

Full Length Research Paper

Moderating effect of organization culture on the relationship between quality management system adoption and performance of public universities in Kenya

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The capacity of higher education institutions (HEIs) to serve as drivers to economic competitiveness has been negatively impacted due to the exponential growth and numerous constraints which interfere with their quality. In Kenya, HEIs, in their attempt to cater for the 28% increase in number of students, 6% government capitation cut and 14.3% of the 28 weeks, academic year time waste between 2014 and 2015, have encountered many challenges caused by overcrowding, crumbling infrastructure, inadequate human capital with 1:500 lecturers to student ratio and financial resources and declining quality of the professional courses on offer. They have raised concerns about the quality of public university education. The aim of this study is to analyze the effect of organization culture on the relationship between Quality Management System (QMS) adoption and organization performance of public universities in Kenya. The study was guided by structural contingency theory and equity theory; using a census survey with a Bureau of Standards. The study results revealed organization culture ($\beta=0.492$ $p=0.030$) moderated the relationship significantly implying the interactive effect of organization culture improved organization Performance by 0.7% ($\Delta R^2 .007p=0.030$). The study concluded that organization culture increases the effect of QMS adoption on organizational performance. response at 94.41% on a population 215 top management personnel of 11 public universities certified by the Kenya

Key words: Quality Management System (QMS), Universities, organizational culture, performance.

INTRODUCTION

Education plays a critical role in the overall development of a country's economy (Ali and Rahmat. 2010) and cannot be underestimated. However, the global demand in education has led to the development of both private

and public owned educational institutions (Mathooko, 2013). Education is no longer a luxury but it is essential for one 'survival. As competition intensifies in businesses worldwide due to changes in business structure and the

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emergence of new technologies, education policy-makers in developing countries are worried about the poor state of their higher education institutions. From the historical development of higher education institutions in Africa, universities have been the main problems (Chang'ach, 2014).

As a developing country and the increase in demand of education in Kenya, Higher education has faced a significant and persistent pressure towards expansion in recent years, and this trend has led to substantial economic and academic challenges for both higher education institutions and the government. According to Mathooko (2013) and Otieno (2010), the historical experience of the development of the university system in Kenya is similar to the situations faced in most developing countries concerning the basic orientation reflecting the influence of the colonial forces. They were established as part of the countries' education systems on the premise of supplying labor to maintain existing industrial facilities developed during the colonial period (Chang'ach, 2014). However, Higher education stakeholders are continually questioning the value of the products the higher education institutions in Kenya are presenting to the market and why foreign universities remain attractive.

According to Alsubait et al. (2014), higher education institutions in African countries play a more significant role in national development than they do in other parts of the world. They are the only institutions with some capacity to undertake research and generate the knowledge required for development. This has led to the development of both publicly owned and privately owned institutions. However, private institutions, irrespective of their levels of status and accreditation stages, have been a significant threat to the public institutions for long. Otieno (2010) and Mathooko (2013) noted that as Kenyan Universities seek to offset declining state of dollar and constant increase in students there has been an incredible increase in university branches and constituent colleges. With the introduction of the double-entry system (2011), students' enrolment in these institutions stood at 539,749 (2015), with public universities accounting for 461,820 students and private universities having 77,929 students. This has put pressure on the government to create jobs for graduates whose number stood at 62,000 in 2002 depicting a 28% increase in the number of students in 2014/2015.

Higher education in Kenya has been facing significant and persistent pressures towards expansion in recent years, and this trend has led to substantial economic and academic challenges for both higher education institutions and the government. Moreover, several factors have contributed to raising public concern over the quality of education, leading to the emergence of quality measurement and improvement devices such as performance indicators, accreditation, programmes, institutional assessment and quality audits. Mathooko

(2013) stated that public universities are subjected to quality assurance overseen by the Commission for University Education (CUE) aimed at streamlining and improving the management of university affairs.

With increasing market competition and limited funding opportunities, universities have to adopt business-like strategies to cope with the changing world economy (Arjomandi et al., 2009). Concerning this, Arjomandi et al (2009) believes that universities should be considered as business entities. Universities are in a competitive environment with limited funding and resources while they have to generate extra cost to curb its deficit. Unlike other organizations, universities need to be productive, as they have to attract students to fulfil both their goals and funding needs. According to Simmons and White (1999), organizations adopt QMS to differentiate themselves from the competition and to improve their image. Moreover, Dia (2000)'s study found out that quality assurance has become a powerful strategic weapon in international competition and trade. Dia supports Simmons and white (1999)'s studies since he stated that improved quality reduces waste and increases productivity. Further improvement in quality and productivity enables firms to increase their market share and to charge higher prices for their products. This in turn results in higher profitability hence strengthening their competitive position.

The world of education is experiencing rapid changes and will probably face even more significant changes in the future (Otieno, 2010; Dia, 2000; Mathooko, 2013). Higher education stakeholders are continually questioning the value of the products the higher education institutions in Kenya are presenting to the market and why foreign universities remain attractive. The same issues could be identified in other African states. On his report dated 2015, President Uhuru Kenyatta agreed that there was a need to allocate more resources to public universities to enhance research and innovation. However, the report of Commission of University Education dated 2015 stipulated that most universities in Kenya have not evolved to address the challenges of the current job markets and have failed to provide contemporary quality programmes to take advantage of emerging technology opportunities. This exists irrespective of the Ksh. 19,814.28 deficit and 6% cut findings towards higher education to US\$ 588 million compared to the US\$ 627.2 million allotted in 2014/2015. As governments in most parts of the world are focusing on higher education over the last decades, Kenyan public universities now focus on quality assurance and quality enhancement. Most of the teachers tend to teach both regular and self-sponsored students which are not really or fully qualified to do (Mwiria, 2007). The study stated that 14.3% of 28 weeks per academic year are wasted in the universities due to the adoption of the semester system and the shuttling character of some lecturers between campuses of the same institution and/or other

universities. This has triggered a major exodus of students to foreign destinations, in search of quality education due to inefficiency in time utilization and use of inferior methods of content coverage; they only focus on areas that they intend to examine at the end of the semester in the universities

The quality management system, which is well embedded in business organizations and industries, is now being used in the higher education institution sector where it was developed and adapted (Deming, 1986).. It is a powerful strategy in international competition and trade and enables firms to increase their market share and profitability (Dobrzański and Roszak, 2007; Mizikaci, 2006). To Sriram and Mersha (2006), quality competitiveness and development in sub-Saharan Africa has enhanced the growth of service and manufacturing institutions. Boiral (2007) state that the business impact of Quality Management System certification makes it reasonable to assume that Quality Management System benefits improve organizational effectiveness; and that positive effects of certification relate to management willingness to make Quality Management System a useful tool for enhancing quality practices. However, Grant et al. (2004), Yilmaz (2010), Blackmore (2004) and Harvey and Stensaker (2008) postulate that due to the complex nature of higher education based on its diverse stakeholders, they tend to impose different views on organizational effectiveness based on Quality Management System and are obliged to comply with regulatory requirements for transparency in governance and financial management (Makawiti, 2011; Gaither, 1998; Lee. et al, 2006).

Quality is a widely used concept that has become one of the essential agendas in most organizations. Quality enables them to compete and face the challenging forces of globalization. Global competition requires organizations across borders to initiate efforts to ensure their products and services achieve the highest quality standard. Most empirical works agree that adoption of a quality management model by organizations could be considered as a potential source of competitive advantage and value-generating. Anecdotal evidence suggests that organizations can achieve internal benefits such as quality or productivity improvements, or that certification can help firms maintain or increase their market share or both. Others argue that the standard is too generic to cause performance improvement, but as a signal of proper management. The use of a moderator can either positively or negatively influence organizational performance.

The studies of Dahlgren and Mahmood (2014), Prajogo and Sohal (2003), and Sanders and Linderman (2014) were similar in the sense that a moderation study was carried out in a survey research design on manufacturing firms. The findings of these studies revealed positive and statistical significant moderation effects. Wanyoike. (2016)'s study anchored on Quality improvement theory

and institutional theory revealed a moderated mediation effect on the relationship between Quality Management System and organizational performance. Further, the studies of Hussain and Younis (2015) and Din et al. (2011) on Quality Management System and organization performance revealed a positive moderation effect. However, Roldán et al. (2017)'s study showed a negative moderation effect of quality management on open innovation performance. Iqbal et al. (2012)'s findings revealed a mix reaction in that there was a strong and positive association between TQM practice and quality performance, innovation performance and organizational performance and culture of support had a moderating role in the relationship between TQM practice and organizational performance. These studies though revealed a positive, negative and mixed reaction on quality management system and performance; they focused on service institutions, used a survey research design on service industries in the developed countries and were limited to ICT telecommunication and Health institutions. Quality Management System as a new culture in the existing organization culture can influence performance. There is no known information on how organizational culture as a moderator affects Quality Management System adoption on return in service institutions, especially in developing countries Higher Education institutions. Based on Quality Management System and performance, as study variables organization culture, was adopted as a moderator variable this was due to the increase in globalization, more interaction among individuals from a diverse cultural perspective is needed for organization competitive advantage. Moreover, the maximization and capitalization of diversity in a work environment have become an essential issue for management in developing countries, and the culture of any organization is a significant factor in its success or failure. The role of organizational culture as a moderator variable can have an effect on performance; it is the glue that combines the non-human resources to that of human resources in organizations to establish teamwork and excellent execution. It needs an investigation in the higher learning institutions.

LITERATURE REVIEW

Mahmood and Ahmed (2014), in their study on 396 textile manufacturing firms, observed that two of the four dimensions of TQM (continuous improvement and employees' involvement) had a positive and significant impact on organizational performance. The other two aspects (customer focus and top management support) had insignificant relation with organizational performance. Mahmood and Ahmed (2014) also found out that continuous improvement significantly and positively affects organizational performance and the relationship of employees' involvement with organizational performance

is also positive and statistically significant. The study concluded that for an organization to transform quality certifications into performance enhancement; changes are monitored with several types of data. In a survey in Australian industries, a structural equation modelling technique was adopted on 174 managers, Prajogo and Sohal (2003) found that TQM significantly and positively relates to both product quality and product innovation performance. However, it appeared that the magnitude of the relationship was greater against product quality. Besides, the significant causal relationship between quality performance and innovation performance was found, suggesting that the achievement of one aspect of performance could impact the other. Kontoghiorghes (2016) used structural equation modelling technique on a sample of 897 automotive supply chain employees of a full-service supply chain management company operating in the southwestern United States. The study revealed that strategically aligned and ethical high performance, organizational culture has a strong effect on talent attraction and retention. Prajogo and Sohal (2003) and Kontoghiorghes (2016)'s study, therefore, concentrated on the use of structural equation modelling technique; the study did not explore how the factors moderated the organizational performance being employed by TQM in the automobile industry.

Wanyoike (2016) conducted a study to establish the effect of quality management practices on the performance of manufacturing firms in Kenya. A census survey was adopted on 60 manufacturing firms in Kenya. Anchored on Quality improvement theory and Institutional theory, the study focused on two objectives; assess the moderating effect of the operating environment on the relationship between quality management practices and performance and to establish the mediating effect of organizational capability on the relationship between quality management practices and performance. The study revealed that organizational capability partially mediated the relationship between quality management practices and performance. Further, the study results on the moderated effects of operating environment and performance showed a positive and statistically significant relationship, thus implying that the working environment is having a moderating impact on the relationship between quality management practices and performance. The study adopted a cross-sectional survey approach.

Sanders and Linderman (2014) also carried a survey of 239 manufacturing firms. From their study, the performance was measured by efficiency and innovation. The study revealed that the influence of process design on productivity and innovation, performance is not dependent on competitive intensity. However, the impact of process improvement and process control on efficiency and innovation performance is, in some instance, moderated by competitive intensity. Moreover, Hussain and Younis (2015) surveyed the synergic impact of

leadership in cultivating the organizational performance outcomes of quality management practices in Pakistan. Using a multiple regression model, the study revealed that there was a Partial moderation between organizational performance and construct of quality management practices. Hussain and Younis (2015) and Sanders and Linderman (2014)'s studies were anchored on survey study design. Moreover, Hussain and Younis (2015)'s study focused on pharmaceutical firms in Pakistan, while Sanders and Linderman (2014) focused on manufacturing firms. The current study will be anchored on a descriptive survey on public universities in Kenya.

A survey study by Din et al. (2011) explored the relationship between an ISO 9000 certified quality management system (QMS) and elements of performance in construction project environments. The study explored three elements of performance: project management practices, financial management practices and Project Success. The study indicated that ISO 9000 certification had a positive moderating effect on the casual relationship between project management Practices and Project Success. Based on the survey results, a Project Management Performance Assessment for Construction model is developed, which extends the Project Management Performance Assessment to include performance enablers linked to financial management activities. The survey was limited to the construction sector in Malaysia.

Roldán et al. (2017) did a research on moderating role of an inter-organizational IT infrastructure and the complementarity of learning styles among an organization committed to quality improvement and its supply network from 270 managers of European firms. The study revealed the adverse effects of quality management on open innovation performance. However, this could be overcome by complementing the organization's learning style with that of its open innovation partner, particularly, its supply network, and, most importantly, obtaining information technologies compatible with those of its supply network members.

Demirbag et al. (2006), based on their research on financial performance, observed that there was a significant relationship between TQM practices and internal and external failure and firms' performance. Customer focus and participation are essential predictors for internal failure. The study also found out that Customer focus and quality system moderates the relationship between TQM implementation and organizational performance. Moreover, customer focus and quality system is found to be significant predictors for external organization failure. In contrast, some of the internal and external failure elements are particularly strong predictors of firms' performance.

Valmohammadi and Kalantari (2015) conducted a survey study on the moderating effect of motivations on the relationship between obtaining ISO 9001 certification

and organizational performance using a structural equation model. The study revealed that motivations, especially internal motivations, have a significant effect on the performance of the surveyed companies. This leads companies toward building competitive capabilities which eventually appears in their performance. The study results demonstrate that ISO 9001 certified companies show better organizational performance than non-certified ISO 9001 companies, and internal motivations moderate an organization in obtaining ISO 9001 certificate and performance. The study was restricted to only a single region and manufacturing and the data collected was cross-sectional. Moreover, the study findings revealed that large organizations have better knowledge management capabilities compared to the medium organizations

Iqbal et al. (2012) studied the effect of TQM practices on the performance of the telecom sector of Pakistan. The study found that innovation performance had a partial mediating impact between TQM and organization performance, whereas, quality practice mediation impact was not established. Moreover, the culture of support had a moderating role in the relationship between TQM practices and organizational performance. The study was only limited to the telecom industry of Pakistan, and the study sample size was limited due to time.

The studies of Mahmood and Ahmed (2014), Prajogo and Sohal (2003), and Sanders and Linderman (2014) were similar in the sense that a moderation study was carried out in a survey research design on manufacturing firms. The findings of these studies revealed positive and statistical significant moderation effects. In support Wanyoike (2016)'s study anchored on Quality improvement theory and institutional theory revealed a moderated mediation effect on the relationship between Quality Management System and organizational performance. Further, Hussain and Younis (2015), and Din et al. (2011)'s studies on Quality Management System and organizational performance revealed a positive moderation effect. However, Roldán et al. (2017)'s study showed a negative moderation effect. These studies, though focused on service institutions, used a survey research design on service industries in the developed countries and were limited to ICT telecommunication and Health institutions. Quality Management System as a new culture in the existing organizational culture can influence performance.

METHODOLOGY

The study adopts a correlation design. Correlation research design aims to ascertain if there are significant associations between study Variables (Kothari, 2004), on 11 public universities in Kenya who attained QMS certification through KEBS. A target population is that group of people from whom the study is designed, and generalizations of the findings are made from (Kothari, 2004). The study unit of analysis will entail organization management personnel in 11 public universities. This will not include the other

subsidiaries either operating under the principal university umbrella or name.

A census survey approach was adopted and a sample frame obtained from the 215 management Personnel based on 11 vice-chancellors, 38 deputy vice-chancellors, 11 finance officers, 25 registrars, 106 deans and 11 librarians. Primary data were collected using questionnaires from senior and top managers. The study much preferred inquiries since they can be used to gather data in a short period and within the minimum expense.

The study sought to analyze the moderating effect of Organizational Culture on the relationship between Quality Management System adoption and organizational performance. The simple rule is that the components of any product must always be included when testing the moderator effect (Cohen, 1991). According to Cohen (1991), the model for moderator analysis is not additive as in the case of other regression models, and the product represents the interaction only when its components have been partial out. For this reason, they are interpreting the coefficients in the model based on un-standardized coefficients rather than the standardized coefficients (Whisman and McClelland, 2005). The study adopted a moderator analysis to determine the relationship between explanatory variables; Organizational culture and Quality Management System adoption and; the dependent variable is organizational performance.

$$\text{Additive model: } Y_i = \beta_0 + \beta_1 X_i + \beta_2 Z_i + e \quad (1)$$

Where Z_i is a moderator variable organizational culture.

This model introduces organizational culture as a moderator to establish its contribution to organizational performance.

$$\text{Moderator model: } Y_i = b_0 + b_1 X_i + b_2 Z_i + b_3 Z_i X_i + e \quad (2)$$

$$\text{Moderator model: } Y_i = (b_0 + b_2 Z_i) + (b_1 + b_3 Z_i) X_i \quad (3)$$

Where $Z_i X_i$ is the cross product of the interaction term (organizational culture and Quality Management System adoption). This model encompasses the dependent and independent, the potential moderating variable and the cross product interaction term of the dependent variable and potential moderating variable (Source: Adapted from Aiken et al., 1991);

Y: Dependent variable (Organizational Performance)

X: Independent variable (Quality Management System adoption)

Z: Moderator variable (organizational culture)

XZ: interaction term (organizational culture and Quality Management System adoption)

β_0 : Standardized Y-intercept in the additive model (model without the interaction term)

β_1 : Standardized coefficient of X in the additive model

β_2 : Standardized coefficient of X in the additive model

b_1 : Un-Standardized coefficient of X in the moderator model (Main effect of X on Y if Z is zero or simple effect of X on Y if Z is above zero).

b_2 : Un-Standardized coefficient of Z in the moderator model (Simple effect of Z on Y)

b_3 : Un-Standardized coefficient of XZ in the moderator model (The interaction measures for moderation)

e: is residual in the equation which is assumed to be identically and independently distributed with zero mean and constant variance

$(b_0 + b_2 Z_i)$: The Y-intercept of the moderator model

$(b_1 + b_3 Z_i)$: The slope of Y to X for different values of Z.

Equation 3 represents the linear functional form with $(b_0 + b_2 Z_i)$ representing the intercept and $(b_1 + b_3 Z_i)$ representing the slope of Y_i to X_i ; therefore at different values Z, Y_i to X_i slope is expected to have different values. The moderator coefficients were expressed

as b because their interpretation is supposed to be based on un-standardized values.

RESULTS AND DISCUSSION

The study target population was 215 out of which 45 were used for piloting, and were administered to the university management to participate in the study. From this total, data were recovered from 210 respondents, or questionnaires, out of which seven did not adequately filled and were dropped. The final response was 203 questionnaires, which gives a response return of 94.41%, from which 38 was used for piloting.

The final objective of the study was to establish the moderating effect of organizational culture on Quality Management System adoption and organizational performance on public universities in Kenya. The study hypothesis is, "Organizational culture does not have a significant moderating effect on the relationship between Quality Management System adoption and organizational performance on public universities in Kenya". Three steps were taken to achieve the objective. First, an interaction term was computed. The interaction term was between the independent variable (Quality Management System adoption) and the moderator variable (organizational culture). An overview of the descriptive statistics measuring the means and standard deviations of the three variables included in the model was then presented. These include the dependent variable (organizational performance), the independent variable (quality management system adoption) and finally, the interaction between Quality Management System Adoption and organizational culture. The results are presented in Table 1.

From the findings in Table 1, the overall sample response remained 165. The minimum and maximum means for the organizational performance and organizational culture were 2.01-4.73 and 1.73-4.60, respectively. For the organizational culture, the mean range was 5.42-21.69. The actual mean for organizational performance was high ($M=3.45$, $SD=0.60$); that for organizational culture slightly higher ($M=3.49$, $SD=0.63$) while that of the interaction term was much high ($M=12.71$, $SD=4.06$) since it was attained after multiplying the mean scores of the dependent and independent variables.

For the objective, testing the null hypothesis was stated as $H_0: \beta_1 = 0$. There are no significant moderating effects of organization culture on Quality Management System adoption and organizational performance on public universities in Kenya. This hypothesis was tested and actualized by use of Multiple Regression Analysis (MRA). The study tested the interaction between quality management system adoption and organizational culture. This procedure involved hierarchical regression which entailed entering the mean composite quality management system adoption and meant corporate

culture in step 1, and then introducing the interaction variable (which is the cross product between quality management system adoption and Quality organizational culture) in step 2. To reduce threats of multi-collinearity by reducing the size of any high correlation of service quality and quality management practices with the new interaction, standardized values were used for the interaction variable.

Table 2 shows the standardized (β) and un-standardized (β) coefficients for quality management system adoption and organizational culture with and without the interaction term. The un-standardized coefficient was used while reporting coefficient for moderation as they represent simple effects rather than the main influences that are exposed in the additive regression model (Whisman and McClelland, 2005). Without the interaction term β results for Organizational Culture had a strong significant contribution to organizational performance ($\beta=0.805$, $t(201)=5.138$, $p=0.000$). In the second Model 2, both Organizational Culture and the interaction term had a significant contribution to the model with ($\beta=0.348$, $p=0.000$) for organizational culture and ($\beta=0.565$, $p=0.000$) for the interaction term respectively. The final model that consisted of the three variables revealed that Organizational Culture affected, ($\beta=0.826$, $p=0.000$). At the same time, the interaction term did not have a significant effect. Still, Organizational Culture moderated the relationship between Quality Management System Adoption and organizational performance, resulting in an impact of ($\beta=0.593$, $p=0.030$). When interaction terms were introduced for management system adoption, organizational culture (moderator) and the interaction term, the β coefficient are 0.492, 0.782, and 0.050, respectively. As a result, the hypothesized moderation model was confirmed to be;

$$\hat{Y} = -0.0400 + 0.492X + 0.782Z + 0.050XZ \quad (4)$$

In the model, the intercept and the XY slope were influenced by Z (the moderate variable) intercepts and slopes of line $\hat{Y} X$. The un-standardized co-efficient of the moderator model b_3 is 0.05. This means that for each unit increase in Z, the slope relating X to Y increases by 0.50 units. This further means that, as Quality management system adoption levels increases by one unit, the organizational performance levels increases by 0.05.

Hierarchical multiple regression models were used to carry out the moderation analysis using these three variables. In the first step, the organizational performance was regressed against organizational culture variables to control for it, simply by entering the organizational culture variable in the model at first. In the second step, the interaction term was entered in the model, and finally quality management system adoption.

The findings in Table 3 indicate the moderation results from the three models. In the first model, the moderator variable (organizational culture) indicated a strong positive

Table 1. Overview of quality management system adoption, organizational performance and interaction term.

Variable	N	Minimum	Maximum	Mean	Standard Deviation
Mean Organizational Performance	165	2.01	4.73	3.45	0.60
Mean Organizational Culture	165	1.73	4.60	3.49	0.63
interaction term	165	5.42	21.69	12.71	4.06
Valid N (listwise)	165				

Source: Research data (2017).

Table 2. Model coefficients the moderating effect of organization culture on the relationship between Quality Management System adoption and organization performance on public universities in Kenya.

Coefficient		Unstandardized coefficients		Standardized coefficients	T	Sig.
Model		B	Std. error	Beta		
1	(Constant)	0.800	0.156		5.138	0.000
	Mean Organizational Culture	0.761	0.044	0.805	17.310	0.000
2	(Constant)	1.241	0.139		8.915	0.000
	Mean Organizational Culture	0.330	0.062	0.348	5.312	0.000
	interaction term	0.084	0.010	0.565	8.608	0.000
3	(Constant)	-0.400	0.763		-0.524	0.601
	Mean Organizational Culture	0.782	0.216	0.826	3.623	0.000
	interaction term	0.050	0.062	-0.336	-0.806	0.421
	Mean Quality Management System Adoption	0.492	0.225	0.593	2.186	0.030

^aDependent Variable: Mean Organizational Performance.

correlation with corporate performance ($R=0.805$). The R square value indicated that Organizational Culture accounted for 64.8% change in the organizational performance, (R square =0.648) while the adjusted R square value after the shrinkage revealed a slightly lower value, 64.6% due to the actual population measure (Adjusted R square = 0.646). These results were significant, implying the overall model 1 was statistically significant, and the results were not by chance but strictly due to precise model fit ($F(1, 201)=146.210$, $p=0.000$).). In Model 2, the findings indicate that both moderator variable and interaction term accounted for 75.8% significant change in organizational performance (R square =0.758, $p=0.000$, $F(1, 162)=74.099$). Finally, in Model 3, Quality Management System Adoption accounted for a significant 0.7% change in organizational performance (R square change =0.007, $p=0.030$, $F(1,161)=4.777$). This implies that organizational culture moderated the relationship between Quality Management System Adoption and organizational performance positively.

They were anchored on structural contingency theory and the conceptual study framework, which highlights that organizations have failed with their quality initiatives and that one possible reason is lack of understanding of

the role of Quality Management System on performance. An introduction of a moderator into a model between the independent and dependent variables would influence the effect of the relationship. To Iqbal et al. (2012), organization culture is that glue that combines the non-human resources to that of human resources in the organization to establish teamwork and excellent performance. From this study finding, Quality Management System adoption has a robust significant contribution to organizational performance. Moreover, on the introduction of organization culture, Quality Management System adoption was reduced to a unique negative contribution, which implies that a change in the organizational culture could lead to a reduction in the organizational performance.

These findings are inconsistent with the results of Wanyoike (2016), Iqbal et al. (2012) and Demirbag et al. (2006) that an introduction of a new variable leads to significantly sizeable positive moderation effect. Further, the findings are corroborated by Hussain and Younis (2015) who established that introduction of continuous improvement on leadership and performance leads to a partial moderation between organizational performance and construct of quality management practices. However, according to the studies of Sanders and Linderman

Table 3. Model summary on the moderating effect of organization culture on the relationship between Quality Management System adoption and organization performance on public universities in Kenya.

Model	R	R square	Adjusted R square	Std. error of the estimate	Change statistics				
					R Square change	F Change	df1	df2	Sig. F change
1	0.805 ^a	0.648	0.646	0.35857	0.648	299.645	1	163	0.000
2	0.871 ^b	0.758	0.755	0.29793	0.111	74.099	1	162	0.000
3	0.875 ^c	0.765	0.761	0.29452	0.007	4.777	1	161	0.030

^aPredictors: (Constant), Mean Organizational Culture. ^bPredictors: (Constant), Mean Organizational Culture, the interaction term. ^cPredictors: (Constant), Mean Organizational Culture, interaction term, Mean Quality Management System Adoption. Source: SPSS Data (2017).

(2014), and Demirbag et al. (2006), though there was a moderation effect on the introduction of a new variable, the moderation impact is partly due to external organization failure and other Quality Management System Variables.

The study findings contradict that of Roldán et al. (2017), whose study revealed the adverse effects of quality management on open innovation performance. However, this could be overcome by complementing the organization's learning style with that of its open innovation partner, particularly, its supply network, and, most importantly, obtaining information technologies compatible with those of its supply network members.

From the study findings, it is evident that organizational culture significantly and positively moderates the relationship between QMS adoption and organizational performance. On this basis H_3 which predicts that there are no significant moderating effects of organizational culture on QMS adoption and organizational performance on public universities in Kenya is rejected. The results of this objective imply that culture should be adhered to when introducing any new system to be able to identify any challenges and opportunities available for appropriate action.

Conclusion

The study sought to establish the moderating effects of organizational culture on Quality Management System adoption and organizational performance on public universities in Kenya. The null hypothesis (H_0) stated that there are no significant moderating effects of organizational culture on Quality Management System adoption and organizational performance on public universities in Kenya. This hypothesis was tested and actualized by use of Moderated Regression Analysis (MRA). It was based on the interaction between quality management system adoption and organizational culture using a hierarchical regression. The model includes quality management system adoption as the independent variable, organizational culture as the moderator and the interaction effect was significant. When compared with the reduced model, which only includes predictor variable and moderators, the addition of the interaction terms in

the full model significantly increases the R^2 . Therefore, in the final model, the overall percentage change in organizational performance is accounted for by quality management system adoption; the moderator term and the interaction term are more than the original R^2 value without the interaction term from 0.758 to 0.765 and was statistically significant. They were implying that organizational culture completely moderates the relationship between quality management system adoption and organizational performance rendering it meaningful.

The findings of this objective indicated that organizational culture had a moderating effect on this relationship. It, therefore, came out that even as the Quality Management System adoption improves the performance of the organizations, which are the public universities, organizational culture has a role to play. The introduction of organizational culture alters the Quality Management System adoption such that good values enhance better performance under the QMS. The finding provides evidence for invalidating the earlier stated null hypothesis that "there are no significant moderating effects of organizational culture on Quality Management System adoption and organizational performance on public universities in Kenya. Based on the above evidence, the study concludes that organizational culture increases the effect of Quality Management System adoption on organizational performance in public universities.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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