

Strengthening Organizational Culture through Total Quality Management: A Moderated Model of Transformational Leadership

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Abstract

This study has a purpose to analyze the influence of the application of Total Quality Management (TQM) in strengthening organizational culture in vocational education, with transformational leadership as a moderating variable. This study was motivated by the challenges faced by SMK Negeri 4 Klaten in developing a culture of caring, contributing, and collaborating to improve school performance and graduate readiness. Employing a quantitative cross-sectional design, data were accumulated from 307 respondents consisting of teachers, staff, and students through a structured questionnaire that measured Total Quality Management (TQM), organizational culture, also transformational leadership. Structural Equation Modeling (SEM) with AMOS was utilized to appraise the direct and moderating effects, preceded by validity and reliability testing utilizing Confirmatory Factor Analysis, Composite Reliability, also Average Variance Extracted. The results showed that the application of Total Quality Management (TQM) significantly and positively influenced organizational culture, and transformational leadership also unfolded a significant positive effect. Furthermore, transformational leadership strengthened the relationship between Total Quality Management (TQM) and organizational culture, confirming its moderating role in internalizing quality values throughout the school environment. This study adds to the treatise on quality management in education by integrating Total Quality Management (TQM) and transformational leadership in the realm of vocational schools. Practically, the findings offer recommendations for school leaders to enhance quality improvement efforts by strengthening leadership capacity and instilling a culture of caring, contribution, and collaboration. These concepts are valuable for policymakers in designing quality assurance strategies that combine managerial systems with leadership-driven cultural development.

Keywords: Total Quality Management (TQM), Transformational Leadership, Organizational Culture, Vocational Education, Structural Equation Modeling (SEM).

Introduction

Improving the quality of vocational education is an increasingly important agenda in facing industrial changes and the need for global competencies. Amidst rapid technological developments and the dynamics of the workplace, vocational schools are required not only to produce graduates with technical skills but also to build an organizational culture that fosters values of caring, contribution, and collaboration. This challenge is evident at SMK Negeri 4 Klaten, where initial findings indicate that a collective work culture has not yet been optimally developed, and some teachers, staff, and students still exhibit a tendency to work individually. This condition hinders the school's ability to produce an adaptive learning environment that aligns with the demands of modern industry. Therefore, a management and leadership approach is needed that can encourage a comprehensive and sustainable transformation of organizational values and behavior.

In this context, Total Quality Management (TQM) is a relevant framework and has been proven to help educational institutions improve performance, refine managerial processes, and build a comprehensive quality culture (Sallis, 2010). Various studies have unfolded that application of the Total Quality Management (TQM) can strengthen collaborative practices, stakeholder participation, and learning effectiveness in schools (Vebriyani et al., 2021; Suwarno et al., 2020). Countries with advanced education systems such as Japan and South Korea have also consistently practiced quality principles to form a culture of discipline, commitment, and cooperation in the school environment (Han & Shim, 2023). However, the effectiveness of Total Quality Management (TQM) is greatly impacted by organizational culture and the leadership that manages it (Prajogo & McDermott, 2005).

Transformational leadership has emerged as a key element that enables quality principles to be more deeply internalized by all members of an organization. Transformational leaders are known for their ability to build a shared vision, inspire collective motivation, encourage innovative thinking, and focus on individual development (Bass & Avolio, 1994; Leithwood & Jantzi, 2005). Previous studies have shown that this type of leadership not only directly impacts

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organizational culture but also moderates the effectiveness of Total Quality Management (TQM) in generating sustainable cultural change (Avolio et al., 2004; García-Morales et al., 2008).

The challenge of developing the quality of vocational education is increasingly apparent. A 2020 World Bank report underscored the persistently low quality of learning in Indonesia, while UNESCO's PISA (2019) results indicated that Indonesian students' collaborative skills were relatively low compared to other countries. Statistics Indonesia (BPS) data (2024) also showed the highest open unemployment rate among vocational graduates, indicating a perceived job readiness issue and a weak productive work culture. These findings are consistent with a study by Wulandari & Sulistyowati (2025), which emphasized that non-technical skills for instance, collaboration and contributing behavior are vital for the achievement of vocational high school graduates in the workforce. Tracer study data from SMK Negeri 4 Klaten further clarifies this situation, with an increasing number of graduates choosing entrepreneurship, highlighting the need for an organizational culture that supports creativity, innovation, and interdepartmental teamwork.

Considering these challenges, the integration of Total Quality Management (TQM) and transformational leadership is an important strategy for strengthening a responsive and quality-oriented organizational culture in vocational schools. Therefore, this study develops a causal model that explains how Total Quality Management (TQM) influences organizational culture and how transformational leadership strengthens this relationship. Through analysis using Structural Equation Modeling (SEM), this study is anticipated to provide theoretical contributions to the study of educational management while offering practical recommendations for strengthening policies and implementing quality assurance in Indonesia.

Method

This study utilized a quantitative explanatory research design utilizing a cross-sectional survey approach. The explanatory design was selected due to the primary objective of the study was to explain and test the formative relationships amidst variables, namely Total Quality Management (TQM) implementation, transformational leadership, and organizational culture. This design enabled the examination of both direct effects and moderation effects within a theoretically grounded research model.

A quantitative approach was deemed applicable as the study focused on measuring perceptions and behaviors of school members through numerical data that could be examined statistically. This approach allows for objective hypothesis testing, estimation of the strength and path of relationships among variables, and the development of a structured causal model. The use of standardized measurement instruments further refines the reliability and validity of the research outcomes.

The cross-sectional survey approach involved accumulating data at one at a time to capture the current conditions of TQM implementation, transformational leadership practices, and organizational culture within the school context. Although this design does not capture longitudinal changes, cross-sectional studies are widely employed in educational management and organizational research to test theoretical models and structural relationships efficiently.

This study adopted a causal modeling framework using Structural Equation Modeling (SEM) as the primary analytical technique. SEM was picked due to that it permits for the continuous examination of multiple relationships among latent variables, accounts for measurement error, and is suitable for testing complex models involving moderation effects. Specifically, SEM was used to appraise: (1) the direct effect of TQM implementation to organizational culture, (2) the impact of TQM implementation to transformational leadership, (3) the effect of transformational leadership to organizational culture, also (4) the moderating role of transformational leadership in the relationship between TQM implementation and organizational culture.

Overall, this research design gives a robust methodological foundation for comprehending how quality management practices and leadership styles jointly contribute to strengthening organizational culture in vocational high school settings.

a. Population and Sample

The population of this study embraced of all members of the academic community at SMK Negeri 4 Klaten, including teachers, educational staff, and students, with a total population of approximately 1,315 individuals. This population was selected because it represents the key stakeholders involved in the of Total Quality Management (TQM) and the formation of organizational culture within the vocational school context. Teachers and educational staff play a central role in designing and applying quality management acts, while students are the primary recipients of educational services and active participants in the school culture.

To obtain a representative sample, this study employed proportional stratified random sampling, as the population was composed of different groups with unequal sizes. This sampling technique ensured that each subgroup (teachers, educational staff, and students) was proportionally represented, thereby minimizing sampling bias and enhancing the generalizability of the findings. The sample size was decided utilizing Slovic's formula with a margin of error of 5%, producing a total sample of 307 respondents. The proportional allocation of samples across strata allowed the study to capture diverse perspectives on TQM implementation, leadership practices, and organizational culture within the school.

b. Research Variabel and Operational Definitions

This study involved three main variables: Total Quality Management (TQM) as the independent variable, organizational culture as the dependent variable, also transformational leadership as the moderating variable. Each variable was conceptualized as a latent construct and operationalized through multiple dimensions to ensure comprehensive measurement.

Total Quality Management (TQM) was defined as a combined management method centered to the continuous development, stakeholder involvement, and customer satisfaction in educational services. In this study, TQM was operationalized through five dimensions: leadership commitment, staff involvement, continuous improvement, training and development, and customer orientation. These dimensions represent the degree to which quality management principles are owned in school management practices.

Organizational culture was denoted as a group of shared values, norms, and behaviors that guide the actions of school members. Organizational culture was measured through three core dimensions relevant to vocational education: care, contribution, and collaboration. These dimensions capture the extent to which school members demonstrate mutual concern, active participation, and cooperative behavior in achieving organizational goals.

Transformational leadership was conceptualized as a leadership style that motivates and inspires organizational members to exceed self-interest for the collective good. It was operationalized using four dimensions, for instance, idealized influence, inspirational motivation, intellectual stimulation, also individualized consideration. These dimensions represent the leader's skill to deliver vision, stimulate innovation, also support individual development, which are essential for strengthening the impact of TQM to organizational culture.



Figure 1. Flow diagram Causal Model of Total Quality Management Implementation on Strengthening Organizational Culture with Transformational Leadership as a Moderator (Source: Processed Data, 2025.)

c. Research Instrument

Data were accumulated utilizing a structured questionnaire planned to calculate respondents' perceptions of TQM implementation, transformational leadership, and organizational culture. The questionnaire consisted of closed-ended statements that utilize a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree) for measurement tool. This scale was picked to capture variations in respondents' behaviour and visions in a quantifiable form.

The questionnaire items were accustomed from established instruments in the aspects of quality management, educational leadership, and organizational culture, and were modified to suit the vocational school context. Prior to the main data collection, the instrument was reviewed by experts in educational management to ensure content validity and clarity. A pilot test was also constructed to appraise the readability and relevance of the items. The use of standardized and validated indicators enhanced the reliability and accuracy of the measurement process.

d. Data Analysis Technique

Data analysis was constructed utilizing Structural Equation Modeling (SEM) with the AMOS software package. SEM was selected because it allows for the simultaneous analysis of couple relationships among latent variables, accounts for measurement mistake, and is suitable for testing complex models involving moderation effects. The analysis process began with descriptive statistics to hand an overview of respondents' characteristics and variable distributions.

Then, examined the measurement model employing the confirmatory factor analyses (CFA) for testing construct validity and internal consistency reliability. Factor loadings, Average Variance Extracted (AVE), and Composite Reliability (CR) were utilized to test convergent validity in turn, whereas inter-construct correlations were used to check discriminant validity. The model manages to confirm the measurement models for both constructs, also it tested the structural model to test relationships between variables.

The moderating role of transformational leadership was tested by analyzing interaction effects within the SEM framework. Model fit was appraised utilizing some goodness-of-fit indices, containing Chi-square/df, RMSEA, GFI, AGFI,

CFI, and TLI. A p-value of less than 0.05 was used as the criterion for statistical significance. Through this analytical approach, the study was able to deliver robust empirical evidence regarding the causal relationships between TQM, transformational leadership, and or-ganizational culture.

Results And Discussion

Result

An amount of 307 respondents in this study, consisting of teachers, educational staff, and students of SMK Negeri 4 Klaten. The respondents represent key stakeholders involved in the application of Total Quality Management (TQM) and the growth of organizational culture in the vocational school context. The distribution of respondents ensured proportional representation of each group, supporting the robustness of the analysis.

1. Converting path diagram to Structural Equation

The model presented in the path diagram in the previous step is then expressed in the shape of a structural equation in Figure 2.

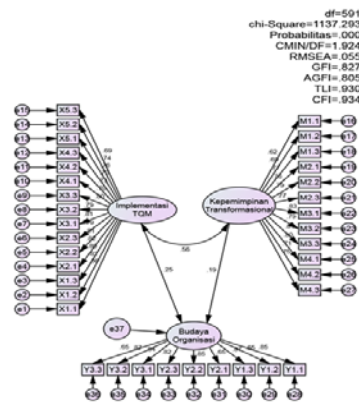


Figure 2. Conversion of Path Diagram to Structural Equation
Source: Processed data (2025)

2. Descriptive Statistics of Research Variable

The descriptive analysis indicates that TQM implementation and transformational leadership are perceived at a high level, while organizational culture is moderately to strongly developed, particularly in the dimensions of care and contribution. Collaboration, although present, still requires strengthening, especially across departments.

Table 1. Descriptive Statistics of Research Variabel

Variable	N	Minimum	Maximum	Mean	Standard Deviation	Category
Total Quality Management (TQM)	307	1	5	3.46	0.87	High
Transformational Leadership	307	1	5	3.57	0.83	High
Organizational Culture	307	1	5	3.02	0.93	Moderate–High

Source: Processed data (2025)

The results stipulate that Total Quality Management (TQM) practices and transformational leadership are perceived positively by respondents, while school culture remains moderate, indicating room for improvement in the values of caring, contribution, and collaboration among stakeholders

3. Evaluation of Measurement Model

The measurement model was appraised to ensure all constructs met the required validity and reliability criteria. CFA results confirmed that all factor loadings exceeded 0.50, indicating adequate convergent validity. Composite

Reliability (CR) and Average Variance Extraction (AVE) also met the recommended thresholds ($CR \geq 0.70$, $AVE \geq 0.50$). A summary is exhibited in Table 2

Table 2. Evaluation of Measurement Model

Variables	CR	VE	Information
Implementation of Total Quality Management (TQM)	0.958	0.602	Reliable
Transformational Leadership	0.943	0.580	Reliable
Organizational culture	0.936	0.623	Reliable

Source: Processed data (2025)

All constructs demonstrated high internal consistency and convergent validity.

4. Structural Model Suitability

The fit indices obtained from SEM-AMOS indicate that the structural model fits the data well. Table 3 displays the main indicators of model fit.

Table 3. Summary of Model Fit

Goodness of fit index	Cut-off value	Research Model	Model
RMSEA	≤ 0.08	0.055	Fit
CMIN/DF	≤ 2.00	1,924	Fit
CFI	≥ 0.90	0.934	Fit
TLI	≥ 0.90	0.930	Fit
GFI	≥ 0.90	0.827	Marginal Fit
AGFI	≥ 0.90	0.805	Marginal Fit

Source: Processed data (2025)

Most of the indices meet the required thresholds, which confirms that the model has an acceptable level of fit and can be used to test structural relationships.

5. Hypothesis Testing

SEM analysis produced standardized regression weights, critical ratios (CR), also significance levels (p-values) displayed in Table 4.

Table 4. Hypothesis Testing Results

Hypothesis	Estimate	CR	p-value	Results
H1: Total Quality Management (TQM) → Organizational Culture	0.240	3,431	0.000	Significant
H2: Transformational Leadership → Organizational Culture	0.272	2,623	0.009	Significant
H3: Total Quality Management (TQM) x Transformational Leadership → Organizational Culture	0.000	2,575	0.010	Significant

Source: Processed data (2025)



Figure 3. Structural Equation Model (SEM) Results
Source: Processed data (2025)

Discussion

1. *Application of Total Quality Management Total Quality Management (TQM) has a positive influence on strengthening organizational culture.*

Empirical results show that the implementation of Total Quality Management (TQM) significantly improves organizational culture (estimate = 0.240, CR = 3.431, $p < 0.001$). This finding suggests that organizations that consistently implement Total Quality Management (TQM) principles such as continuous development, customer-focused processes, empowerment, and systematic problem-solving tend to develop a stronger and more cohesive organizational culture.

These results are in conformity with previous research emphasizing that Total Quality Management (TQM) is not just a technical or operational framework, but also a transformative cultural mechanism. Prajogo & McDermott (2005) detected that Total Quality Management (TQM) practices significantly shape organizational norms, particularly in fostering a culture of continuous improvement. Schein (2010) argued that quality-oriented practices progressively influence shared values, assumptions, also behavioral models on an organization. Haffar, Al-Karaghoul & Ghoneim (2014) stated that Total Quality Management (TQM) own a direct role in institutionalizing cultural elements such as teamwork, accountability, and learning orientation. Thus, the findings of this study align with the global literature, strengthening the argument that Total Quality Management (TQM) serves as an operational and cultural architecture. A significant aspect is that Total Quality Management (TQM) encourages employees to internalize disciplined work behavior, customer-centered thinking, and adherence to standards—factors that contribute significantly to long-term cultural cohesion. Furthermore, local research by Harsono & Mujiwati (2022) shows that the application of Total Quality Management (TQM) in Indonesian vocational schools significantly contributes to strengthening a collaborative work culture and improving learning effectiveness. This is reinforced by the findings of Hidayat & Wulan (2021), who stated that Total Quality Management (TQM) mechanisms such as SPMI, PDCA, and quality-based evaluation can foster a sustainable quality culture.

Furthermore, the mean value of the Total Quality Management (TQM) variable with a variable value of 3.46 in the descriptive analysis indicates that respondents generally perceive Total Quality Management (TQM) practices to be well implemented, further supporting the statistical results. The finding that Total Quality Management (TQM) own a positive effect to organizational culture is in conformity with the theoretical perspective that quality management enhances shared values, norms, and behaviors within an organization. At SMK Negeri 4 Klaten, Total Quality Management (TQM) resulted in more structured processes, stronger collaboration, and improved service quality, persistent with the outcomes of Yusuf et al. (2007) and Zu et al. (2010). The strongest contribution of Total Quality Management (TQM) is on staff engagement and continuous improvement, which directly encourages a more adaptive and collaborative school environment.

2. *Transformational leadership has a positive influence on strengthening organizational culture.*

Hypothesis 2 was supported with an estimate of 0.272, CR = 2.623, and $p = 0.009$. This validates that transformational leadership own a vital role in building, strengthening, and keeping organizational culture. Leaders who demonstrate inspirational motivation, individualized consideration, idealized influence, also intellectual stimulation tend to build stronger cultural bonds within the organization.

These results align with strong evidence from previous international literature. Bass & Avolio (1994) asserted that transformational leaders shape culture through the articulation of vision and modeling of behavior, which results in value alignment among employees. García-Morales, Matías-Reche & Hurtado-Torres (2008) detected that transformational leadership significantly influences organizational learning and cultural adaptability. Eisenbeiss, van Knippenberg & Boerner (2008) emphasized that transformational leadership protects a culture of innovation, collaboration, and shared identity. A local study by Anugraheni (2023) confirmed that principals with a transformational leadership style are able to strengthen organizational culture through effective communication, teacher empowerment, and the development of a supportive work climate. Findings by Sunarto & Fitriyani (2022) also revealed that visionary leadership have a powerful role in building an adaptive, collaborative, also innovative school culture.

In this study, the mean transformational leadership score of 3.57 indicates that leaders in the sample organizations were perceived as moderately effective, which aligns with the statistically significant relationship found. Transformational leaders are essential change agents, especially in cultures undergoing modernization or restructuring. They facilitate cultural internalization by connecting employee values to the organizational vision, thereby fostering stronger shared norms. The significance of this relationship underscores the strategic importance of leadership as the backbone of organizational development culture.

Transformational leadership exhibits a slightly stronger coefficient than Total Quality Management (TQM), indicating that leadership behavior own a significant role in forming the social environment. Leaders who prove idealized influence, inspirational motivation, intellectual stimulation, also individualized consideration are better able to protect meaningful cultural growth. This assists Bass & Avolio's (1994) argument that transformational leaders function as cultural architects, embedding values into organizational routines.

3. *Transformational leadership moderates the influence of Total Quality Management (TQM) implementation on organizational culture.*

The moderation test showed a significant result (estimate = 0.000, CR = 2.575, $p = 0.010$), indicating that transformational leadership strengthens the influence of Total Quality Management (TQM) on organizational culture. This implies that even when Total Quality Management (TQM) is implemented, its role to culture is strengthened when transformational leadership is present. Although the estimate appears numerically small (typical of interaction terms), the significant CR and p-value confirm that the moderation exists and is meaningful.

These findings confirm several arguments in previous international research. Sila & Ebrahimpour (2005) noted that leadership is the most crucial contextual factor determining whether Total Quality Management (TQM) transforms organizational culture or simply serves as a set of technical tools. Kaynak (2003) emphasized that leadership commitment determines the depth of cultural change resulting from Total Quality Management (TQM). Shin, Kalinowski & El-Enein (1998) found that transformational leadership increases employee acceptance of quality-oriented behavior, thereby strengthening the cultural transition initiated by Total Quality Management (TQM). Research by Anugraheni (2023) and Sunarto & Fitriyani (2022) confirmed that transformational leaders are apt to accelerate the internalization of Total Quality Management (TQM) values, strengthen the commitment of school members, and foster a culture of innovation.

The moderating effect found in this study recommends that without transformational leadership, Total Quality Management (TQM) may not fully permeate the organizational culture. Leaders own a vital role in translating Total Quality Management (TQM) principles into cultural norms, ensuring that quality practices are internalized rather than mechanically implemented.

When leaders model quality-focused behavior, articulate the importance of excellence, encourage innovation, and motivate individuals, Total Quality Management (TQM) becomes deeply embedded in the organizational culture. Thus, leadership acts as a catalyst that accelerates the cultural transformation initiated by Total Quality Management (TQM).

A significant moderating effect indicates that Total Quality Management (TQM) produces stronger cultural outcomes when supported by transformational leadership. Without strong leadership, Total Quality Management (TQM) tends to remain procedural rather than becoming an internalized culture. This echoes Shahin & Dabestani (2010) and is reinforced by Harsono & Mujiwati (2022) and Anugraheni (2023). Both suggest that successful educational organizations are those capable of combining systematic quality practices with inspirational, visionary, and committed leadership, emphasizing that leadership drives the successful application of Total Quality Management (TQM). In the case of SMK Negeri 4 Klaten, transformational leaders tend to motivate staff, encourage innovation, and ensure that Total Quality Management (TQM) routines are internalized as cultural norms, rather than mere administrative tasks.

When combined, these three hypotheses describe a comprehensive causal model that includes:

1. Total Quality Management (TQM) acts as a fundamental key of cultural strength.
2. Transformational leadership directly enhances cultural values.
3. Leadership strengthens the effect of Total Quality Management (TQM) culture
4. This integrated model aligns with contemporary organizational theory, which emphasizes that quality management and leadership are inseparable pillars in fostering cultural excellence. The structural model fit indices (RMSEA = 0.055, CFI = 0.934, TLI = 0.930) further demonstrate that this model is statistically robust and theoretically valid.

Thus, this study makes a substantive contribution to the international discussion on how leadership behavior and quality management interact to build a sustainable organizational culture.

Conclusion

This study concludes that Total Quality Management (TQM) and transformational leadership own a significant role in shaping organizational culture in vocational education settings. The findings stipulate that Total Quality Management (TQM) own a positive and significant influence to organizational culture, indicating that continuous improvement, staff engagement, leadership commitment, and customer orientation contribute to strengthening the values of caring, contribution, and collaboration in schools. Transformational leadership also demonstrates a significant influence on organizational culture. Leaders who inspire, motivate, stimulate innovation, and provide individual support create a stronger cultural foundation that fosters collective engagement and a sense of shared ownership. Furthermore, this study confirms that transformational leadership moderates the relationship between Total Quality Management (TQM) and organizational culture. This suggests that Total Quality Management (TQM) practices alone are not sufficient to create cultural change; instead, their effectiveness depends on how leaders translate Total Quality Management (TQM) principles into everyday actions and interactions in schools. Overall, these results emphasize that improving school culture requires a combination of systematic management practices and transformational leadership behaviors. Schools that integrate these two components are more likely to develop a sustainable and collaborative culture that supports student quality improvement and success.

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