

# **The Effects Structural Model of Hard and Soft Quality Management on Organizational Performance Improvement in Vocational High Schools**

**Giri Wiyono**  
**Yogyakarta State University**  
***giriwiyono@uny.ac.id***

## **Abstract**

The objective of this research was to examine: the effect of soft quality management aspects on organizational performance at the Vocational High Schools, and the effect of hard quality management aspects on organizational performance at the Vocational High Schools. The type of research was ex post facto by the survey method. This was carried out at the Vocational High Schools located in Yogyakarta Special Region, covering Yogyakarta, Sleman, Bantul, Kulonprogo, and Gunungkidul. The sample consisted of 139 the Vocational High Schools. Subjects were the managerial staffs at the Vocational High Schools including the principals, deputy principals, and heads of department at the Vocational High Schools. Data were collected by using questionnaires. The test for the validity and reliability of the indicators of constructs was done through confirmatory factor analysis. This research used structural equation modeling analysis. The results of the research were: (1) soft quality management aspects had a positive effect on organizational performance at the Vocational High Schools, and (2) hard quality management aspects had a positive effect on organizational performance at the Vocational High Schools.

*Keywords:* Total Quality Management (TQM); Organizational performance; Vocational High Schools

## **INTRODUCTION**

Total Quality Management (TQM) is one of the key components in regulating the dynamic environment of an organization, so that the organization has a high performance (Schermerhorn, Hunt & Osborn, 2003:26). TQM becomes an important issue in the development of the organization. Even Dale and Bunney (1999:25) state that currently most organizations work with TQM.

This moment the evolution of quality management system has entered the Total Quality Management (TQM). The stages of quality management system hierarchy are as follows: (1) inspection, (2) quality control, (3) quality assurance, and (4) quality management or total quality management (Sallis, 2002:19-20) Pike and Barnes (1994:21) say that the total quality management is a new approach to quality

management. Overall the management system comprising quality management and total quality management is seen as a management philosophy (Wilkinson, et al., 1998:183). Thus both have the same function continuously to improve the quality and performance of the organization for meeting the needs of its customers.

In the context of education, TQM is a new thing. Sallis (2002:27) defines the concept of TQM in education as follows: "*TQM is a philosophy of continuous improvement, which can provide any educational institution with a set of practical tools for meeting and exceeding present and future customers needs, wants, and expectations*". This definition gives the notion that TQM is a philosophy of continuous improvement which can provide a set of practical tools at any educational institution in meeting the needs, wants, and expectations of its customers, now and in the future. Thus, TQM is a philosophy about education improvement in school that is done continuously by using a set of principles for managing the school organization.

In connection with the implementation of TQM, Fields (1994:23-25) states that the application of TQM in education is done in the form of the application of the TQM principles. Even Weller in the West-Burnham (1998:320) concluded that the application of TQM principles shows the positive results, so that schools adopt TQM as the process of reconstruction of education in schools.

According to the standard ISO 9001:2000, there are eight principles of the quality management system, namely: focus on the customer, leadership, the involvement of all people, process approach, system approach, continual improvement, the fact approach to decision-making, and mutual beneficial customers relationship (Point Development International, 2008:4). Therefore, the eight main principles of the quality management system become a standard in the application of TQM in schools.

Wilkinson, et al. (1998:14-15) say that. implementation of TQM contains two aspects, namely hard quality management, and soft quality management. Hard quality management is related to the production orientation and emphasis on systems, data collection, and measurement. Meanwhile, soft quality management is related to human resource management in organizations including commitment, cooperation, involvement, training, and so on. In this study, soft quality management has four dimensions, namely: (1) leadership, (2) focus on the customer, (3) the involvement of all people, and (4) mutual beneficial customer relationship. Meanwhile, the hard quality management has four dimensions, namely:

(1) the process approach, (2) system approach, (3) continuous improvement, and (4) the fact approach to decision-making.

Currently the management of education in Indonesia has implemented the school-based management (SBM). In implementing SBM in Vocational High Schools are carried out by developing the Quality Management System of ISO 9001:2000 (ISO 9001:2008) standard (Directorate General of Primary and Secondary Education- Ministry of National Education, 2009: 128-134). The TQM is the foundation of quality management system of ISO 9001 standard. Thus, the vocational high schools in Indonesia, which have the certification of the Quality Management System of ISO 9001:2008 standard, have implemented TQM in management education to compete globally. According to Fields, the application of TQM principles and organizational performance shows high student achievement (1994:xxx).

In the context of education, the school is an organization. Dimensions of school management are grouped into three categories, namely: input, process, and output (Lunenburt & Ornstein, 2000:16-18) School as a system has components, such as inputs, processes, and outputs that will affect the successful achievement of objectives and outcomes of school (Mulyasa, 2010:44). For that, all components need to be empowered to achieve school goals.

School performance can be measured from inputs, processes, outputs, outcomes, productivity, efficiency, and effectiveness (Slamet PH., 2004:8). These measures serve as benchmarks to assess the performance of the school organization. So the school organizational performance measurement is essential to make the efficiency and effectiveness of an organization. In this study the performance of the school organization has six dimensions, namely: (1) the process of organization, (2) the output of organization, (3) the results of organization, (4) the efficiency of organization, (5) the effectiveness of organization, and (6) the productivity of organization.

The implementation of quality management in vocational high schools is expected to improve the performance of school organization. Thus, the application of the principles of quality management is urgent for Vocational High Schools that wish to improve their school performance. Therefore, this research is important to deeply investigate the effect of the application of total quality management, both soft quality management and hard quality management, to increase organizational performance

in Vocational High Schools. The results of this research will provide a constructive recommendations to improve organizational performance in Vocational High Schools which apply the principles of the quality management system of ISO 9001 standard, so that this has an impact on improving the quality of Vocational High Schools.

## **RESEARCH METHODOLOGY**

This research used an analysis unit of school organization. The population in this research was all public and private Vocational High Schools in Yogyakarta Special Region which have gained the certification of Quality Management System ISO 9001:2000/ISO 9001:2008 standard or are currently in the process of certification. The samples in this research consisted of 139 vocational high schools. Subjects were the managerial staffs at the Vocational High Schools including the principals, deputy principals, and heads of department. In this research, there are two exogenous latent variables, namely: soft quality management ( $\xi_1$ ), and hard quality management ( $\xi_2$ ), as well as the endogenous latent variables, namely the performance of the organization ( $\eta_1$ ).

In this research, the test for the validity and reliability of the indicators of constructs was done through a measurement model with Confirmatory Factor Analysis (CFA). This research used the Structural Equation Modeling (SEM) with Lisrel 8.70 program.

The hypotheses in this research were that: (1) there is a positive effect of the soft quality management on organizational performance in Vocational High Schools, and (2) there is a positive effect of the hard quality management on organizational performance in Vocational High Schools. The structural model of the relationship between variables that tests the hypotheses is shown in figure 1.

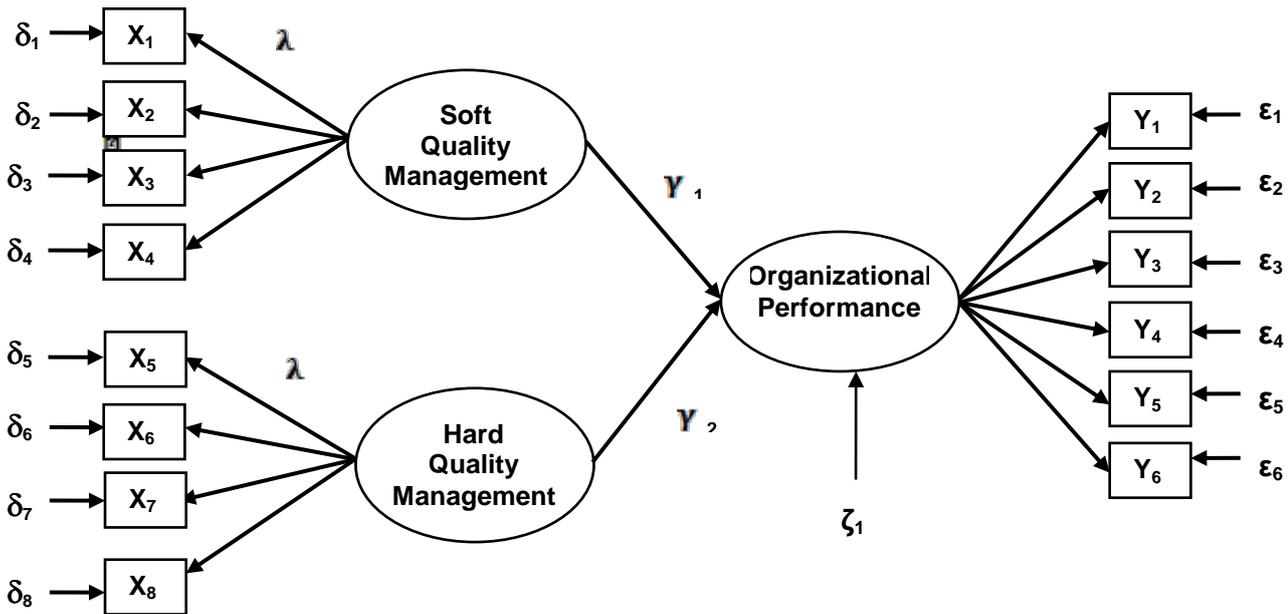


Figure 1. The structural model of the relationship between variables

Specification :

X<sub>1</sub> : leadership,

X<sub>2</sub> : focus on the customer,

X<sub>3</sub> : the involvement of all person,

X<sub>4</sub> : mutual beneficial customer relationship,

X<sub>5</sub> : the process approach,

X<sub>6</sub> : the system approach to management,

X<sub>7</sub> : continuous improvement,

X<sub>8</sub> : the fact approach to decision-making

Y<sub>1</sub> : the process of organization

Y<sub>2</sub> : the output of organization

Y<sub>3</sub> : the results of organization

Y<sub>4</sub> : the efficiency of organization

Y<sub>5</sub> : the effectiveness of organization

Y<sub>6</sub> : the productivity of organization

λ<sub>x</sub> : lambda X, the coefficients of factor loading on the exogenous manifest variables,

λ<sub>y</sub> : lambda Y, the coefficient of factor loading on the endogenous manifest variables,

δ : theta - delta, the measurement errors on the exogenous manifest variables,

ε : theta - epsilon, the measurement errors on the endogenous manifest variables,

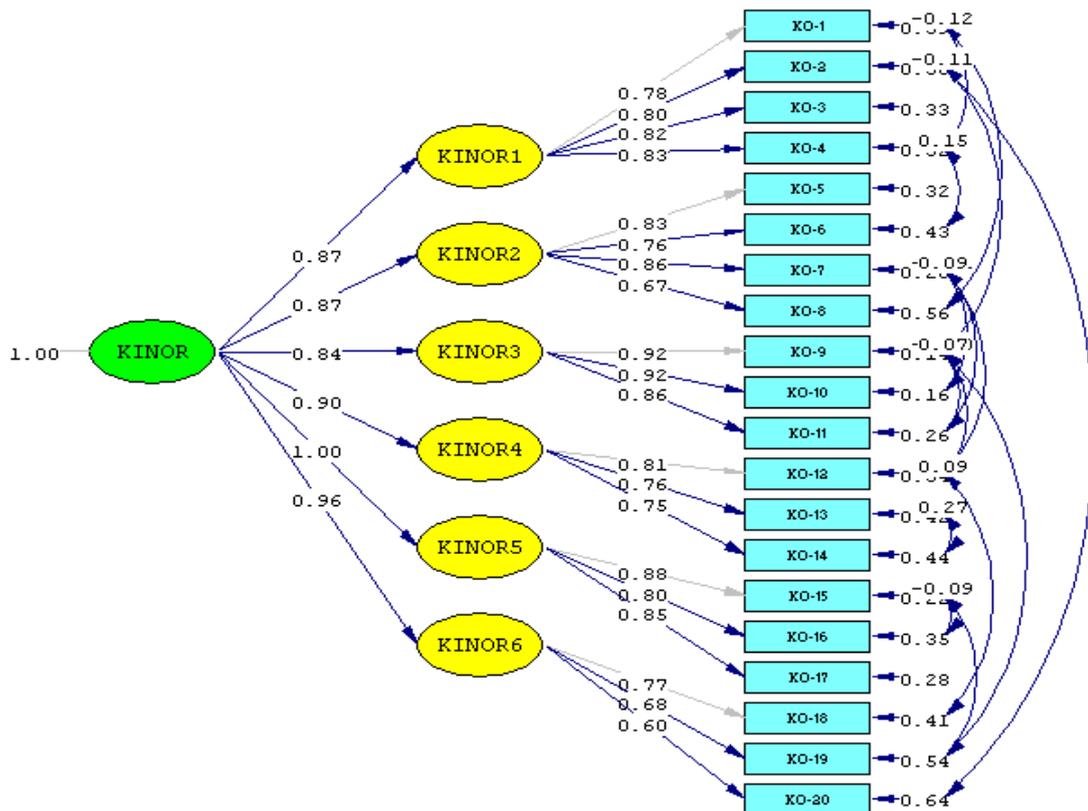
γ : gamma, the path coefficients of exogenous latent variables on the endogenous latent variables

ζ : zeta, error variance in structural model equation

## RESULTS

### Latent Variable Measurement Model

This study uses the second order confirmatory factor analysis (CFA). Measurements on the second order CFA shows the relationship between the indicators and the latent variables (constructs). The results of testing using the second order CFA for measuring the organizational performance construct (KINOR) is shown in figure 2.



Chi-Square=175.45, df=149, P-value=0.06836, RMSEA=0.036

Figure 2 The test results of the organizational performance construct

The test results of the second order CFA of organizational performance construct (KINOR) produces the goodness of fit index for p-value is 0,06836 and RMSEA is 0,036. This measurement model is fit after a modification of the model by freeing parameters of the indicators of organizational performance construct, so that parameters correlate with each other. Thus, this measurement model meets the statistical requirements and it is categorized as a measurement model that fits to measure the construct of organizational performance. The results of testing the second order CFA are shown in the following table 1.

Table 1. The test results of the organizational performance construct

Dimension	Standardized Factor Loading	Standard Error	t <sub>value</sub>	R <sup>2</sup>	Comment
KINOR-1	0,87	0,07	9,30	0,76	significant
KINOR-2	0,87	0,07	9,87	0,76	significant
KINOR-3	0,84	0,07	10,98	0,71	significant
KINOR-4	0,90	0,07	9,88	0,82	significant
KINOR-5	1,00	0,07	12,98	1,01	significant
KINOR-6	0,96	0,07	9,99	0,92	significant
<b>Construct Reliability (CR)</b>				<b>0,82</b>	<b>good</b>

Source: Result of LISREL Analysis

From table 1, it can be concluded that the organizational performance construct produces six significant dimensions and coefficient values of standardized factor loading which over 0,50 with a  $t_{\text{value}}$  greater than 1,96. Meanwhile, the coefficient of construct reliability for organizational performance construct is greater than 0,70. This means that the indicators and dimensions used to measure organizational performance construct have adequate validity and reliability.

The testing results of the second order CFA measurement model for a soft quality management construct is drawn within the path diagram in figure 3.

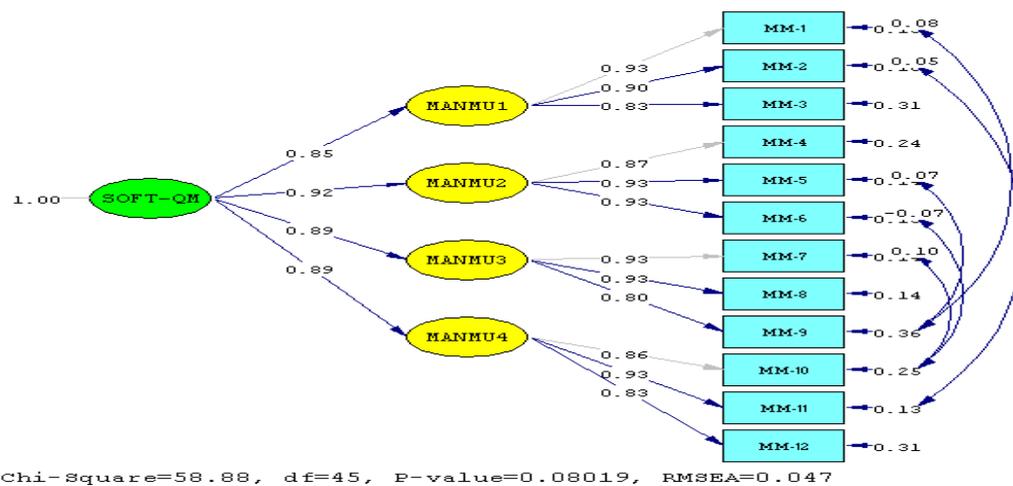


Figure 3. The test results of the soft quality management construct

The test results of the second order CFA of soft quality management construct (Soft QM) produces  $p_{\text{value}} = 0,08019$  ( $p_{\text{value}} > 0,05$ ) and  $RMSEA = 0,047$  ( $RMSEA < 0,05$ ). This measurement model is fit after a modification of the model by freeing parameters of the indicators of soft quality management construct, so that parameters correlate with each other.

Thus, this measurement model meets the statistical requirements and it is categorized as a measurement model that fit to measure the construct of soft quality management. The results of testing the second order CFA are shown in the following table 2.

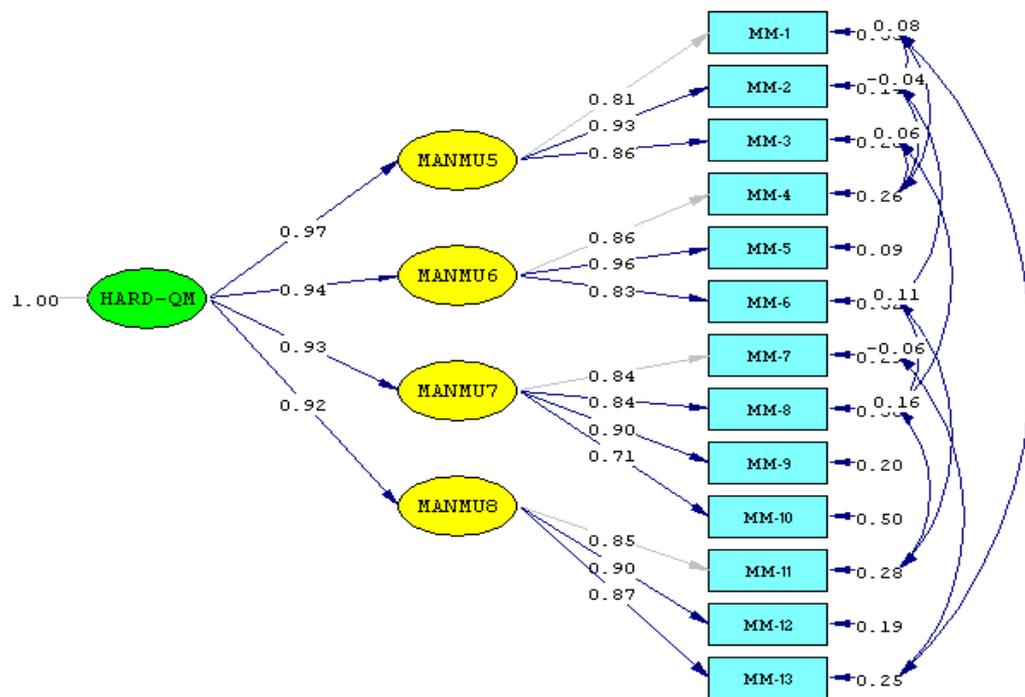
Table 2. The test results of second order CFA soft quality management construct

Dimension	Standardized Factor Loading	Standard Error	$t_{\text{value}}$	$R^2$	Comment
MANMU-1	0,85	0,07	11,03	0,72	significant
MANMU-2	0,92	0,07	11,34	0,85	significant
MANMU-3	0,89	0,07	11,62	0,79	significant
MANMU-4	0,89	0,07	10,58	0,78	significant
<b>Construct Reliability (CR)</b>				<b>0,78</b>	<b>good</b>

Source: Result of LISREL Analysis

From table 2, it can be concluded that the soft quality management construct produces four significant dimensions and coefficient values of standardized factor loading has over 0,50 with a  $t_{\text{value}}$  greater than 1,96. Meanwhile, the coefficient of construct reliability for a soft quality management construct is greater than 0,70. This means that the indicators and dimensions used to measure the soft quality management construct have adequate validity and reliability.

The testing results of the second order CFA measurement model for a hard quality management construct is shown within path diagram in figure 4.



Chi-Square=65.29, df=50, P-value=0.07198, RMSEA=0.047

Figure 4. The test results of the hard quality management construct

The test results of the second order CFA of hard quality management construct (Hard QM) produces  $p_{\text{value}} = 0,07198$  ( $p_{\text{value}} > 0,05$ ) and  $RMSEA = 0,047$  ( $RMSEA < 0,05$ ). This measurement model is fit after a modification of the model by freeing parameters of the indicators of hard quality management construct, so that parameters correlate with each other.

Thus, this measurement model meets the statistical requirements and it is categorized as a measurement model that fit to measure the construct of hard quality management. The results of testing the second order CFA are shown in the following table 3.

Table 3. The test results of second order CFA hard quality management construct

Dimension	Standardized Factor Loading	Standard Error	t <sub>value</sub>	R <sup>2</sup>	Comment
MANMU-5	0,97	0,07	10,91	0,95	significant
MANMU-6	0,94	0,07	11,33	0,88	significant
MANMU-7	0,93	0,07	11,06	0,87	significant
MANMU-8	0,92	0,07	11,08	0,85	significant
<b>Construct Reliability (CR)</b>				<b>0,88</b>	<b>good</b>

Source: Result of LISREL Analysis

From table 3, it can conclude that the hard quality management construct produces four significant dimensions and coefficient values of standardized factor loading has over 0,50 with a t<sub>value</sub> greater than 1,96. Meanwhile, the coefficient of construct reliability for a hard quality management construct is greater than 0,70. This means that the indicators and dimensions used to measure the hard quality management construct have adequate validity and reliability.

Thus, it can be concluded that the indicators and dimensions used to measure the constructs of organizational performance, soft quality management, and hard quality management have adequate validity and reliability.

### The Structural Model of Latent Variable Relationships

The results of structural model testing is obtained the model of causal relationships between two exogenous latent variables (soft quality management, and hard quality management) with one endogenous latent variable (organizational performance) which is shown within path diagram in figure 5.

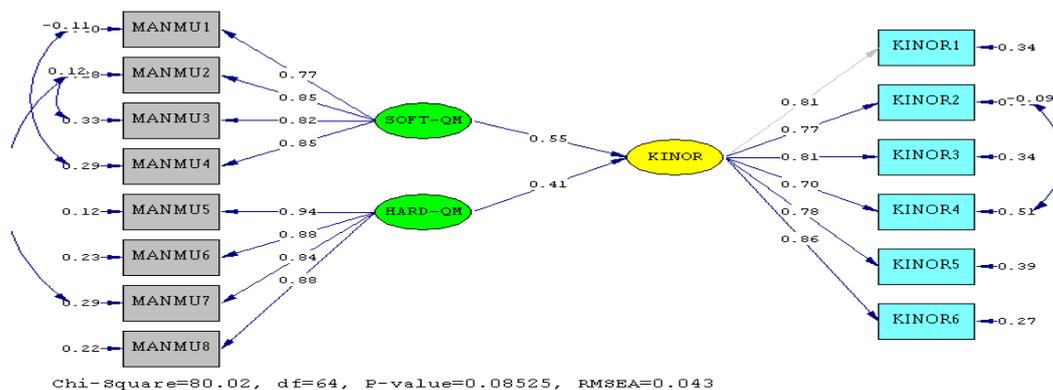


Figure 5. The results of structural model testing

The results of the standardized structural equation model analysis is obtained 7 values that meet goodness of fit index criteria. This results are shown in the following table 4.

Table 4. The results of the structural model analysis

<i>Goodness of fit index criteria</i>	<i>Cutoff value</i>	<i>Computation results</i>	<i>Comment</i>
P-value	> 0,05	0,08525	<i>good fit</i>
RMSEA	≤ 0,05	0,043	<i>good fit</i>
RMR	< 0,05	0,030	<i>good fit</i>
GFI	≥ 0,90	0,92	<i>good fit</i>
NNFI	≥ 0,90	0,99	<i>good fit</i>
NFI	≥ 0,90	0,98	<i>good fit</i>
RFI	≥ 0,90	0,98	<i>good fit</i>

Source: Result of LISREL Analysis

From table 4, it can conclude that the structural model meets some criterias in testing of the model fit and it is categorized as a model that fit to the data. The test results of the structural equation model are obtained the parameters of estimated Lambda-X ( $\lambda_x$ ) as standardized factor loading coefficients that are shown in the following table 5.

Table 5. The results of estimated Lambda-X parameter

Measurement model	Standardized factor loading	$t_{value}$	<i>Error var</i>	$R^2$	Comment
$X_1 \leftarrow \xi_1$	0,77	10,53	0,07	0,60	Significant
$X_2 \leftarrow \xi_1$	0,85	12,23	0,07	0,72	Significant
$X_3 \leftarrow \xi_1$	0,82	11,50	0,07	0,67	Significant
$X_4 \leftarrow \xi_1$	0,85	12,07	0,07	0,71	Significant
$X_5 \leftarrow \xi_2$	0,94	14,62	0,06	0,88	Significant
$X_6 \leftarrow \xi_2$	0,88	13,01	0,07	0,77	Significant
$X_7 \leftarrow \xi_2$	0,84	12,20	0,07	0,71	Significant
$X_8 \leftarrow \xi_2$	0,88	13,10	0,07	0,78	Significant

Source: Result of LISREL Analysis

From table 5, it can conclude that  $t_{test}$  values of all observed variables of soft quality management ( $X_1 - X_4$ ) and hard quality management ( $X_5 - X_8$ ) are greater than 1,96 ( $t_{test} > 1,96$ ), so that they can be declared significant. Besides, the values of the standardized factor loading coefficient ( $\lambda_x$ ) have over above 0,50 so that they can be categorized as good. This means that the observed variables can be used to measure significantly the latent variables of soft quality management and hard quality management.

The test results of the structural equation model are obtained the parameters of estimated Lambda-Y ( $\lambda_y$ ) as standardized factor loading coefficients that are shown in the following table 6.

Table 6 The results of estimated Lambda-Y parameter

Measurement model	Standardized factor loading	$t_{value}$	Error var	R <sup>2</sup>	Comment
$Y_1 \leftarrow \eta_1$	0,81	---	---	0,66	Significant
$Y_2 \leftarrow \eta_1$	0,77	10,37	0,09	0,60	Significant
$Y_3 \leftarrow \eta_1$	0,81	11,18	0,09	0,66	Significant
$Y_4 \leftarrow \eta_1$	0,70	9,06	0,09	0,49	Significant
$Y_5 \leftarrow \eta_2$	0,78	10,61	0,09	0,61	Significant
$Y_6 \leftarrow \eta_2$	0,86	12,07	0,09	0,73	Significant

Source: Result of LISREL Analysis

From table 6, it can conclude that  $t_{test}$  values of all observed variables of organizational performance ( $Y_1 - Y_6$ ) are greater than 1,96 ( $t_{test} > 1,96$ ), so that they can be declared significant. Besides, the values of the standardized factor loading coefficient ( $\lambda_y$ ) have over above 0,50 so that they can be categorized as good. This means that the observed variables can be used to measure significantly the latent variables of organizational performance.

The results of the hypotheses testing are obtained the gamma parameters ( $\gamma$ ) as the direct effect of soft quality management, and hard quality management latent variables on organizational performance latent variables that are shown in the following table 7.

Table 7. The testing results of parameter Gamma ( $\gamma$ )

GAMMA		
	SOFT-QM	HARD-QM
KINOR	0,44	0,33
	(0,16)	(0,16)
	2,71	2,04

Sumber: Hasil Analisis LISREL

From table 7, the results of the hypotheses testing produces the value of the path coefficient ( $\gamma_1$ ) = 0,44 with the value of the  $t_{value}$  = 2,71 and the value of path coefficient ( $\gamma_2$ ) = 0,33 with the value of the  $t_{value}$  = 2,04. This results show that the  $t_{test}$  value for two paths coefficient values are greater than 1,96 ( $t_{test} > 1,96$ ). Thus, this results can be concluded that both the path coefficients are significant, so that this research hypotheses have proved.

It can be concluded that this research hypotheses have been proven, namely: (1) there is a positive effect of the soft quality management on organizational performance in Vocational High Schools, and (2) there is a positive effect of the hard quality management on organizational performance in Vocational High Schools. The results of this research also concluded that the magnitude of the effect of the soft quality management on the organizational performance is 0,44 or  $(0,44)^2$  by 19,36%; and the effect of the hard quality management on the organizational performance is 0,33 or  $(0,33)^2$  by 10,89%. Meanwhile, the magnitude of the effect of the soft quality management and hard quality management together on the organizational performance is 0,88 or 88%. This provides a common fact that the soft quality management and hard quality management provide a major influence on organizational performance improvement at the Vocational High Schools in DIY .

The findings of this research support the results of empirical study conducted by Ling Xi Li (1997:535-545) that examined the relationship between the implementation of quality management and organizational performance by examining the effect of each of the principles of quality management on the organization's service quality performance. This study results explain that there is a relationship between the determinants of quality management and service quality performance .

The results of this study also support the findings of a study conducted by Noor Hazilah (2005:204-216 ) about how the quality management practices in Malaysian hospitals. This study shows that there are eight quality management principles applied in practice and the results is concluded that there is a relationship between the application of quality management principles and the organization's service quality performance.

Thus, the results of this research reinforce some other research studies related to the application of the principles of quality management. In this research, the application of the principles of quality management are grouped into two aspects, namely hard quality management, and soft quality management. The hard quality management relate to: the process approach, the system approach to management, continuous improvement, and the fact approach to decision-making. Meanwhile, the soft quality management related to: leadership, focus on the customer, the involvement of all people, and mutual beneficial customer relationships. This research results show that both aspects of the quality management effect on

organizational performance. It can be concluded that there are effect of the soft quality management, and hard quality management on the organizational performance at the Vocational High Schools in DIY. This shows that the organizational performance in Vocational High Schools can be improved by increasing the quality of soft quality management related to leadership, focus on the customer, the involvement of all people, mutual beneficial customer relationships, and improving the quality of hard quality management related to the process approach, the systems approach on management, continuous improvement, and the fact approach to decision-making. The findings of this research also provide information that improving the quality of soft quality management provide a greater contribution in the improvement of organizational performance at the Vocational High Schools in DIY compared to the hard quality management improvement.

In the context of vocational education, the findings of this research show that the application of the soft quality management principles in Vocational High Schools gives greater the influence in the improvement of organizational performance in Vocational High Schools compared with application of the hard quality management principles. Therefore, improving the soft quality management related to leadership, focus on the customer, the involvement of all people, mutual beneficial customer relationship needs to be prioritized in the application of the principles of quality management in Vocational High Schools. This is important because it provides a greater influence in the improvement of organizational performance at the Vocational High Schools in DIY.

So far, the most of the Vocational High Schools in DIY have implemented the quality management systems. It is indicated from the number of Vocational High Schools that have obtained the certification of Quality Management System ISO 9001: 2008 standard. This certification is awarded to at the Vocational High Schools that have implemented quality management system at their institution and audited by competent authorities, so that for graduating from these audits will get the certificate of ISO 9001: 2008 standard. Thus, the application of quality management system at the Vocational High Schools in DIY impacts on improving organizational performance at the Vocational High Schools in DIY. The quality management focuses on the customer service, so that the application of quality management is capable of changing the mindset of managerial staffs at the Vocational High Schools to provide the education services quality to its customers, especially the students.

Thus, the application of the quality management principles at the Vocational High Schools in DIY impacts in improving the organizational performance at the Vocational High Schools in DIY. This condition will impacts on improving the quality of Vocational High Schools.

## Conclusion

The results of this research can be summarized as follows: (1) the soft quality management has positive effect on organizational performance in Vocational High Schools, and (2) the hard quality management has positive effect on organizational performance in Vocational High Schools. These results imply that the level of quality of the organizational performance in Vocational High Schools influenced strongly by the quality of soft quality management, and hard quality management. Thus, improving the quality management can affect on improving the quality of organizational performance in Vocational High Schools. This will certainly have an impact on improving the quality of vocational education in DIY.

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