

The impact of quality awareness on quality results of manufacturing firms: The mediating effect of total quality management

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ABSTRACT

This study highlights the important role of quality awareness for each company in implementing total quality management in producing quality results that is in accordance with consumer desires. This study aims to analyze the effect of quality awareness on total quality management and quality results. The research was conducted at manufacturing firms in the Makassar industrial area (KIMA). The unit of analysis used is a company that has implemented total quality management, namely as many as 40 companies. Respondents are managers or staff that represents each company. Data were analyzed using Partial Least Square (SmartPLS). The results of the study provide evidence that, (1) quality awareness has a positive significant effect on total quality management; (2) quality awareness has a positive insignificant effect on quality results; (3) total quality management has a positive significant effect on quality results; and (4) quality awareness has a positive significant effect on quality results through total quality management.

Keywords: Quality awareness, total quality management, quality results, manufacturing firms

INTRODUCTION

One of the benefits of globalization in supporting the development of the manufacturing industry is to provide greater market opportunities. But globalization also presents quite a tough challenge, especially in the competition to produce high-quality products. The momentum of economic globalization, product quality has increasingly become a global problem (Wu, 2007). Changes in industrial competition place strong pressure on continuous quality improvement (Mendes, 2012). Quality is a determining factor for the creation of competitiveness data for companies (Georgiev & Georgiev, 2017). Quality is considered as one of the competitive strategic tools and is as important as the price in an organization (Al-Assaf & Gentling, 1996; Singh & Deshmukh, 1999). Another scholar's view explains that increasing competition has forced many organizations to participate in the quality movement (Arumugam

et al., 2008). The increasing intensity of competition results in organizations having to realize the importance of a quality system (Bader, 2001; Sahoo, 2018).

Manufacturing firms in facing challenges and being able to become winners in the competition in the globalization era certainly need a program that leads to quality programs, so it is very important for companies to raise quality awareness and employee involvement in quality improvement programs (Mendes, 2012). The method used to improve quality and reduce costs is to apply the practice of total quality management (TQM) (Shams, 2011; Youssef & Youssef, 2018). Quality awareness among people is very important for achieving TQM goals (Psychogios & Priporas, 2007). According to Panizzolo et al. (2012), the concern in changing the mindset of the people, training and lack of awareness about the lean concepts lead to more cost and time involved in lean implementation; this makes the process slow in India, which is quite similar to the other developing countries. Psychogios & Tsironis (2012) observed basic quality awareness in all managers, who supported the view that quality assurance is critical to their day-to-day activities. The high levels of quality awareness during the development of TQM produce basic prerequisites for the success and main objectives of TQM (Keng Boon et al., 2005; Sahoo, 2018).

TQM as a philosophy is used to increase awareness of the importance of quality and to change the attitudes of employees (Sallis, 2002). The success of applying TQM will be achieved with the involvement of employees (Chiu, 1999). All members of organizations in all departments and management levels need to give commitment in implementing TQM (Juran, 1988), because employees are the key to implementing quality management (Soltani et al., 2004). This is in line with that proposed by Deming (1986) that human resource management is a significant driver in implementing TQM and emphasizes its implications for continuous quality improvement.

Existing research tends to only discuss that quality awareness has a relationship with quality results. Meanwhile research on quality awareness has a positive significant effect on the TQM application. Furthermore, the research on the effect of TQM on the quality results has a positive and significant effect. There is still very limited research that discusses what indicators are included in the quality awareness variable that affects TQM and quality results. Therefore, it is very necessary to continue research on quality awareness, TQM and quality results.

Empirical evidence shows that employee behavior includes quality awareness, quality competence; quality motivation has a significant impact on TQM Practice. The practice of TQM has a significant impact on company performance as measured by customer satisfaction, market share, and sales growth (Respati & Amin, 2014). The Quality awareness, and staff capacity, quality attitude as well as staff interest have a positive and significant impact on TQM practices (Xu et al., 2012). There is a relationship between the quality management system reflected through strategy, quality practices and company performance with quality awareness as measured by good communication, trust in the system and encouraging contributions from all parties (Hussain et al., 2006).

The relevance of TQM on performance, based on the findings of scholars, shows that the quality program (TQM) is significantly and positively related to the performance of product quality and product innovation (Prajojo & Sohal, 2003). TQM factors consisting of strategic factors, tactical factors and operational factors have a significant effect on operational performance as measured by cost reduction, waste reduction, improving product quality, improving delivery and product and service development performance (Riyadi & Munizu, 2013). The TQM dimension is positively related to innovative quality and performance (Zehir

et al., 2012). There is a significant relationship between total quality management to competitive advantage as measured by price, quality, dependability delivery, product innovation and time to market (Prayhoego, 2013). TQM has an effect on the cost of quality and product quality, but TQM with a quality culture has no significant effect on the cost of quality and product quality, and the cost of quality and product quality have no significant effect on company performance (Haryani et al., 2015).

In general, manufacturing firms in Indonesia produce low quality products. The Indonesian industry average is still at the level of achieving 2-sigma with a DPMO (defects per million opportunities) value of 308,538. That with the level of achievement of 2-sigma if measured by percentage between COPQ (cost of poor quality) on sales shows that Indonesian industrial products are still difficult to compete (Gaspersz, 2002: 3). This is also related to the condition of manufacturing firms in the Makassar industrial area (KIMA).

LITERATURE REVIEW

Quality awareness

The term of quality awareness was first used by CR. Sheaffer in 1947 to the first convention (ASQC) of the American Society for Quality Control. Quality awareness can be inferred by "3-An" awareness, alignment and attention (Radziwill, 2013). Quality awareness is a way of thinking that includes all elements of the quality system. This emphasizes the constant interaction between people needed for the relationship between organizational efficiency and communication aspects. Quality awareness includes; (1) good communication; (2) trust in the system, and (3) encouraging contributions from all parties, which are termed the quality awareness triangle, namely awareness, alignment and attention (Hussain et al., 2006). Quality awareness is the motive for creating quality products (Respati & Amin, 2014).

Total quality management

Total quality management (TQM) is defined as a way to improve continuous performance (continuous performance improvement) at each level of operation or process, in each functional area of an organization, using all available human and capital resources (Gaspersz, 2001: 4). TQM is a unified management philosophy and a series of practices that emphasize, inter alia, continuous improvement, meeting customer needs, reducing rework, long-term thinking, increasing employee engagement and team work, redesign processes, benchmarking, competitive, problem solving based team, always measuring results, and relationships that are closer to suppliers (Yang, 2006; Youssef & Youssef, 2018). Total quality management can be defined as managing the entire organization so as to make it superior in all dimensions of products and services that are important to customers (Jacobs et al., 2015: 363). The views of other scholars state that TQM refers to the emphasis on quality which includes the entire organization, from suppliers to customers (Heyzer & Render, 2009: 307).

Quality results

The word quality first appeared on Cicero's *Academica* (Cicero, 45 BC) as Latin which is equivalent to the ancient in Greek word they said *poiotes* (quality). Quality has several meanings expressed by several experts. Aristotle gave two meanings to the word quality: (a) shows how an object is distinguished from other objects and (b) the perception of objects good or bad (Von Wright, 1963; quoted by Anttila & Jussila, 2017). Then the enhanced quality in ISO becomes a level where a set of inherent characteristics of an object meets the requirements (Anttila & Jussila, 2017).

Quality is something that satisfies and exceeds customer wants and needs (Sallis, 2006: 56). Quality is meeting or exceeding customer expectations, customer satisfaction (Besterfield D. H, 2011; Ramli & Sjahruddin, 2015). Quality is the overall features and characteristics of a product or service that is able to satisfy visible or vague needs (American Society for Quality; cited in Heyzer & Render, 2009: 301). There are eight dimensions or quality indicators that can be used to analyze the quality characteristics of a product, especially for manufacturing products (Garvin; cited in Gaspersz, 1997: 3) that dimension is; (1) performance of the main operating characteristics of the core product (strength / primacy of the product); (2) additional features or features, namely secondary or complementary characteristics; (3) reliability, which is less likely to be damaged or fail to use; (4) conformity with specifications (conformance to specification), namely the extent to which the characteristics and operations meet the standards set beforehand; (5) durability (durability) related to how long the product can continue to be used; (6) service ability, including speed, competence, comfort, easily repaired; satisfying complaints handling; (7) aesthetics, namely product attraction to the five senses; and (8) perceived quality, namely the product image and reputation as well as the company's responsibility for it.

Based on the background and literature review, the following hypothesis formulations can be described:

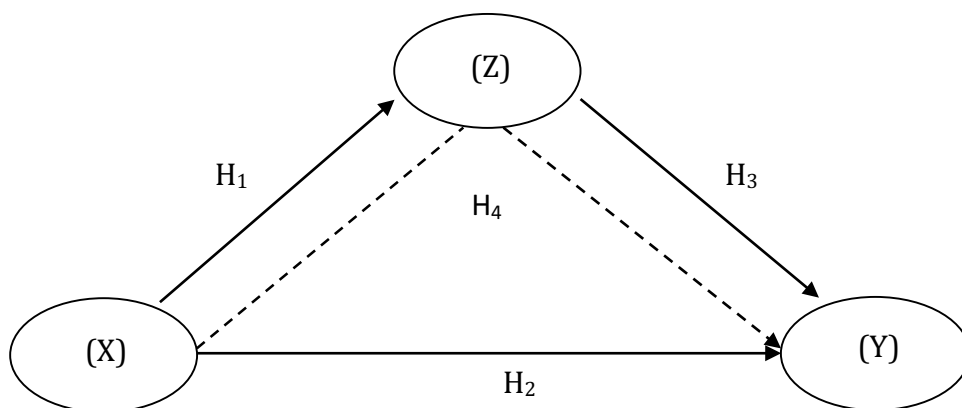


Figure 1: Conceptual Framework

Description:

X = Quality awareness

Z = Total quality management

Y = Quality results

Based on empirical facts and Figure 1, the hypothesis proposed in this study is as follows:

- H₁ Quality awareness has a positive significant effect on total quality management manufacturing firms in Makassar industrial area
- H₂ Quality awareness has a positive significant effect on quality results of manufacturing firms in Makassar industrial area
- H₃ Total quality management have a positive significant effect on quality results of manufacturing firms in Makassar industrial area
- H₄ Quality awareness have a positive significant effect on quality results through a total quality management of manufacturing firms in Makassar industrial area

METHOD

The research approach used in this research is explanatory research which intends to explain the position of the variables studied and the relationship between one variable and another. The characteristics of this study are replication, so the results of hypothesis testing must be supported by previous studies, which are repeated with other conditions that are more or less

the same (Sugiyono, 2012: 21). The population in this study is all companies in Makassar industrial area that are engaged in manufacturing and have implemented total quality management. The unit of analysis in this research is manufacturing firms that implement TQM as much 40 companies. In one company, 1 (one) respondent was determined so that the number of samples was 40 people. The subject of this research is one from the production manager, marketing manager or production or marketing department staff. 30 questions designed on a Likert five-point scale with criteria (5) very good and (1) very bad. All questions in the questionnaire are designed based on existing theories or published research results to ensure the quality of the questionnaire.

RESULTS

Based on the empirical model proposed in this study we can test hypotheses proposed through path coefficients. Testing is done to determine the strength of the influence of exogenous variables on endogenous variables, both directly and indirectly. The test results can be seen in the following table:

Table 1: Test results of direct and indirect

Exogenous	Variable		Effects			t-value > 2.0240	Results
	Intervening	Endogenous	Direct	Indirect	Total		
Quality awareness	TQM	-	0.8675	-	0.8675	40.9968	Positive significant
Quality awareness	-	Quality results	0.1617	-	0.1617	1.6823	Positive Insignificant
-	TQM	Quality results	0.7713	-	0.7713	8.5242	Positive significant
Quality awareness	TQM	Quality results	0.1617	0.6691**)	0.8308*)	8.3015	Positive significant

Based on the four hypotheses proposed, one hypothesis shows insignificant results. The interpretation of Table 1 can be explained as follows:

Effect of quality awareness on total quality management

The test results show that the quality awareness has a positive significant effect on total quality management with the path coefficient of 0.8675 and the t-statistics value of 40.9968 > t-table 2.024, (H_1 is support). If the intensity of the application of quality awareness is improved, the effectiveness of implementing total quality management will also increase. These results prove that all indicators of quality awareness are in the form of responsibility, awareness, harmony, attentiveness, increasing contribution from everyone, and good communication has a positive and significant influence on the implementation of TQM. This finding supports the results of previous studies that quality awareness among people is very important for achieving TQM goals (Psychogios & Priporas, 2007). The success of implementing TQM will be achieved with the involvement of employees (Chiu, 1999). High levels of quality awareness during the development of TQM produce basic prerequisites for the success and main objectives of TQM (Keng Boon et al., 2005). Employee behavior in the form of quality awareness, quality competence and quality motivation has a significant impact on the practice of Total Quality Management (Respati & Amin, 2014). Quality awareness, and staff capacity, quality attitude as well as staff interest have a positive and significant impact on TQM practices (Xu et al., 2012).

Effect of quality awareness on quality results

The test results show that quality awareness has a positive but insignificant effect on quality results with the path coefficient values of 0.1617 and the t-statistics value of 1.6823 < t-table 2.024, (H_2 is rejected). These results indicate that indicators of quality awareness in the form of

responsibility, awareness, harmony, attentiveness, increased contribution from everyone, and good communication have a positive but insignificant effect on quality results. These findings contradict the scholar's view that the success or failure of an organization in achieving many goals will be determined by the awareness of individuals in carrying out their duties, because humans are the implementers of activities in order to achieve goals. One of the goals of the organization is to produce high quality products (Mathis & Jackson, 2001).

The importance of quality awareness and employee involvement in quality improvement programs as well as the relationship of the quality management system through the implementation of strategies, quality practices and company performance with quality awareness reflected in good communication; trust in the system and encouraging contributions from all parties (Hussain et al. 2006 ; Mendes, 2012). The insignificance of the effect of quality awareness on quality results is due to the lack of good communication in a company. This is relevant to the statement that communication is an important element of quality awareness, and the main cause of lack of interest in quality problems is poor communication (Oakland, 1993). Communication will work well if there is a contribution from all people by building a quality culture that stimulates growth and competitiveness and enhances team work and systems of sharing, learning and system suggestions (Hussain et al., 2006).

Effect of total quality management on quality results

The test results show that total quality management has a positive significant effect on quality results with the path coefficient values of 0.7713 and the t-statistics value of 8.5242 > t-table of 2.024, (H_3 is supporting). The higher the intensity of the application of total quality management, the higher the quality results. These results prove that all TQM indicators in the form of leadership, organizational culture, top management support, continuous improvement, benchmarking, quality goals and policies, employee empowerment, employee involvement, employee training, use of information technology, supplier quality, supplier relations, supplier performance assessment, product and service design, process control, customer orientation, realistic TQM implementation schedule, and inspection and checking of work have a positive and significant influence on improving quality results.

This finding is relevant to the findings of previous researchers that the application of total quality management will improve the quality results, that the quality program (TQM) is significantly and positively related to product quality performance and product innovation (Prajogo & Sohal, 2003). TQM factors consisting of strategic factors, tactical factors and operational factors have a significant effect on operational performance as measured by cost reduction, waste reduction, product quality improvement, improvement in product delivery and product and service development performance (Riyadi & Munizu, 2013). The TQM dimension is positively related to innovative quality and performance (Zehir et al., 2012). There is a significant relationship between total quality management on competitive advantage as measured by price, quality, dependability delivery, product innovation and time to market (Prayhoego, 2013). TQM affects the cost of quality and product quality (Haryani et al., 2015).

Effect of quality awareness on quality results will be mediated by total Quality Management

The results of using the Sobel's test to test the indirect effect of variables namely quality awareness of quality results through total quality management obtained indirect coefficient of influence of 0.6691 and the t-statistics value of 8.3015 > t-table of 2.02, this means quality awareness has a positive and significant effect on quality results will be mediated by total quality management (supporting H_4). The direct effect of quality awareness on the quality

results produces a non-significant effect but with mediation total quality management changes the effect that is not significantly. This shows that even though quality awareness is getting better in a company but not necessarily directly will improve the quality results but with the mediation of TQM will be able to improve the quality results. This finding is relevant to the results of previous studies that employee behavior as measured by quality awareness, competency, and quality motivation has a significant effect on TQM practices and the other effect that the TQM practices have a significant effect on firm performance as measured by customer satisfaction, market share and sales growth (Respati & Amin, 2014).

CONCLUSIONS AND LIMITATIONS

Based on the results of the analysis and discussion as well as several findings from testing the consistency of the effect of quality awareness on total quality management in manufacturing firms in the Makassar industrial area (KIMA) the following conclusions were obtained; First, quality awareness is directly positive and significant effect on total quality management in manufacturing firms in the Makassar industrial area; Second, quality awareness has a positive and significant effect on quality results will be mediated by total quality management but, directly, quality awareness has a positive and insignificant effect on quality results. This shows that the existence of total quality management as a mediating variable has shown is a full mediation. Total quality management changes the influence that is not significant to be significant quality awareness of quality results.

Based on the results of the analysis, the manufacturing firms managers located in the Makassar industrial area (KIMA) should strive to strengthen the application of TQM in their companies. By applying TQM consistently, two contributions are obtained, namely: (a) increasing the influence of quality awareness on the quality results, and (b) changing the effect of quality awareness on the quality results that is not significantly significant. Workers or employees must be made aware that quality awareness must support the application of TQM. With the application of TQM based on quality awareness, the quality results will increase. This is in accordance with the theory in general, that TQM affects the achievement of predetermined quality standards; third, the biggest indicator of its contribution in forming quality awareness is increasing the contribution of all people. Increased contribution can be formed by building a quality culture that stimulates growth and competitiveness and improves performance through teamwork.

This research has been carried out as well as the steps of good scientific research, however there are still some limitations such as; **first**, research only focuses on manufacturing industries in the Makassar industrial area (KIMA). The research area should be expanded to include manufacturing firms in South Sulawesi; **Second**, endogenous variables and exogenous variables in this study consisted of only one variable. Therefore, it is expected that in the next study it can add both variables. For exogenous variables it is not only about quality awareness but can also be related to other psychological factors. While endogenous variables are not only limited to the quality results but add other variables such as those related to financial performance.

References

- Al-Assaf, AF, & Gentling, SJ (1996). Executives' Perceptions of Total Quality Improvement. *Hospital topics*, 74 (1), 26-30. <https://doi.org/10.1080/00185868.1996.11736046>
- Anttila, J., & Jussila, K. (2017). Understanding quality - conceptualization of the fundamental concepts of quality. *International Journal of Quality and Service Sciences*, 9 (3/4), 251-268. <https://doi.org/10.1108/IJQSS-03-2017-0020>

- Arumugam, V., Ooi, KB, & Fong, TC (2008). TQM practices and quality management performance: An investigation of their relationship using data from ISO 9001: 2000 firms in Malaysia. *The TQM Journal*, 20 (6), 636-650. <https://doi.org/10.1108/17542730810909383>
- Bader, A. (2001). Identifying some management approaches to total quality management within industrial organizations. A research paper.
- Besterfield, Dale H. (2011). *Total Quality Management*. New Jersey Prentice-Hall.
- Chiu, RK. (1999). Employee involvement in a total quality management program: problems in Chinese firms in Hong Kong. *Managerial Auditing Journal*, 14 (1/2), 8-11. <https://doi.org/10.1108/02686909910245522>
- Deming, WE (1986). *Out of the crisis*. Massachusetts Institute of Technology. Center for advanced engineering study, Cambridge, MA.
- Gaspersz, Vincent. (1997). *Quality Management*. PT. Gramedia General Library. Jakarta
- Gaspersz, Vincent. (2001). *Total Quality Management*, PT Gramedia General Library, Jakarta.
- Gasperz, Vincent. (2002). *Total Quality Management*, PT. Gramedia. General Library, Jakarta.
- Georgiev, S., & Georgiev, E. (2017). Evolution of top management understands of product quality in Eastern Europe since the end of communism: The case of Bulgaria. *The TQM Journal*, 29 (1), 82-100. <https://doi.org/10.1108/TQM-09-2015-0115>
- Haryani, AD, Wiratno, A., & Maghfiroh, S. (2015). Total Quality Management (TQM), Cost of Quality and Quality of Products and Their Implications for Company Performance with Quality Culture as Moderating Variables. *AKUNTABEL*, 5 (1).
- Heizer, Jay & Barry, Render. (2009). *Operations Management Book 1 Issue 9*. Jakarta. Salemba Empat.
- Hussain, K., Abba, H., & Leleu-Merviel, S. (2006). A quality awareness approach for the industry. *IFAC Proceedings Volumes*, 39 (3), 779-784. <https://doi.org/10.3182/20060517-3-FR-2903.00383>
- Jacobs, F. Robert, Chase, & Richard B. (2015). *Supply Chain Operations and Management*. Jakarta. Salemba Empat
- Juran, JM (1988). *Juran on planning for quality*. Macmillan Collier.
- Keng Boon, O., Arumugam, V., & Seng Hwa, T. (2005). Does soft TQM predict employees' attitudes? *The TQM Magazine*, 17 (3), 279-289. <https://doi.org/10.1108/09544780510594243>
- Mathis.L. Robert & Jackson.H. John. (2001). *Human Resource Management*. Second book. Jakarta
- Mendes, L. (2012). Employee's involvement and quality in small and medium enterprise (SME) improvement in manufacturing: A comparative analysis. *African Journal of Business Management*, 6 (23), 6980-6996.
- Oakland, JS (2007). *Total organizational excellence*. Routledge.
- Panizzolo, R., Garengo, P., Sharma, M. K., & Gore, A. (2012). Lean manufacturing in developing countries: evidence from Indian SMEs. *Production Planning & Control*, 23(10-11), 769-788. <https://doi.org/10.1080/09537287.2011.642155>
- Prajogo, DI, & Sohal, AS (2003). The relationship between TQM practices, quality performance, and innovation performance: An empirical examination. *International journal of quality & reliability management*, 20 (8), 901-918. <https://doi.org/10.1108/02656710310493625>
- Prayhoego, CA (2013). Analysis of the Effect of Total Quality Management on Competitive Advantage and Company Performance. *Business Accounting Review*, 1 (2), 236-245.
- Psychogios, A. G., & Tsironis, L. K. (2012). Towards an integrated framework for Lean Six Sigma application: Lessons from the airline industry. *Total Quality Management & Business Excellence*, 23(3-4), 397-415. <https://doi.org/10.1080/14783363.2011.637787>
- Psychogios, AG, & Priporas, CV (2007). Understanding total quality management in context: Qualitative research on managers' awareness of TQM aspects in the Greek service industry. *The qualitative report*, 12 (1), 40-66.
- Radziwill, NM (2013). A review of the *Quality Management Journal*: Influential resources, key themes, and emerging trends. *Quality Management Journal*, 20 (1), 7-36. <https://doi.org/10.1080/10686967.2013.11918089>
- Ramli, A. H., & Sjahruddin, H. (2015). Building patient loyalty in healthcare services. *International Review of Management and Business Research*, 4(2), 391.

Respati, H., & Amin, R. (2014). Research on Continues Mediation: Employee Behavior and TQM Practice as ISO 9000 Strategy to Improve Performance of Manufacturing Companies in East Java, Indonesia. *European Journal of Business and management*, 6 (29), 125-136.

Riyadi, S., & Munizu, M. (2013). Creating Superior Operational Performance through Total Quality Management Practices at Manufacturing Companies in Surabaya, Indonesia. *European Journal of Business and Management*, 5 (10), 39-50.

Sahoo, S. (2018). TQM, TPM and their integration from Indian manufacturing industry. *Journal of Manufacturing Technology Management*, 29 (7), 1188-1210.<https://doi.org/10.1108/JMTM-03-2018-0075>

Sallis, Edward, (2002). *Total Quality Management in Education*, third edition. London's Kogan Page Ltd, Stylus Publishing Inc. USA

Sallis, Edward. (2006). *Total Quality Management, Interpretation*, Ahmad Ali Riyadi. Yogyakarta: Ircisod.

Shams, Thani MS (2011) *Quality Costing*, MA Student of Business Management Journal International Market. 3

Singh, S., & Deshmukh, SG (1999). Quality service sector initiatives: A case. *Total Quality Management*, 10 (1), 5-16.<https://doi.org/10.1080/0954412998027>

Soltani, E., Gennard, J., Van der Meer, RB, & Williams, T. (2004). HR performance evaluation in the context of TQM: A review of the literature. *International Journal of Quality & Reliability Management*, 21 (4), 377-396.<https://doi.org/10.1108/02656710410530082>

Sugiyono. (2012). *Qualitative Quantitative Research Methods and R & D*. Alfabeta. Bandung

Wu, Y, (2007). China stands for quality. *China Daily*: Dec. 13. http://www.chinadaily.com.cn/china/2007-12/13/content_6319258.htm, accessed March 12, 2018.

Xu, Y., Zhu, J., Huang, L., Zheng, Z. & Kang, J. (2012). Research on the influences of staff's psychological practices for factors to total quality management: An empirical study of Chinese manufacturing industry. In *Management of Innovation and Technology (ICMIT), 2012 IEEE International Conference on* 303-308. IEEE.

Yang, CC (2006). The impact of human resource management on total implementation management: An empirical study on high-tech firms. *The TQM Magazine*, 18 (2), 162-173. <https://doi.org/10.1108/09544780610647874>

Youssef, MA, & Youssef, EM (2018). The synergistic impact of ISO 9000 and TQM on operational performance and competitiveness. *International Journal of Quality & Reliability Management*, 35 (3), 614-634.<https://doi.org/10.1108/IJQRM-02-2016-0024>

Zehir, C., Ertosun, Ö. G., Zehir, S., & Muceldilli, B. (2012). Total quality management practices' effects on quality performance and innovative performance. *Procedia-Social and Behavioral Sciences*, 41, 273-280. <https://doi.org/10.1016/j.sbspro.2012.04.031>