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Factors Affecting the Successful Implementation of Kaizen in Ethiopia

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Abstract:

Kaizen has been chosen by the Ethiopian government as a strategic change tool necessary to improve the competitiveness of business organizations in the country. However, besides government's effort and temporal hype, business entities are not successfully implementing the change and able to benefit from its advantages. The aim of this study is to investigate factors affecting the successful implementation of kaizen In Ethiopia. After reviewing prior literature, we have identified six factors as determinants of the successful implementation of kaizen i.e. proper communication, top management support and commitment, training, teamwork organizational culture and education. A survey data from sample of 214 employees from 125 Technique, Vocational, and Enterprise Development Office (TVEDOs) employees was collected using a questionnaire. After checking for the reliability and validity of the data, Structural Equation Modeling Technique was used to test the developed hypotheses. We have found that top management commitment support, education level, teamwork, and organization culture have positive and statistically significant relationship with successful implementation of kaizen. On the other hand, communication found to be insignificant determinant of the successful implementation of Kaizen in Ethiopia. Training was a significant mediator of the relationship between identified factors and implementation of Kaizen. Ethiopian Kaizen Institute as well as implementing organizations should focus on these factors that are found to be significant determinants of successful implementation of Kaizen.

Keywords: Kaizen, implementation, TVEDOs, Ethiopia

1. Introduction

Product/service quality and productivity improvement are the modern global agendas that require new management systems like kaizen. Kaizen has become a global project that spread by various international and domestic business organizations and their employees aimed to improve quality and productivity so as to achieve organizational mission and objectives (Maarof & Mahmud, 2016; Garcia & Rivera, 2016; Glover et al., 2011). The advantages from kaizen implementation are enormous and reported along economic, social and technical dimensions of firms and include cost reduction, productivity improvement, decrease in defects and improvement in workers' ethics and incentives for better results (Buunet & New, 2003; Bessant, 2003).

Countries have applied Kaizen Management for various sectors and encountered multi-dimensional success and challenge stories (Karn, 2009). The Introduction of kaizen in Ethiopia doesn't have a long history as compared to other change tools like business process reengineering (BPR). In 2011, Ethiopian Kaizen Institute (EKI) was established under Ministry of Industry after a bilateral agreement between government of Ethiopia and Japan was signed (Tigist, 2015; EKI, 2013). The government of Ethiopia has identified 30 domestic manufacturing industries for pilot project so as to better understanding about kaizen philosophy while experts from Japanese guide the organizations in implementing the new management system. For the first time, Ethiopia kaizen Institute prepared training for 380 sugar corporation managers and supervisor, during this time the Federal Technique, Vocational, Education and Training Development (TVETD) and enterprise agency presented its experience for the trainees (Asefash, 2014).

The Federal Technique, Vocational, Educational Training and Development & Enterprise Agency and its regional branches became one of the facilitators of kaizen implementation in Technique, vocational and enterprises developmental office (TVEDO). The Amhara National Regional State Technical, Vocational and Enterprises Development Bureau is also one of the facilitators of kaizen implementation in various TVEDOs.

In spite of increasing recognition of kaizen management philosophy researches show that the implementation of kaizen is not effectively accomplished by organizations (Fukuda, 1988). The study done by Imai (2000) shows those over 90% of companies that start to implement kaizen give up in the middle of the implementation phase.

Desta et al. (2014) identified important challenges of kaizen implementation in the manufacturing industry of Ethiopia. He found that most manufacturing industry did not empower employees, power is mostly concentrated in the hand of top management, and employees lack motivation

The purpose of this study is to investigate the major factors that are affecting the successful implementation of kaizen in Ethiopia. The significance of this study is threefold. (1) the findings will provide some insight on what is hindering Ethiopian organizations in order to fully implement kaizen principles. (2) it will also provide an input to policy makers particularly, the Ethiopian Kaizen Institute on what to do next to make kaizen a success story in Ethiopia. (3) Lastly, the study, on its part, will fill the existing literature gap especially in Ethiopia.

2. Review of Related Literature

Kaizen was created in Japan in the post second world war (WW II). The word kaizen means "continuous improvement". It comes from the Japanese words "kai" meaning "change" and "Zen" which means "better" which is means continuous improvement. Kaizen focuses on the social, individual and practical parts of manufacturing and service industries of the organization and concepts the idea of quality with improvement (Imai, 2000). Kaizen is a management system that forces higher standards at all levels of the companies by encouraging continuous improvement in all process. Kaizen is a never-ending trip towards waste elimination process, quality improvement, efficient and effective utilization (Desta et al., 2014).

Kaizen is a process of continual understanding by an organization to improve its business as well as with the aim to always improve quality of products and services in order to the companies can meet full customer satisfaction (Ethiopia kaizen manual, 2011). According to Imai (2000), kaizen has three pillars, these are as follow: 1. housekeeping, 2. waste elimination and 3. standardization. The first steps of housekeeping as identified by Imai (2000) are as follow: sort (focus on removing all unnecessary items from the work place), set in order (putting the right things at the right place), shine (when the workplace clean and bright where everyone enjoys working environment), standardize (the first three steps are maintained) and sustain. The second step of muda (waste elimination) is a Japanese word which indicates any non-value adding activities (Berk et al., 1993). In kaizen management philosophy, the main purpose is to eliminate the seven types of muda (7 deadly wastes) which caused by overproduction, waiting, transportation, over processing, unnecessary stock, motion and a defective component. Muda is any non-value-added task. Wastes are one means of productivity loss mechanism. Therefore, to boost the production quality and quantity must apply wastes reduction approach in the real working environment (Ethiopia Kaizen Institute Book, 2006). The third steps of standardization are set by management body; however, it was change when the situations changes. Most business organizations are able to achieve significant improvement as reviewing the standards periodically, collecting, and analyzing data on defects, and motivating teams to conduct problem solving activities (Dysco, 2010).

3. Variables and Hypothesis Development

3.1. Top Management Support

Management support and commitment is the process of planning, organizing, leading and controlling the available resources in a way to achieve stipulated objectives efficiently and effectively (Humphrey, 1995). Top management should be committed to empower the workers by providing adequate authority for the employees to make both individual and collective decision. Top management support and commitment is an importance pillar for effective and sustaining the best culture of kaizen but most of top managements do not give proper attention for the implementation of kaizen and its sustainability (Amanuel, 2014).

- H₁: Top management support has significant effects on the effective implementation of kaizen.

3.2. Teamwork

Teams are established when a combination of skills, knowledge and expertise are necessary to carry out a specific activity that helps to accomplish the company's goal. On the face of challenges such as falling services, improvements in quality principles, putting together a new project, tackle major change initiatives and cross process can harmonize in huge and complex companies.

The most significance part of team work journey is meeting regularly to review progress, deal with problems, decide on next steps, and make other decisions relevant to the team's work. One of the most crucial principles of kaizen approach is the ability to work in teams. For effective kaizen implementation teamwork is highly important because it increase information sharing among team members, to create better decisions and improve employee's motivation and productivity.

- H₂: Team work has significant impact on the effective implementation of kaizen

3.3. Proper Communication

Communication delivers the organization's value, expectations, and guidelines; provide information company developments. It also provides information about the performance of the organization and allow feedback from all levels (Buunnet & New, 2003). Communication is one of the most crucial supportive dimensions to be considered when implementing kaizen in a company. From the principles of kaizen management philosophy, it is understandable that communication is one of the key success factors in the process of effective implementation of the philosophy (Oakland 2007).

- H₃: Proper communication has significant effects the effective implementation of kaizen.

3.4. Education Level

Education is a tool to improve the productivity of citizens in all aspects of the economy. According to Kamau (2012) 62% employees agreed education level of employees strongly affects the effective implementation of kaizen whereas 67% managers were not sure if education level affects the effective implementation of kaizen. Workers admired education level as important for effective implementation of kaizen than managers who doubted if education level has any effect on kaizen implementation. This is because most general worker had reached primary school and had problems understanding even kaizen poster written in English so they saw their low level of education as a challenge in implementing kaizen. Therefore, the view of managers and workers about the effects of education in kaizen implementation is different (Kamau, 2012).

- H₄: Educational level has significant effects on kaizen implementation.

3.5. Organizational Culture

Organizational culture is regarded as the specific collection of values and norms that are shared by people and groups in an organization and that control the way they interact with each other and with stakeholders outside the organization. Kaizen involves changes in organizational culture and structure which allows open-communication, teamwork, and trust development (Imai, 2000; Ohno, 2009). Such concept as kaizen which is context-dependent, level of effective transfer is highly dependent on the organizational culture that kaizen involves. Desta et al. (2014) found that organizational culture and motivation were critical factors that affect kaizen implementation within the organization context.

- H₅: Organizational Culture Has Significant Relationship With Effective Implementation Of Kaizen.

3.6. Training as a Mediator

Training is learning process which involves the acquisition of knowledge, sharpening of important skills, procedures, rules, changing of behaviors and attitudes so as to improve the effectiveness of every employee. It is a continuous activity in which employees get the knowledge. According to Mangal (2009) training helps to acquire and develop necessary skills, attitude, and knowledge through learning experience so as to attain the firms' established mission and objectives. Kaizen related training also helps management to develop their managing knowledge and skills (Amanuel, 2014). Lack of adequate training and information about kaizen leads to lack of understanding about Kaizen management tools and techniques which results fail to implement the new management philosophy (Michael, 2014).

- H₆: Training significantly mediates the relationship between identified independent variables and effective implementation of kaizen.

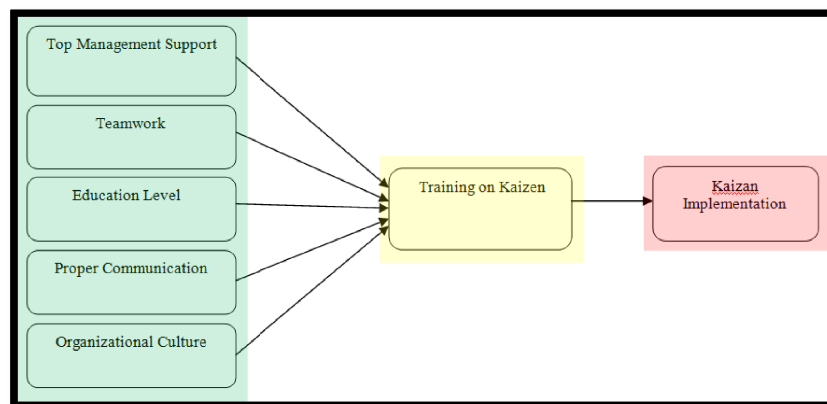


Figure 1: Proposed Framework

4. Research Methods

4.1. Survey Administration and Data Collection

Data for this study was obtained from a questionnaire-based survey. Questionnaire items were adopted from prior researches after conducting a comprehensive literature review in the field of Kaizen and other organizational change tools. The necessary data to test the hypotheses was collected from a sample of randomly drawn 214 employees of 125 TVEDOs located in Amhara Region, Ethiopia. We primarily targeted individuals with an educational level of college diploma and above from those organizations. We specifically targeted these group of individuals based on the notion that they have a better knowledge on the concepts of Kaizen. Data collection was done using a paper-and-pencil approach. Among the 525 questionnaires distributed, 217 of them responded within the time frame we set (one month) yielding a 41% response rate. Among those responses three of them were incomplete and consequently disregarded. The remaining 214 valuable responses were used for further analysis. Table 1 shows the summary of demographic data of respondents.

Variable	Frequency	Percentage
Sex		
Male	147	69%
Female	67	31%
Experience (Years)		
≤ 1 year	13	6%
1 - 5 years	119	56%
≥ 5 years	82	38%
Department		
Enterprise Development	60	28%
Industry Extension & Tech. Transfer	61	29%
Planning & Control	20	9%
Input Supply	34	16%
Marketing	39	18%

Table 1: Summary of Demographic Information of Respondents (N = 214)

4.2. Validity and Reliability of Items

In the first step, measurement model was tested and reliability, convergent validity, and discriminant validity are checked. In assessing the reliability of the constructs, we used both Cronbach's alpha and composite reliability approach (Fornell & Larcker, 1981). All the values were well above the threshold (> 0.7) with values ranging from 0.8761 to 0.9667 as shown in Table 2. Multicollinearity was assessed using the variance inflation factor (VIF) method. All the values were found to be below the 5.0 standard (Hair *et al.*, 1998).

Factor	Item	Mean	S.D	Loading ^a	Alpha ^b	CR ^c	AVE ^d	VIF ^e
Top Management Support	MS1	2.85	1.05	0.8537	0.9465	0.9575	0.7898	1.24
	MS2	2.84	1.01	0.9101				
	MS3	2.83	1.07	0.8627				
	MS4	2.87	1.02	0.9357				
	MS5	2.93	1.07	0.8668				
	MS6	2.83	1.04	0.9003				
Team Work	TW1	2.76	1.07	0.7519	0.8496	0.8891	0.616	2.12
	TW2	2.73	1.03	0.7860				
	TW3	2.76	1.07	0.8029				
	TW4	2.70	1.08	0.8074				
	TW5	2.74	1.07	0.7749				
Education Level	EL1	3.45	1.15	0.8890	0.8955	0.9254	0.7602	1.72
	EL2	3.34	1.17	0.9634				
	EL3	3.43	1.20	0.6483				
	EL4	3.31	1.16	0.9498				
Proper Communication	PC1	3.09	1.13	0.8660	0.9666	0.9742	0.8831	1.24
	PC2	3.08	1.18	0.9597				
	PC3	3.09	1.16	0.9677				
	PC4	3.12	1.12	0.9525				
	PC5	3.11	1.16	0.9491				
Organizational Culture	OC1	3.06	1.13	0.7887	0.8761	0.9098	0.6697	1.85
	OC2	2.72	1.10	0.8921				
	OC3	2.65	1.10	0.8052				
	OC4	3.05	1.15	0.7272				
	OC5	2.69	1.09	0.8679				
Kaizen Training	KT1	2.68	1.21	0.7296	0.8783	0.912	0.6759	1.63
	KT2	2.50	1.12	0.8539				
	KT3	2.41	1.06	0.8854				
	KT4	2.51	1.12	0.8707				
	KT5	2.40	1.14	0.7589				
Kaizen Implementation	KI1	2.59	1.06	0.9787	0.9370	0.9578	0.852	2.01
	KI2	2.81	1.12	0.7314				
	KI3	2.58	1.07	0.9784				
	KI4	2.59	1.06	0.9787				

Table 2: Summary of Measurement Scale (N = 214)

^aAll Items Loadings Are Significant at $P < 0.001$, ^bCronbach's Alpha Value

^cCR = Composite Score, ^dAVE = Average Variance Extracted

^eVIF = Variance Inflation Factor

We used partial list square (PLS) based SEM to test the structural model. We favored PLS-SEM over covariance based SEM (CB-SEM), due to the advantages that the former can bring, such as, (1) it does not require the data to follow normality; (2) can be applied when the researcher has fewer indicators; (3) large number of indicators can be included in the model; (4) it assumes all measured variance (including error) is useful for explanation and prediction of the relationship (Hair, 2011; Afthanorhan, 2013). Since all factors included in this study are second order variables, we used a "reflective - formative" based CFA known as "hierarchical component model" (HCM) in PLS-SEM. HCM helps researchers to reduce number of indicators in SEM besides making the entire model more parsimonious. It is proved to be very essential when constructs are highly correlated which makes the estimation more biased to multicollinearity (Afthanorhan, 2013).

4.3. Analysis of the Inner Model

According to Cohen (1998), R^2 value, > 0.26 is considered substantial, > 0.13 as moderate and < 0.02 as weak indication of explained variation of an endogenous variable by a given exogenous indicator. All values were well above the "moderate" threshold. Predictive relevance of a reflective endogenous variable can be tested using Q^2 and according to Chin (1998), Q^2 value greater than zero indicates that the respective endogenous variable has a significant predictive relevance. As shown in table 4, all Q^2 values were well above zero hence predictive relevance has been achieved.

The effect size f^2 is used to assess the impact of a specific predictor (exogenous) variable on an endogenous variable. The value of f^2 tells what happens to the R^2 value of an endogenous variable when a specific predictor variable is omitted from the model

Factor	R^2	Q^2	f^2
TopManagementSupport			0.3756
TeamWork			0.2498
EducationLevel			0.4560
ProperCommunication			0.1031
Organizational Culture			
KaizenTraining	0.397	0.2169	
KaizenImplementation	0.254	0.0646	

Table 3: Summary of Effect Size

Cohen (1998) suggests that f^2 value > 0.35 represents strong effect size while > 0.15 shows moderate effect size and > 0.02 indicates a weak effect size. In our case, all exogenous variables' effect size value ranges between moderate to strong effect size (Table 3).

The hypotheses were tested by assessing the direction, strength, and level of significance of the path coefficients estimated by PLS, using a bootstrap resampling method with 5000 resample following Chin's (1998) suggestion. Table 4 provides the summary of findings and indirect effects. Hypotheses 1, 2, 3 and 6 were supported at 5% significance level. Hypothesis 5 can still be supported at 10% alpha level. Hypothesis 5 was not supported.

Hypothesis	Independent -> dependent variables	Path coefficients	t- statistics	Result
H1(+)	TopManagementSupport -> KaizenTraining	0.3426	3.5223***	Supported
H2(+)	TeamWork -> KaizenTraining	0.2280	2.6372***	Supported
H3(+)	EducationLevel -> KaizenTraining	0.1661	2.1624**	Supported
H4(+)	ProperCommunication -> KaizenTraining	0.0162	0.1827	Not Supported
H5(+)	OrganizationalCulture -> KaizenTraining	0.1845	1.94807*	Supported
H6(+)	KaizenTraining -> KaizenImplementation	0.3924	4.435***	Supported

Table 4: Path Coefficients and Significance Level (N= 214)

*Hypothesis Supported at 0.1 Alpha Level

**Hypothesis Supported at 0.05 Alpha Level

***Hypothesis Supported at 0.001 Alpha Level

Sobel's test is used to test the indirect (mediation) effects. Table 5 provides the summary of findings and indirect effects. All the hypotheses were supported at 5% alpha value except hypothesis one which still can be supported at 0.1 alpha level.

Latent variable	Linkage	Dependent Variable Kaizen Implementation
Top Management Support	Kaizen Training	2.0448(0.042)
Team Work		1.99083(0.050)
EducationLevel		2.1324 (0.033)
Proper Communication		3.1321(0.005)
Organizational Culture		4.1321(0.005)

Table 5: Sobel's test of Mediation Significance

5. Conclusion Recommendations

Around the late 2010s, kaizen was one of the priorities of the Ethiopian government in order to bring quality and competitiveness in both public and private organizations. Despite the temporal hype, however, the implementation of kaizen has been sluggish and not to the fullest of the management philosophy. The purpose of this study was to identify determinant factors of successful kaizen implementation in Ethiopia. After intensive review of prior studies, we have identified that a persisted top management commitment and support, effective team work, education level of employees, proper communication within the organization and organizational culture are the most important factors that help facilitate the adaptation process of any organizational change tools including kaizen. There is also strong literature evidence that proper training on the philosophy itself will mediate the relationship between the above independent variables and kaizen implementation.

We have collected a primary survey data from 214 employees of 125 TVEDOs located in Amhara region, Ethiopia using an Amharic version of structured questionnaire. Once we have checked for validity, reliability, and multicollinearity of items, data and variables, we have tested our hypothesis using PLS – SEM.

Top management support, teamwork, and education level were found to be the most important determinants of effective kaizen implementation in Ethiopia. Organizational culture was also a modest determinant of successful kaizen implementation. We have also found that proper intervention through training on kaizen management philosophy significantly mediates the relationship between the identified independent variable and effective kaizen implementation. Despite strong prior empirical evidence, proper communication was not found to be a significant determinant of effective kaizen implementation in Ethiopia. The most plausible reason can be the fact that kaizen is a continuous process improvement technique, hence, communication should be bottom – up. In Ethiopia, however, communication seems top – down where the top management introduces changes and generates process improvement ideas then communicates to lower level employees.

Based on the finding of the study, researchers have forwarded the following recommendations. To successfully implement kaizen, organizations should create conducive environment for team work. Since the implementation process involves every one, employees must be multi-skilled (well educated) to be able to understand and work with kaizen philosophy as it requires a versatile work force. It is also important to have empowering and encouraging organizational culture. For any gap, in employees' competency, awareness on kaizen and attitude, proper training on kaizen principles is also very important. Future researchers may look into other variables that may potentially affect the successful implementation of kaizen in different cases.

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