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MANAGEMENT | RESEARCH ARTICLE

Development and validation of a total quality management model for Uganda's local governments

Ibrahim Abaasi Musenze^{1*} and Mayende Sifuna Thomas²

Abstract: The objectives of this study were to provide reliable and valid constructs of TQM and a measurement model in the context of Uganda's local governments (LGs) for evaluation of TQM implementation process. The paper used survey-based data from Uganda's LGs. Data were analysed through exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) using Analysis of moment structure (AMOS) version 20 software. Through EFA and CFA procedures, the findings show support for reliability and validity of the new TQM scale. Managerially, the instrument presented provides Uganda's LGs with an understanding of TQM implementation to inform quality delivery. Practitioners therein, will also be able to use this instrument to evaluate their TQM implementation so as to target improvement areas. The study contributes to theory through development and validation of an original parsimonious TQM scale for the LGs that can be used to improve quality delivery.

Subjects: Testing, Measurement and Assessment; Public Management; NonProfit Management; Strategic Management

Keywords: total quality management; exploratory factor analysis; confirmatory factor analysis; instrument validation

1. Introduction

Across the global public service delivery systems, there is strong interest and commitment to improving quality delivery. This is manifest from a range of improvement initiatives being undertaken by forefront teams charged with service delivery schemes and improvement agenda at group, organisation and system echelon. Improving quality is a collective effort and to realise real and

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PUBLIC INTEREST STATEMENT

The manufacturing landscape has witnessed unprecedented revolution marked by numerous psychometric tools and analytic quality techniques meant for effective implementation of total quality management (TQM). However, this cannot be conjectured with certainty in the public service sector. TQM studies from the local government perspective still suffer from lack of a holistic TQM model which has led to continued delivery of poor quality services. This study explores how public sector organisations may deliver quality services through TQM lens.

resolute improvements, we need to find new and better ways to accomplish the outcomes that we desire (Hamaria et al., 2017; Abdirahman, 2016; Ndlovu, 2008). Through a range of frameworks, international organisations provide insights into what can be achieved when quality is positioned at the hub of all business. The Australian/New Zealand Standard Quality Management systems (2016) specify the requirement for quality management system and key processes needed to support the system. Many decades ago, the Jonkoping county council healthcare system (Sweden), Ireland health service executive framework, the Thai foundation quality system framework and Salford royal foundation trust (UK) have steered their services to prioritise quality, a practice leading to improved health outcomes, better safety, reduced quality delivery costs and reported better client experience. The quality award frameworks such as Malcolm Baldrige National Quality Award (Malcolm Baldrige National Quality Award, 2005); European Quality Award (European Quality Award, 1994); the Deming Prize (1996); Kanji Business Excellence Model, provide useful insights and benchmark for organisations and help in implementing TQM as well as evaluating performance outcomes, most especially in the area of quality delivery management.

Extant literature reveals numerous governance frameworks in Uganda aimed at supporting quality service delivery. These include effective citizen participation as viewed in the decentralisation policy; accountability and transparency supported through the establishment of the Public Accounts Committee (PAC); the Public Procurement and Disposal of Public Assets Authority (PPDA) and, most importantly, the institution of the Inspectorate of Government (IGG), *inter alia*. However, despite the existence of these good governance frameworks for quality management, quality service delivery remain poor, uneven, and below the citizen's expectations (MoPS, 2016; Nambalirwa & Sindane, 2012). For instance, the education sector experiences disparity, accountability and transparency challenges; inadequate physical infrastructure; and difficulty in providing satisfactory seating space. In the case of the health sector, poor quality delivery is mirrored in inadequate access to drugs, limited bed capacity for patients and poor access to medical practitioners. Sanitation is also remarkably poor and road infrastructure remains generally pitiable (Nambalirwa & Sindane, 2012). These quality service delivery challenges in Uganda's local governments (LGs) reveal that the current LGs' service delivery system is under significant strain and the quality delivery architecture is enormously busy and stretched. It is specifically this stressed environment that necessitates intervention, with focus on improving planning and quality delivery away from emergency management to proactive service improvement. Total quality management, hereafter referred to as TQM, is positively associated with service quality (Abdirahman, 2016; Agbor, 2011; Joiner, 2007). On account of this, development of a TQM scale to address LG service quality delivery challenges becomes essential.

Service Quality has reached a strong position in the mainstream quality management literature during the last two decades (Hamaria et al., 2017; Hansen, 2001; Molinéro-Demilly et al., 2018; Yong & Wilkinson, 2002). This is because quality management has long been recognised as a source of competitive advantage and one of the most important drivers of global competition and customer satisfaction (Joiner, 2007; Agbor, 2011; Punnakitakashem et al., 2010; Faisal Talib et al., 2013; Abdirahman, 2016). Research within the field has greatly focused on TQM (Punnakitakashem et al., 2010; Sadikoglu & Olcay, 2014). Notably, in recent years, TQM has been considered among different approaches as a new organisation management paradigm with demonstrable and undeniable potential to effect significant improvements in organisations through quality improvement and cost reduction (Al-Qahtani et al., 2015; Faisal Talib et al., 2013; Gharakhani et al., 2013; Joiner, 2007).

TQM is also regarded as change management quality approach (Arumugam et al., 2009; Karyotakis & Moustakis, 2014) that improves effectiveness, flexibility, and competitiveness of a business to meet customers' requirements (Abdirahman, 2016; Ooi et al., 2011). In line with this movement, many organisations have resorted to TQM to refocus their efforts towards client satisfaction, with earlier TQM evolution focusing mostly on manufacturing sector (Jain et al., 2011; Juneja et al., 2011) and, to a limited extent on public service sector (Karyotakis &

Moustakis, 2014; F Talib & Rahman, 2010). The manufacturing landscape that has shaped the corporate world has therefore witnessed a quality revolution, resulting in abundance of research on the tools, techniques and critical dimensions for the effective implementation of TQM (Ooi et al., 2011). But the same cannot be inferred with certainty of public service sector. Research on TQM is not exhaustive in the sense that there seems to be a vacuum in the literature as far as a TQM holistic model (from the LGs' perspective) is concerned. The new public management movement that swept a number of economies led to many practitioners and researchers to broadly defend TQM practices as a measure to spur organisational efficiency and effectiveness (Hamaria et al., 2017; Molinéro-Demilly et al., 2018). Although TQM has been evidently conceptualised around basic domains such as teamwork, continuous improvement (CI), customer centeredness, employee empowerment and process design, among others, there is evidently lack of consensus with regard to its primary domains (Ooi et al., 2008). This lack of clarity hinders generalisation of empirical evidence across sectors.

Since the 1990s, emerging stream of research in the field of TQM regarding TQM critical factors has yielded varying sets of factors (Ahire et al., 1996; Antony et al., 2002; Black & Porter, 1995; Flynn et al., 1994; Kureshi et al., 2010; Saraph et al., 1989; Talib & Rahman, 2010; Zhang, 2000). Consequently, there still exists no universal instrument to evaluate TQM implementation, particularly in the context of LGs. The importance attributed to TQM makes development of a reliable TQM measure for LGs apparent. Studies have indicated that TQM is essential in providing development and improvement in employee participation and customer's satisfaction. Similarly, it also reduces costs, builds commitment, and promotes open decision-making among workers (Abdirahman, 2016; Çankaya, 2015). The present study is an attempt to fill this gap. Furthermore, despite the significant effect of TQM on organisational success, the majority of this has concentrated on the manufacturing sector (Jain et al., 2011; Juneja et al., 2011). Little is known on the reliable measures of TQM, particularly within the setting of LGs' sector.

The above scenario persists against the background that for the last 2 decades, there has been renewed importance of the broad services' sector to both national and international economies. Services sector is leading and fastest rising component of the global economy, accounting for sufficient and largest share in overall output and employment in most developed countries. The proportion of services sector in total GDP is 47% in low developing economies, 53% in middle-income economies and 73% in high income-economies. The sector accounts for a considerable and rising share in cross-border business and foreign direct investment (FDI), and generates more export opportunities for services suppliers and lower costs for imported services. It is projected that the rising trend of services sector would persist to gain renewed importance through progression in the area of knowledge-based and skill-oriented actions (Ayaz & Henna, 2011; Directorate for Science, Technology and Industry (STI), 2008; Global Forum Report, 2008). In particular, the public sector, collectively, is the world's leading service provider. Therefore, any incremental advance in public services positively impacts millions of people (PWC, 2007). Therefore, developing and validating a TQM measure so as to provide both a theoretical and practical platform to the LG sector is pertinent. Based on this, bridging this gap requires a sector specific TQM tool, necessary for securing quality conformance particularly in the context of public service sector in general and LGs in particular. Thus, given the above arguments, the scope of this study resides in developing and validating a TQM implementation model for the LG sector, an area that has less been considered in the literature.

1.1. Purpose

The objectives of this study were to provide reliable and valid constructs of TQM and a measurement model in the context of Uganda's LG sector for evaluation of TQM implementation process.

2. Theoretical development and hypotheses

2.1. Total quality management

Conceptualised as a management strategy aimed at embedding awareness of quality in all organisational processes (Dudek-Burlikowska, 2015; Juse, 2010; Siddiqui et al., 2009), the importance of TQM in organisations has increased significantly over the past 20 years. Its implementation is associated with improved effectiveness, flexibility and organisational competitiveness necessary in securing customer requirements (Abdirahman, 2016; Arumugam et al., 2009; Talib et al., 2012). Furthermore, it is a driver for enhanced organisational performance through CI in organisation's activities (Sajjad & Amjad, 2012). In recent decades, the level of awareness towards TQM has increased drastically and has gone to its peak to become a well-established field of research (Arumugam et al., 2008; Molinéro-Demilly et al., 2018).

2.2. Development of TQM practices for quality management

The extant review of previous TQM literature reveals primary TQM key practices for TQM success (Talib et al., Antony et al., 2002; Arumugam & Mojtahedzadeh, 2011; Kureshi et al., 2010; Malik & Khan, 2011; Saraph et al., 1989; Talib & Rahman, 2010; Zehir et al., 2012; Zhang, 2000). These studies reveal diverse sets of practices considered relevant to the successful TQM implementation in organisations. Described as best ways in which organisations and their employees undertake business activities in all key processes, these practices include leadership and top management commitment; customer focus (CF) and satisfaction; supplier management; training and education; human resource management; process management (PM); quality systems; employee involvement (EI); quality information and performance measurement; CI and quality work culture (Talib & Rahman, 2012). The inconsistencies in previous research, as to what constitutes the universal domains of TQM, has made it difficult to reach a conclusion on TQM practices (Hoang et al., 2006; Ooi et al., 2008; T. Talib & Rahman, 2012). In the circumstances, no available study has identified a universal set of practices for successful TQM implementation within the LGs, the criticality of the sector notwithstanding (Ayaz & Henna, 2011; Directorate for Science, Technology and Industry (STI), 2008; Global Forum Report (2008); PWC, 2007).

This scenario persists in total disregard of existence of some quality award models such as Malcolm Baldrige National Quality Award (Malcolm Baldrige National Quality Award, 2005); European Quality Award (European Quality Award, 1994); the Deming Prize (1996); Kanji Business Excellence Model, which provide a useful insights for industries and help in implementing TQM as well as evaluating their performance outcomes. There is no agreement with regard to universality of critical TQM domains. Over the years, based on extensive review of literature, interviews and analysis of related organisational activities (Talib & Rahman, 2012), recognised international quality management scholars have reported various measures as a priori list to tap the domain of TQM. These include: Saraph et al. (1989), Flynn et al. (1994), Ahire et al. (1996), Black and Porter (1995), Zeitz et al. (1997), Joseph et al. (1999), and Rao et al. (1996). According to Sila and Ebrahimpour (2003), the reported vital factors of quality management were originally used by Saraph et al. in 1989. Saraph et al. (1989) developed a TQM instrument, recognising 8 critical factors of quality management. These factors include top management support, quality reporting (that embraces quality information availability and quality information usage), employee training, EI, product design, supplier quality, PM and role of quality department. Sila and Ebrahimpour (2003) noted that the same critical factors were afterwards used by Quality management scholars such as Motwani et al. (1994), Badri and Davis (1995) and Quazi, Jemangin, Kit and Kian (1998). These studies had established and reported the quality management tool used by Saraph et al. (1989) as valid and reliable (Motwani et al., 1994; Badri & Davis, 1995; Quazi et al., 1998 as cited in Sila & Ebrahimpour, 2003). According to Flynn et al. (1994), 7 critical factors tap the construct of quality management (top management support, customer involvement, quality information, workforce management, product design, PM and supplier involvement) whilst Ahire et al. (1996) expanded the practices by developing 12 fundamental factors. These included top management commitment, CF, supplier quality

management, design quality management, benchmarking, statistical process control, internal quality information, employee empowerment, EI, employee training, product quality and supplier performance.

Consistent with (Malcolm Baldrige National Quality Award (2005) criteria, Black and Porter (1995) placed emphasis on 10 critical factors of TQM measure. These include supplier partnership, people and customer management, customer satisfaction orientation, external interface management, communication of improvement information, strategic quality management, operational quality planning, quality improvement, measurement systems, teamwork structure for improvement, and corporate quality culture. Zeitz et al. (1997) developed 7, whereas Joseph et al. (1999) developed 10 (see Table 1, below). Rao et al. (1996) made a considerable contribution to this quality management literature by developing and validating a measurement instrument for international quality management research which highlighted 13 vital factors of quality management. Bayraktar et al. (2008) established leadership, vision, measurement and evaluation, process control and improvement, programme design, quality system improvement, EI, recognition and award, education and training, student focus, and stake holder's focus, as crucial measures for tapping the TQM construct in organisations. In a survey of 370 Greek companies, Fotopoulos and Psomas (2009), found leadership, PM, service design, human resource management, CF, education and training, and supplier quality management as critical and reliable measures of TQM implementation. The apparent lack of consensus as to what constitutes a universal measure of TQM, suggests the need to explore and confirm industry-specific instrument for TQM implementation (Idris & Zairi, 2006; Karuppusami & Gandhinathan, 2006; Singh & Smith, 2006). Table 1 below summarises the critical factors developed by the 7 eminent groups of scholars above in the field of Quality Management. An extensive review of above TQM literature suggests that about 28 factors clustered under 7 groups of eminent scholars have been reported globally as significant for TQM. Nonetheless, studies in the field of TQM are limited in as far as making adequate comparison of study findings across diverse industry and national settings due to the inconsistency in the critical factors used in the research tools. Sila and Ebrahimpour (2003) provide additional evidence in this regard.

Accordingly, through extensive review of the TQM literature (Table 1), out of 28 different essential TQM practices developed by scholars as listed in Table 1, the present study initially identified a set of 6 TQM practices, namely leadership and management commitment (LMC), CF, EI, process design and management (PD), product and service design (PS), and CI. These practices were later confirmed through confirmatory factor analysis (CFA) to determine a reliable TQM measure for public sector, notably LGs. The reasons for selecting these practices stem from the view that they cross cut and are identical with the following renowned quality award models: Malcolm Baldrige National Quality Award (2005); European Quality Award (European Quality Award, 1994); The Deming Prize (1996); Kanji Business Excellence Model, which provide useful insights and benchmark framework for industries and help in implementing TQM as well as evaluating their organisation performance outcomes.

2.3. Leadership and management

Preliminary evidence suggests that TQM success largely depends on managers' ability to craft a vision, map out strategies and direct the required organisational change for TQM success. Broad industry and healthcare sector are replete with TQM studies that emphasise and address the significance of visionary leadership, comprising of philosophy, approach and behaviour in the implementation process of TQM programs (e.g. Mosadeghrad, 2005, 2015; Kunst & Lemmink, 2000). The leadership and management commitment variable examines how senior managers such as leaders are individually involved in designing and implementing quality management systems, motivating and directing the required quality management adjustments as well as supporting CI traditions. Thus, we can expect to the extent that:

Table 1. TQM practices compared across different studies

TQM Practice	Saraph et al. (1989)	Flynn et al. (1994)	Ahire et al. (1996)	Black & Porter (1995)	Zeitz et al. (1997)	Joseph et al. (1999)	Rao et al. (1996)	Frequency/ Rate of Recurrence
Leadership& Management commitment *	•	•	•		•	•	•	6
Quality Information Availability	•	•		•			•	4
Quality Information Usage	•		•		•		•	4
Bench Marking			•				•	2
Strategic Quality Planning							•	1
Employee Training	•		•			•	•	4
Employee Involvement*	•	•	•	•	•	•	•	7
Product Design *	•	•	•			•	•	5
Supplier Quality	•	•	•	•	•	•		4
Corporate Quality Culture				•				1
Strategic Quality Management				•				1
Customer Orientation*		•	•	•	•		•	5
Process Management	•	•	•			•	•	5
Continuous Improvement Systems*			•	•	•	•	•	5
Role of Quality Department	•					•		2
Internal Quality Results							•	1
External Quality Results							•	1
Statistical Process control			•					1
Employee Empowerment*	•		•	•	•		•	5
Product Quality			•					1
Supplier Performance			•					1
Operational Quality Planning				•		•		2

(Continued)

Table 1. (Continued)

TQM Practice	Saraph et al. (1989)	Flynn et al. (1994)	Ahire et al. (1996)	Black & Porter (1995)	Zeitz et al. (1997)	Joseph et al. (1999)	Rao et al. (1996)	Frequency/ Rate of Recurrence
Supervision					•			
External Interface Management				•				1
Quality Citizenship							•	1
Quality Policy						•		1
Technology Utilisation						•		1
Process Design/Management *	•	•	•			•	•	5

Note:

•The significant factor was developed and used by researchers

* The most accepted critical factors i.e. rate of recurrence is equal to 5 or more than 5.

H₁: Leadership and management commitment is positively and significantly related to LG quality delivery.

2.4. Customer management

Several quality gurus and authors regard customer-driven quality as a fundamental success factor for any TQM program (Oakland, 2003; Crosby, 1992; Deming, 1986). Quality management systems, approaches and processes should clearly be stipulated to facilitate the process of identifying customer needs, transforming these needs into suitable organisational requirements and satisfying them (Mosadeghrad, 2015). The customer management philosophy examines how organisations build relationships with customers, determine customers' needs and prospects, measures their satisfaction levels, and use the customer feedback to improve quality delivery. In light of these arguments, it can be proposed that:

H₂: Customer management has a positive effect on LGs quality delivery.

2.5. Process design and management

The focus of TQM is on learning, understanding and continuously improving the quality management processes that support the initiative. PM emphasises adoption of value adding systems and comprises design of the policies, procedures and practices that are necessary to control the TQM process. Lots of TQM scholars have suggested many benefits associated with focus on effective PM (Flynn et al., 1994; Hamidi & Gharneh, 2017; Oakland, 2003). These include efficiency improvement through reduction in service delivery costs (Corredor & Goñi, 2011), improved organisation results and customer satisfaction (Hamidi & Gharneh, 2017; Kumar et al., 2008). Process design and management therefore examines how key organisational processes are designed, executed, administered and improved to support the institution's strategy and action plans, entirely meet customers' needs and achieve superior performance. Based on these foregoing arguments, we propose that:

H₃: PM has a positive and significant effect on LG quality delivery.

2.6. Employee management/Involvement

Scholarly evidence on TQM suggests that employee empowerment, commitment and involvement in quality management initiatives are fundamental enablers in successful TQM execution and were indeed incorporated in preceding TQM studies (Mosadeghrad, 2015; Ahire et al., 1996; Black & Porter, 1995; Flynn et al., 1994; Rao et al., 1996; Saraph et al., 1989). EI examines how managers develop and manage the capabilities of people at three levels namely individual, team and organisation; encourage justice, fairness and equity; engage, promote and facilitate employees to contribute to the realisation of organisational goals as well as realising their accomplishments. In light of these arguments, we propose that:

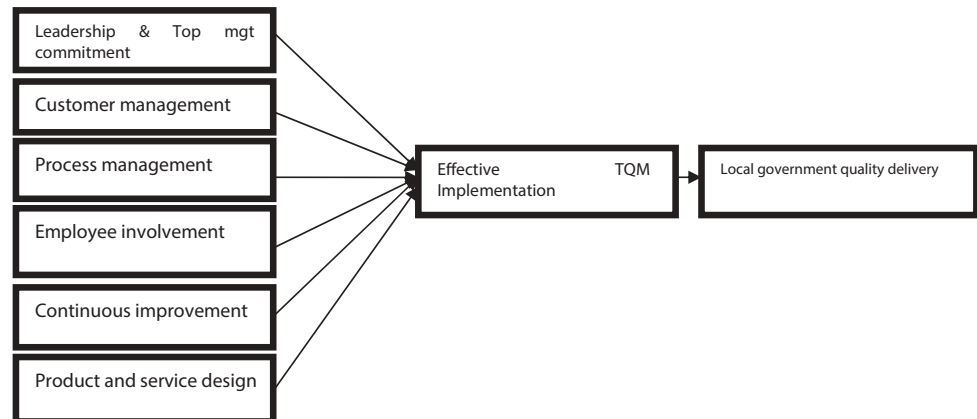
H₄: Employee management has a positive and significant effect on LGs quality delivery.

2.7. Continuous improvement

The concept CI in maintenance of Total quality comprises "soft" management aspects for instance, leadership and organisational culture, and "hard" aspects like organisational systems (Chang, 2005). Oakland (2000) argues that TQM is a management philosophy that has progressively evolved over time, and thus drives superior performance in organisations. CI process consists of determining internal and external customer needs, meeting the needs, measuring degree of success, and constantly checking customers' requirements to establish areas in need of improvements (Chang, 2005). Bessant et al. (2001) argues that CI represents a specific set of routines that drive organisations to achieve superior performance. Extant literature is in agreement that CI is a dynamic process that focuses on improvement programs and their association with other organisational aspects as well as its environment

Figure 1. Conceptual model for TQM enabling critical factors in LGs.

Source (Ahire et al., 1996; Black & Porter, 1995; Flynn et al., 1994; Joseph et al., 1999; Rao et al., 1996; Saraph et al., 1989; Zeitz et al., 1997)



(Mosadeghrad, 2015; Hamidi & Gharneh, 2017; Nilsson-Witell et al., 2005; Oliver, 2009); and leads to performance improvement and organisational efficiency. Organisations achieve operational effectiveness and efficiency by minimising waste and unnecessary costs, empowering people with necessary skills and technology, continuously improving their services and products through improved processes, benchmarking, hiring expert staff and huge investment in modernised operational systems (Mosadeghrad, 2015; Hamidi & Gharneh, 2017; Khan, 2010). Lately, institutions are in constant search for ways to cut down the lead-time for example, through improved automation, novel technology and modernised processes that embrace CI initiatives across organisation performance chain (Ndlovu, 2008). CI and efficiency are key indicators that organisations embrace as they tap several benefits like increased productivity, increased market share, EI, and reduced rework caused by errors, reduction of waste, proper communication and customer satisfaction. Organisations that are efficient in their operational processes will therefore easily accept change in a dynamic and turbulent environment and this will facilitate them to continuously improve (Mosadeghrad, 2015; Hamidi & Gharneh, 2017; Khan, 2010). From the foregoing, it is proposed that:

H₅: CI has a positive and significant effect on LG quality delivery.

2.8. Product and service design

Product and service design is conceptualised as an interrelated set of procedures and actions that are integrated into the development process of an organisation to attain high quality and superior performance (Karimi et al., 2014). As well, product and service design examines an organisation's product quality and service delivery performance in regard to timeliness, errors and quality associated costs, reliability, responsiveness and customer satisfaction (Shan et al. (2013). Kim et al. (2012) and Shan et al. (2013) are in agreement that successful TQM implementation perse is a business-level strategy that goes beyond process to address the strategy content choice of product design efficiency, product reliability, process efficiency and market advantage hence leading to customer satisfaction. In light of the above arguments, we hypothesise that:

H₆: Product and service design has a positive and significant effect on LG quality delivery.

2.9. Conceptual model of the study

The conceptual model of the study was designed after an extensive literature review and this framework is used for the second part of the study to analyse the most critical factors in TQM implementation in the LGs using CFA. Figure 1 represents this model as suggested for LGs.

3. Research methodology

3.1. Research design and procedure

Both exploratory factor analysis (EFA) and CFA are recommended for scale development (Kline, 2011; Netemeyer et al., 2003). EFA was conducted to extract the new factor structure and examine the TQM's construct validity. EFA has been used as an analytical tool in research to reveal a factor structure to be confirmed in a measurement model (DiStefano et al., 2009; Kline, 2011). CFA is a component of structural equation modelling (SEM) that particularly deals with the measurement models, that is, the relationships between observed measures and latent variables. An essential feature of CFA is its hypothesis-driven attribute. Unlike EFA, CFA requires the researcher to pre-specify all model aspects. Therefore, the researcher must have a strong *a priori* sense, based on previous proof and theory, of the number of factors that exist in the data, of which indicators are related to which factors, and so on. Further to its greater emphasis on theory and hypothesis testing, the CFA approach provides many other analytic possibilities such as evaluation of method effects, examination of the factor model stability or invariance over time which is not available in EFA (Brown, 2015; Kline, 2011).

CFA was used to investigate whether the TQM factor structure, derived through EFA could be confirmed in a sample of 302 LGs in Uganda. The methods may be used in novel and exploratory research situations as a precursor to latent variable modelling (Schumaker & Lomax, 2004). Accordingly, this study adopted a two-step procedure in estimating TQM measurement model for LGs: first, performing EFA and secondly, confirming through SEM the TQM factor structure hitherto revealed under EFA. Data on TQM practices (i.e. LMC, CF, EI, PM and CI) were collected using a self-delivered survey questionnaire. Consistent with the requirements of instrument piloting, before the wider distribution of the questionnaire, the questionnaires were pilot-tested, where the pre-test was conducted to test the workability (Ismail et al., 2018; Monette et al., 2002).

3.2. Participants

The targeted respondents (unit of inquiry) were the chief administrative officers, the heads of department and section heads in LGs drawn from LG units (district LGs, municipal councils, town councils, division councils, and sub county councils). These were selected as they are at the forefront of quality management in their respective LGs. To determine the required number of participating LGs, we relied on stratified proportionate random sampling technique, where LGs were divided into different strata such as (district LGs, municipal councils, town councils, division councils, and sub county councils). Stratified proportionate sampling was deemed necessary as it takes into account the issue of population homogeneity and heterogeneity (Saunders et al., 2009). Later, to limit the potential issues of bias, we used simple random sampling technique to draw simple random LG samples from the different strata. Regarding unit of inquiry, 1365 questionnaires were distributed through self-delivered survey methods. A total of 850 valid returned questionnaires were used in this study constituting 62.2% response rate. From the number of participating staff, the bulk, averaging 70% of the responded LGs, were from sub counties and district local councils that had existed for more than 6 years and had implemented TQM practices in their service delivery efforts. All responses were aggregated to unit of analysis level which was an LG.

A sample of 302 LGs was drawn from a total population of 1448 LGs, but usable questionnaires were from 212 LGs representing 70.1% response rate. Measurement items of the questionnaire were adapted from previous studies with similar purpose, as this case is. All items were later scaled on 6-point likert like scale (1 strongly disagree—6 strongly agree). Minor modifications, for example, in regard to rewording were done based strictly on experts' opinions.

3.3. Analysis

This study adopted a two-step procedure in estimating TQM measurement model for LGs: firstly, performing EFA to determine a factor structure to be confirmed through CFA; secondly, confirming using SEM, through CFA, the TQM factor structure hitherto revealed under EFA.

3.4. Ethical considerations

To conduct this research, ethical clearance was obtained from the Faculty of Management Sciences, Busitema University and Faculty of Graduate Studies and Research of Makerere University (ethical clearance number: ECFGs No. 17). Thereafter, the respondents were given research consent sheets and informed about confidentiality and likelihood of withdrawal from the study.

4. Results

4.1. TQM EFA results

To establish a factor structure to be confirmed in the TQM measurement model, it became necessary to perform EFA. Using EFA with Principal Component Method, the 23 items of TQM were inter-correlated and rotated using varimax rotation method. To arrive at which variables to retain, the factor loadings and cross loadings of items on more than one factor, the reliability and the importance of variable were taken into consideration before deleting certain items. After deleting 8 items, another round of EFA was done. Based on Eigen value criterion, while we had conceptualised six factors, five (5) factors were extracted: CF (18.8%), EI (11.0%), CI (10.5%), LMC (10.0%) and PD (9.4), respectively.

These EFA results demonstrate the need for LGs to give due attention to the customer requirements. The EFA did not uniquely extract PM which reveals that PM is not manifest in LGs. The TQM factor analysis extracted only five factors. The Kaiser–Meyer–Olkin (KMO), the measure of sampling adequacy and the Bartlett’s test of sphericity displayed satisfactory results. The KMO value (.90) explaining 60% of the variation indicates that the data set is likely to factor well. This is confirmed by Bartlett’s test which was significant at ($p < 0.001$). Both diagnostic tests, thus, confirm that the data are suitable for factor analysis. Based on this, a TQM composite variable was computed based on: CF, EI, CI, LMC and PD. Table 2 below show results of EFA.

4.2. Confirmatory factor analysis results for TQM

EFA results for TQM revealed a five factor structure (CF, EI, CI, LMC and PD) to be empirically confirmed in the measurement model of TQM of Uganda’s LGs. To achieve this end, Analysis of moment structure (AMOS) and SEM framework were used. CFA revealed a three factor structure of process design (PD), CF, and leadership and management commitment (LMC). Figure 2 indicates the measurement model for TQM in LGs. In performing CFA, 5 iterative processes of adjustment were done leading to removal of 11 items. This process resulted in the final TQM measure consisting of 6 items. The resulting TQM model was assessed for goodness of fit and iteratively adjusted in an attempt to obtain a theoretically sound and statistically satisfactory model. Items were dropped for the following reasons: a) the item had a non-significant loading on its factor ($p > 0.05$); b) the item appeared to load more than once on different factors demonstrating item complexity and finally; c) the item had a loading < 0.4 on its factor domain (DeVellis, 2003; Streiner, 2003). Consistent with the above recommendations, 6 items were retained and buttressed the hypothesised theoretical structure of the TQM construct as seen in Table 4.

The sensitivity of the resulting LGs TQM model was assessed by restricting the number of domain co-variances to the following pre-specified factors that TQM literature suggests are more correlated: Factor 1 (process design); Factor 2 (CF); Factor 3 (leadership and top management commitment); Factor 4 (EI); Factor 5 (product design) and Factor 6 (CI). When co-variances between the remaining factors were fixed to zero, the model fit was worse, suggesting that estimating all co-variances between the domains produced a better model as indicated by standardized and unstandardized path coefficients in Table 3 as well as the fit statistics in Table 5.

Figure 2 below indicates the measurement model for TQM in LGs.

Three different types of validity were examined in this study namely: convergent validity, discriminant validity and content validity. As seen in Figure 2, an NFI of .953 is an indication of

Table 2. EFA results

	Component				
	Customer Focus (1)	Employee Involvement (2)	Continuous Improvement (3)	Leadership & Mgt (4)	Process Design (5)
Preventing faulty products and services is a strong practice in this local government	.752				
Client requirements are thoroughly analysed and infused in service delivery systems and processes in this local government	.742				
Working systems and procedures are regularly reviewed before a service is generated	.727				
Employees often take total responsibility for service delivery	.709				
Local Governments undertakes client satisfaction survey regularly through for as such as barazas	.679				
Local government employees often work in groups	.660				
This local government often establishes long term relationship with all service delivery stakeholders	.524				
Employees are directly involved in quality related activities		.783			
Work is done in teams involving a number of stakeholders in services delivery		.714			
My supervisor often comments on quality of my work		.592			
Senior local government leaders improve managerial systems like timely reporting to ensure that service delivery systems are error free		.529			
As employees, we have higher importance in service delivery process			.842		
Local government employees are competent in duty performance to support quality programmes			.772		

(Continued)

Table 2. (Continued)

	Component				
	Customer Focus (1)	Employee Involvement (2)	Continuous Improvement (3)	Leadership & Mgt (4)	Process Design (5)
Qualified and knowledgeable staff are involved in delivery of services			.737		
Local government leaders reward workers for quality improvement endeavours				.705	
Quality initiatives such project supervision and Quality Circles are available, funded and implemented				.681	
Client Charters are in place to guide the delivery of client centred services				.642	
Local government often organise employee joint meetings				.633	
Schedule of duties are prepared and brought to attention of employees					.798
Local government managers are change drivers/ agents and actively direct change management programmes					.644
Measuring tools to evaluate staff performance are in place and implemented					.624
Eigen Values	4.148	2.433	2.318	2.218	2.068
Percent Total Variance	18.857	11.059	10.536	10.081	9.402
Cumulative Percentage	18.857	29.916	40.451	50.532	59.934

Figure 2. Total quality management measurement model.

NFI = .953; IFI = .974;
 TLI = .934; CFI = .973;
 GFI = .980; AGFI = .932;
 RMSEA = .073; $\chi^2 = 12.784$; d.
 f = 6; RMR = .0017, AVE = .525.

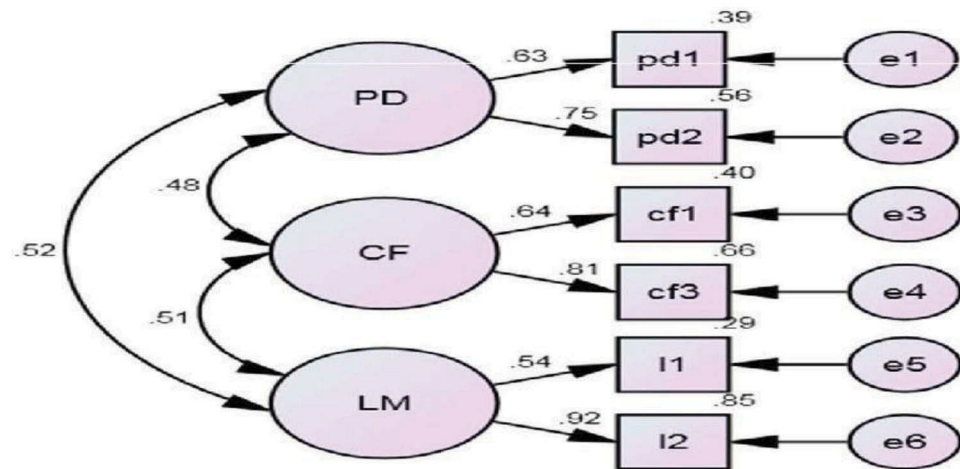


Table 3. Standardised and unstandardised path coefficients for TQM service sector

Path	Unstandardised path coefficient	CR	Standardised Path Coefficient	AVE	P
TQM_PD_1 <—PD	1.000		.626	0.525	
TQM_PD_2 <—PD	1.152	5.081	.750		***
TQM_CF_13 <—CF	1.000		.636		
TQM_CF_15 <—CF	1.445	5.395	.811		***
TQM_L_20 <—LM	1.000		.537		
TQM_L_21 <—LM	1.617	4.653	.922		***

Table 4. TQM measurement model for service organisations

TQM practices		Analysis code
Process design	1. Schedule of duties are prepared and brought to attention of employees	PD1
	2. Local government managers are change drivers/agents and actively direct change management programmes	PD2
Customer focus	1. This local government often establishes long term relationship with all service delivery stakeholders	CF13
	2. Client requirements are thoroughly analysed and infused in service delivery systems and processes in this local government	CF15
Leadership and Management commitment	1. Local government often organise employee joint meetings	LM20
	2. Quality initiatives such project supervision and Quality Circles are available, funded and implemented	LM21

strong and acceptable convergent validity (Mark & Sockel, 2001). The χ^2 statistic is insignificant at 5% (0.05) level of accuracy with a *p* value of 0.470, demonstrating acceptable model fit of the data in our study population. Additional evidence is adduced by other fit indices: RMSEA = .073, TLI = .934, IFI = .981, CFI = .973, GFI = .980, AGFI = .932, which is larger than .9 (Kline, 2011; Yang, 2006). Discriminant validity was evaluated based on Average Variance Extracted (AVE), which according to Fornell and Larcker (1981) should be > 0.5. In this case, it was 0.525, which is satisfactory and tolerable. In this research, the 3 evolving TQM practices have content validity since they were derived from extant literature review and thorough assessment by academics and

Table 5. Fit statistics for TQM measurement model in LGs

Confirmed TQM Measure	NFI	TLI	CFI	GFI	AGFI	RMSEA	χ^2
	.953	.934	.973	.980	.932	.073	12.784

practitioners with vast experience in the area of TQM in LGs. Specifically, as the measurement instrument was based on defined quality management practices of Saraph et al. (1989), Flynn et al. (1994), Ahire et al. (1996), Black and Porter (1995), Zeitz et al. (1997), Joseph et al. (1999), and Rao et al. (1996), it is so considered to have strong content validity.

All the critical ratio (CR) values were greater than 1.96, while p values < 0.05 , an indication of acceptable significance level. The standardised parameter estimates for all the retained indicators, were statistically significant ($p < 0.05$) and loaded on TQM variable. Accordingly, the TQM measurement model was confirmed in the context of Uganda's LGs. Furthermore, SPSS was used to establish the internal consistency of all TQM dimensions. Results of this analysis revealed an alpha coefficient value well above .70 (Nunnally, 1978). These results lend credence to construct reliability for TQM in this specific study. Accordingly, the TQM Measurement instrument for LGs is confirmed in the context of Uganda.

5. Discussion

The purpose of this study was to develop and validate TQM measurement model proposed to improve LGs' performance outcomes, using CFA in the setting of Uganda's LGs. This study proposes a conceptual TQM model that has empirically been validated by perceptual data collected from employees of Uganda's LGs. These employees are at the heart of TQM implementation. The suggested three-factor model provides a conceptual framework to operationalise the TQM construct in LGs. CFA showed that all path coefficients were high and significant at $p < .05$, signifying an important contribution of each item to the corresponding TQM scale. The three factor structure demonstrated good fit with acceptable fit indexes. These results consequently provide strong empirical support for the construct validity of TQM scale with the sample of LG employees. Therefore, the derived TQM scale for LGs was found to comprise 6 items underlying three factors. These practices include CF, PD and leadership and management commitment and are as a result considered reliable measures that tap TQM scale in Uganda's LGs. CFA did not confirm "EI" factor implying that "leadership commitment" absorbs employees' issues.

The findings also suggest limited success of TQM in Uganda's LGs. This seems to be in line with the findings of Psomas et al. (2017), Nambalirwa and Sindane (2012), and MoPS (2016) on TQM application in LGs. Implementing TQM in LGs requires a comprehensive understanding of the specific nature of the industry and sector, which influences the applicability of TQM practices. Owing to the distinctive nature of services offered by the LGs, there is incongruity between the TQM philosophy and the practices on which the management of LGs is presently based. The complexity of the LG system and its bureaucratic and extremely hierarchical structure can significantly impede TQM implementation and reduce its effectiveness (Mosadeghrad, 2012a). The confirmed three factor TQM model can therefore, provide redress to this performance challenge. Whilst "secondary" TQM factors are important, the findings reveal that in a wider sense, "primary" TQM practices such as leadership and management support, CF and PM are more significant and impactful on LG performance. The relevance of secondary factors resides in provision of a supportive role to "primary" practices. CF, process design and management as well as leadership and management commitment were the strongest and significant predictors of LG performance in terms of quality delivery. Consequently, effective implementation of these TQM practices may result in superior performance. This aligns with Samson and Terziovski (1999) and Sila and Ebrahimpour (2005) who

argued that leadership types, human resource management and CF are important factors for superior organisational performance.

In this study, leadership and management commitment (LMC) has been reported as an enabler for TQM success. Thus, LMC is fundamental for the success of TQM initiatives. The high correlation between LMC and each of the other confirmed TQM practices suggests that the former played a fundamental role in driving the later which is CF and process design and management. The findings are telling that LMC positively impact LG performance by influencing other TQM practices. These results reveal that for LGs to effectively deliver quality services, they will require a culture of sound LMC to improve TQM initiatives. This finding is mirrored by TQM literature Balding (2005), Ooi et al. (2011) and Lasrado (2015). Top managers will therefore need to establish effective communication and sound information systems to support staff in usage of purposeful data to inform decision making process, for example, involving resource allocation.

As well, leadership can serve as a tool for senior LG management staff in implementing TQM in two basic ways. First by modelling TQM philosophy and practices within the LG departmental operations, leadership serves as a central feature for the TQM process throughout the organisation. Secondly, leadership with senior management's support can take TQM Process organisation wide by developing and executing the long term training and development needed for the core institutional culture shift necessary for TQM. Moreover, TQM implementation demands an intensive team effort headed by a well-established leadership and management team. Team members involved in LG TQM initiatives, need to have their responsibilities clearly spelt out and it is significant for the entire organisation to recognise leadership role in TQM so as to ease delegation process. The results too, show that TQM success is likely to be high in LGs where authorities are more committed to TQM Implementation. This finding is line previous TQM literature (Mosadeghrad, 2015). Senior management should therefore, demonstrate total commitment to TQM in order to sustain long-term performance improvement. Quality attainment and sustainability requires total and lasting commitment to quality management initiatives. Quality will need to be documented and recognised as LGs' strategic goal and this should be clearly highlighted in the institutions' vision and mission. LG managers should therefore derive robust plans to implement quality management initiatives and manage their outcomes.

CF as well, was established as one of the latent measures of TQM, implying that the success of TQM philosophy is partially dependent on customer orientation. The findings suggest CF as a central TQM Philosophy thus implying that TQM success is dependent on a strong CF. These findings are consistent with earlier studies that found effective management of customer behaviour and total consideration of customers' requirements as enabler for enhanced customer satisfaction levels (Mosadeghrad, 2012a). This finding is unique to the TQM literature. It is in line with the more recent TQM literature that highlights the fundamental importance of integrating customer needs into the TQM process (Corredor & Goñi, 2011; Mosadeghrad, 2012b). As TQM is a management strategy with emphasis on continuous, organisation-wide effort to deliver and sustain quality customer service and satisfaction, the findings demonstrate the need to promote customer loyalty by delivering echelon of service required to satisfy customer needs. The findings as a result, highlight the need for an LG TQM strategy to facilitate customers specify their quality expectations, and as well, provide consistent feedback to determine how services and products can be improved across the entire LG performance chain. This can for instance, be realised when LGs commit to meeting targets and deadlines.

The findings also reveal that in TQM, organisations achieve efficiency improvement by means PM as specified by continued design of processes, among other factors. This is because development of these activities facilitates reduction in production and service delivery costs (Corredor & Goñi, 2011). Previous studies have demonstrated that process design and management significantly improves firm results and customer satisfaction (Hamidi & Gharneh, 2017; Kumar et al., 2008). Process design and management is a managerial approach characterised by the focus on business

processes as a method used by the top management for organisational design and assignment of managerial responsibilities. Through this managerial approach, LGs have been able to implement reform initiatives such as Integrated Financial Management System (IFMIS), and evolution of client charters, all aimed at increasing customer orientation and inter-organisational co-ordination in the public sector.

TQM in LGs is therefore a three-dimensional model. These three TQM practices represent meaningful categorisation of TQM and seem to reflect the major thematic notions and conceptions intended by the authors. The instrument, though may not address all possible TQM measures used in public sector, broadens the definition of TQM towards a direction, which is especially meaningful to LGs. It is also interesting to observe that the confirmed TQM measures of CF, PD and LMC mirror practices that earlier quality management scholars emphasised (Ahire et al., 1996; Flynn et al., 1994; Hamaria et al., 2017; Molinéro-Demilly et al., 2018; Saraph et al., 1989; Zehir et al., 2012). A similar pattern can be discerned in Fotopoulos and Psomas (2009) and Jain et al. (2011)'s study, where in each of them reported one or more of these TQM practices as dominant in organisations. The resulting three-dimensional TQM measure based on a large sample of LGs symbolise a departure from the majority of general TQM measures that are frequently used in the domain of quality management literature (Fotopoulos & Psomas, 2009; Bayraktar et al., 2008; Sila, 2007; Ahire et al., 1996).

Previous studies have revealed several practices that tap the domain of TQM in organisations. This suggests that some of the TQM practices do not adequately measure TQM sufficiently in the LGs. Tourangeau and McGilton (2004) have argued that strong scale validity and reliability properties are secured through research tools that are concise as these lessen respondents' burden and associated costs relating to data collection, exploration and analysis. The three-dimensional TQM scale that has evolved to measure TQM in LGs fits this argument and accordingly can be judged to have sufficient statistical power. As well, the possible explanation for this resulting fit is conceptual inconsistencies. The noticeable lack of consensus as to what constitutes TQM measure is still manifest in literature (Hoang et al., 2006; Ooi et al., 2008; Singh & Smith, 2006). The apparent lack of consensus, as to what constitutes a universal measure of TQM, suggests the need to explore and confirm industry-specific instrument for TQM implementation (Karuppusami & Gandhinathan, 2006; Singh & Smith, 2006). In the absence of a consensus as to what amounts to universal measure of TQM and its latent indicators in LGs, misinterpretations may easily occur. Such misunderstandings may result into unpredictable results, as this case is.

5.1. Study limitations

The contribution of this study should be judged in light of existing limitations. Although the CFA factor structure of scores on TQM practice can be deemed adequate with this LG population, the homogeneity of the sample used in this study places limits on the generalizability of these findings. The organisations in this study were drawn from LGs and therefore may only be generalizable to this sample. Further confirmatory research with other service organisations other than LGs is needed so as to cater for issues of external validity. Since the model suggests that TQM may be manifested differently in industry setting; future research could focus more on parastatal organizations considering the importance of quality management in a broad services sector. Finally, the cross sectional nature of the survey research methodology employed in this study, allows for assessment of statistical relationship at a snapshot and therefore, statements about the direction of the associations can simply be made in terms of consistency of results with the effects suggested in the theoretical development. Therefore, future studies could use longitudinal research methods to logically explore the theoretical links proposed in our study.

6. Conclusion and study implications

The purpose of this research was to develop and validate a measurement model for TQM construct in LGs using CFA method. TQM concept is thus a proven coherent approach used to largely improve organisation's operational process, including product and services. Data were collected from 212

LGs, from five (5) LG types, namely, district LGs, municipal councils, town councils, division councils and sub county councils. CFA was applied using AMOS version 20. Assessment of the measurement model was based on three major criteria: goodness of fit (GOF) indices, items loadings (factor loadings) values and applying modification index. Furthermore, TQM in Uganda's LGs can be described as a latent exogenous construct, which is represented by three observed manifest factors (PD, CF and LMC). This study has therefore developed, validated and qualified a TQM measurement model for use in the context of Uganda's LGs. TQM deals with overall organisational performance and recognises the significance of the processes as well as customer- focus interfaces, both within and externally. LG managers must therefore, recognise the critical TQM measures and effectively implement them since TQM has been both commended for its ingenuity and criticised for falling short of measurable results. Yet, the lack of results can often be attributed to apparent lack of consensus in the understanding of TQM across diverse setting. TQM critical success factors (CSFs) as established to buttress this derived model should be implemented holistically, rather than on a progressive basis to adequately realise the full TQM potential. In addition, the review of the suggested TQM model highlights the need to link the confirmed TQM practices (LMC, CF and PD) to LG quality delivery in order to realise successful TQM implementation. LG managers need to understand which TQM practices are relevant for execution of LG mandate.

This study has both theoretical and managerial implications. The findings of this study contribute to quality management and LG service literature in several ways. Firstly, it contributes to further refinement and validation of TQM measurement scales used to assess each of the constructs included in the model within LGs, an area least considered in the literature. In particular, a valid and reliable instrument has been developed and recommended for use in the assessment of TQM practices in the service sector with explicit focus on LGs. Also, this study enriches TQM literature both theoretically and empirically by minimising the knowledge gap in TQM—service quality related to LGs context, while focusing on LGs' heads of department and sections to obtain a better understanding of TQM practices in LGs. As well, the better fit of the TQM model, as reflected by the fit statistics, is a confirmation that in any quality management initiative, LMC, PD and CF are fundamental for TQM improvements in LGs. Finally, as earlier noted, there is limited information in the current literature on the extent of quality management implementation in LGs of this country. This study contributes to theory about the nature of quality management practices in LGs. Whilst each of these confirmed factors, has differing scoring pattern on the developed TQM model, it is important to note that this study signifies a first stride in conveying extra precision of TQM measurement in LGs.

The study has implications for management. It provides an alternative quality management framework for LG practitioners with practical understanding of this sector-specific TQM practices and their applicability in the public sector. The framework serves to inform the implementation of TQM programmes in LGs. The findings consequently provide managers, with a practical understanding of the significant factors of TQM execution in LGs. The findings will assist LG management in planning for effective and efficient TQM designs and proposals. Viewed from this lens, the results ease work for LG managers regarding the process of re-allocation of supplementary resources to those key TQM constructs that have been found to have more significant impact on quality delivery. Also, the results present decision makers with evidence based and irrefutable standard on TQM implementation in LGs. LGs managers can utilise the derived TQM model to evaluate TQM implementation programs and identify problem areas requiring improvement. Finally, the study motivates and offers justification for LG managers to invest enormously both time and resources for successful TQM program implementation.

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