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CONTENTS

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INTRODUCTION

REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESIS (ES)

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

LIMITATIONS

SCOPE FOR FURTHER RESEARCH

REFERENCES

APPENDIX/ANNEXURE

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FACTORS INFLUENCING CORE QUALITY MANAGEMENT PRACTICES (THE CASE OF SOME SELECTED COLLEGES OF ETHIOPIAN MINISTRY OF AGRICULTURE)

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ABSTRACT

In this study the researcher empirically investigated factors influencing core quality management practice. Considerable effort has been devoted over the years by many organizations to adopt quality management practices, but few studies have assessed factors that influence core quality management practices in EMoA ATVET Colleges. The problem addressed in this study was to investigate the factors influencing core quality management practice in a single important ATVET projects (i.e., EMoA ATVET Colleges). A survey instrument was adapted from business quality literature and was sent to 120 functional managers in three EMoA ATVET colleges. All the questionnaires were responded with a 100% response rate. Factor analysis using confirmatory factor analysis was performed to assess 35 survey items designed to measure 7 dimensions of EMoA ATVET College quality management practices. The researcher is 95 percent confident to say that all loadings and correlations between the indicators and the latent variables are significant (p< 0.05) and all have a loading of 0.4 or greater with the exception of eight indicators (items) under five constructs. After examining the factor loading, the researcher analyzes the data for suggested modification indices, then model fit result for this study depicts a better improvement by comparing the parent model with a nested model. The framework was subjected to validity and reliability analysis and the result shows meeting the criteria satisfactorily. Finally, after confirming the measurement model used in this study, the researcher analyzed the relationship between top management commitment, information technology responsiveness, process management, employee management, suppliers quality management, information analysis and customer orientation. Out of 21 relationships only ten correlation results are statistically significant at (p=0.05) level. Also from the thirteen hypothesized relationships only five relationships were significant at (p=0.05) level. The results of this study showed that the pre-specified quality management practice constructs are resulted into the development of an instrument to assess quality management practices in EMoA ATVET Colleges. Furthermore, this study extended the scope of existing quality management literature to the education sectors in Ethiopia and contributed to theory about the nature of quality management practices.

KEYWORDS
Factor analysis, Quality Management Practices, Amos, Latent variables.

INTRODUCTION
With the greater successes of Japanese companies during the 1980s, companies all over the world found that it was necessary to have good quality management practices in order to stay competitive (lagrosen, 2002). The type of organizations that use Total Quality Management (TQM) varies from large to small, private to public and from manufacturing to service organizations. According to (hodgetts, 1999), all enterprises regardless of size and financial status, are involved in the quality revolution. Organizations need to understand how to implement Quality Management (QM) to achieve the maximum benefit. Taking a one-size fits all approach to QM may not lead to optimal outcomes. Different organizations may need different approaches to QM. A study on QM implementation in hospitals, found that hospitals that customized the QM practices had higher performance than hospitals that adopted standardized approaches to QM. However, their study did not provide an explanation about how organizations can customize QM practices (Westphal, Gulati, & Shortell, 1997).

Other researchers examined QM factors for ISO 9001:2000 implementation centered on eight quality principles that considered as critical for the TQM implementation outcomes. Based on deeper analysis they state the most critical factors for TQM implementation results as those related with quality data and reporting, customer satisfaction, human resource utilization, management of process control, training and education, management commitment, continuous improvement, leadership, strategic quality planning, performance measurement, customer focus, and contact with suppliers and professional associates (Lewis, Pun, & Lalla, 2006). Also it is obvious that IT has an important role to play in the area of quality management. According to (Pearson, Mccahon, & R.T, 1995), IT responsiveness to the needs of TQM is a critical success factor in the implementation of such an information-intensive management system.

According to (Kanji & Malek, 1999), there are ten TQM practices: top-management commitment, customer focus and satisfaction, quality information and performance measurement, human resource management, employee involvement, teamwork, process management, quality assurance, zero defects, and communication. According to (Toensmeier, 1997), the main obstacles or barriers that organizations face in implementing any quality system are lack of available resources to implement and maintain a quality assurance system, lack of financial capacity to meet the implementation and maintenance costs, lack of time, and a lack of experience amongst managers.

The aim and philosophy of quality management is not the measurement of quality performance as an end in itself, but the continual improvement of quality through a process of cultural and organizational change (Tesema, 2008). It is people-driven and results are evidenced in terms of improved teamwork, company morale and organizational climate, resulting in improved productivity and profitability (Birhanu, 2011).

Living behind the debate on applicability of quality management practices in all the sectors now it is understandable by most of the stakeholders in any organization that quality related problems are the stumbling block for the majority of the industries. Furthermore, quality related problems were apparent in all the sectors (Birhanu, 2011).According to (Birhanu, 2011), Quality awards and ISO 9000:2000 Quality Management System are the two major instruments or frameworks or models of quality management. In addition he reported that Ethiopian organizations competing for the Ethiopian Quality Award are evaluated on seven criteria: leadership, policy and strategy, resources management, process management, customer satisfaction, business performance and impact on the society.

LITERATURE REVIEW
According to (Pfeffer & Coote, 1991), the word "quality" has been derived from the Latin word qualis, meaning, "what kind of". With a wide variety of meanings and connotations attached to it, quality is a difficult and elusive term to define, having thus been referred to as a "slippery concept". It is slippery because it changes in meaning with the context or point of view. The word implies different things to different people. It has, thus, been defined with different

perspectives and orientations, according to the person, the measures applied and the context within which it is considered. Generally, quality is fitness for the intended purpose.
The theory of quality management has been developed from three areas: contributions from quality leaders (Deming, 1986; Juran J., 1986), formal evaluation models (e.g., Ethiopian Quality Award, EFQM, and MBNQA) and measurement studies (Flynn et al., 1994; Saraph et al., 1989). Based on these contributions, TQM consists of a number of elements, which may be grouped into two dimensions: the managerial system and the technical system (Yen-Yu, 2014) or the 'soft' and 'hard' parts (Ayman, 2013). Quality management is a method for ensuring that all the activities necessary to design, develop and implement a product or service are effective and efficient with respect to the system and its performance (Deming, 1986). Quality management (QM), also called total quality management, evolved from many different management practices and improvement processes. QM is not specific to managing people, but rather is related to improving the quality of goods and services that are produced in order to satisfy customer demands. According to (Bank, 1992), Total Quality Management (TQM) refers to management methods used to enhance quality and productivity in organizations, particularly businesses.
The ISO 9000 series of standards is the international standard for quality management. The objective of this series of standards is to aid supplier quality assurance and to provide a common, authoritative and widely accepted standard by which to evaluate and compare the potential of firms to meet acceptable levels of quality and reliability. The word potential is vital here, since it looks at the system and not the product (Gill, 2009). In addition, Gill stated that ISO 9000 series were harmonized with BS5750 in 1987 and have been revised twice up to their current state. ISO 9000 usage has more than doubled from 457,834 in December 2000 to 1,064,785 in December 2009. It is clearly popular, and there are a variety of possible reasons for individual organizations to adopt the standard (ISO, 2014).
Another researcher Kanji G., (2001) asserted that top-management commitment is the fundamental driver of business excellence. Further, studies showed that top-management commitment as one dimension of quality management practice (Arumugam V. O., 2008; Prajogo D. B., 2004).The leaders' role has become so important in successful implementation of quality initiatives in firm and most quality models take leadership as a separate variable to measure QM practices (Prajogo D. &., 2008). Leadership is very important. Any text on Quality Management or indeed any major initiative will confirm this fact.
According to Zakuan et.al., (2010), effective supplier quality management can be achieved by cooperation and long term relationship with the suppliers. This argument is also supported by(Zineldin, 2000), who found that developing supplier partnership and long-term relationships can increase the organization competitiveness and thus improve performance. Supplier quality management has been identified as an important dimension of quality management practices, especially with regard to the manufacturing firms (William, Andrew, & Richard, 2009).
Deming claimed that involvement and participation of employees at all level is must to improve the quality of the current and future product or service. Even non-managerial employees can make significant contributions when they are involved in quality improvement processes, decision making processes, and policy making issues (Sadikoglu E. &., 2010; Ooi K. A., 2007b). A research conducted by Prajogo D. I., (2005) revealed the importance of information and its contribution to quality performance. Similarly, Sit et al., (2009) also indicated that information and analysis have a significant effect on customer satisfaction. Information and analysis also helps an organization to ensure the availability of high quality, timely data and information for all users like employees, suppliers, and customers (Teh et al., 2009; Lee et al., 2003).

STATEMENT OF THE PROBLEM

According to(Engelkemever, 1993), QM can be applied as a means for improving student/ staff morale/ increasing productivity, and delivering higher quality services to both internal and external customers. This proposes the possible adoption of commercially based approaches such as TQM, ISO Series, BPR and kaizen in a service sector like Technical, Vocational, Educational and Training Colleges (Richard et.al., 2010). Although Educational Institutions are able to adopt many of the principles of QM, it is reasonable to expect some problems when applying them to a different organizational structure in the commercial environment(Tam, 2002).
According to(Daniel & Fasika, 2003), most literatures are revolved around manufacturing organizations and there are only few empirical researches available in Ethiopia concerning the study of factors influencing QM practices in service sector, particularly an educational institutions. Besides, a research conducted by Birhanu (2011) confirmed that the literature on quality management practice in Ethiopia is insufficient.
Important aspect to be recognized here is that although studies on factors influencing QM Practice were conducted for companies of all sizes in other countries, there is none actually focused on studying factors influencing core QM practices in Ethiopia, particularly in ATVET Colleges. In addition to this the researcher emphasized on factors that are considered to be a success factors in many other researches for successful implementation of core quality management practice in a way that fits the study area where clear failure of quality management implementation is observed. The colleges are rendering service through training and development agents to the country as a whole by engaging themselves simultaneously in production, which pose a big difficulty in coordinating quality management efforts designed to achieve customer orientation. So the researcher attempts to bridge the aforementioned empirical gap and mitigate the prevailing problems encountered by ATVET colleges by investigating factors influencing core quality management practice (customer orientation).

GENERAL OBJECTIVES

The general objective of this study is to assess factors influencing core quality management practice in MoA ATVET Colleges.

SPECIFIC OBJECTIVES

1. To investigate the underling structure of quality management practices constructs
2. To examine the relationship between quality management practices constructs.
3. To examine the influence of quality management constructs on core quality management practice construct

RESEARCH QUESTIONS

1. What is the underling structure of quality management practices constructs?
2. What is the relationship between quality management practices constructs?
3. Does quality management practice constructs influence core quality management practice?

SCOPE OT THE STUDY

This study was conducted on federally owned three MoA ATVET colleges in Ethiopia, namely, Ardaita, Alage and Agarfa from September to December 2014. The study focused on assessing factors influencing quality management practice through investigating the relationship between 35 observable exogenous items and endogenous latent variables constituting quality management practices constructs. The researcher delimits its scope only on seven constructs, which includes process management, employee management, supplier quality management, top management commitment, information technology responsiveness, information and analysis, where all this latent variables are measured using reflective measurement models.
The data for the study is collected from individual senior and functional managers of the colleges through a structured questionnaire. The population for this study encompasses only three ATVET colleges under the direct responsibility of MoA ATVET project office. This study area is purposively identified because the researcher acknowledges that they exhibit some level of implementation and initiatives on quality management systems using ISO 9001, 2008.
The researcher employed quantitative approach to deal with the analysis. The data obtained through a structured questionnaire were analyzed quantitatively. And the survey results were presented through descriptive and inferential statistics using IBM SPSS statistics software version 20 and IBM SPSS Amos version 20 employing Factor Analysis. Therefore, any of the analysis and finding of this research confined only to the selected study area.

LIMITATIONS OF THE STUDY

- All primary data were obtained from respondents through questionnaire so Response were based on the managers perception, thus research findings might have been biased. However these limitations in the study leave future ground for explorations and research on the subject.
- Because of time and financial constraints, the area coverage of this study was delimited to only three MoA ATVET Colleges. The targeted population numbers for this study is large. But the researcher tried to estimate a representative sample size for the purpose of maximizing the credibility of the study.
- On top of this, the conclusions and recommendations drawn by this study will be applicable only for Ministry of agriculture ATVET Colleges incorporated in the study.

RESEARCH METHODOLOGY

The type of research employed in this investigation is decripto-explanatory research. This type of research is used because it enables the researcher to carry out survey strategy. Survey strategy is usually associated with the deductive approach survey strategy is a popular and common strategy in business and management research and is most frequently used to answer who, what, where, how much and how many questions. Surveys are popular as they allow the collection of a large amount of data from a sizeable population in a highly economical way and it is, often obtained by using a questionnaire administered to a sample, allowing easy comparison. In addition, the survey strategy is perceived as both comparatively easy to explain and to understand (Jelke, 2009). In this research both primary and secondary data were used. Primary data were collected from the target respondents using structured questionnaire whereas the secondary data were gathered from the secondary sources such as reports, manuals, internal publications and books which help the researcher to gather theories and principles related to the topic of the research.

The total population of this study is 175 constituting three ATVET colleges' functional managers in MoA. To determine an appropriate sample size from the three strata of population, the researcher used stratified sampling technique provided by *Cochran (1977)* to determine a sample size from strata.

$$n_0 = \frac{(t)^2 * (s)^2}{(d)^2}$$

$$n = \left(\frac{(1.96)^2 * (1.25)^2}{(0.25)^2}\right)$$

Where

n = 96

n_0 = the required sample size: (?)

t = value for selected alpha level of 0.05 = 1.96 (the alpha level of 0.05 indicates the level of risk the researcher is willing to take that true margin of error may exceed the acceptable margin of error.)

s = estimate of standard deviation in the population = 1.25 (estimate of variance deviation for 5 point scale calculated by using 5 [inclusive range of scale] divided by 4[number of standard deviations that include almost all (approximately 98%) of the possible values in the range])

d = acceptable margin of error for mean being estimated = 0.25 (number of points on primary scale * acceptable margin of error; points on primary scale = 5; acceptable margin of error = .05 [error researcher is willing to except]) Taking into account previous research on this line of study area the researcher assumes 80 percent response rate and the researcher determine the drawn sample size required to produce the minimum sample size as 96/0.80 which results a *120 sample size.*

After identifying the sample size using the above equation the researcher need to allocate the estimated sample size to each strata college under the study to maximize the predictive power of the model. One method is proportional allocation. Thus the proportional allocation was done using the formula adapted from Kothari (2004). The formula is as follows:

$$N_h = \frac{nN_h}{N}$$

Where:

N_h = Proportional sample to the strata

n = Sample size determined using the formula provided by (Cochran, 1977)

N = target population

TABLE 1: SAMPLE SIZE DETERMINATION FOR EACH STRATUM

ATVET Colleges'	Number of managers	Proportional size
Ardaita	43	30
Alage	74	50
Agarfa	58	40
Total	**175**	**120**

Source: *Field Survey, (2014)*

As the table 3, in Appendix B indicates, Bartlett's test of sphericity is significant (p<0.05), which indicates the appropriateness of factor analysis. It was also suggested in different statistical books that Kaiser Meyer measure of sampling adequacy should be greater than 0.07(Tabachnick, 2007). In this study the measure indicates a value of 0.790 which indicates the achievement of the minimum suggested value for good factor analysis. So the researcher specified all this latent variables as it was suggested in (Lassaad, 2006; William et al., 2009; Kanagi, 2009). Therefore, the sampe size drawn by the researcher is adequate to represent the study population.

DATA COLLECTION METHOD

A structured interview questionnaire/ schedule/ was designed to gather primary data from senior and functional mangers of the selected colleges to collect the desired information within a limited period of time. To maintain the reliability and validity of the data, the researcher provided proper insight about the purpose of the study to the individuals from whom the data were collected.

Moreover, the researcher conducted a pilot survey by distributing the instrument to academicians and practitioners knowledgeable about the management of quality in order to assure the validity of the instrument developed. Participants in the pilot study constituted eight instructors from Ardaita ATVET College, one former ISO/ 9001 2008 team coordinator of Ardaita ATVET College and one employee of Ethiopian conformance assessment enterprise. The researcher asked these respondents to assess each item on the survey and to identify items that need to be reworded, items that have to be eliminated if they did not add value and items that should be added in order to adequately measure quality management in EMoA ATVET Colleges. Even though the researcher incorporated 43 items, according to the responses from pilot respondents only 35 items were into the final version. At the end, the study also used Cronbach's alpha to the

validity of instrument used to collect the data. As the results of Cronbach's alpha for all seven variables is more than 0.70, internal consistency of latent variables is strong (see table 2, in appendix A).

Many of the published studies assessed quality management practices using different instruments developed by such researchers as Saraph et al. (1989). However, the researcher of this study adapted the instrument from the works done by Lassaad et al., (2006); Zakuan et al., (2007); Kanagi (2009); William et al., (2009); Ayman (2013); Yen-Yu, (2014) because of lack of access to the original work of Sarpha et al.,(1989). To this effect, close-ended questions format with five-points Likert Scale was used (i.e., 1, 2, 3, 4 and 5), which indicates 'strongly disagree', 'disagree', 'undecided', 'agree' and 'strongly agree' respectively. The final questionnaire used in this study contained two sections. Section one contained questions regarding demographic characteristics which included (occupation, gender, and number of subordinates under their function). Section two consisted of statements relating to the latent variables of the study and it has 35 items related to: *Leadership, Information and analysis, Process management, Employee Management, Supplier quality management, Customer orientation and information technology responsiveness*.

METHOD OF DATA ANALYSIS

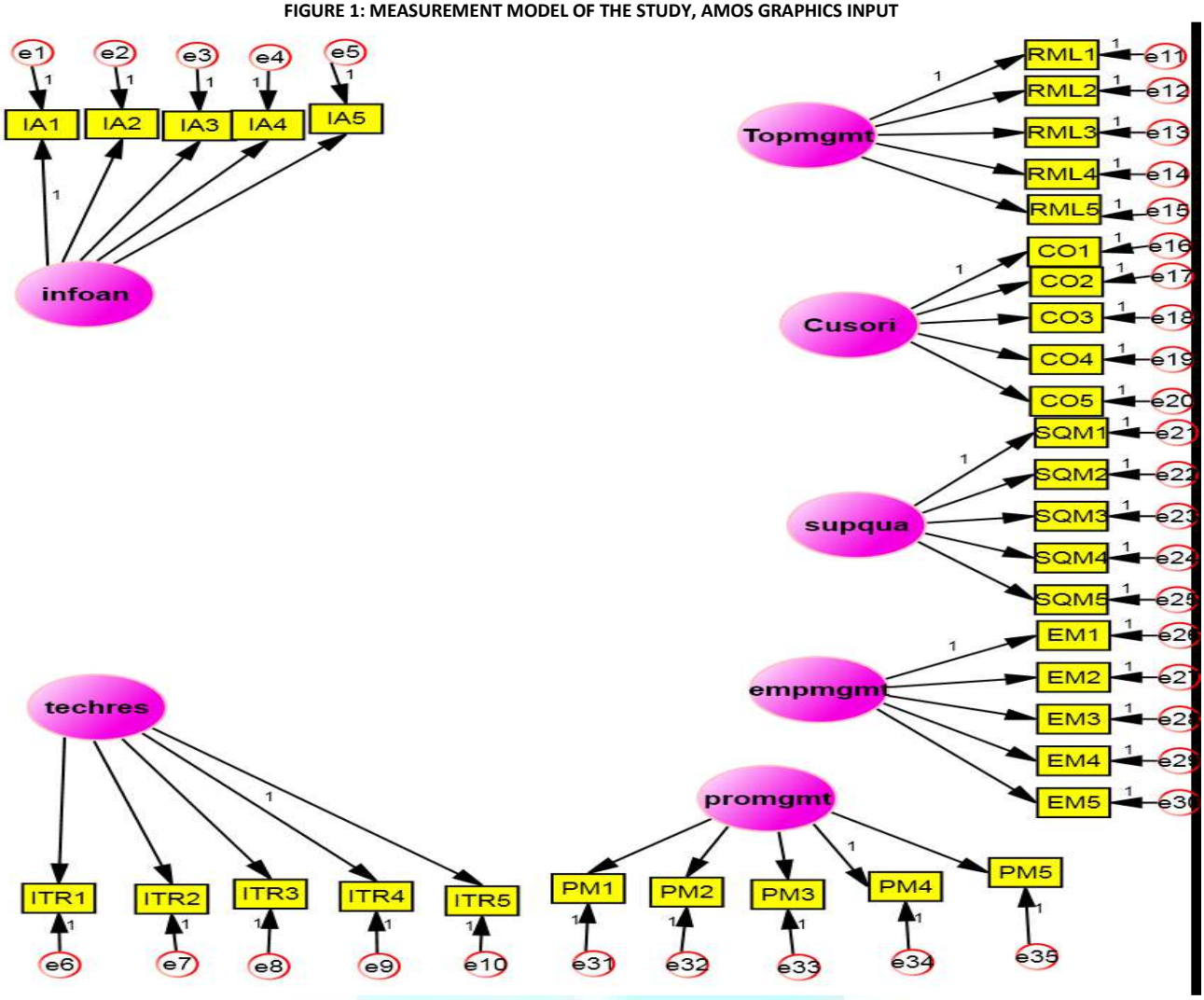
To analyze the factors that influence core quality management practice, it is important that the measures should reflect the theoretical concept that underlies quality management and cover all the domains of its implementation. To analyze the collected data in line with the overall objective of the research undertaken, statistical procedures were carried out using SPSS statistics and SPSS Amos version 20.00. In all cases alpha (significance value) is set at 0.05, to test at 95 percent confidence level. Using this software, analysis was performed by employing factor analysis. Factor analysis is an interdependent technique and it is essential in several stages of development and assessment of measures.

DATA ANALYSIS AND INTERPRETATIONS

INITIAL SPECIFICATION

Amos Graphics follows the conventions of structural equation modeling (SEM) diagrams. The ovals represent latent (or unobserved) variables. In this case, Top Management Commitment (represented by items coded as RML1- RML5), Employee Management (represented by items coded as EM1- EM5), Process Management (represented by items coded as PM1- PM5), Information and Analysis (represented by items coded as IA1- IA5), Supplier Quality Management (represented by items coded as SQM1- SQM5), Information Technology Responsiveness (represented by items coded as ITR1- ITR5) and Customer Orientation (represented by items coded as CO1- CO5) represent the seven subscales of the quality management practices construct. The rectangles represent observed variables, which are the actual Quality Management Practices Construct items indicated above in bracket. The curved double-headed arrows represent the correlations or covariance's among the latent variables (for the standardized and unstandardized solutions, respectively), and the straight single-headed arrows represent the factor loadings of the observed variables on the latent variables. The small circles with arrows pointing from the circles to the observed variables represent errors or unique factors that each latent variable has a 1 next to the path from it to one observed variable (e.g., from top management commitment to RML1). This serves to constrain the parameter and define the scale of the latent variable as it was suggested by (Arbuckle, 2012), each latent variable must be scaled. So all the procedures are performed with due considerations pertinent to the quality management literatures and analysis was done according to Arbuckle (2012) manual. The figure below depicts the initial graphical input used for specification search, where yellow colored rectangles represent observable variables, pink colored circles represent latent variables and red circles represent measurement error for each observable variables incorporated in this study. Here the researcher wants to stress that the specification of the model at this time have no implications to the order of the latent as well as the observable variables. Generally in this study, there are 35 loading estimates, 35 error estimates, 7 variance and 21 correlation estimates between construct. The estimate for each arrow linking a construct to a measured variable is an estimate of a variable's loading-the degree to which that item is related to the construct. So totally there are 99 parameters to be estimated in this study. But for the purpose of identification, one parameter was fixed at one. Accordingly, these results estimate 98 free parameters. The model does not deny the existence of variables such as organizational context, organizational structure and culture, which may play an important role in the explanation of quality management practices. Despite that, these variables are not included in this model explicitly. Their effects will be considered by the error terms specified in the structural model.

FIGURE 1: MEASUREMENT MODEL OF THE STUDY, AMOS GRAPHICS INPUT



Source: Survey Data (2014)

The above figure 4.1 shows the raw input to be used for the proceeding analysis which is imported from SPSS version 20. According to (hair et al., 2010) the SEM program used for this analysis have the capability to compute a model solution directly from raw data, without the researcher computing a correlation or covariance matrix separately. Also they pointed out that, the alternatives between correlations versus covariance matrix used is a statistical and interpretation issue. To aid interpretation and show the procedures clearly, the researcher presented the curved double-headed arrows which represent the correlations or covariance's among the latent variables.

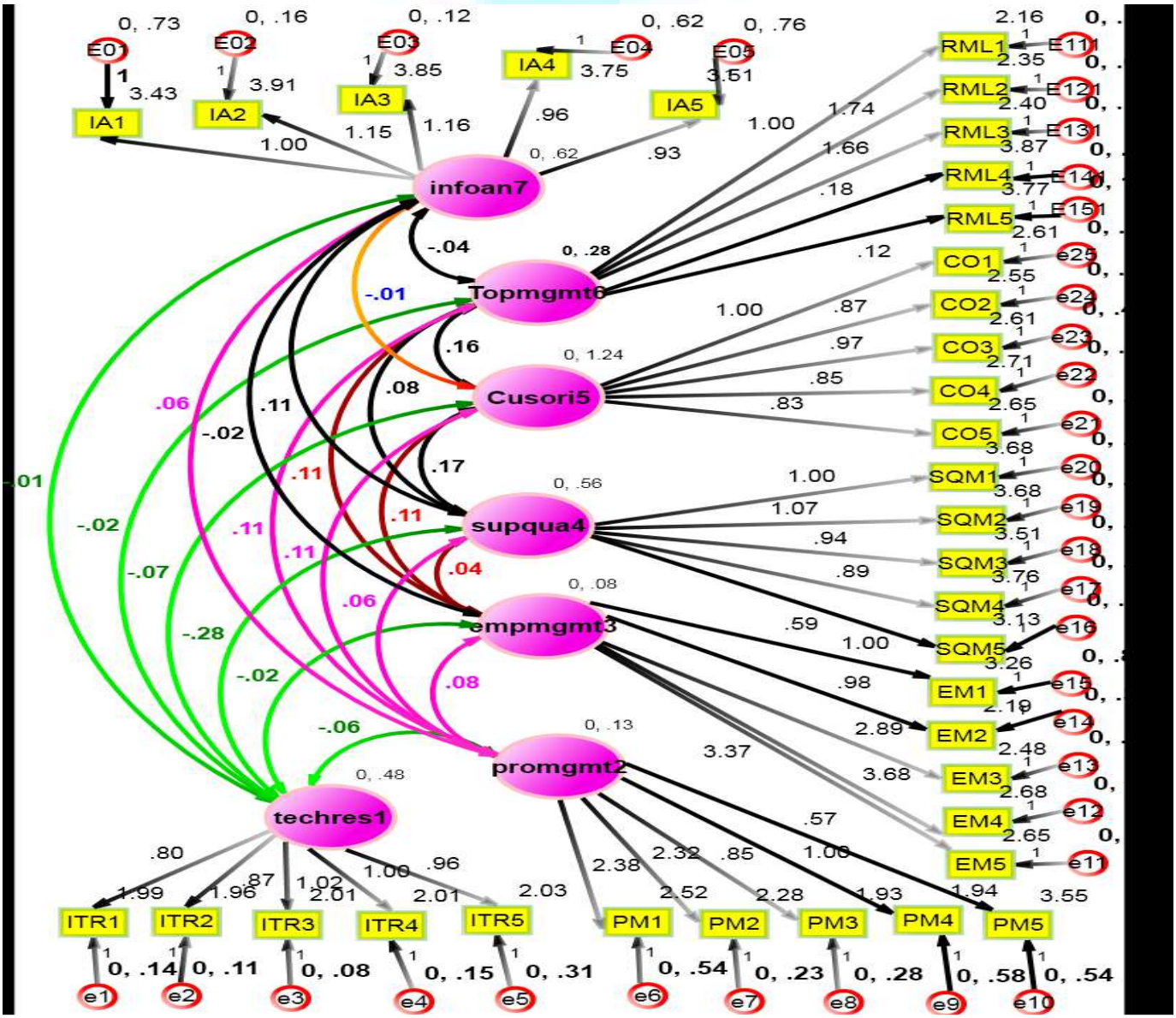
TABLE 2: AMOS RESULTS OF COVARIANCE AMONG CONSTRUCTS

Covariance			Estimate	S.E.	C.R.	P
supqua4	<-->	empmgmt3	.037	.024	1.551	.121
Cusori5	<-->	supqua4	.173	.083	2.074	.038
Cusori5	<-->	empmgmt3	.111	.049	2.266	.023
empmgmt3	<-->	Topmgmt6	.112	.041	2.731	.006
supqua4	<-->	Topmgmt6	.080	.039	2.031	.042
Cusori5	<-->	Topmgmt6	.164	.063	2.602	.009
promgmt2	<-->	Topmgmt6	.107	.034	3.185	.001
promgmt2	<-->	techres1	-.056	.029	-1.919	.055
techres1	<-->	infoan7	-.014	.053	-.266	.790
Topmgmt6	<-->	techres1	-.016	.036	-.433	.665
Cusori5	<-->	techres1	-.068	.077	-.892	.372
supqua4	<-->	techres1	-.283	.060	-4.687	***
empmgmt3	<-->	techres1	-.022	.021	-1.083	.279
Cusori5	<-->	infoan7	-.006	.088	-.063	.950
promgmt2	<-->	infoan7	.057	.033	1.753	.080
promgmt2	<-->	empmgmt3	.076	.031	2.429	.015
promgmt2	<-->	supqua4	.058	.031	1.883	.060
promgmt2	<-->	Cusori5	.108	.050	2.159	.031
supqua4	<-->	infoan7	.113	.059	1.915	.055
empmgmt3	<-->	infoan7	-.019	.023	-.849	.396
Topmgmt6	<-->	infoan7	-.044	.041	-1.061	.289

Source: Survey Data (2014)

The second estimate displayed is of the covariance between customer orientation and suppliers quality management. The covariance is estimated to be 0.173. Right next to that estimate, in the S.E. column, is an estimate of the standard error of the covariance, 0.083. The estimate 0.173 is an observation of an approximately normally distributed random variable, centered around the population covariance with a standard deviation of about 0.083. The researcher used these figures to construct a 95 percent confidence interval on the population covariance by computing 0.173 + 1.96*0.083 = 0.173 + 0.16268. Next to the standard error, in the C.R. column, is the critical ratio obtained by dividing the covariance estimate by its standard error 0.173/0.083 = 2.074. This ratio is relevant to the null hypothesis, that is, in the population from which this survey subjects came, the covariance between customer orientation and suppliers quality management is 0. If this hypothesis is true and considering distribution assumptions for Amos Models, the critical ratio is an observation on a random variable that has an approximate standard normal distribution. Thus, using a significance level of 0.05, any critical ratio that exceeds 1.96 in magnitude would be called significant (Arbuckle, 2012). In this study, since 2.074 is greater than 1.96, the researcher would say that the covariance between customer orientation and suppliers quality management is significantly different from 0 at the 0.05 level. The P-column, to the right of C.R., gives an approximate two-tailed p-value for testing the null hypothesis that the parameter value is 0 in the population. The table shows that the covariance between customer orientation and suppliers quality management is significantly different from 0 with p = 0.038. So both tests agree in rejecting the null hypothesis at the 0.05 level. In addition the results in table above shows the covariance between customer orientation and employee management is significantly different from zero at p = 0.023, employee management and top management is significantly different from zero at p = 0.006, suppliers quality management and top management is significantly different from zero at p = 0.042, customer orientation and top management is significantly different from zero at p = 0.009, process management and top management is significantly different from zero at p = 0.001, suppliers quality management and information technology responsiveness is significantly different from zero at p = 0.001, process management and employee management is significantly different from zero at p = 0.015 , process management and customer orientation is significantly different from zero at p = 0.031. Generally of the 21 covariance's tested 10 parameters found to be significantly different from zero and 11 parameters are found to be not significantly different from zero. So it poses a limitation for the finding to be generalized for the entire study population concerning the parameters found to be not significant.

FIGURE 2: AMOS RESULTS OF ESTIMATED MEANS AMONG INDICATORS



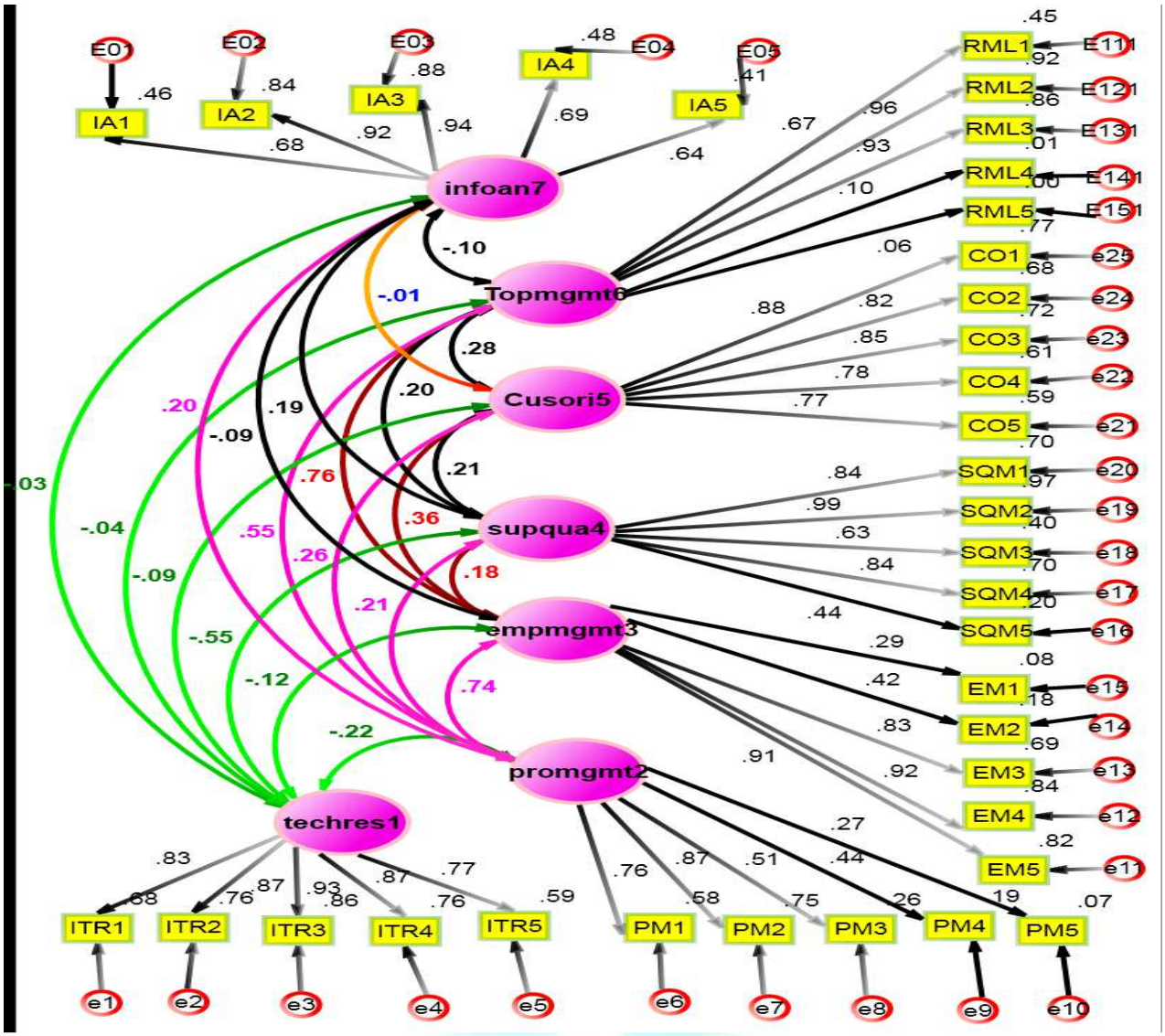
Source: Survey Data (2014)

Figure 2, here above, shows estimated population mean for all the indicators. This results are shown at the right top corner of each small rectangle boxes, where almost all the indicators of customer orientation, employee management, process management and information technology responsiveness constructs are rated by respondents as disagree, strongly disagree or undecided options on the five point Likert scales. On the other hand indicators associated with information analysis, suppliers quality management are rated as agree, strongly agree or undecided options on the five point Likert scales. Since sample mean is recognized as unbiased estimator of the population mean (Larson & Farber, 2013), the researcher becomes 95% confident to infer that all the sample mean results of each indicators exhibited lower rating. So as the literatures for assessing the level of quality management practices suggested that each construct indicators scored below average requires managerial attention for successful implementation and realization of quality management initiatives.

AMOS RESULTS OF CORRELATION AND FACTOR LOADING

The standardized estimates output provided by Amos version 20.0 using ML estimation is presented in Figure 3 here under. The results presented in Amos Table 3 are similar to the results presented in Figure 3. In other words, Table 3 is prepared based on the results presented in Figure 3.

FIGURE 3: AMOS RESULTS OF CORRELATION AND FACTOR LOADING



Source: Survey Data (2014)

TABLE 3: STANDARDIZED CORRELATION BETWEEN CONSTRUCTS AMOS TEXT RESULTS

Path	Correlation
Supplier quality management <-->Employee management	.177
Supplier quality management<-->Top management	.203
Supplier quality management<-->Technology responsiveness	-.548
Supplier quality management<-->Information and analysis	.192
Supplier quality management<-->Process Management	.212
Customer orientation<-->Supplier quality management	.208
Customer orientation<-->Employee management	.356
Customer orientation<-->Top management	.277
Customer orientation<-->Technology responsiveness	-.089
Customer orientation<-->Information and analysis	-.006
Customer orientation<-->Process Management	.263
Employee management<-->Top management	.759
Employee management<-->Technology responsiveness	-.115
Employee management<-->Information and analysis	-.087
Employee management<-->Process Management	.738
Top management<-->Process Management	.551
Top management<-->Technology responsiveness	-.042
Top management<-->Information and analysis	-.105
Technology responsiveness <-->Process Management	-.220
Technology responsiveness<-->Information and analysis	-.026
Process Management<-->Information and analysis	.197

Source: Survey Data (2014)

The above table shows the correlations among the latent variables next to each double arrow. The correlation between suppliers' quality management and (employee management, Top management commitment, Information technology responsiveness, information and analysis and process management) is 0.177, .203, -0.548, 0.192 and 0.212 respectively. The correlation between customer orientation and (Suppliers' Quality management, Employee management, Top Management, Information Technology responsiveness, Information and analysis and process management) is 0.208, 0.356, 0.277, -0.089, -0.006 and 0.263 respectively. The correlation between Employee management and (Top management, Information Technology Responsiveness, Information and analysis and Process management) is 0.759, -0.115, -0.087 and 0.738 respectively. The correlation between Top Management commitment and (Process Management, Information Technology Responsiveness and Information and analysis) is 0.551, -0.042 and -0.105 respectively. The correlation between Information Technology Responsiveness and (Process Management and information analysis) is -0.220 and -0.026 respectively. The correlation between Process Management and Information analysis is 0.197. These all correlations suggest that the latent variables are somewhat related, as would be expected given that they are all hypothesized to be aspects of one construct, however, the correlations are not so high as to suggest that they are all measuring the same construct.

TABLE 4: FACTOR LOADING OF THE CONSTRUCTS

Constructs	Items	Factor Loading	Constructs	Items	Factor Loading
Top Management Commitment	RML1	.671	Information Technology Responsiveness	ITR1	.825
	RML2	.959		ITR2	.875
	RML3	.928		ITR3	.925
	RML4*	.100		ITR4	.872
	RML5*	.062		ITR5	.768
Employee Management	EM1*	.290	Customer Orientation	CO1	.877
	EM2*	.422		CO2	.822
AVE=	EM3	.829		CO3	.851
	EM4	.917		CO4	.781
	EM5	.906		CO5	.769
Supplier Quality Management	SQM1	.839	Information and Analysis	IA1	.679
	SQM2	.986		IA2	.916
AVE=	SQM3	.629		IA3	.937
	SQM4	.837		IA4	.694
	SQM5*	.443		IA5	.643
Process Management	PM1	.764			
	PM2	.869			
AVE=	PM3	.511			
	PM4*	.435			
	PM5*	.272			

Source: Survey Data (2014)

The factor loadings are shown on the arrows from the latent variables to the observed variables in Figure 4.3. The same can be observed from the table above where Amos do the Algorithm to come up with the standardized regression weight where it indicates the direct relationship between each observed variables and the construct it was supposed to measure (indicated by a single arrow). So, Table 4 Shows the loadings for the five variables on Customer Orientation ranging from 0.769(CO5) to 0.877 (CO1). The loadings for the five variables on Suppliers' Quality Management from 0.443 (SQM5) to 0.986 (SQM2), the loadings for the five variables on Employee Management are 0.290 (EM1) to 0.917 (EM4), the loadings for the five variables on Top Management commitment ranges from 0.100 (RML4) to 0.959 (RML2), the loadings for the five variables on Information Technology Responsiveness ranges from 0.768 (ITR5) to 0.925 (ITR3), the loadings for the five variables on Process Management ranges from 0.272 (PM5) to 0.869 (PM2) and the loadings for the five variables on Information and analysis ranges from 0.643 (IA5) to 0.937 (IA3). Indicators with weaker outer loadings are sometimes retained on the basis of their contribution to content validity. Indicators with very low outer loadings (below 0.40) should, however, always be eliminated from the scale (Hair et al., 2014).

The researcher is 95 percent confident to say that all loadings and correlations among the latent variables are significant ($p< 0.05$) and according to (Donna, 2009), all have a loading to be considered as above excellent and very good with the exception of PM4 (customer needs and expectations are considered while designing the process), PM5 (the work process of our department is flexible to make change easily), RML4 (Top management incorporate quality issues on performance evaluation) RML5 (top management consider quality as first priority), EM1 (employee participation in decision making is encouraged), SQM5 (long term relations are offered to suppliers), and EM2 (Employees are recognized for superior quality improvement performance). According to (Tabachnick & Fidell, 2007) in general, the higher the factor loading the better, and typically loadings below 0.30 are not interpreted. Also according to (Donna, 2009)general rules of thumb, loadings above 0.71 are excellent, 0.63 very good, 0.55 good, 0.45 fair, and 0.32 poor. These rules of thumb are based on factor analyses, where factor loadings are correlations between the variable and factor, so squaring the loading yields a variance accounted for as the researcher performed in the next section. According to (Hair et al., 2010), the size of path estimate and statistical significance confirmed that the indicators are strongly related to their associated constructs and are one indication of construct validity.

DISCRIMINANT AND CONVERGENT VALIDITY

Discriminant validity is the extent to which a construct is truly distinct from other constructs by empirical standards, thus, establishing discriminant validity implies that a construct is unique and captures phenomena not represented by other constructs in the model (Hair, G, Christion, & Marko, 2014). In this study, Fornell-Larcker criterion which is more conservative approach to assessing discriminant validity was used according to the suggestions' given by (hair et al., 2014). The researcher compares the square root of the AVE values with the latent variable correlations. As they pointed out specifically, the square root of each construct's AVE should be greater than its highest correlation with any other construct (Note: This criterion can also be stated as the AVE should exceed the squared correlation with any other construct).

TABLE 5: CONSTRUCTS AVERAGE VARIANCE EXTRACTED AND SQUARE ROOT OF AVE

Constructs	Items	VE, AVE & √AVE	Constructs	Items	Factor Loading
Top Management Commitment	RML1	VE=2.231106 AVE= .743702 √AVE=0.862381	Information Technology Responsiveness	ITR1	VE=3.652083 AVE=0.7304166√AVE=0.854644
	RML2			ITR2	
	RML3			ITR3	
Employee Management	EM3	VE=2.348966 AVE=0.7829886√√AVE =0.884866		ITR4	
	EM4			ITR5	
	EM5		Customer Orientation	CO1	VE=3.370336 and AVE=0.6740672 √AVE=0.8210
Supplier Quality Management	SQM1	VE=2.772327 AVE= 0.69308175 √AVE= 0.832515		CO2	
	SQM2			CO3	
	SQM3			CO4	
	SQM4			CO5	
Process Management	PM1	VE=1.599978 AVE=0.533326 √AVE=0.7302917	Information and Analysis	IA1	VE=3.073151 and AVE=0.6146302 √AVE=0.7839
	PM2			IA2	
	PM3			IA3	
				IA4	
				IA5	

Source: Survey Data (2014)

The numbers at the upper right hand corner of each observed variable in Figure 3 are the squared multiple correlations for each observed variable. A common measure to establish convergent validity on the construct level is the average variance extracted (AVE) (Hair, G, Christion, & Marko, 2014). Also they defined this criterion as the grand mean value of the squared loadings of the indicators associated with the construct (i.e., the sum of the squared loadings divided by the number of indicators).

For this study, the AVE values of Top management commitment (0.743702), Information Technology responsiveness (0.7304166), Employee management (0.782988), Suppliers quality management (0.69308), Process management (0.533326), Information and analysis (0.61463) and Customer Orientation (0.7471) are well above the required minimum level of 0.50. Thus, the measures of the seven reflective constructs have high levels of convergent validity. Overall, the square roots of the AVEs for the reflective constructs: Top management commitment (0.862381), Information Technology responsiveness (0.854644), Employee management (0.884866), Suppliers quality management (0.832515), Process management (0.7302917), Information and analysis (0.7839) and Customer Orientation (0.8210) are all higher than the correlations of these constructs with other latent variables as shown in figure 3. According to (Hair et al., 2010), an AVE of 0.5 or higher is a good rule of thumb suggesting adequate convergence. So in this study the result shows that the measurement model has adequate convergence validity.

SUMMARY OF FINDINGS

In this study the researcher provided empirical evidence for factors influencing core quality management practices in EMoAATVET colleges. The 35 items of the seven constructs used in this study were subjected to CFA using SPSS. Prior to performing CFA, the suitability of data for factor analysis and internal consistency analysis was assessed. This result corroborates the studies of (William, Andrew, & Richard, 2009) and (Ooi K. B., 2010). Note that all of the studies conducted before this study operationalize QM as a single construct, in contrast with this study,which operationalizes it as a multiple construct. This approach is therefore inspired by (Kanagi, 2009) and (Lassaad , Federico, & Mohamed, 2006), who underscored the importance of obtaining consistent results among multiple studies that use different methodologies. The result elucidated that the prior assumptions of the underling structure of the constructs' measurement model confirmed that the indicators are strongly related to their associated constructs and are one indication of construct validity. In this study, Fornell-Larcker criterion which is more conservative approach to assessing discriminant validity was used according to the suggestions' given by hair et al., (2014). The researcher compared the square root of the AVE values with the latent variable correlations (Table 5). Thus, the measures of the seven reflective constructs have high levels of convergent validity and exhibited discriminant validity, which is supported by studies of Ooi K. A., (2008) and Prajogo and Hong (2008). In order to examine the underlying structure of each indicator of the latent variables, the researcher performed confirmatory factor analysis and the result suggested that the initial seven-factor CFA model did not fit well. But with critical considerations of the literature, the researcher proceed with modification indices which resulted in noticeably better than the earlier parent model. Generally of the 21 covariance's tested 10 parameters found to be significantly different from zero and 11 parameters are found to be not significantly different from zero. So it posed a limitation for the finding to be generalized for the entire study population concerning the parameters found to be not significant. In this study as part of the confirmatory factor analysis, the researcher performed correlation analysis to examine the relationship between latent variables the result of which suggested that the latent variables are somewhat related to each other.

As the result of the structural model depicts, in this study five hypothesized relationship between constructs representing the paths from (top management commitment-→employee management, top management commitment-→process management, top management commitment-→ suppliers quality management, IT responsiveness-→suppliers quality management, IT responsiveness-→process management) are supported in this study with a significance value of (p=0.01, p=0.01, p=0.05, p=0.01 and p=0.05) respectively. While all the other six hypothesized relationships are not significant at either 5 percent or one percent level of significance. This result is consistent with the finding of (Lassaad et al., 2006; Kanagi, 2009).

Besides, the results highlight the crucial role played by top management commitment and support. Specifically, top management commtment has a statistically significant and positive relatioship with suppliers quality manamgent, employee manamgent and process manamgent. These conclusions corroborate previous studies by (Adam E. C., 1997; Flynn et al., 1995; Lassaad et al., 2006). Moreover, the results of this empirical study clarify the relative importance and the interplay between the indicators of each constructs incorporated in this study.

After examining the significance of relationships, it is important to assess the relevance of significant relationships. Many studies do not undertake this important step in their analyses but simply focus on the significance of effects. However, the path coefficients in the structural model may be significant, but their size may be so small that they do not warrant managerial attention. An analysis of the relative importance of relationships is crucial for drawing conclusions (Joseph et al., 2014).

CONCLUSION

The result of this study demonstrated that quality management practices could be assessed in ATVET Colleges utilizing a valid and reliable instrument which was developed from a previous survey conducted by many researchers which measured business quality management practices. The findings of this study add support for previous theory as to the underlying factors of quality management practices, by operationalizing it as a multiple construct. After performing analysis, the researcher addressed main objectives of this study by investigating the relationship between all the constructs in the study with core quality management practice (Customer orientation).

The results highlighted the crucial role played by top management commitment and clarified the relative importance and the interplay between process management, employee management, suppliers quality management, information analysis and core quality management practices (customer orientation). In this respect, future research focusing on applying the proposed model in new industrial contexts would be helpful. Besides, there is also a need to refine and clarify the relative importance and the interplay between the constructs in determining core quality management practices.Researchers in the area of quality management have used different combinations of critical factors or constructs to design questionnaires to measure quality management practices in different parts of the world. The inconsistency in the critical factors developed and used by international researchers made it difficult to make good comparisons of the

research findings. Based on the literature reviewed, it is recommended that the critical factors of quality management used in research questionnaires be standardized so that a sound comparison can be made between research findings of studies conducted in various countries of the world. The utilization of the same critical factors in research questionnaires will lead to a standardized method of evaluating the implementation of quality management in organizations. In line with this notion, the seven most common critical factors of quality management identified in this paper can be used by researchers and practitioners who intend to study or evaluate the implementation of quality management in organizations.

The result highlighted the relationship between information technology responsiveness with all the other constructs suggests inverse relationships or logically by examining the underling indicators of this construct. The researcher identified that functional managers of the college argued that their organizations level of being responsive towards information technology influences their level of managing the employees, process and suppliers. Here the most fascinating result of the study highlighted that information technology responsiveness has both direct and indirect influences on core quality management practice: customer orientation. But with regard to the generalizability of the result, the researcher confounded only on the selected study area. This is because the result provided by the covariance suggests that many of the parameters used to test the relationship between information technology responsiveness and all other latent variables are not significant to infer the result to the study population.

RECOMMENDATIONS

1. Several practical recommendations can be made from this study. The study has provided empirical support for the presence of the critical factors which could foster employee management, process management, suppliers' quality management and information analysis which in turn would influence core quality management practice. In this sense, the information obtained through this study could be of primary assistance especially to EMoA ATVET colleges that plan to stimulate or foster the kinds of organizational development strategy such as customer orientation in their organizations at individual, group and organizational level. The managers, as leaders in these organizations, could focus more on the critical factors which are top management commitment and information technology responsiveness employed in this study to promote and influence quality improvement. The managers can use the results of this study to prioritize the implementation of these critical factors in their organizations. The quality promoters, particularly government and development partners should give special attention to ATVET colleges. Furthermore, they have to work more to develop teams of quality consultants among the institutions.
2. In addition to the limitations already mentioned, the researcher acknowledged the fact that the sample size is relatively small as ompared to the study population. The results of this study, therefore, should not be generalized beyond the study area as each study area has its own objective reality.
3. The future studies, in order to increase the generalizability of findings, should consider substantially larger samples including greater representation of industries and countries.
4. In this study, the researcher has taken the cross-sectional survey because of shortage of time to conduct longtudinal research. In the future, it is better to conduct longtudinal research to see whether the findings of it fits to the findings of this study which is resulted from cross-sectional study
5. Even though this study is cross-sectional by nature, it enabled the researcher to observe an association between top management, information technology responsiveness, process management, suppliers quality management, information analysis, employee management and customer orientation. More detailed and integrated longitudinal studies should be conductedd in all industrial sectors to assess the factors affecting the quality management practices in the industries. may be appropriate for assessing causality.This contribution enables researchers to use similar methodologies to measure quality management practices in other industries. Other colleges and institutions also pursue similar investigations to examine the factors affecting the quality of their management practices.

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APPENDIX

APPENDIX A

TABLE 2: INTERNAL CONSISTENCY OF LATENT VARIABLES

Factors	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of items
Top Management	0.686	0.688	5
Employee Management	0.809	0.803	5
Process Management	0.710	0.714	5
Information and Analysis	0.883	0.888	5
Supplier's Quality Management	0.856	0.869	5
Customer Orientation	0.911	0.911	5
Information technology Responsiveness	0.926	0.929	5

Source: Survey Data (2014)

APPENDIX B

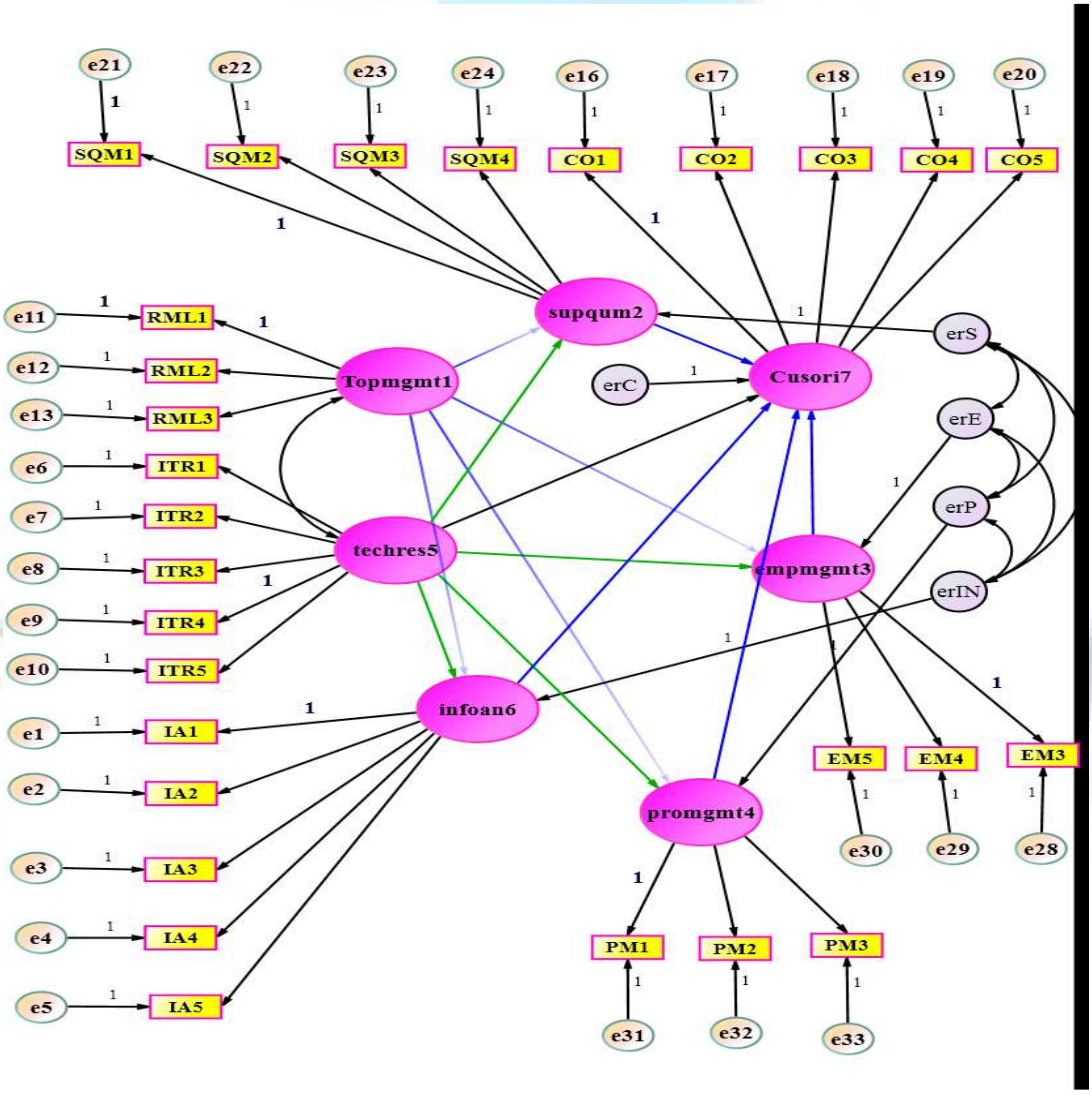
TABLE 3: KMO AND BARTLETT'S TEST

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.790
Bartlett's Test of Sphericity	Approx. Chi-Square	3617.818
	df	630
	Sig.	.000

Source: Survey data (2014).

APPENDIX C

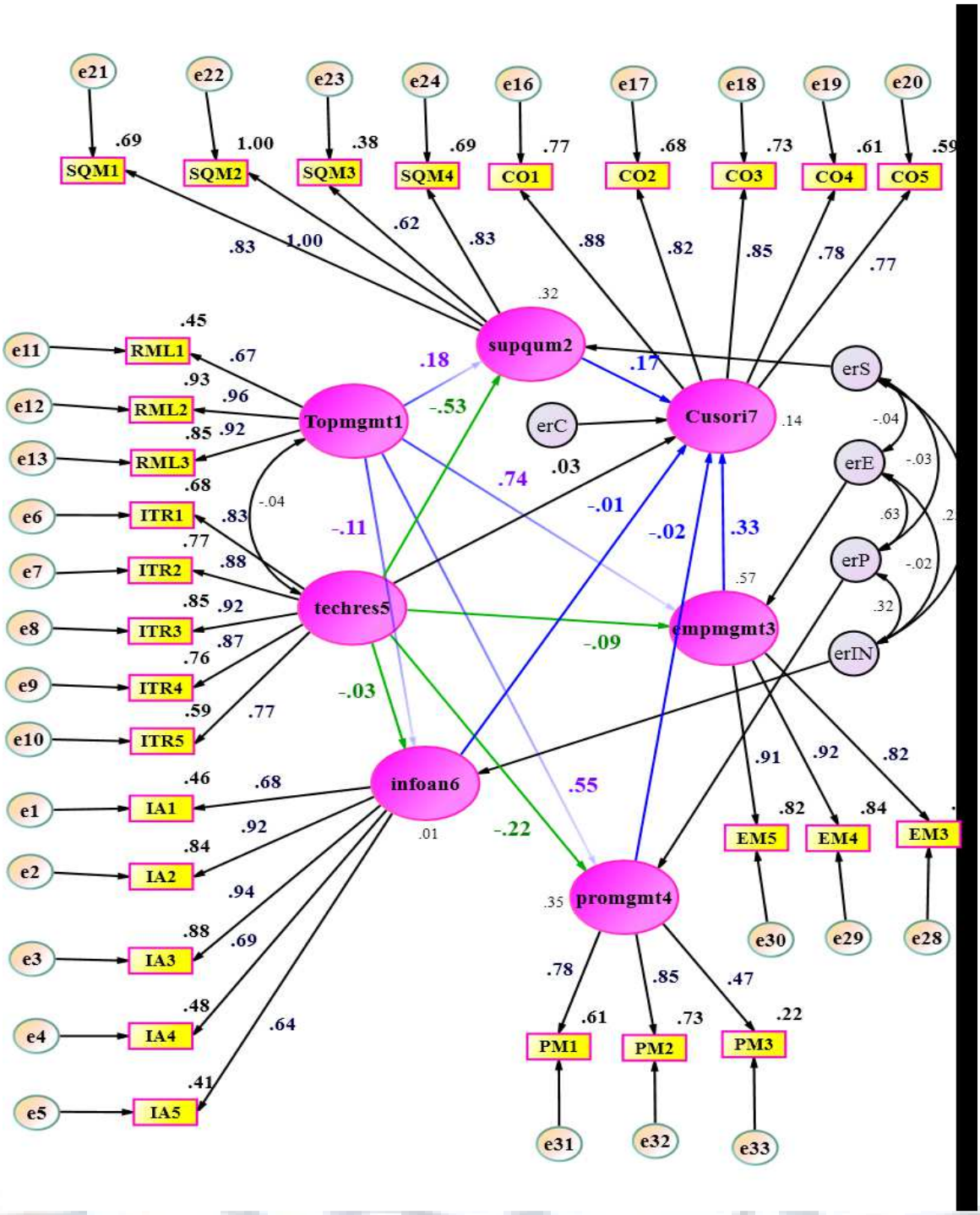
FIGURE 4: ITEMS AND LATENT VARIABLES USED FOR STRUCTURAL MODEL AMOS GRAPHICS



Source: Survey data (2014).

APPENDIX D

FIGURE 5: STRUCTURAL MODEL STANDARDIZED ESTIMATE AMOS GRAPHIC OUTPUT RESULT



Source: Survey data (2014).

APPENDIX E

TABLE 4: REGRESSION WEIGHTS: AMOS TEXT RESULT FOR THE STRUCTURAL MODEL SUMMARY

Path	Estimate	S.E.	C.R.	P	hypothesis	Standardized
EM<---RML	1.128	.174	6.491	***	H1d-supported	(0.745)
PM<---RML	.923	.189	4.888	***	H1c-supported	(0.546)
IA<---RML	-.157	.145	-1.080	.280	H1b-not supported	(-0.105)
SQM<---RML	.255	.114	2.243	.025	H1a-supported	(0.184)
SQM<---ITR	-.563	.100	-5.629	***	H2a-supported	(-0.528)
IA<---ITR	-.034	.111	-.308	.758	H2b-not supported	(-0.030)
EM<---ITR	-.101	.082	-1.239	.215	H2e-not supported	(-0.087)
PM<---ITR	-.283	.121	-2.350	.019	H2d--supported	(-0.219)
CO<---EM	.459	.293	1.565	.118	H3d-not supported	(0.351)
CO<---PM	-.023	.283	-.083	.934	H3c-not supported	(-0.043)
CO<---IA	-.010	.168	-.057	.954	H3b-not supported	(0.003)
CO<---SQM	.254	.175	1.446	.148	H3a-not supported	(0.149)
CO<---ITR	.055	.195	.283	.777	H2c-not supported	(0.034)

Source: survey Data (2014)

APPENDIX F: AMOS OUTPUT RESULTS

TABLE 5: GUIDELINES FOR ESTABLISHING ACCEPTABLE AND UNACCEPTABLE FIT

Structural Equations Modeling Overview

TABLE 4 Characteristics of Different Fit Indices Demonstrating Goodness-of-Fit Across Different Model Situations

No. of Stat. vars. (*m*)	*N* < 250			*N* > 250		
	m ≤ 12	12 < *m* < 30	*m* ≥ 30	*m* < 12	12 < *m* < 30	*m* ≥ 30
χ^2	Insignificant *p*-values expected	Significant *p*-values even with good fit	Significant *p*-values expected	Insignificant *p*-values even with good fit	Significant *p*-values expected	Significant *p*-values expected
CFI or TLI	.97 or better	.95 or better	Above .92	.95 or better	Above .92	Abo e 90
RNI	May not diagnose misspecification well	.95 or better	Above .92	.95 or better, not used with *N* > 1,000	Above .92, not used with *N* > 1, 00	Above .90, not used with *N* > 1,000
SRMR	Biased upward, use other indices	.08 or less (with CFI of .95 or higher)	Less than .09 (with CFI above .92)	Biased upward; use other indices	.08 less (with CFI above .92)	.08 or less (with CFI above .92)
RMSEA	Values < .08 with CFI = .97 or higher	Values < .08 with CFI of .95 or higher	Values < .08 with CFI above .92	Values .07 wi h C I f .97 o higher	Values < .07 with CFI of .92 or higher	Values < .07 with CFI of .90 or higher

Note: *m* = number of observed variables; *N* applies to number of observations per gr p when applying CFA to multiple groups at the same time.

APPENDIX G: CONFIRMATORY FACTOR ANALYSIS

TABLE 6: NORMALITY CHECKING USING KURTOSIS AND SKEWNESS

Variable	min	max	skew	c.r.	kurtosis	c.r.
IA5	1.000	5.000	-.433	-1.938	-.895	-2.001
PM5	2.000	5.000	-1.185	-5.301	-.059	-.133
ITR5	1.000	5.000	1.402	6.269	2.213	4.949
IA4	1.000	5.000	-1.038	-4.644	.161	.359
IA3	2.000	5.000	-.787	-3.518	-.301	-.674
IA2	2.000	5.000	-.842	-3.763	-.268	-.600
IA1	1.000	5.000	-.459	-2.054	-1.145	-2.561
PM1	1.000	5.000	.887	3.966	-.397	-.887
PM2	1.000	5.000	1.266	5.661	1.106	2.472
PM3	1.000	4.000	1.374	6.146	4.733	10.583
PM4	1.000	5.000	1.884	8.427	4.756	10.635
ITR1	1.000	4.000	1.372	6.137	3.435	7.681
ITR2	1.000	4.000	1.283	5.736	2.981	6.666
ITR3	1.000	5.000	1.477	6.606	3.212	7.182
ITR4	1.000	5.000	1.402	6.271	2.637	5.898
RML5	2.000	5.000	-.779	-3.483	-.478	-1.069
RML4	2.000	5.000	-.964	-4.310	.072	.162
RML3	1.000	5.000	1.272	5.689	.612	1.369
RML2	1.000	5.000	1.036	4.634	.119	.267
RML1	1.000	4.000	1.263	5.648	1.369	3.061
EM5	1.000	5.000	1.005	4.495	-.444	-.994
EM4	1.000	5.000	.985	4.404	-.548	-1.225
EM3	1.000	5.000	1.205	5.390	.240	.537
EM2	1.000	4.000	1.981	8.858	3.461	7.739
EM1	1.000	5.000	-.479	-2.140	-1.414	-3.162
SQM5	1.000	5.000	-.151	-.675	-.981	-2.194
SQM4	2.000	5.000	-1.406	-6.286	1.202	2.688
SQM3	1.000	5.000	-.368	-1.645	-1.069	-2.390
SQM2	2.000	5.000	-1.370	-6.128	.648	1.449
SQM1	2.000	5.000	-.781	-3.492	-.200	-.447
CO5	1.000	5.000	.259	1.158	-1.329	-2.973
CO4	1.000	5.000	.292	1.306	-1.245	-2.785
CO3	1.000	5.000	.322	1.439	-1.260	-2.817
CO2	1.000	5.000	.311	1.393	-1.335	-2.986
CO1	1.000	5.000	.297	1.329	-1.329	-2.972
Multivariate					137.226	14.769

Source: survey Data (2014)

APPENDIX H: EXPLORATORY FACTOR ANALYSIS

TABLE 7: SPSS PARTIAL RESULTS OF TOTAL VARIANCE EXPLAINED

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.049	22.360	22.360	8.049	22.360	22.360	4.694	13.039	13.039
2	5.442	15.116	37.476	5.442	15.116	37.476	4.536	12.600	25.639
3	4.359	12.108	49.584	4.359	12.108	49.584	4.455	12.375	38.014
4	3.291	9.143	58.727	3.291	9.143	58.727	4.192	11.645	49.659
5	2.285	6.346	65.072	2.285	6.346	65.072	3.361	9.336	58.995
6	1.765	4.903	69.975	1.765	4.903	69.975	2.287	6.353	65.349
7	1.372	3.812	73.788	1.372	3.812	73.788	2.228	6.188	71.536
8	1.095	3.043	76.830	1.095	3.043	76.830	1.906	5.294	76.830
9	.798	2.217	79.048						
10	.747	2.076	81.123						
11	.697	1.937	83.060						
Extraction Method: Principal Component Analysis.									

Source: survey Data (2014)

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