

Use of Quality Management Systems to Improve Instructional Management Practices in Tertiary Educational Institutions in Kenya

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Abstract

Since inception of International Organization for Standardization (ISO) Quality Management Systems (QMS), there has been a more prevailing effort by institutions of higher learning to document their procedures on the basis of ISO 9001:2008. This study assessed the status of ISO 9001:2008 QMS implementation among certified public Technical, Vocational Education and Training (TVET) institutions in Kenya. It also sought to establish the relationship between implementation of Quality Management Systems (QMS) and improvement in instructional management practices. The study set out two (2) null hypotheses to guide it. Quantitative research design was adopted for this study. Similarly, ISO 9001:2008 quality management principles offered theoretical guidance. At a confidence interval of 95%, an online sample size calculator was used to arrive at two hundred and seventy four (274) respondents out of nine hundred and forty five target (945) population. Proportionate stratified random sampling technique and an online list randomizer were used to select respondents in the selected TVETs to participate in the study. Hierarchical cluster analysis, independent samples t-test (ANOVA), and regression analysis were used to test the hypotheses in this study based on empirical data obtained gathered using a survey questionnaire of forty nine (49) questions from eleven (11) ISO 9001:2008 certified public institutions. Based on the agglomeration coefficient change, Tukey post-hoc test, and coefficient of determination (R^2), the two null hypotheses (H_{01} & H_{02}) were rejected at $p < 0.05$. Regression analysis showed that there is statistically significant relationship between implementation of ISO 9001:2008 Quality Management Systems and improvement in instructional management practices among TVET institutions at $p < 0.05$. The study recommends that all ISO certified TVET institutions should emphasis continued conformity to all the quality management standards in order to register improvements in pedagogy and instructional management practices.

Key words: *Instructional Management Practices, Tertiary Institutions*

Introduction

Most organizations in the world continually strive to improve their capacities in terms of delivery of services. The primary development goal of any organization in the contemporary world is to achieve broad based sustainable improvements in the quality of services that it offers to customers (Kobia & Mohammed, 2006). The quality revolution is sweeping its way through most organizations globally (Van De Berghe, 1998). This could be the reason why many organizations in the world over have either embraced ISO certification or are in the road map to quality certification (Chow-Chua, Goh & Wan, 2003). Although originally conceived for

the manufacturing sector, the ISO standards have increasingly spread to other sectors of the economy, especially the education sector. There has been a more prevailing effort by institutions of higher learning to document their procedures on the basis of ISO quality management systems. In many countries, the application of ISO standards as a quality management system flourishes as an efficient and scientific tool for maintaining standards in public education (Bae, 2007).

Statement of the Problem

In Kenya today, the application of ISO standards as a quality management system continues to flourish as an efficient and scientific tool for maintaining standards in public education. In this quest, by the end of the year 2012, approximately thirty one (31) educational institutions had been certified on ISO 9001:2008 standards by KEBS, twelve (12) of which are public TVET institutions (<http://www.kebs.org>). According to Nyerere (2009), TVET institutions continue to face quality related challenges despite most of them being certified under ISO standards.

Empirical studies and findings by Sakthivel, Rajendran, & Raju, 2005; Antonio & Nuno, 2012; have shown the potential benefits which accrue from ISO 9001:2008 certification. Contrary to positive findings on the impact of ISO certification documented above, there is a school of thought that argues that there are no explicit claims for benefits of ISO, other than the fact that it is an internationally recognized standard (Bae, 2007; Zailani, Jauhar, & Othman, 2008).

In the light of these inconsistent findings, perhaps the view held by Peter, To, & Billy (2009) that it is possible that certified organizations may not implement the eight (8) ISO 9001:2008 principles in similar extents, and therefore, exhibit varying patterns of implementation resulting in different performance outcomes, holds the key to this puzzle.

This study, therefore, sought to fill the gap in literature on the status of ISO implementation among certified public TVETS and to establish the relationship between implementation of ISO 9001:2008 QMS and instructional management practices in those institutions.

Theoretical and Model Underpinnings

This study was based on ISO 9001:2008 Quality Management Principles (ISO, 2008), Juran's Quality Management Approach (Juran and Gryna, 1993) and SERVQUAL scale in higher education (Oliveira and Ferreira, 2009).

The ISO 9001:2008 quality management principles are comprehensive and fundamental rules and beliefs for leading and operating an organization aimed at continually improving performance by focusing on customers that receive a service/product. The eight (8) quality management principles are: customer focus, the role of leadership, involvement of people, process approach, system approach to management, continual improvement, factual approach to decision making, and mutual beneficial supplier relationship (ISO, 2008).

This study was also based on Quality Management Approach, Juran's Trilogy proposed by

Juran and Gryna (1986). According to the proponent of this model, quality management has three (3) basic processes: quality planning, quality control, and quality improvement. This approach to management defines quality as “customer satisfaction” or “fitness for use”.

This study is also based on SERVQUAL scale developed by Parasuraman, Zeithaml and Berry (1985) for measuring service quality and later adapted and applied for measuring service quality in institutions of higher learning by Oliveira and Ferreira (2009). The proponents of this quality service instrument consider quality as a customer satisfaction index for any service and an attribute in consumer choices. The SERVQUAL scale is composed of five (5) broad based dimensions used as judgment criteria for services. The model seeks to compare the difference between perceptions of service expected and actual service received, based on tangibility, reliability, responsibility, empathy, and security dimensions.

Purpose of the Study

The study sought to assess the status of ISO implementation among certified public TVETS and to establish the relationship between implementation of ISO 9001:2008 QMS and instructional management practices in these institutions.

Hypothesis of the Study

- H01 There are no statistically significant variations in implementation of Quality Management Systems among certified public TVET institutions in Kenya.
- H02 There is no statistically significant relationship between implementation of Quality Management Systems and improvement in Instructional Management Practices among certified public TVET institutions in Kenya.

Literature Review

Available literature indicates that ISO certification enhances Total Quality Management (TQM) practices and organizational competitiveness.

Antonio & Nuno (2012) carried out a study on the impacts and success factors of ISO 9001 in educational institutions based on experiences from vocational schools in Portugal. The study specifically examined the benefits, disadvantages and success factors associated with the adoption of ISO 9001:2008 using an a priori model. The results of the study revealed that ISO 9001 adoption in vocational schools lead to the following four (4) constructs of internal benefits: process standardization and improvements, generation of dynamics of continuous improvement, provision of strategic focus and foundation for planning, and increased involvement of people. Two (2) constructs of external benefits revealed from the study include: improved market credibility, and promotion of competitiveness. From the study, the three (3) constructs on disadvantages of ISO 9001 adoption which were revealed are: increased bureaucracy, difficulties with interpreting and adapting the standard, and that the process was demanding and time consuming. The study further found out that adoption of ISO 9001 leads

to the following constructs of success factors: quality team, management commitment and support, communication with and involvement of all members, and previous level and preparedness of the organization. The study recommended that in order to ensure a fruitful implementation of the standard, there was need to compare the outcomes of various implementations of the standard, which was the intention of this study.

Sakthivel et al. (2005) did a study on TQM implementation and students' satisfaction of academic performance in India. The study aimed at developing a TQM model of academic excellence and find out whether there is relationship between TQM implementation and students' satisfaction of academic performance. Data was collected from seventy three (73) students from ISO certified privately owned engineering institutions and one hundred and eighty three (183) students from non ISO certified privately owned engineering institutions. Statistical measures of independent t-test showed that ISO certified engineering institutions offered better quality service than non ISO certified engineering institutions. However, because the study was carried out in privately owned institutions, its findings may not be generalized to publicly owned institutions. Perhaps to enrich the study, perceptions from employees needed to have been sought, as has been covered in this study.

Zailani, Jauhar, & Othman (2008) compared service quality in higher education between ISO certified and non ISO certified colleges in Malaysia. A comparison was made based on perceptions of students in ISO certified and non ISO certified colleges towards: quality of teaching, quality of learning processes, quality of support system, quality of resources, and quality of operation management. Using independent samples t-test, the study found out that students from ISO certified and non ISO certified colleges had no significant difference in their perception towards the quality of services provided in their colleges.

Bae (2007) compared performance of students in state-mandated tests and school attendance between ISO certified and non ISO certified schools in the United States of America (USA). Using Hierarchical Linear Modeling (HLM), the study concluded that ISO 9000 does not lead to higher students' achievement, because there was no significant difference in students overall achievement between ISO certified and non ISO certified schools. On the contrary, the study found out that although ISO 9000 certification may not improve student achievement, it promotes students' school attendance. In the light of these inconsistent findings, there was need to find out the status of ISO implementation among certified public TVET institutions and to establish the relationship between implementation of ISO 9001:2008 QMS and instructional management practices in those institutions

Methods

This study was conducted in ISO 9001:2008 certified public TVET institutions in Kenya. As at the end of the year 2012, there were twelve (12) ISO 9001:2008 certified public TVET institutions in Kenya. These TVETs had approximately one thousand and sixty two (1,062) staff. However, for the purposes of this study, simple random sampling was used to select eleven (11) out of the twelve (12) ISO certified public TVET institutions to participate in the study. The eleven selected TVETs had nine hundred and forty five (945) members of academic staff. One (1) certified public TVET institution that did not participate in the study was used to pilot the instruments.

An online sample size calculator was used to determine the sample size that would precisely reflect the target population (www.surveysystem.com/sscalc.htm). At a confidence level of 95%, a sample of two hundred and seventy three (274) was arrived at. Stratified simple random sampling technique, and more specifically an online list randomizer was used to proportionately select respondents in every selected TVET institution (stratum) to participate in the study (<https://www.random.org>).

This study used the following two instruments; questionnaires and document analysis. The main instrument was the questionnaire which was administered on two hundred and seventy four (274) members of staff in order to obtain information on implementation of quality management systems and instructional management practices. Two hundred and fifty (250) questionnaires were duly filled and returned. The questionnaires comprising of forty nine (49) questions were closed ended and in the Likert type of scale ranging from: Weak (1), Satisfactory (2), Good (3), Very Good (4), Excellent (5) for the first part of the instrument and ‘Strongly Disagree’ (SD), Disagree (D), Undecided (U), Agree (A), Strongly Agree (SA) for the second, third and fourth part of the questionnaire. Document analysis was used to find out the number of staff in the participating institutions.

Independent Variable - ISO 9001:2008 Quality Management Principles

This study operationalized quality management principles in terms of specific requirements for quality management system where TVET institutions demonstrated their ability to provide products and services that meet customer, statutory, and regulatory requirements, and enhance customer satisfaction. The independent variable was measured in terms of customer focus, leadership, involvement of people, process approach, systems approach to management, continual improvement, factual approach to decision making, and mutually beneficial supplier relationship. Cronbach’s Alpha test revealed that the responses were internally consistent, with results ranging from 0.856 (Process approach) to 0.944 (Security dimension). Shapiro-Wilk test showed that the responses were normally distributed (sig.

0.827), while multiple regression showed that the responses were free of multicollinearity problem with Variance Inflation Factor loadings ranging from 1.961 (Leadership) to 8.201 (Continual Improvement).

Dependent Variable - Instructional Management Practices

In this study, this term was used to mean those activities in TVET institutions that project academic activities in terms of availability of instructional materials, assessment and evaluation, and pedagogy and instructional preparation. Questionnaires comprising of fourteen (14) questions were used to obtain quantitative data on the following three constructs: availability of instructional materials, assessment and evaluation, and pedagogy and instructional preparation. Cronbach’s Alpha test revealed that the responses were internally consistent, with results ranging from 0.938 (assessment and evaluation) to 0.898 (availability of instructional materials) and 0.889 (pedagogy and instructional preparation). Shapiro-Wilk test showed that the responses were normally distributed (sig. 0.837).

Model and Analysis

In order to establish whether there were statistically significant variations in ISO 9001:2008 QMS implementation among certified public TVET institutions, hierarchical cluster analysis was used to create clusters and the agglomeration coefficient was used to select the best number of stable clusters. One way ANOVA was used to determine whether the means of the clusters were significantly different on the basis of QMS implementation at $p < 0.05$ and a Tukey post-hoc test was carried out to determine where the mean differences in QMS implementation lie.

To establish whether there is relationship between ISO 9001:2008 QMS implementation (independent variable) and improvement in instructional management practices (dependent variable) in public TVET institutions, the aggregate mean scores of the independent variable were regressed on the aggregate mean scores of the dependent variable: $Y = \beta_0 + \beta_1 X_1 + \epsilon$, Where; Y = Aggregate mean score of dependent variable, β_0 = y-intercept/constant, β_1 = Regression coefficient (beta), X_1 = Aggregate mean score of independent variable, ϵ = error term-random variation due to other unmeasured factor.

Summary of Findings

Situational Analysis on Implementation of Quality Management Systems Hierarchical cluster analysis showed that a clear demarcation of clusters based on sudden change in agglomeration coefficient occurred when the groups changed from a three (3) cluster solution to a four (4) cluster solution as shown in Table 1.

Table 1: Summary of Agglomeration Coefficient

NUMBER OF CLUSTERS	COEFFICIENT LAST STEP	COEFFICIENT THIS STEP	CHANGE
2	1690.492	1098.736	591.756
3	1098.736	700.142	398.594
4	700.142	541.560	158.582
5	541.560	455.125	86.475

Based on the three clusters created, one hundred and sixty (160) respondents were clustered in cluster 1, while there were seventy one (71) in cluster 2 and nineteen (19) in cluster 3. One Way ANOVA results revealed that the three clusters were significantly different on the basis of implementation of all the eight (8) Quality Management Principles at $p < 0.05$. Tukey post-hoc multiple comparison results showed that implementation of all the eight Quality Management Principles were significantly different across the three clusters at $p = 0.000$. Given the distinct implementation levels in all ISO 9001:2008 Quality Management Principles as inferred by the F test ratios, $p = 0.000$, this study, therefore, rejected H_0 . Table 2 shows a summary of the results.

Table 2: Cluster Centres Based on Eight (8) Quality Management Principles

ISO 9001:2008 QMS	CLUSTER CENTRE					
	CLUSTER 1 (N=160)		CLUSTER 2 (N=71)		CLUSTER 3 (N=19)	
	CENTRE		CENTRE		CENTRE	
	\bar{X}	SD	\bar{X}	SD	\bar{X}	SD
Customer Focus	2.46	.699	3.61	.520	1.00	.00
Leadership	2.58	.748	3.49	.504	1.00	.00
Involvement of People	2.97	.739	3.83	.414	1.00	.00
Process Approach	2.86	.659	3.82	.390	1.00	.00
Systems Approach to Management	2.65	.478	3.96	.572	1.00	.00
Continual Improvement	2.88	.467	4.27	.755	1.00	.00
Factual Approach to Decision Making	2.77	.423	3.56	.996	1.00	.00
Mutually Beneficial Supplier Relationship	2.86	.588	3.08	.671	1.00	.00

Relationship between Implementation of QMS and Improvement in Instructional Management Practices

The aggregate mean scores from data on implementation of ISO 9001:2008 Quality Management Systems (independent variable) were regressed on the aggregate mean scores from data on improvement in instructional management practices (dependent variable). The results showed that Quality Management Systems significantly predict instructional management practices, and that the regression model is a good fit of the data, $F(1,245) = 226.274, p < 0.05$ as shown in Table 3.

Table 3: Significance Level of Simple Regression Analysis of QMS on IMP

ANOVA ^b						
Model		Sum of Squares	df	Mean Squares	F	Sig.
1	Regression	81.866	1	81.866	226.274	.000 ^a
	Residual	88.641	245	.362		
	Total	137.565	246			

- a. Predictors: (constant), Quality Management Systems
- b. Dependent Variable, Instructional Management Practices

The model also showed that R² (coefficient of determination) is 0.480, which means that approximately 48.0% of the variation in instructional management practices is explained by Quality Management Systems as shown on Table 4.

Table 4: Model Summary for Simple Regression of QMS on IMP

Model	R	R Square	Adjusted R Square	Standard Error
1	.693a	.480	.478	.602

a. Predictors: (constant), Quality Management Systems.

Because Quality Management Systems significantly predicted variations in organizational management practices, $F(1,245) = 226.274$, $p < 0.05$, $R^2=0.480$, H_0 was therefore safely rejected.

On the basis of the results on Table 5, the following simple regression equation that can be used to estimate the instructional management practices in ISO certified public TVET institutions for a given level of QMS implementation is given by: $IMP = 1.044 + 0.799QMS$ Where; IMP = Instructional management practices, QMS = Quality Management Systems, 1.044 = y-intercept-constant, 0.799 = an estimate of the expected improvement in instructional management practice corresponding to increase in implementation of Quality Management Systems.

Table 5: Beta coefficient of Simple Regression of QMS on IMP

Model		Coefficients ^a		t	Sig.	Tol.	VIF
		Unstandardized B	Standardized Beta				
1	(Constant)	1.044	.156	6.675	.000		
	QMS	.799	.693	15.042	.000	1.000	1.000

a. Dependent Variable, Instructional Management Practices

Discussion and Conclusion

Variation in Implementation of Quality Management Systems

Most organizations are more concerned with successful implementation of the standards after certification and would prefer to be rated better than their ISO certified competitors in terms of quality (Peter, To, & Billy (2009). Although ISO 9001:2008 is widely considered as a replicable management standard for organizations to accomplish quality service and customer satisfaction, it cannot be assumed that it is homogenously practiced across all ISO 9001:2008 certified institutions. Using ISO 9001:2008 Quality Management Principles as variables, this study used Hierarchical clustering method and change in agglomeration coefficient to separate the data into groups. One-Way (ANOVA) and Tukey post-hoc were used to test the difference between the cluster means, therefore, the differences between the F ratios made it possible to draw the general conclusion that the implementation levels of all ISO 9001:2008 Quality Management Principles were significantly different among the TVET institutions. Given the distinct implementation levels in all ISO 9001:2008 Quality

Management Principles as inferred by the F test ratios, this study therefore, rejected H01. As such the results inferred that there is statistically significant variation in implementation of Quality Management Systems among certified TVET institutions. The three clusters represent TVET institutions with varying levels of commitment towards ISO 9001:2008 standards which agrees with literature by Lee, To, & Billy (2009).

Implementation of Quality Management Systems and Instructional Management Practices

Instructional management practices refer to aspects of course related academic activities designed to provide learners with knowledge and skills. It is a framework or philosophy for effective teaching that involves providing students with different avenues to acquiring content; to processing, constructing, or making sense of ideas; and to developing teaching materials and assessment measures to enable students learn effectively, regardless of their individual differences.

According to Ing (2008) there is a new push for quality instructional management practices in schools, and yet Horng, Loeb & Mindich, (2010) point out that such instructional improvement is only tenable in schools with high quality teachers who are adequately and appropriately supported with learning resources to be successful in their work. From the literature review, this study teased out the following distinct generic instructional management practices that are applicable to institutions of higher learning; Availability of Instructional Materials, Assessment and Evaluation, Pedagogy and Instructional Preparation. Historically, standardization has been one of the best mechanisms to maintain quality in schools, and adoption of ISO 9001:2008 is the most recent attempt to improve on quality and standards in schools. Empirical studies have shown that organizations which have adopted quality certification have flourished in maintaining and improving their academic standards.

Using Quality Management Principles as independent variables, this study used simple regression to establish the relationship between Quality Management Principles and instructional management practices. The findings showed that there is statistically significant positive linear relationship between implementation of ISO 9001:2008 Quality Management Principles and improvement in instructional management practices (p-value = 0.000). These findings support the findings and literature by Bae (2007); Sakhthivel, Rajendran, & Raju (2005); Van De Berghe (1998). From the results, the following simple regression equation can be used to estimate the instructional management practices of ISO certified public TVET institutions for a given level of QMS implementation: $IMP = 1.044 + 0.799 \text{ QMS}$.

Recommendations

Based on the above findings the following recommendations are presented: In order to improve on homogeneity in implementation of quality management systems, ISO certified TVET

institutions should emphasize continued compliance with all the eight (8) mutually related quality management principles. This is because ISO certification emphasizes

complete implementation of all standards.

ISO certified TVET institutions should emphasize continued conformity to all the quality management standards in order to register improvements in; availability of instructional materials, pedagogy and instructional preparation, and assessment and evaluation.

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