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Citation: Shokri, Alireza and Nabhani, Farhad (2019) Quality management vision of future early career Operations Managers. *International Journal of Quality & Reliability Management*, 36 (2). pp. 162-185. ISSN 0265-671X

Published by: Emerald

URL: <https://doi.org/10.1108/ijqrm-06-2017-0114> <<https://doi.org/10.1108/ijqrm-06-2017-0114>>

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Quality management vision of future early career Operations Managers

ABSTRACT

Purpose - This research aims to investigate the gap between the current vision and knowledge of future early career operations managers (OM) and a common strategic total quality management (TQM) framework.

Design/Methodology/Approach - A survey questionnaire and a non-parametric test for different groups of participants was adopted to identify the gap and analyse the significance of these groups on the factors in TQM framework.

Findings – A new set of TQM factors with necessity of more knowledge and understanding of future generation was identified, followed by identification of clear differences amongst different groups of this generation.

Practical Implications – A sustainable OM practice needs managers and leaders with a sustainable knowledge development of quality management (QM); and as the result of this study, the current vision of future young operations managers would not echo this.

Originality/Value - This study has a systematic, non-parametric approach towards currently fragmented QM analysis, and is integrated with human resource and visionary elements of future young OM and universal QM models and theories.

Key words – Quality Management, Operations Management, Human Resource Management, Early Year Professionals, MBNQA Model, Non-Parametric Test

Article Type – Research Article

1. Introduction

Operations management philosophy has progressed significantly in recent decades as the result of globalisation and cultural integration. The increased number of ever – demanding customers who are geographically dispersed and culturally and demographically diverse has shifted the operations management paradigm from mass production, with more volume in product and customer, to sustainable mass customisation with an agile customer service (Qi et al, 2016; Orsdemir et al, 2014). In this paradigm, customers expect higher quality products and services with lower prices that would put more pressure on organisations to gain a competitive advantage (Jimenez-Jimenez et al, 2015). Future production and operations management research and practice is aligned with more operations management sustainability (Starr, 2016; and Walker et al, 2014), which obliges the future Operations Managers (OM) to transform their operations management and leadership philosophy towards even better quality and efficiency. Recent research has sought OM and their employees possess requisite job

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3 skills and a unifying sense of quality in their organisation (Jayaram and Xu, 2016). Quality is
4 defined as delighting all stakeholders, taking context into consideration (Van Kemenade,
5 2014).
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9 The relationship between Quality Management (QM) and organisational performance is a
10 recurrent theme in several branches of operations management, and it is in the interest of both
11 academic scholars and practicing OM (Sabella et al, 2014; and Yeung et al, 2005). Soltani et
12 al (2005) placed emphasis on synergic relationship between organisational performance
13 management and TQM. The “Context” paradigm of QM was introduced as the future trend
14 embedded in operational and strategic factors and dimensions of operations management, to
15 handle the emergent change in QM, with more contextual approaches promising flexibility
16 and adaptability (Van Kemendae, 2014). There have been numerous research studies in
17 relation to the service, manufacturing and supply chain context of QM (Dong et al, 2016;
18 Mosadeghrad, 2015; Kanpp, 2015; Isa and Usmen, 2015; Graham et al, 2014; Bhat et al,
19 2014; Algasem et al; 2014; Asif et al, 2013; Brianvand and Khasseh, 2013; and Yeung et al,
20 2005) and also in the context of the size of organisations (Dora and Gellynck, 2015). Despite
21 heavy longitudinal studies in QM integration with sector, industry and size contexts, there is
22 insufficient data on the integration of human resources (HR) with QM philosophy to promote
23 more sustainable and competitive management (Stanton et al, 2014).
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35 **Current** operations management research and practice advocate technology, innovation,
36 design, new product development and sustainability as part of future operations management
37 objectives of business operations, which are both exploitative and explorative, (Ergun et al,
38 2014; Phan and Chambers, 2013; and Holmstrom and Romme, 2012). Interestingly, there has
39 not been adequate emphasis on QM philosophies, models and practices as part of
40 management evolution for the future. On the other hand, the crucial role of top management
41 commitment on QM (Njeru and Omondy, 2016) and the evolution of the QM concept from
42 competition-driven to an established culture, with a proactive approach, has been highlighted
43 (Weckenmann et al, 2015). Therefore, this puts more pressure on future OM to enhance the
44 organisation, environment and workforce for the future in order to meet satisfactory customer
45 quality standards. However, it was suggested that the examination of QM with a successful
46 theoretical and conceptual approach in a business is strongly fragmented in the real world
47 (Evans, 2013). This prescribes the necessity of more critical analysis of the vision of future
48 OM about QM. We intended to identify the human and workplace elements – relate critical
49 success factors for QM in the vision of future young OM and also investigate the distinctive
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3 gap between their vision and the common critical success factors of the respective QM
4 models.
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6 7 8 **2. Future early career OM**

9 We describe the future OM as a young generation, who are considered as “early year
10 professionals (EYPs)” in their future roles and have still no professional and management
11 experience. EYPs emerged as a specialised group of inexperienced practitioners within a
12 workforce who view their role as important towards managing quality in provision as well as
13 managing staff (Hallet, 2013). This generation of professional OM and leaders, who will
14 account for the majority of OM over the next 40 years, are more self-conscious, aspiring and
15 demanding with more entrepreneurial skills. They require less social approval and concerns
16 for others but need more social capital (Hamouri et al, 2015). The current research, in relation
17 to OM, has emphasised the importance of sustaining the leadership power of future OM
18 (Starr, 2016). Despite introducing EYPs as a homogeneous group with differing values,
19 attributes or operations than the previous generation (Ng et al, 2012), more recent studies
20 revealed that their job attributes are heterogeneous (Guillot-Soulez and Soulez, 2014).
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30 This generation in different cohorts or proxy such as gender, age, work and education
31 experience differs remarkably from previous generations. Rao (2013) states that one of the
32 most crucial skills for young OM involves leading the operations or organisations to a best-
33 in-class level. With the support from previous studies (Guillot-Soulez and Soulez, 2014), this
34 study intends to focus on young potential graduates as future senior OM in order to exclude
35 the effect of career stage, which is a recurrent problem in generational analysis. However,
36 prior to analysing this generation in relation to their QM vision as future OM, it is important
37 to review the common QM philosophy of TQM and its model approaches.
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45 **3. TQM model approaches**

46 TQM is a crucial philosophy and ultimate formula for operational enhancement to meet
47 complex objectives of immense consumer demand in globally oriented operations (Jimenez-
48 Jimenez et al, 2014; and Moonsamy and Singh, 2014). It supports both exploiting capabilities
49 with a continuous improvement (CI) focus and exploring capabilities with an innovative
50 focus. Phan and Chambers (2013) recommended TQM as a philosophy that facilitates young
51 OM to experimental problems with unknown solutions in order to establish quality. However,
52 despite a great level of recognition for this philosophy, some researchers admit that there is
53 no guarantee of TQM success as this is a heterogeneous philosophy with a lack of clear
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3 prescription (Mosaddeghrad, 2015 and Sabella et al, 2014). In response to this challenge,
4 Graham et al (2014) have recommended operations management contribution and
5 commitment to generate clear results and minimise the ambiguity of TQM as a key driver of
6 TQM success.
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10 The essence of operations management visibility and interdependency of critical factors, or
11 TQM elements, (Suarez et al, 2014) has revealed a greater need of systematic and well-
12 proven models to be utilised in organisations. This advocates the role of any OM as
13 facilitators to establish QM in their operations management philosophy through developing
14 appropriate visions and utilising appropriate models. There are different QM models and
15 frameworks that directly or indirectly reflect principles and hard and soft elements of TQM
16 such as the Malcolm Baldrige National Quality Awards (MBNQA) (Jones, 2014), European
17 Foundation for Quality Management (EFQM) Excellence Model (Suarez et al, 2014),
18 Competing Value Framework (CVF) (Do Nascimento Gambi et al, 2015) and Quality
19 Management Extension Model (Slack et al, 2013). In addition to these models, the theories of
20 some quality gurus such as Deming, Juran and Crosby (Singh et al, 2013) can be used as
21 theoretical platforms to extract quality constructs which could be considered by any
22 operations manager including future young OM with their distinctive personality in this
23 century.
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35 The important role of organisational culture in establishing TQM was acknowledged by many
36 scholars (Do Nascimento Gambi et al, 2015; Kanpp, 2015; and Antony, 2014). Among
37 several organisational culture models that were used in QM literature, the CVF has been
38 introduced as a well-established, theoretically sound and relatively widely used instrument.
39 This model presents four different organisational culture as: “Group Culture”, “Hierarchical
40 Culture”, “Rational Culture” and “Developmental Culture” (Do Nascimento Gambi et al,
41 2015), which are essential to be assessed for EYPs.
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48 The Quality Management Extension Model presented by Slack et al (2013), demonstrates the
49 paradigm shift of quality inspection to quality control, quality assurance (QA) and TQM as
50 part of evolution of QM culture. This has been supported by more recent research studies
51 which revealed that QA encompasses “human-focused and intelligent quality management
52 perceptions” QM (Weckenmann et al, 2015). Therefore, it was decided to investigate the
53 position of the vision of future young OM in relation to the evolution of this research study.
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3 EFQM was nominated as one of the most well-known, widespread and established TQM
4 frameworks in which human and social aspects of QM are strongly considered (Weckenmann
5 et al, 2015; Kim et al, 2010). This model proposed that the optimum integrated management
6 of key TQM factors such as leadership, strategy, people, partnership and process will lead to
7 **improved** results (Suarez et al, 2014). The EFQM model was designed following TQM
8 principles, and implies that leadership is the engine of the system that makes **the** other
9 elements function (Gomez Gomez et al, 2011). Some scholars have criticised this model due
10 to a lack of distinguishing between soft and hard indicators in TQM, **and as a result of the**
11 disparity between theory and practice in relation to **the** social impact on processes (Gomez
12 Gomez et al, 2011).

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20 Edward Deming, who was widely regarded as the prominent personality of QM movement,
21 developed **the** “Deming theory of 14 points of Management” as a TQM roadmap that was
22 garnered over a long consulting career in Japan and elsewhere (Singh et al, 2013). Deming’s
23 philosophy represents seven major constructs: visionary leadership, internal and external
24 cooperation, learning, process management, CI, employee fulfilment and customer
25 satisfaction (Radziwill and Benton, 2013; and Singh et al, 2013). It was found that Deming’s
26 theory made OM responsible to create culture, develop people and facilitate QM
27 implementation in any organisation (Radziwill and Benton, 2013). Deming’s theory has been
28 criticised due to the unclear impact of individual-level factors on organisations and lack of
29 effects and results prediction (Singh et al, 2013). His theory is significantly compatible with
30 “Juran’s Trilogy” approach of QM, which **is** composed of quality planning, quality control
31 and quality improvement, and Crosby’s approach of TQM, **which focuses** on top
32 management commitment, training and goal setting (Njeru and Omondi, 2016). Therefore,
33 indicators in these QM gurus’ theories have been considered for this research study.
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45 **4. MBNQA – guided conceptual model approach for young OM**

46 Established in 1987, the MBNQA has been widely recognized as a model of an exemplary
47 QM framework (Yeung et al, 2005). The MBNQA system is a national initiative that is
48 administrated by **the** National Institute of Standard and Technology (NIST). **The system** is
49 used in any organisation in different sectors **and of differing sizes** to guide and measure the
50 success of organisational **and** operational excellence in terms of quality and process
51 improvement (Jones, 2014). It was stated that this model is a re-developed version of the
52 EFQM (Gomez Gomez et al, 2011). This model has been selected to be used as the guiding
53 framework for this research, since its universality and relationship with many different QM
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3 constructs has been acknowledged by both scholars and practitioners (Moonsamy and Singh,
4 2014). Another rationale of using this specific model in this research is its unique structure
5 with seven different constructs or factors, each of which contains different quality indicators
6 (Sabella et al, 2014). Further studies found this model to be advantageous in respect to
7 exceeding criteria beyond users' expectations and which could be used as source of
8 information to accomplish business excellence (Sabella, 2014).
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14 According to the NIST (2011), the MBNQA model has a point system, whereby a specific
15 point value can be allocated to each of the seven factors with breakdown of some points of
16 each indicator in each factor (Jones, 2014). These points, which have been used in the
17 descriptive analysis of this research, were extracted from the "Criteria for Performance
18 Excellence" document (CPED) as part of 2015-16 Business/Non-profit Baldrige Excellence
19 Framework published by NIST (2016). These categories or factors include; "leadership",
20 "strategic planning", "customer focus", "measurement, analysis and knowledge
21 management" integrated with "workforce focus", "operations" and "result", with all seven
22 factors supported by the "core values" (Jones, 2014; and Sabella et al, 2014).
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30 *Leadership*

31 Visionary and transformational leadership and organisational culture was introduced as one
32 of the main TQM constructs to facilitate change and creativity (Knapp, 2015; Dora and
33 Gellynck, 2015; Suarez et al, 2014; Moonsamy and Singh, 2014; Asif et al, 2013; Manville,
34 et al, 2012; and Yeung et al, 2005). Deming (1986) argues that leadership is the ability to
35 establish a long – term vision, apply coaching and to change management accordingly (Njeru
36 and Omondi, 2016; and Graham et al, 2014).
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43 *Strategy*

44 Strategic decision making in operations management and re-engineering has been noted by
45 current operations research (Venkat et al, 2015). Planning for QM was highlighted in Juran's
46 theory of QM (Njeru and Omondi, 2016). Rao (2015) emphasised that successful leaders
47 require clear strategy with stretched goals for employees, as Jack Welsh successfully did in
48 General Motors (GM) through the Six Sigma quality tool. According to NIST (2016),
49 efficient work systems must also be designed in a way that allows an organisation to be agile
50 and protect intellectual property. For instance, workplace flexibility practices have a strong
51 positive relationship with strategic corporate performance (Whyman et al, 2015).
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Customers

Market research and customer engagement are essential for OM to identify customers' needs and translate them into appropriate organisational requirements **in order to** satisfy them (Njeru and Omondi, 2016; Mosadeghrad, 2015; and Jayaram and Xu, 2015). Social media as a recently-used, digital marketing tool was suggested as one of the most efficient and interactive norms of capturing **the** ever-demanding voice of customer (VOC) and global market research for technology and innovation – oriented OM now and in the future (Chan et al, 2016; Evans, 2013; and Holmstrom and Romme, 2012).

Workforce

Longitudinal studies of TQM practices found a positive association between HR practices such as; empowerment, extensive training, performance appraisal and teamwork with TQM and organisational performance in the manufacturing and service sector (Stanton et al, 2014; and Kathuria and Davis, 2001). Training and TQM-driven performance management have been introduced as integral intellectual competence (IC) factors, **which act as catalysts**, to develop knowledge, skill and attitude (Harley et al, 2010, Soltani et al, 2005). This would be necessary to strengthen the employee capability in the form of adaptability, which is critical in achieving various quality attributes presented in the MBNQA including “customer” (Jayaram and Xu, 2016). Hilton and Sohal (2012) and Dahlgaard and Dahlgaard-Park (2006) supported the idea of developing a manager's and employee's capacity as the first priority to pursue any quality strategy.

Operations

Research studies have revealed that **the** pursuit of QM at an operational or process level is the ultimate formula to TQM (Moonsamy and Singh, 2014; and Suarez et al, 2014). Process improvement and control is a result of strategic management and human resource development and was suggested as part of the TQM philosophy to minimise variation and promote QA culture in the organisation (Asif et al, 2013). This practice must be continuously reviewed and modified to create CI culture **which is** another important indicator to establish TQM. The contemporary research (Van Kemenade, 2014) recognised CI as an ongoing improvement process with a crucial role in a TQM environment.

Measurement and Knowledge Management

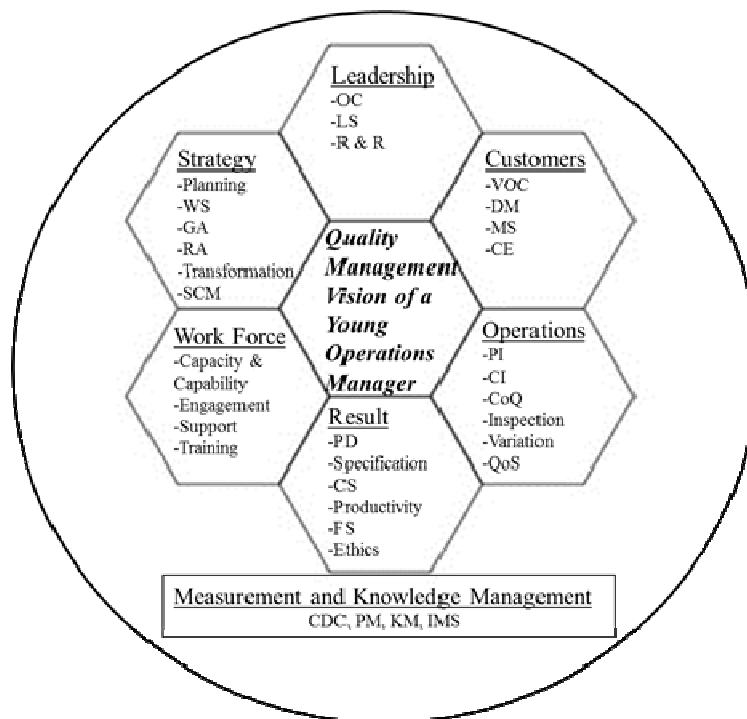
Emergence of technological-based management and effective, collaborative and interactive information management systems and performance measurement have been recommended as

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3 the essential element to be more highly recognised and promoted by OM in the future
4 (Mosaddeghrad, 2015; and Holmstrom and Romme, 2012). Creating the knowledge
5 management pool and a continuous, cohesive and collaborative tacit and explicit knowledge
6 and information sharing would promote effective QM practices (Pascal et al, 2013; Tracy
7 Zou and Lee, 2010; Wu and Lin, 2009; and Reed, 2009) and broaden effective operations
8 management experiential learning (Roth et al, 2016).
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13 14 *Result*

15 The human-focused and intelligent two-folded approach of QM, as suggested by Weckenmann
16 et al (2015), Jimenez-Jimenez (2015) and Van Kemendae (2014), would encourage OM to
17 produce a higher quality organisation, environment and workforce for the future considering
18 ethics, governance and financial performance. Notwithstanding, perceived customer
19 satisfaction, in an ever-growing and considerably demanding environment, is a challenge for
20 OM who want to excite their customers due to complex customer satisfaction rubric and
21 possible external and internal mediating factors. Asif et al (2013) brought some very
22 interesting issues to attention, which include social and ethical considerations in a broader
23 context and environment as an essential indicator for the MBNQA. This has sparked
24 significant attention towards ethics and social responsibility, which was also reflected in the
25 leadership and workforce environment alongside the additional outcome factors in the
26 MBNQA model. Therefore, a three -dimensional, sustainable OM with social, environmental
27 and financial perspectives has been increasingly promoted by scholars and OM as a future
28 trend (Walker et al, 2014). The crucial TQM indicators that were presented in the MBNQA
29 and other QM models and theories which were summarised in table 1, have guided authors to
30 develop and propose a “multi-hexagonal conceptual framework” (see Figure 1).
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43 Despite a comprehensive approach to necessary QM indicators and critical success factors in
44 an ad hoc approach, this framework seems to be generic according to indicators. Hence, it
45 needs to be contextualised and more focused towards a younger operations manager due to
46 the theoretically – supported heterogeneity of TQM success. Sabella et al (2014) have
47 already supported the idea of contextualising and moderating the generic MBNQA model,
48 since their study focused on health care that recommended process and people management,
49 alongside information management and analysis as the most significant factors to promote
50 QM.
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Leadership: OC (organisational Culture), LS (leadership Style), R&R (Reward & Recognition); Strategy: WS (Work System), GA(Gap Analysis), RA (Resource Analysis), SCM (Supply Chain Management & Partnership); Customers: VOC (Voice of Customer), DM (Digital marketing), MS (Market Segmentation), CE (Customer Engagement); Measurement & Knowledge Management: CDC (Comparative Data Collection, PM (Performance Measurement), KM (Knowledge Management, IMS (Information Management System); Operations: PI (Process Improvement & Design), CI (Continuous Improvement), CoQ (Cost of Quality), QoS (Quality of Supply); Result: PD (Performance Dimensions), CS (Customer Satisfaction), FS (Financial Stability)

Figure 1 – A common Multi –Hexagonal Conceptual QM framework (retrieved from MBNQA)

Table 1 appears here

Therefore, it was decided to investigate the vision of potential future, young OM for every single category in order to investigate the current view of these future EYPs about QM key performance indicators (KPIs) and find the most significant gaps. Respectively, differences in relation to the QM vision amongst ergonomic groups of participants as future OM with hypothetically heterogeneous job attribute will be identified. Hence, two research questions (RQ) have been developed by authors:

RQ1. What are the key TQM KPIs with greatest deal of knowledge gap for future OM?

RQ2. Is there any significant difference in the vision of future young OM in relation to their ergonomic aspects about TQM KPIs?

5. Research methodology

This section provides detailed insight into the data collection, sampling and data analysis techniques used within this research. A survey questionnaire instrument (appendix A) was utilised to cover an appropriate number of future OM. The sampling method was purposive sampling, in which a specific generation was targeted (Saunders et al., 2012). As supported by Guillot-Soulez and Soulez (2014), it was decided to target the young and educated generation, with no particular permanent management role and extensive experience as future OM, to prevent the effect of career stage in the survey. Nonetheless, their casual work experience, during or before their education, has been considered as non-career stage and therefore was included in the survey. This means that the authors intended to investigate the pure vision of future OM among EYPs. Two different cohorts of people were targeted in the format of two case studies, as post A-level students and to be – graduated students, to investigate the knowledge gap and reflect RQ1. The ergonomic measures such as age, gender, casual work experience and course of study have been analysed to reflect RQ2. The target population consists of random community of both cohorts who differ from the older generation, but could also be heterogeneous within their community.

The questionnaire was designed as the result of extensive review on literature sources associated with TQM models and quality theories. Questions reflected predominantly MBNQA factors and their indicators, while covering some ergonomic measures. Table 2 presents indicators in each MBNQA category that were used in this questionnaire and their corresponding TQM model and theory as well as literature sources. The questionnaire consists of two sections: Section 1 of the questionnaire concerned with ergonomic and personal questions and Section 2 included questions to reflect all indicators in the MBNQA. This constructed a set of 61 questions, each of those reflects one variable corresponding to the MBNQA and ergonomic indicators. The Likert score of 1 (as lowest level of agreement) to 7 (as highest level of agreement) was mainly used in the questionnaire structure. However, questions B-C and E-H sought a ranking of between 1 to 4 or 5 due to the nature of the questions in which all options could be selected in priority of the respondents. The theoretical validity to investigate these specific constructs is evident in last column of table 2 by providing a few current supportive literature sources for each indicator.

Table 2 appears here

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3 Having considered common ethical measures and practices, the questionnaire was
4 disseminated among populations in both cohorts followed by a three week, follow-up period.
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6 In total, 1483 questionnaires were sent to potential respondents of both cohorts in a Business
7 faculty as part of a UK-based University via physical or digital dissemination. Having had
8 careful consideration of questions and terminology of indicators, researchers were confident
9 about the level of potential respondents' self-knowledge and understanding of the
10 questionnaire. This was also supported by conducting a pilot scheme and asking 10
11 individuals randomly from each cohort to review and answer questions in order to remove
12 any ambiguity in the questionnaire.
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19 The quantitative, non-parametric testing was selected as an appropriate research tool to
20 investigate the real-world phenomena in this case study. The appropriateness of selecting
21 quantitative data analysis was supported by the literature. Sabella et al (2014), Moonsamy
22 and Singh (2014), Jones (2014), Jayaraman et al (2012), Asif et al (2013), Calvo-Moa et al
23 (2014), Do Nascimento Gambi (2015) and Mossadegh Rad (2015) have all used quantitative
24 analysis to evaluate all TQM soft (cultural and visionary) and hard measures, while ??? have
25 actually used Structural Equation Modelling (SEM) analysis to evaluate the MBNQA factors.
26 However, the non-parametric test was conducted for this investigation, since normal
27 distribution was not considered as a pre-assumption, data points were independent from each
28 other and dependent variables are not continuous (Field, 2013). In order to answer RQ1, the
29 median values were used to identify the lowest and highest overall scores for different
30 constructs in each category. The non-parametric "Kruskal-Wallis" and "Mann-Whitney" tests
31 were utilised to identify differences amongst groups (Field, 2016) and answer RQ2. The main
32 ergonomic variables that were analysed are "age", "gender", "casual work experience" and
33 "studied courses" as the key indicative factors for future EYPs who are in their early or final
34 stages of their education. Statistical Package for the Social Sciences (SPSS) that
35 accommodates non-parametric testing has been used as the software.
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48 **6. Median analysis**

49 The median analysis was utilised for this study in order to answer RQ1 and identify the gap
50 between current vision and knowledge of EYPs as future OM and existing categories with
51 different factors of a TQM framework (MBNQA). This is the appropriate test for this purpose
52 as median is unaffected by the extreme scores on either side of distribution, is relatively
53 unaffected by skewed distributions and can be used with ordinal data (Field, 2013). The
54 variables from different categories of MBNQA framework that were analysed, with the
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Likert score system, were investigated to identify the lowest and highest appreciation of participants towards these TQM variables. The variables with the middle range of median have been dis-regarded, as this would not represent the significant gap. The variables with the lowest and highest possible median were identified to reflect the least and most recognised factors in MBNQA framework (table 3). Interestingly, participants recognised teamwork and dictatorial leadership style as two least important factors for the success of TQM. However, they strongly believe on reward, listening to customers and meeting their requirements via performance measurement and information exchange to promote TQM.

Table 3 appears here

7- Kruskal-Wallis and Mann-Whitney Tests

In order to answer RQ2, the Kruskal-Wallis test was utilised to identify difference amongst various ergonomic groups of participants as future OM. The Mann-Whitney test has also been utilised to identify the possible differences between two groups within each ergonomic category. The result is presented for each individual ergonomic factor and their groups.

Age range factor

It was revealed that there is a significant difference ($p\text{-value} < 0.001$) amongst all age ranges in relation to importance of creativity and innovation (to reflect the developmental organisational culture), listening to the VOC, and recognising the meeting customer specification and retaining satisfied customers as measure of TQM success (table 4). As the result of the Mann-Whitney test, it was suggested that there is a significant difference ($p\text{-value} < 0.001$) between 18-19 years old participants with older ages (if aggregated in one group) in relation to the above variables alongside the view on Inspection, importance of collaboration and durability of products/services as critical factors of TQM.

Table 4 appears here

Gender factor

As the result of the Kruskal- Wallis test, it was evident that there is a significant difference ($p\text{-value} < 0.001$) between female and male participants when they have been asked about leadership style, and importance of reward, VOC, employee involvement, support, training and supervision, process improvement and inspection during production in order to achieve TQM (table 5). Authors did not apply Mann-Whitney test to analyse the gender, since there

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3 were only two groups within this analysis that was covered by Kruskal-Wallis test.
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11 *Education subject background factor*

12 It was concluded from **the** Kruskal-Wallis test that participants from different business and
13 management courses are significantly different when they were asked about the importance
14 of information management system to facilitate customer engagement and promote TQM
15 (table 6).
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21 **Table 6 appears here**
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24 Notwithstanding, when more detailed analysis, **as a result of the Mann-Whitney test,** between
25 two individual **and** independent groups was conducted, the result was different. It was
26 revealed that participants **with course backgrounds in business management** were
27 significantly different **compared to** their counterparts with **educational backgrounds in**
28 international business management. **Here, differences were found** in terms of the importance
29 of creativity and innovation (to reflect the developmental organisational culture) and
30 employee capacity and capability as a workforce factor to promote TQM culture. The level of
31 customer engagement as a measurement tool for customer satisfaction was the only variable
32 with significant difference ($p\text{-value} < 0.001$) between participants with general business
33 management educational background and those with financial management education.
34 Participants with general business management educational background and accounting
35 education were significantly different ($p\text{-value} < 0.001$) in relation to agreeing on meeting
36 customer specification as an important quality factor in TQM. There **were** no more significant
37 differences between participants with other education backgrounds (i.e. marketing and human
38 resource management management).
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50 *Educational experience factor*

51 There were only two groups of participants involved in this study and therefore **the** Kruskal-
52 Willis test could also represent the purpose of **the** Mann-Whitney test. It was revealed that
53 post A-level participants are significantly different ($p\text{-value} < 0.001$) **than** ready-to be
54 graduated future YEPs in relation to importance of creativity and innovation (to reflect the
55 developmental organisational culture), flexibility of work systems and meeting customer
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3 specification as critical factors of TQM (table 7). Their view was also significantly different
4 in terms of the importance of inspection before delivering to the customer and also
5 importance of customer retention as the measure for customer satisfaction.
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12 **Table 7 appears here**

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16 *Casual work experience factor*

17 This factor was decided to be analysed by authors to investigate whether the non- career
18 informed casual work experience would have influence on the view of the participants. Two
19 groups of participants with and without any work experience have been analysed via Mann-
20 Whitney test. The result revealed that they are only different significantly ($p\text{-value} < 0.001$)
21 in relation to importance of social media to collect the VOC and importance of employees'
22 behaviour of supplier as the metric to measure supplier's quality (table 8).
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29 **Table 8 appears here**

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32 **8- Concluding remarks and managerial implications**

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35 This study intended to identify the clear gap between the current young and educated
36 generation as future EYPs or OM with common TQM models such as MBNQA. It was also
37 decided to identify if there is any difference amongst different groups. It was clearly evident
38 from this analysis that there are some serious concerns in relation to lack of appreciation
39 towards the importance of organisational culture and leadership required to establish TQM
40 culture amongst this generation. In fact, it was really difficult to identify to which CVF
41 category this generation belongs to, since the gap in all of variables in this category was quite
42 significant. They recognised the participative leadership with teamwork decision making as
43 the most important leadership style for TQM establishment. However, its low significance
44 recommends lack of leadership appreciation amongst them. It was also worrying that higher
45 education would not dramatically change the view of future OM in relation to QM.
46 Therefore, EYPs need tremendous amount of supervision in their workplace and as part of
47 their career development to recognise the strong HR integration with QM. In contrast, the
48 customer orientation of TQM seems to be strongly recognised by this generation alongside
49 integrated information and performance measurement systems.
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4 Nevertheless, the journey in higher education seems to be effective in relation to changing the
5 view of EYPs about recognition of developmental culture and customisation to support TQM
6 establishment in organisations. It is clear that female EYPs as future OM recognised softer
7 elements of TQM such as leadership, reward and employee involvement in decision making
8 more than their male counterparts do. This is also extended to some hard elements, such as
9 supervision and training, which female future OM believe to be of higher importance. The
10 educational subject background and experience made future EYPs heterogeneous in relation
11 to recognition of organisational culture as a soft element and customisation as a hard element
12 of TQM establishment.
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21 Overall, it is obvious that the current young generation would not be able to follow TQM
22 frameworks and models comprehensively to establish sustainable QM and operation in their
23 organisation or department, unless changes in their attitude towards softer elements of these
24 models, such as organisational culture and leadership as key derives for TQM, are made. This
25 study only covered the business and management-related, educated, future OM and did not
26 certainly have a comprehensive view. The similar study could be extended to other higher
27 education backgrounds such as engineering, social sciences and health. As a future study, it is
28 also crucial to investigate the differences amongst these future managers and future managers
29 with no higher education background to understand their view in relation to TQM.
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Appendix A

Dear student,

We are currently doing a research about your existing vision of quality management as future young business managers. We will be grateful if you could spend few minutes and complete this questionnaire as accurate as possible. Your participation is greatly appreciated and we would assure you that you will remain anonymous throughout this research. The data is kept until the end of this year (Dec2016), it is stored in a locked cabinet and is only used for this research purpose (or similar to this) and not for any other purposes or anybody else. You may contact Dr Alireza Shokri who is leading this research via [...](#) if you would like to have further information. By filling in the form you have agreed to participate but can withdraw at any point by contacting Dr Alireza Shokri.

Before completing this questionnaire, you may assume that you will be a young business manager and you will consider improving quality of your products or services through quality management practices.

Questionnaire:

A-General Questions

A1- Your current age range:

18-19 20-22 More than 22

A2 – Your gender: Female Male

A3 – Your programme (course):

A4- Your current year of study:

First Year Second Year Final Year

A5 – Placement Experience:

Work Placement Study Abroad Both None

A6 – Have you had any work experience so far: Yes No

	Score
As a leader I believe quality is achieved ONLY through teamwork	
As a leader I believe quality is achieved when we consider creativity and innovation	
As a leader I believe quality is achieved when everything is in order and control	

As a leader I believe quality is achieved when we achieve the set goal

B-Rank the following factors from 1 to 4 (*4 as the highest and 1 as the lowest*) when you want to improve the quality of your products or services as a young business or operation manager:

C-Rank the following factors from 1 to 5 (*5 as the highest and 1 as the lowest*) as potentially what type of leader do you want to be in your business:

	Score
I would like to be part of the team to make decisions	
I listen to my employees but make final decision myself	
I make decision based on the current situation	
I set the goal for my employees to achieve and make decision accordingly	
I make a decision and ask my employees to do it	

D-Giving the score of 1 to 7, please specify your level of agreement for these following factors when improving the quality of the products and services in your business: (7 for the highest level and 1 for the lowest level)

	Score	
D1	I must reward my employees for their active and successful participation	
D2	I must challenge my teams with setting stretched and ambitious objectives	
D3	I prefer flexible work schedule and duties to the fixed work schedule and duties for my employees	
D4	To improve quality we must find differences between what we think and what customer wants	
D5	We must analyse our resources; so, some projects may not be considered at all regardless how important they are	
D6	We may have to transform every agent in the Company to improve quality of one product or service	
D7	We must share every necessary information with our suppliers to improve our product and service no matter how sensitive they are	
D8	We must listen to customers first and for most	
D9	We must use social media (Facebook, Twitter) to communicate with all parties	
D10	We must categorise customers based on their need to collect information	
D11	It is crucial to invite some customers to the Company for decision making	
D12	We must collect information from competitors no matter how difficult it is	
D13	We must measure our performance constantly no matter where and when	
D14	We appreciate learning by doing as much as actual training and education	
D15	We must have a good integrated database system across the Company	
D16	We must distinguish between capacity and capability of workforce	
D17	I must invite my employees for making all important decisions	
D18	I must provide great level of support for my employees no matter how hard it is	
D19	I must assign supervisors for my employees while they are doing their job	
D20	When improving quality of one product in one process, we must improve other relevant processes accordingly and involve other people too	
D21	We need high performing teams to monitor previous improvements all the time; so, previous projects must never stop	
D22	I believe inspecting final products is much more expensive than preventing problems	

D23	I believe we must deliver exactly what the quality target is even if it is still acceptable by us and customer	
D24	I believe improving quality means meeting specifications asked by the customer	
D25	I would not consider any quality improvement project if it is not productive, no matter how important it is	
D26	Quality improvement will definitely reduce cost and increase revenue if it is accomplished well	
D27	I believe we have to consider the impact on whole society and environment when improving quality of any product or service even if we target certain market	

E- Rank the following factors from 1 to 4 (*4 as the highest and 1 as the lowest*) top to bottom as when is it the best to conduct your inspection of the quality of your product:

	Score
I would prefer our inspection in the property of our goods and services supplier's	
I would prefer our inspection in our door step when goods are delivered by supplier	
I would prefer our inspection during our production time	
I would prefer our inspection when the production and packaging is complete and before delivering to customer because it is cheaper and easier	

F- Rank the following factors from 1 to 5 (*5 as the highest and 1 as the lowest*) top to bottom as the most concerning factor for YOU when dealing with your supplier:

	Score
The quality of the supplied goods from supplier	
The speed of the supplier to deliver the goods	
The service punctuality and reliability of the supplier	
The price of goods and services from supplier	
The behaviour of all employees of our supplier	

G- Rank the following factors from 1 to 5 (*5 as the highest and 1 as the lowest*) top to bottom as what you think could be the most important quality dimension FOR YOUR CUSTOMER when improving the quality of your product or service:

	Score
Overall performance of the product	
Conformance of the product to what they wanted	
General appearance of the product	
The ability to remain undamaged or unaffected by external factors	
Value for money	

H- Rank the following factors from 1 to 5 (*5 as the highest and 1 as the lowest*) top to bottom as what could be the most important indicator for measuring customer satisfaction:

	Score
Number of customer complaints that you received	
Number of customer retention to your business	
Number of customers being loyal to a specific brand	
Number of customers willing to help you and be more closely engaged with your decision making	

Number of delightful customers whom you met much higher level of their expectations for a single product or service	
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Thank you for participation!
End of Questionnaire

Table 1 – Scoring system with the criteria items in MBNQA framework (NIST, 2016; and Sabella, 2014)

MBNQA Factor	Construct	Indicators	NIST Point Value
Leadership		Organisational culture	70
		Leadership style	
		Reward	
Strategy	Strategy development	Planning, work system	40
	Strategy implementation	“gap analysis (PDCA cycle)”, “resource analysis”, “all agents’ transformation” and “Supply Chain Management (SCM) and partnership”	45
Customer	Voice of customer (VOC)	Digital marketing, Market segmentation	45
	Customer engagement		40
Workforce	Workforce environment	Workforce capability, Training	40
	Workforce engagement		45
Operations	Work systems	Cost of poor quality, place of inspection, SCM	45
	Work processes	Process improvement, CI, quality of supply	40
Measurement, analysis and knowledge management	Performance measurement and analysis	Collaborative data collection	45
	Knowledge and information system management		45
	Product and process outcomes		120
	Customer outcomes		90
	Workforce outcome		80
	Leadership and governance outcomes		80
	Financial outcomes		80

Table 2 – MBNQA indicators and their TQM corresponding models and theoretical support

MBNQA Factors	Indicators	Themes	Supporting quality management model	Theoretical support
Leadership	Organisational culture	group culture, developmental culture, rational culture, hierarchical culture	CVF, EFQM, MBNQA, Deming Points, QM extension model	NIST (2016); Sabella (2014); Asif et al (2013)
	Leadership style	Participative, democratic, situational, goal oriented, dictatorial (autocratic)	CVF, EFQM, MBNQA, Deming Points, QM extension model	NIST (2016); Sabella (2014); Asif et al (2013); Singh et al (2013)
	Rewarding and recognition	Importance of the rewarding and recognition	EFQM, MBNQA, Deming Points	NIST (2016); Sabella (2014); Singh et al (2013)
Strategy	Planning	Stretched objectives	EFQM, MBNQA, Deming Points	NIST (2016); Sabella (2014); Asif et al (2013)
	Work system	Flexibility and adaptability	EFQM, MBNQA	NIST (2016); Sabella (2014)
	PDCA Cycle (Gap Analysis)	Agreement on gap analysis	EFQM, MBNQA, Deming Points, QM extension model	NIST (2016); Sabella (2014)
	Resource analysis	Agreement on resource analysis	EFQM, MBNQA	NIST (2016); Sabella (2014)
	Transformation	Importance of multi-approached transformation	EFQM, MBNQA, Deming Points	NIST (2016); Sabella (2014); Singh et al (2013)
	Supply chain management and partnership	Agreement on partnership approach with suppliers	EFQM, MBNQA, Deming Points, QM extension model	NIST (2016); Sabella (2014); Asif et al (2013); Singh et al (2013)
Customer	VOC	Importance of listening to VOC	MBNQA, QM extension model	NIST (2016); Sabella (2014); Asif et al (2013)
	Digital marketing	Importance of social media	MBNQA, QM extension model	NIST (2016); Sabella (2014)
	Market segmentation	Importance of segmentation to attain information	MBNQA, QM extension model	NIST (2016); Sabella (2014)
	Customer engagement	Importance of customer engagement	MBNQA, QM extension model	NIST (2016); Sabella (2014); Asif et al (2013)
Measurement, analysis and knowledge management	Comparative data collection	Importance of external information	MBNQA	NIST (2016); Sabella (2014); Asif et al, 2013
	Performance measurement	Importance of performance measurement	MBNQA	NIST (2016); Sabella (2014); Asif et al (2013)
	Knowledge management	Importance of explicit and implicit knowledge transfer	MBNQA, EFQM	NIST (2016); Sabella (2014); Singh et al (2013)
	Information management system	Importance of information management systems	MBNQA, EFQM	NIST (2016); Sabella (2014); Asif et al (2013); Singh et al (2013)

Workforce	Employee capacity and capability	Importance of quality and quantity of employees	MBNQA, EFQM, Deming Points	NIST (2016); Sabella (2014); Asif et al (2013)
	Employee involvement and engagement	Importance of employee involvement and engagement	MBNQA, EFQM, Deming Points	NIST (2016); Sabella (2014); Asif et al (2013); Singh et al (2013)
	Support	Importance of management support	MBNQA, Deming Points	NIST (2016); Sabella (2014); Asif et al (2013)
	Training	Importance of on job training and supervision	MBNQA, Deming Points	NIST (2016); Sabella (2014); Asif et al (2013); Singh et al (2013)
Operations	Process improvement and design	Importance of integrated process improvement and design	MBNQA, EFQM	NIST (2016); Sabella (2014); Asif et al (2013); Singh et al (2013)
Cont. Operation	Continuous improvement	Importance of continuous process improvement	MBNQA, EFQM, Deming Points	NIST (2016); Sabella (2014); Asif et al (2013); Singh et al (2013)
	Cost of quality	Agreement on quality improvement being expensive	MBNQA, EFQM	NIST (2016); Sabella (2014)
	Inspection	Location of Inspection	MBNQA, EFQM, Deming Points, QM extension model	NIST (2016); Sabella (2014); Singh et al (2013)
	Variation	Importance of variation reduction	MBNQA, EFQM, Deming Points	NIST (2016); Sabella (2014)
	Quality of supply	Supplier Performance Dimensions	MBNQA, Deming Points	NIST (2016); Asif et al (2013)
Result	Product and service	Product and Service performance dimensions	MBNQA, EFQM, Deming Points	NIST (2016); Sabella (2014)
	Customer specification	Agreement on quality as reflection of customer specification	MBNQA, EFQM	NIST (2016); Sabella (2014)
	Customer satisfaction	Customer satisfaction factors	MBNQA, EFQM	NIST (2016); Sabella (2014); Asif et al (2013); Singh et al (2013)
	Productivity	Importance of productivity against quality	MBNQA, EFQM	NIST (2016); Sabella (2014)
	Financial stability	Importance of quality to bring financial stability	MBNQA, EFQM	NIST (2016); Sabella (2014)
	Ethics	Importance of social aspects of quality improvement	MBNQA, EFQM	NIST (2016); Sabella (2014); Asif et al (2013)

Table 3 – Top and bottom range of Median analysis of MBNQA framework factors

	N		Mean	Median	Mode
	Valid	Missing			
Reward	611	535	5.7234	6.0000	7.00
Gap Analysis	611	535	5.3879	6.0000	6.00
Voice of customer (VOC)	611	535	5.6825	6.0000	7.00
Performance measurement	611	535	5.4157	6.0000	7.00
Support	611	535	5.3584	6.0000	6.00
Information management system	610	536	5.3131	6.0000	6.00
Creativity & innovation	611	535	2.6596	3.0000	3.00
Order & control	611	535	2.7823	3.0000	4.00
Setting & achieving goal	610	536	2.6328	3.0000	4.00
Democratic leadership	611	535	3.1817	3.0000	3.00
Situational leadership	611	535	3.2750	3.0000	4.00
Goal-oriented leadership	611	535	3.2619	3.0000	3.00
Team work	611	535	2.2897	2.0000	1.00
Dictatorial leadership	611	535	1.9836	1.0000	1.00

Table 4 – Influence of age range factor on MBNQA variables

	Chi-Square	df	Asymp. Sig.		Chi-Square	df	Asymp. Sig.
Team work	3.429	2	.180	Training and supervision	.109	2	.947
Creativity & innovation	12.547	2	.002	Process improvement and design	1.143	2	.565
Order & control	1.649	2	.438	Continuous improvement	.171	2	.918
Setting & achieving goal	.465	2	.793	Cost of quality	.935	2	.626
Participative leadership	.205	2	.902	Variation	.047	2	.977
Democratic leadership	2.886	2	.236	Customer specification	13.252	2	.001
Situational leadership	.424	2	.809	Productivity	1.262	2	.532
Goal-oriented leadership	.071	2	.965	Financial stability	.238	2	.888
Dictatorial leadership	.941	2	.625	Ethics	2.160	2	.340
Reward	3.166	2	.205	Supplier in-property inspection	3.953	2	.139
Planning	.921	2	.631	Inspection on delivery	.474	2	.789
Work system	4.539	2	.103	Inspection during production	.740	2	.691
Gap analysis	3.709	2	.157	Inspection before delivery to customer	5.751	2	.056
Resource analysis	2.476	2	.290	Quality of supplied goods	.051	2	.975
Transformation	3.317	2	.190	Speed of supplier to deliver	2.220	2	.329
SCM & partnership	3.201	2	.202	Service punctuality and reliability	4.423	2	.110
Voice of customer	15.507	2	.000	Price of goods	1.614	2	.446
Digital marketing	3.364	2	.186	Employee's behaviour of supplier	.751	2	.687
Customer segmentation	.363	2	.834	Overall performance of the product	2.193	2	.334

Customer engagement	.966	2	.617	Conformance of the product	.792	2	.673
Collaborative data collection	5.037	2	.081	Appearance of the product	.279	2	.870
Performance measurement	4.470	2	.107	Durability	4.955	2	.084
Knowledge management	2.652	2	.265	Value for money	.159	2	.924
Information system	.461	2	.794	Number of customer complaints	.679	2	.712
Employee capability and capacity	.247	2	.884	Number of customer retention	13.287	2	.001
Employee involvement and engagement	1.345	2	.511	Number of customers being loyal	1.521	2	.467
Support	2.428	2	.297	Number of customers being engaged	.402	2	.818
a. Kruskal Wallis Test, b. Grouping Variable: Age Range				Number of customers being delighted	2.228	2	.328

Table 5- Influence of gender factor on MBNQA variables

	Chi-Square	df	Asymp. Sig.		Chi-Square	df	Asymp. Sig.
Team work	3.239	1	.072	Training and supervision	22.221	1	.000
Creativity & innovation	1.560	1	.212	Process improvement and design	9.583	1	.002
Order & control	.105	1	.746	Continuous improvement	.147	1	.702
Setting & achieving goal	1.177	1	.278	Cost of quality	.486	1	.486
Participative leadership	4.835	1	.028	Variation	.192	1	.661
Democratic leadership	3.076	1	.079	Customer specification	.544	1	.461
Situational leadership	1.683	1	.194	Productivity	1.254	1	.263
Goal-oriented leadership	1.872	1	.171	Financial stability	3.881	1	.049
Dictatorial leadership	18.206	1	.000	Ethics	5.853	1	.016
Reward	24.584	1	.000	Supplier in-property inspection	.052	1	.820
Planning	.902	1	.342	Inspection on delivery	.962	1	.327
Work system	.705	1	.401	Inspection during production	7.469	1	.006
Gap analysis	4.981	1	.026	Inspection before delivery to customer	.063	1	.802
Resource analysis	.012	1	.913	Quality of supplied goods	.195	1	.659
Transformation	1.000	1	.317	Speed of supplier to deliver	1.967	1	.161
SCM & partnership	.266	1	.606	Service punctuality and reliability	.567	1	.451
Voice of customer	11.825	1	.001	Price of goods	1.307	1	.253
Digital marketing	3.491	1	.062	Employee's behaviour of supplier	1.512	1	.219
Customer segmentation	3.663	1	.056	Overall performance of the product	1.081	1	.298
Customer engagement	.463	1	.496	Conformance of the product	3.529	1	.060
Collaborative data collection	2.108	1	.147	Appearance of the product	3.726	1	.054
Performance measurement	2.049	1	.152	Durability	.065	1	.798
Knowledge management	3.531	1	.060	Value for money	1.361	1	.243

Information system	6.304	1	.012	Number of customer complaints	1.000	1	.317
Employee capability and capacity	2.780	1	.095	Number of Customer Retention	2.347	1	.126
Employee involvement and engagement	22.080	1	.000	Number of customers being loyal	2.356	1	.125
Support	7.860	1	.005	Number of customers being engaged	.124	1	.725
a. Kruskal Wallis Test, b. Grouping Variable: Gender				Number of customers being delighted	1.341	1	.247

Table 6 - Influence of educational course factor on MBNQA variables

	Chi-Square	df	Asymp. Sig.		Chi-Square	df	Asymp. Sig.
Team work	1.639	7	.977	Training and supervision	13.465	7	.062
Creativity & innovation	15.080	7	.035	Process improvement and design	4.351	7	.739
Order & control	4.743	7	.691	Continuous improvement	5.855	7	.557
Setting & achieving goal	4.224	7	.754	Cost of quality	4.075	7	.771
Participative leadership	7.156	7	.413	Variation	11.407	7	.122
Democratic leadership	9.226	7	.237	Customer specification	15.024	7	.036
Situational leadership	6.259	7	.510	Productivity	3.789	7	.804
Goal-oriented leadership	8.580	7	.284	Financial stability	2.952	7	.889
Dictatorial leadership	12.534	7	.084	Ethics	4.852	7	.678
Reward	15.728	7	.028	Supplier In-property inspection	16.232	7	.023
Planning	9.026	7	.251	Inspection on delivery	8.526	7	.289
Work system	7.122	7	.416	Inspection during production	11.613	7	.114
Gap analysis	10.097	7	.183	Inspection before delivery to customer	11.691	7	.111
Resource analysis	5.078	7	.650	Quality of supplied goods	10.617	7	.156
Transformation	7.825	7	.348	Speed of supplier to deliver	10.781	7	.148
SCM & partnership	6.508	7	.482	Service punctuality and reliability	14.168	7	.048
Voice of customer	10.983	7	.139	Price of goods	6.077	7	.531
Digital marketing	5.772	7	.567	Employee's behaviour of supplier	14.727	7	.040
Customer segmentation	6.096	7	.529	Overall performance of the product	10.676	7	.153
Customer engagement	8.394	7	.299	Conformance of the product	12.573	7	.083
Collaborative data collection	2.933	7	.891	Appearance of the product	9.208	7	.238
Performance measurement	6.123	7	.526	Durability	5.692	7	.576
Knowledge management	9.942	7	.192	Value for money	7.981	7	.334
Information system	22.785	7	.002	Number of customer complaints	3.974	7	.783
Employee capability and capacity	15.785	7	.027	Number of customer retention	2.609	7	.919
Employee involvement and engagement	5.667	7	.579	Number of customers being loyal	6.637	7	.468

Support	9.699	7	.206	Number of customers being engaged	16.037	7	.025
a. Kruskal Wallis Test, b. Grouping Variable: Course				Number of customers being delighted	11.130	7	.133

Table 7 - Influence of educational experience factor on MBNQA variables

	Chi-Square	df	Asymp. Sig.		Chi-Square	df	Asymp. Sig.
Team work	2.853	1	.091	Training and supervision	.082	1	.775
Creativity & innovation	18.119	1	.000	Process improvement and design	.039	1	.843
Order & control	3.346	1	.067	Continuous improvement	.121	1	.728
Setting & achieving Goal	2.601	1	.107	Cost of quality	.632	1	.427
Participative leadership	.173	1	.678	Variation	.234	1	.628
Democratic leadership	.725	1	.394	Customer specification	10.236	1	.001
Situational leadership	3.537	1	.060	Productivity	1.809	1	.179
Goal-oriented leadership	.611	1	.435	Financial stability	.913	1	.339
Dictatorial leadership	.825	1	.364	Ethics	.002	1	.961
Reward	.073	1	.787	Supplier in-property Inspection	.200	1	.655
Planning	2.181	1	.140	Inspection on delivery	.225	1	.635
Work system	10.669	1	.001	Inspection during production	.317	1	.573
Gap analysis	.648	1	.421	Inspection before delivery to customer	6.728	1	.009
Resource analysis	.605	1	.437	Quality of supplied goods	.005	1	.944
Transformation	.242	1	.623	Speed of supplier to deliver	.034	1	.853
SCM & partnership	5.412	1	.020	Service punctuality and reliability	3.010	1	.083
Voice of customer	4.322	1	.038	Price of goods	1.427	1	.232
Digital marketing	2.009	1	.156	Employee's behaviour of supplier	.014	1	.907
Customer segmentation	.846	1	.358	Overall performance of the product	.708	1	.400
Customer engagement	.414	1	.520	Conformance of the product	.022	1	.883
Collaborative data collection	.356	1	.551	Appearance of the product	.356	1	.551
Performance measurement	.180	1	.671	durability	2.849	1	.091
Knowledge management	2.162	1	.141	Value for money	.066	1	.797
Information management system	.163	1	.686	Number of customer complaints	.778	1	.378
Employee capability and Capacity	.197	1	.657	Number of customer retention	15.260	1	.000
Employee involvement and engagement	.006	1	.937	Number of customers being loyal	.620	1	.431
Support	1.925	1	.165	Number of customers being engaged	.028	1	.866
a. Kruskal Wallis Test, b. Grouping Variable: Current year of study				Number of customers being delighted	.295	1	.587

Table 8 - Influence of work experience factor on MBNQA variables

	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)		Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Team work	30340.000	38341.000	-.127	.899	Training and supervision	30407.500	148262.500	-.085	.932
Creativity & innovation	28043.500	145898.500	-	.140	Process improvement and design	28432.500	146287.500	-	.216
Order & control	30021.000	147876.000	1.477	.753	Continuous improvement	29751.000	147606.000	1.237	.641
Setting & achieving goal	29923.000	37924.000	-.314	.738	Cost of quality	30349.000	147719.000	-.467	.935
Participative leadership	28559.000	36560.000	-.334	.239	Variation	28184.500	36059.500	-.082	.242
Democratic leadership	30265.500	148120.500	1.178	.867	Customer specification	29236.500	37237.500	1.169	.445
Situational leadership	28607.000	146462.000	-.168	.255	Productivity	29042.500	37043.500	-.764	.384
Goal-oriented leadership	28849.500	146704.500	1.137	.320	Financial stability	30346.500	38347.500	-.871	.904
Dictatorial leadership	29639.000	147494.000	-.994	.570	Ethics	28483.500	146338.500	-.120	.229
Reward	29076.000	37077.000	-.568	.384	Supplier in-property	30085.500	147940.500	1.202	.783
Planning	29111.000	37112.000	-.871	.395	Inspection	26725.000	144580.000	-.276	.024
Work system	29838.000	146241.000	-.851	.760	Inspection on delivery	27810.500	35811.500	2.256	.104
Gap analysis	26686.500	144541.500	-.306	.024	Inspection during production	27424.000	145279.000	1.624	.064
Resource analysis	29756.000	37757.000	2.256	.671	Inspection before delivery to customer	29410.500	147265.500	1.850	.462
Transformation	27866.000	145721.000	-.425	.121	Quality of supplied goods	27453.000	145308.000	-.735	.070
SCM & partnership	27018.500	144873.500	1.551	.042	Speed of supplier to deliver	29970.000	147825.000	1.815	.733
Voice of customer	28780.500	36781.500	-.203	.295	Service punctuality and reliability	29272.000	147127.000	-.342	.455
Digital marketing	25822.500	143677.500	1.046	.006	Price of goods	25690.500	143545.500	2.971	.003
Customer segmentation	29930.000	147785.000	2.725	.718	Employee's behaviour of supplier	27516.500	145371.500	1.886	.059
Customer engagement	28959.000	146814.000	-.361	.358	Overall performance of the product	27419.500	145274.500	1.695	.090
Collaborative data collection	30298.500	38299.500	-.920	.882	Conformance of the product	27827.500	145682.500	1.589	.112
Performance measurement	29193.000	37194.000	-.148	.428	Appearance of the product	27167.000	145022.000	1.968	.049
Knowledge management	29073.500	145959.500	-.793	.428	Durability	28130.500	36131.500	1.411	.158
Information management system	29545.000	37546.000	-.793	.580	Value for money	30382.500	148237.500	-.100	.920
Employee capability and Capacity	29157.000	37158.000	-.553	.436	Number of customer complaints	29831.000	37832.000	-.421	.674
Employee involvement and engagement	26952.000	144322.000	-.778	.041	Number of customer retention	29296.000	147151.000	-.733	.464
Support	29428.000	37429.000	2.047	.512	Number of customers being loyal	26344.000	144199.000	2.447	.014
			-.655		Number of customers being engaged	28000.000	145855.000	1.479	.139
					Number of customers being delighted				

a. Kruskal Wallis Test, b. Grouping Variable: Work experience