



Figure 1. A conceptual model depicting the relationship between Transformational leadership, teamwork processes and knowledge management

Research Methodology

This study was undertaken in three steps. The first step was to identify characteristics of transformational leadership from the Multi Leadership Questionnaire (MLQ) developed by Bass and Avolio (1995). The second step was to come up with a list of teamwork processes from literature. Two key teamwork processes of cohesion and communication were derived from a list of seven primary categories as adapted from a conceptual framework developed by Swezey and Salas (1992). The third step was to review the knowledge management practices identified from literature for their relevance in the Kenyan University situation. The knowledge management practices of creation, sharing and utilization were derived from literature.

Relevant survey instruments were developed to enable data collection. These were captured in a three-section questionnaire. The first section focused on the transformational leadership characteristics as identified from the multi leadership questionnaire. The section listed a number of statements reflecting transformational leadership characteristics measured in a five point Likert scale, ranging from strongly disagree(1) to strongly agree(5). The second section of the questionnaire captured statements aimed at determining the perceived effect of the leadership behaviors on the two identified teamwork processes of cohesion and communication. The last section of the questionnaire included statements that reflect the different KM practices adopted and implemented in the universities in Kenya.

In line with the requirement of the National Commission for Science and Technology (NACOSTI), a request was sent for approval to collect data from public and private Universities in Kenya. After receiving the approval, an official letter was sent to six Universities, inviting them to participate in the study. Kenya has 30 accredited Universities. Simple random sampling was used to select six universities for the study. Six Universities represent a 20% industry representation, which is considered adequate for a cross sectional study, Mugenda and Mugenda (2006). A questionnaire was sent via email to the heads of academic departments of the selected Universities. Sixty (60) questionnaires were sent out, 36 of the returned ones were found usable for data analysis. Before data could be collected, research instruments were subjected to diagnostic tests. To determine reliability of the instruments, Cronbach alpha method was used with an alpha coefficient of 0.6 as

the minimum acceptable threshold. Results of tests of reliability indicated that all the items had an alpha coefficient ranging from 0.7 for teamwork processes and 0.9 for both transformational leadership and knowledge management. All the items satisfied the minimum threshold of 0.6 and were therefore accepted.

Table 1: Results of Reliability tests

Variable	No of items	Cronbach's Coefficient	Conclusion
Transformational Leadership	18	0.9	Accepted
Knowledge Management	29	0.9	Accepted
Work Team Communication	13	0.7	Accepted

The collected data was analyzed using descriptive statistics such as mean and standard deviation as well as inferential statics such as linear regression. Descriptive statistics were used to describe characteristics of the data obtained while inferential statistics were used to determine the nature of the relationships between and among the study variables. The study sought to determine the extent to which University leaders exhibit attributes of transformational leadership and the extent to which these attributes influence teamwork processes of cohesion and communication. Respondents were requested to indicate the extent to which characteristics of individualized consideration, intellectual simulation, inspiration motivation and idealized influence described the leadership structure in their universities on a five point Likert scale ranging from "strongly disagree" (1) to "strongly agree"(5). Four items were used to measure individualized consideration, (e.g. "Our leader promotes development of individuals"), five items were used to measure intellectual stimulation (e.g. "our leader encourages employees to solve problems"), four items measured inspirational motivation (e.g. "our leader creates optimism among the employees") and four items were used to measure idealized influence (e. g "our leader uses power for positive gain")

Items adapted from Fillius and De Jong, (2000) were used to measure the three knowledge management dimensions. Twelve items were used to measure Knowledge creation (e.g. "there is an active involvement of the members in external professional work and associations"), knowledge sharing was measured using six item (e.g. "members are able to discuss their methods of working during internal review briefs and meetings") and knowledge utilization as measured using seven items e.g. "experiences of clients are used to improve products and services". Teamwork processes was measured using items developed from literature review. Work team communication was measured using six item such as "giving feedback is encouraged at all levels" while teamwork cohesion was measured using seven items, (e.g." team members are always working towards the same goals and targets")

Table 2; Descriptive Statistics

Variable	Mean	SD
Transformational Leadership	3.9	1.0
Knowledge Management	3.6	1.06
Teamwork Processes	3.9	0.9

N=36

Transformation Leadership and Knowledge Management

To test the effect of transformational leadership on knowledge management, the following regression was run; $Y = \beta_0 + \beta_1 X_1 + e$. Where Y = Transformational Leadership, β_0 = intercept, β_1 =regression coefficient, X_1 = knowledge management. The results presented in table 3 show that transformational leadership explains 48 per cent of the variance in knowledge management.

Table 3. Model Summary for Transformation Leadership and Knowledge Management

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.693a	0.48	0.465	0.731

- a. Predictors: (Constant), Transformation Leadership
- b. Dependent Variable: Knowledge Management

Analysis of variance results in table 4 show that the model is significant for predicting knowledge management. $F = 31.44$, $p \leq 0.05$

Table 4. ANOVA for Transformation Leadership and Knowledge Management

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.815	1	16.815	31.44	.000a
	Residual	18.185	34	0.535		
	Total	35	35			

- a. Predictors: (Constant), Transformation Leadership
- b. Dependent Variable: Knowledge Management

The results in table 5 show that the coefficients β_1 (knowledge management) is both positive and significant, $\beta_1 = 0.693$, $t = 5.607$. These results support the study's proposition that transformational leadership has a significant influence on knowledge management

Table 5 Regression coefficients for Transformation Leadership and Knowledge Management

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.07E-16	0.122		0.00	1
	Transformation Leadership	0.693	0.124	0.693	5.607	0.00

- a. predictor Variable: Transformational Leadership
- b. Dependent Variable: Knowledge Management

Transformational Leadership and teamwork processes

To test the effect of transformational leadership on teamwork processes, the following regression model was run; $Y = \beta_0 + \beta_2 X_2 + e$. Where Y = Transformational Leadership, β_0 = intercept, β_2 = regression coefficient for teamwork processes, X_2 = Teamwork processes

The results presented in Table 6 show that transformational leadership explains 53 per cent of the variance in team work processes, $r^2 = 0.053$

Table 6 .Model Summary for the Relationship between Transformation Leadership and Team Work processes

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.230a	0.053	0.025	0.98751

- a. Dependent Variable: Teamwork processes
- b. Predictors: (Constant), Transformation Leadership

Analysis of variance in table 7 shows that the model is significant ($F = 1.891$). These results support the study's hypotheses that transformational leadership has a significant influence on teamwork processes.

Table 7. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.844	1	1.844	1.891	.178a
	Residual	33.156	34	0.975		
	Total	35	35			

- a. Predictors: (Constant), Transformation Leadership
- b. Dependent Variable: Team work Processes

The results in table 8 indicate that the coefficients β_2 (Teamwork processes) is both positive and significant, $\beta_2 = 0.23$, indicating the amount of change in teamwork processes that is attributable to transformational leadership, $t = 1.375$, $p \leq 0.05$

Table 8. Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.16E-16	0.165		.0000	1
	Transformation Leadership	0.23	0.167	0.23	1.375	0.18

- a. Dependent Variable: Work Team Process
- b. Independent variable: Transformational Leadership

Relationship between Teamwork Processes and Knowledge Management

To test the effect of teamwork processes on knowledge management, the following regression model was run; $Y = \beta_0 + \beta_3 X_3 + e$. Where Y = knowledge management, β_0 = intercept, β_3 = regression coefficient for teamwork processes, X_3 = Teamwork processes as the predictor variable. The results which are presented in table 9 show that teamwork processes explain 63 per cent of the variance in knowledge management $r^2 = 0.063$.

Table 9 .Model Summary for the effect of teamwork processes on knowledge management.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.251a	0.063	0.035	0.982181

- a. Predictors: (Constant), Work Team Process
- b. Dependent Variable: Knowledge Management

Analysis of variance in table 10 show that the model is significant ($F = 2.281$). These results support the study's proposition that teamwork processes predict knowledge management.

Table 10. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.201	1	2.201	2.281	.140a
	Residual	32.799	34	0.965		
	Total	35	35			

- a. Predictors: (Constant), Work Team Process
- b. Dependent Variable: Knowledge Management

The results in table 11 show that the coefficient β_3 (knowledge management) is both positive and significant, $\beta_3 = 0.251$, indicating the amount of change in knowledge management that is attributable to team work process, $t = 1.51$, $p \leq 0.05$.

Table 11; Regression Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-8.88E-17	0.164		0.00	1
	Work Team Process	0.251	0.166	0.251	1.51	0.14

- a. Predictors: (Constant), Work Team Process
- b. Dependent Variable: Knowledge Management

Transformational Leadership, teamwork processes and knowledge management

To determine whether transformational leadership predicts knowledge management through teamwork processes, stepwise regression model proposed by Baron and Kenny (1986) and Kenny et al (1997) was run. The results are presented in table 12, 13 and 14.

Results of regression analysis in table 12 show that transformational leadership and teamwork processes together explain 48.9 per cent of the variance in knowledge management, $r^2 = 0.489$

Table 12. Model Summary for the effect of teamwork processes on the relationship between transformational leadership and knowledge management.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.700a	0.489	0.458	0.735965

- a. Predictors: (Constant), Work Team Process, Transformation Leadership
- b. Dependent Variable: Knowledge Management

Analysis of variance in table 13 show that the model is significant ($F = 15.809$) for predicting knowledge management.

Table 13. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.126	2	8.563	15.809	.000a
	Residual	17.874	33	0.542		
	Total	35	35			

- a. Predictors: (Constant), Work Team Process, Transformation Leadership
- b. Dependent Variable: Knowledge Management

The results in table 14 show that when teamwork processes is added to the model, the beta coefficient for knowledge management reduces significantly from 0.671 to 0.097, the t statistic changes from $t = 5.25$ to $t = 0.76$. The model becomes insignificant $p \geq 0.05$. From these results, hypothesis 1.2 which states that teamwork processes mediate the relationship between transformational leadership and knowledge management is not supported.

Table 14. Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.18E-16	0.123		.000	1
	Transformation Leadership	0.671	0.128	0.671	5.25	0.00
	Work Team Process	0.097	0.128	0.097	0.76	0.45

- a. Dependent Variable: Knowledge Management
- b. Independent Variable; Transformational leadership

Conclusions, Recommendations and limitations

The current study examines the relationship between transformational leadership and knowledge management in the Kenyan Universities. The mediating role of teamwork processes in the relationship is also explored. Prior research found evidence that transformational leadership positively influences teamwork processes, leading to improvements in team performance, and functioning (Sosik et al.1997; Yammarino, et al.2004). Extant studies regarding the influence of transformational leadership on knowledge management though limited determines it to be positive (Crawford, 2005). Studies seeking to determine the intermediate team processes which explain the positive influence of transformational leadership on firm outcomes including a firms knowledge management initiatives are very limited.

The results of this study supported the view that transformational leadership has a positive influence on teamwork processes. The results further determined that transformational leadership has a significant positive influence on knowledge management. Teamwork processes however were found to have no significant mediating influence on the relationship between transformational leadership and knowledge management. This was quite interesting since prior research has found teamwork processes to positively predict firm outcomes with transformational leadership as the predictor variable (Walumbwa and Muchiri, 2012, Yamarinno, 2005). One possible explanation for these results could be the choice of teamwork processes used for the study. Further research incorporating more teamwork variables is therefore recommended. Cultural context may also be a factor that may have influenced the findings. Most of the studies referred to in this paper are based in western countries contexts which have different cultural value systems that influence group functioning. This research study is based in a cultural context characterized by collectivism, which emphasizes harmony and close interpersonal ties. As such, interpersonal communication and cohesiveness are intertwined in the daily existence of the societies. This may have influenced the study findings. Such a conclusion however is subject to validation by future research studies. It is also important to note that the findings show that teamwork processes by themselves account for 63% of the variance in knowledge management while transformational leadership accounts for 48% of the variance individually. This implies that Transformational Leadership may not be a very critical element if an organization has highly cohesive teams and good communication.

This study has theoretical implications. Firstly, the results showed that transformational leadership has a positive effect on knowledge management practices. This is consistent with the underpinnings of the transformational leadership theory that transformational leaders inspire, motivate and empower followers to higher levels of performance. The findings are also consistent with Crawford (2005) and Turner et al.(2012),who determined the influence of transformational leadership on knowledge management to be positive. Thirdly, the hypothesized mediating influence of teamwork processes in the relationship between transformational leadership and knowledge management was not confirmed. Further research is needed to determine the specific teamwork processes and their combined and individual effect on the relationship between transformational leadership and knowledge management. Future research may also determine the possible role of culture on the relationship.

One limitation of this study is that this is an initial attempt at understanding how transformational behavior may influence Knowledge Management performance via teamwork processes. Out of the studies reviewed, none has attempted to link the transformational leadership style to knowledge management through teamwork processes. Further research is therefore needed to validate the findings of this study. Although up to seven teamwork processes have been identified in literature, only two were considered for this study. This may have influenced and limited the study findings. Future research is recommended to provide more clarity on these relationships.

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