance. After rotation, factors are designed to demonstrate underlying similarities between groups of variables.

Three measures were considered for the analysis.

- (1) Kaiser – Meyer – Olkin Measure of Sampling adequacy  
KMO measure is acceptable, (KMO = 0.756) since it is higher than 0.5. There fore the distribution of data is acceptable for performing the factor analysis.
- (2) Bartlett's test of sphericity  
Bartlett's test of sphericity: Significance = 0.000. This result is acceptable since data do not differ significantly from multivariate normal. That is the chance to differ occurs at  $p = 0.000 < 0.05$ .
- (3) Component Matrix  
At the beginning there were two components. But, after extracting, two variables come under one component. Therefore the entire set of questionnaire is unidimensional. It means that the questionnaire has equally measured all of the variables.

### *Descriptives*

The Standard Error of Mean (SEM) is less than 3.5% for all variables and the highest standard Error of mean is for leadership behavior (2.6%). The TQM excellence had the highest average scores. Overall averages are above 03, and it implies that successfulness of all factors. The following table (table-2) shows a summary of the descriptives.

Table 2: Summary of descriptives

		Mean	Standard Deviation	Remarks
	Leadership	4.08	0.343	Highest dispersion : Points scattered away from the mean
	TQM excellence	4.15	0.248	Points scattered some what close to the mean.

Source: Survey Data

#### Correlation analysis

Scatter plots were taken to identity relationship of TQM excellence with the leadership. The correlation between leadership and TQM excellence is positive and significant at 1% significance level since  $r = 0.530$  and  $P = 0.000$ . The results of the scatter plots are commented in table-3 as follows.

Table 3: Comment on scatter plots

	Variables Involved	Correlation Co-efficient(r).	Comments
	Leadership-TQM excellence	0.530	A positive correlation The points are much scattered around a straight line

Source: Survey Data

Regression between leadership behavior and the TQM excellence.

The analysis gives s the following information.

1.  $R = 0.531$ , which means a moderate gradient regression line.
2.  $R^2 = 0.282$ , means 28% of the variance of success of TQM was accounted for by leadership.
3. Sum of squares figures explain a larger proportion of unexplained variance than explained variance.
4. Sag  $F = 0.000$ , which shows that a particular "F" value could occur by a chance of less than 1 in 1000.

#### Test of Hypothesis

The alternate hypothesis states 'quality leadership behavior of functional level heads is positively related to the TQM excellence'. Correlation analysis explained a positive relationship between leadership and TQM excellence ( $r = 0.531$ ,  $P = 0.000$ ). Regression analysis also supported this by giving a value, ( $B_3 = 0.236$ ). Hence leadership is a predictor of TQM excellence ( $F = 35.189$ ,  $0.000$ ). Hence the decision is that the leadership behavior is a predictor of TQM excellence. Consequently null hypothesis is rejected and the alternate hypothesis is accepted.

#### Discussion

The study revealed a moderate relationship between leadership and TQM excellence ( $r = 0.531$ ,  $P = 0.000$ ). This is significant at 1% significance level. Hence leadership is reflected on the TQM excellence. The simple regression analysis described that leadership has a positive impact on TQM excellence with the strength of  $B = 0.384$  ( $F = 69.423$ ,  $P = 0.000$ ). The leadership behavior gives a measure of TQM excellence

and it has a 28.2% accuracy of predicting. That is 28.2% of TQM excellence is accounted by the leadership behavior.

The distribution of the leadership shows that the Mean and standard Deviation are at favorable levels. (Mean = 4.0789, Standard Deviation = 0.3425). The Standard deviation shows that the leadership behavior of functional heads is committed on the quality at plus or minus 0.3425 Standard Deviation level.

### **Conclusion**

As far as the role of TQM leader is concerned, every manager is responsible for quality. Management's role is no longer to make the final decision, but to make sure the team's decision is aligned with the quality statements of the organization. Managers push problem solving and decision making to the lowest appropriate level by delegating authority and responsibility. They should provide needed resources to train employees in the TQM tools and techniques, the technical requirements of the job, appropriate equipment and security. Similarly, managers must be visibly and actively engaged in the quality effort by serving on teams, coaching teams, and teaching seminars. They should lead by demonstrating, communicating, and reinforcing the quality statements. As a rule of thumb, they should spend about one third of their time on quality (Besterfield, 2003). Another very important role is the communication. The objective is to create awareness of the importance of TQM and provide TQM results in an ongoing manner. Consequently, leadership is essential during every phase of the implementation process and particularly at the start. More importantly, the leadership of functional level heads is a crucial factor in gaining the TQM excellence.

### **Implications**

The article made an original contribution by investigating how leadership behavior of functional level managers contributes to the TQM excellence of a firm. Therefore, policy makers would be benefitted in making their quality leadership related policy decisions. With sparse research in the area of quality leadership, the study has filled this gap and enhanced the body of knowledge of TQM. Consequently; policy makers, academic community and researchers are benefitted by this study.

### **About the author**

*Richard Wickramaratne is a Senior Lecturer in the Department of Management Studies at the University of Peradeniya in Sri Lanka. His main roles as a lecturer involve teaching and research supervision at both undergraduate and postgraduate levels. He has published a number of research articles in refereed journals and proceedings of international research conferences. Currently, he is reading for his PhD in HRM at Murdoch University in Australia.*

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## Appendix

### Perceived TQM excellence questionnaire

#### *Educative process*

1. Quality means making a product conformance to specifications/standards irrespective of customer satisfaction (R\*).

2. I believe that the correct manufacturing process of a product determines its quality
3. Responsibility for quality is not only with quality control department but also with all members of the firm.
4. I always like to meet the production targets irrespective of the level of product quality (R\*).

*Participative structures*

5. I always involve in the quality related participative problem solving (such as quality circles, quality related action teams).
6. I always have the chance to make work/organization related suggestions to my supervisor/immediate senior.

*Greater autonomy and self-control*

7. I have adequate autonomy for quality and quality improvement.
8. I have adequate self-control and responsibility for quality and quality improvement.

*Decreasing trend of errors towards zero defects*

9. In doing my works, I always try to minimize rejects and re-work.
10. I like work in teams to reduce rejects and re-work and to achieve zero defects level in our firm.

*Adherence to quality concepts*

11. It's my desire to do things right in the first time and every time.
12. I trust that zero defects and no re-work in production result in reducing the cost of production.

*Creativeness or innovativeness*

13. I have adequate opportunities within the firm to be creative in quality improvements.
14. I have received adequate encouragements from the firm to be creative and innovative related to quality improvements.

*Perception of customer satisfaction*

15. Quality means not only to meet customer expectations, but delight the customers in the process.
16. Measurement of organizational performance in terms of customer expectation is more suitable than the measurement of internal performance.

R\*=reverse coded