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FACTORS AFFECTING KAIZEN PHILOSOPHY IMPLEMENTATION (WITH SPECIAL REFERENCE TO ASSOSA UNIVERSITY, ETHIOPIA)

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ABSTRACT

Kaizen is considered as one of the most important approaches to achieve quality and waste minimization technique. This survey pursued to determine the factors influencing implementation of kaizen philosophy in Assosa University. Only university store, students' cafeteria, library, registrar, and laboratory assistances employees were involved in this study. Factors considered in the study were only employees' training, management support (commitment), team work and communication approach. The study adopted a descriptive research design and explanatory factor analysis research design. The study used stratified and simple random sampling to determine the sample size. Primary data for the study was collected using structured questionnaires. Collected data was analyzed through SPSS software (Version 20). The findings of this study revealed that employees' training, management commitment, team work and communication approach directly influences the implementation of kaizen philosophy. The study recommended that university has to be train its employees on kaizen events initiatives, managements commit themselves in providing leadership and key resources needed, building up good team spirit, develop appropriate, effective and flexible communication systems that allow free flow of relevant information at all levels in the university. The study recommended that, further studies may be done to explore other factors.

Introduction

The original American technique which was adapted and adjusted became a Japanese management system (JMS), better known as *kaizen (ky'zen*). According to Imai (1986), *kaizen* is defined as continuous improvement involving employees in all levels of an organization (Asayehgn, 2012). Japanese word of kaizen, (kai) change (Zen) for good. Or it is "continuous improvement" for the change (ibid). The Kaizen philosophy assumes that our way of life, working life, our social life, or our home life should focus on constant-improvement efforts. The beauty of kaizen is that it can realize productivity improvements with little additional investments. Thus simplicity and cost effectiveness are the major reasons why kaizen is well appreciated globally. There are large numbers of related and often overlapping components that belong to the kaizen toolkit such as 5S, 7 wastage/muda/ reduction principle, safety rules, Total Quality Control (TQC), Just-In-Time (JIT). Among these, 5s is generally considered to be the most basic step for improving quality and productivity (Asefash, 2014).Hence implementing kaizen management philosophy in the universities or colleges help to create quality and productivity "trained man power" and these leads to quality of production in the industry sectors hence graduates of university trainees will be either an employee or the owner of the industry (ibid).

Statement of the problem

According to Imai (1986), kaizen is a management philosophy which instructs how a human should conduct his or her life. It focuses on the way people approach work. It shows how management i.e., leaders and trainers can change their mindset together to improve their productivity "trained man power" (Asefash, 214).As Berihu (Berihu, 2009), suggested, globalization and growing competitiveness of world markets, enterprises are continually looking for different management techniques such as Kaizen which includes 5S, 7wastage/muda/

reduction principle, QCC, etc. Thus universities and higher institutions provide for a wider array of beneficiaries among workers in the manufacturing sector than in other types of organization. Kaizen implementation in learning department is prerequisite to get qualified manpower from the training center (EKI yearly booklet Aug, 2011).

Lack of communication explained as the most common problems facing traditionally managed organizations (Asefash, 214). As articulated by (Er. Rajesh *et al.*, 2012), cited that organizations are lacking in the trained and experienced employees, lack of support from top management, lack of interest of employees, dependencies on traditional system of working, lack of research, financial constraints, lack of supervision, and absence of departmental (team) harmonization are mentioned as an obstacle in the implementation Kaizen philosophy (Lean Manufacturing System).

While many studies have looked at these factors in other countries, it is important to note that most of these studies have been done in manufacturing and others none education service industry. In Ethiopia, very limited research if any has been done with none having been conducted in universities. This study aimed to bridge this gap by looking at the factors that affect implementation of kaizen philosophy in education sectors using Assosa University as a case study.

Research questions

1. To what extent to which employee's training influence implementation of kaizen philosophy in Assosa University
2. How does top management commitment influence implementation of kaizen philosophy in Assosa University?
3. To what extent influence of communication on implementation of kaizen philosophy in Assosa University?
4. To what extent does influence of team work on implementation of kaizen philosophy in Assosa University?

Objective of the Study

General objective

The ultimate objective of the study is to investigate factors that influence implementation of kaizen philosophy implementation in Assosa University.

Specific objectives

1. To examine the extent to which Employee's Training influence implementation of kaizen system in Assosa University
2. To investigate Management (support) Commitment influence implementation of kaizen system in Assosa University?
3. To determine the influence of Communication on implementation of kaizen system in Assosa University?
4. To assess the influence of team work on implementation of kaizen system in Assosa University?

Significance of the study

The study will help to understand obstacles of kaizen implementation in education sectors / universities. More over the result of a study helps: It helps all stakeholders within the university; store keeper, educators and decision makers, to improve the practice of the kaizen implementation process. It also helps to show the nature of the problem and initiate others to undertake further studies.

Delimitation (scope) of the study

This study focused on the assessment of factors influencing implementation of kaizen philosophy in Assosa University with descriptive survey and explanatory factor analysis research design.

Limitations of the Study

For the first, kaizen is relatively newly introduced concept in Ethiopia due to this there is no adequate research results in the area because of this the researcher had faced lack of sufficient materials for the study; second, at the time of collecting data the researcher has faced some respondents who has reluctant or hesitant to provide information and finally, time and budget constraints restricted the scope of the study to assess factors of kaizen implementation in related to other functional unit departments and Universities and also other variables.

LITERATURE REVIEW

The Concept of Kaizen

Kaizen is a Japanese philosophy meant for process improvement that can be traced to the meaning of the Japanese words 'Kai' and 'Zen', which translate roughly into 'to break apart and investigate' and 'to improve upon the existing situation'(Asefash, 214). The Ethiopia Kaizen Institute defines Kaizen (2012) as the Japanese term for continuous improvement.

Benefit of kaizen

According to *www.vsrdjournals.com* any organization implementation of kaizen management philosophy has a benefit from its staff member work satisfaction beyond profitability of the organization.

Implementation of Kaizen

As articulated by (Anh. P. *et al*., 2011), the success of kaizen overseas transferability and implementation practices depends on the degree of compatibility between the Japanese company's kaizen culture and the host country's national culture. Given this conceptual framework, the introduction of kaizen as a management tool and success in the transfer of technology to improve and enhance productivity and managerial capability in higher institution needs to be seen in the establishment of several building blocks in addition to conceptual issues related to:

- ✓ *The fit between kaizen culture and the organizational culture of the practices;*
- ✓ *Changes in the mindset of cross-functional department of workers so they will adhere to the kaizen work ethics;*
- ✓ *Workers' training and discipline so that workers follow standard operating procedures;*
- ✓ *The existence of a hungry mentality so c workers will do work which is above and beyond their responsibility; and*
- ✓ *The empowerment and involvement of workers in decision-making to cooperatively identify problems, generate solutions, implement them and then follow up to evaluate quality and productivity.*

Pillars of kaizen

According to Imai (1986), the three pillars of kaizen are summarized as follows:-

A. ***Housekeeping/ 5S techniques***

5S technique is also a sub part of, Kaizen‟ which means "Change for better". 5S improves the workplace effectiveness by making it perfect for working. It includes the following 5 Steps started with, 'S':-

1. **Sort** – Remove unnecessary items from the work area and attach red tag to the all unnecessary and infrequently used items.
2. **Set in order** – customize the work area for effective working by keeping important materials, tools nearby workplace.
3. **Shine** – Clean the work area, machines, tools, equipment for finding and eliminating the minor and unwanted constituents.
4. **Standardize** – create a standardized and consistent 5S work flow by maintaining high standards of housekeeping, workplace organization, cleanliness and orderliness, everything in order and in its right place.
5. **Sustain** – ensure the 5S as a long term goal and give awareness and training to the workers and employees by explaining its significance.

Figure: 1.pictorial Presentation of 5S.

Source: Adapted from different literatures.

B. *Waste (Muda) Elimination*

As (Berk, J & Berk, S, 1993) citation, Muda in Japanese means "waste". The resources at each process, people and machines either add value or do not add value and therefore, any non-value adding activity is classified as Muda in Japan. Wastes are one means of productivity loss mechanism. So, to increase quantity must apply wastes reduction methods in the working area.

C. *Standardization*

According to (Kilian, 1992) explained that standards are set by management, but they must be able to change when the environment changes.

Influencing factors of Kaizen philosophy Implementation

Several factors that are critical for a successful kaizen process and implementation have been identified in prior research. Like, managerial commitment. This was mainly because it determines the level of resources allocated to kaizen activities, like human capital, financial, informational, and technological resources. Top management acts as a driver of kaizen activities, creating value, goals and systems to develop a kaizen culture. Another factor that is identified as critical to kaizen success is the role of organizational structure for communication and decision making it affects group decisions and teamwork combination (Wesonga, 2004). Role of communication is the mode of knowledge sharing, because socialization is the dominant mode of knowledge transfer from one to another (Kodo and Harm, 2013).

Kaizen practices could be implemented by the organizations of the host countries provided that the host organizations have a low level of centralization of authority, and practice cross-functional team cooperation of eight to 12 people with a skilled facilitator to identify, measure, and correct the problem associated with the process(Er. Rajesh, *etal.*, 2012).

According to (Sevtap, 2015), surveyed within Wood Products Industry and identified several barriers to implementing kaizen initiatives. These barriers include employee and/or middle management resistance, lack of implementation expertise, lack of time, lack of labor resources, lack of capital funds, no sense of urgency, and failure of past continuous improvement projects and employee and managerial resistance as hindrances to implementation. He also reviewed as employees may view lack of planning and the lack of a formal ability to include employees' ideas as barriers to implementing and sustaining continuous initiatives.

The conceptual framework

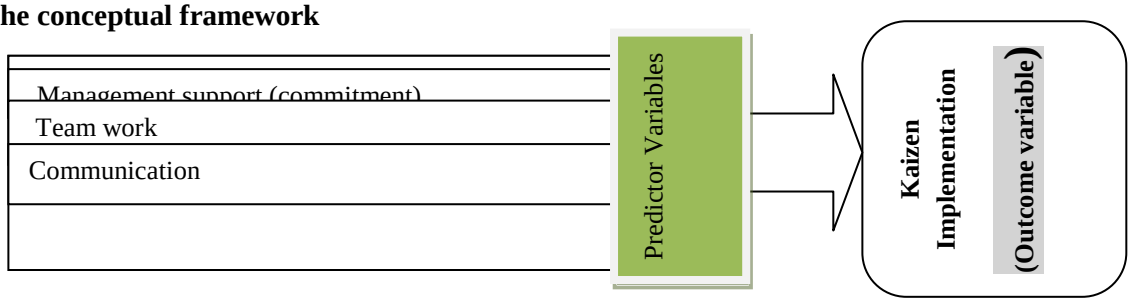

Figure 2.1 Conceptual framework developed by the researcher from literatures

RESEARCH METHODOLOGY

Description of study area

A study was conduct in Assosa University which is located in Benishangul Gumuz Regional State West Region of Ethiopia 661 km away from capital city of Addis Ababa.

Research design

A descriptive survey and explanatory factor analysis research design was employed in the study to assess the influencing factors for implementation of Kaizen philosophy in Assosa University. Moreover, the study also utilized correlation and regression statistics in to order to see the relationship and degree of effects of dependent and independent variables.

Data type and Data Source

Data type

Both primary and secondary sources of data were used for the study.

Sources of Data

The primary sources of data was questionnaires to the selected respondents, observation was conducted on some selected functional unit departments. Secondary data in literatures, which are relevant to the theme of the study, would be gathered from various sources to complement the survey-based analysis.

Target population and Sampling Design Technique

Study (target) population

My survey purposely was focused on only university store, students' cafeteria, library, registrar, and laboratory assistances employees. Those constitutes 175 permanent staffs only.

Sampling technique and sample size determination

The researcher used stratified sampling followed by simple random sampling method since the target populations are located in different functional unit departments. For this study a researcher used (Yamane's, 1969), sample size determination formula with 95% confidence interval and 5% level of precision .The formula is stated as follows:

$n = \frac{N}{1+N(e)^2} = \frac{175}{1+175(.05)^2} \approx 122$

Where: n = sample size, N = the target population of the study and e = the level of precision.

Method of data collection and Data collection Instruments of the study

The study used standardized questionnaire (close and open end) and observation as an instrument to collect data from respondents and realities.

Methods of Data processing and Analysis

Manual and computerized data processing system was performed for editing, coding, classification and tabulation of the collected data. After the data had been collected, the statistical package for social science (SPSS) version 20.0 was used to analyze the data by using descriptive statistics techniques such mean, frequency table, standard deviation to present the data while, inferential statistics was conducted such as multiple linear regression analyses and correlation to measure the degree of association between the variables and also analysis of variance (ANOVA) tested. Qualitative data would be analyzed by descriptive narration.

Model equation

The multiple linear regression models for the study were presented as follows;

$Y = \beta_{0+}\beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \in$

Where, Y= Kaizen Implementation (dependent variable)

β_0 = Intercept (constant) , $\beta 1, \beta 2, \ldots \ldots \beta 4$ = coefficien of explanatory variables

X_1 = Employees' training (level of awareness), X_3 = Team work, $\in$ = Error term

X_2 = Management support X_4 = communication

Results and Discussion

This chapter presents the analysis and discussion of the data gathered from primary sources. During the survey a total of 122 questionnaire was distributed out of it, after eliminating defective questionnaires, at last 105 questionnaires taken in to consideration for further analysis.

Demographical Variables of Respondents

Table 1. Demographical Variables of Respondents

Variables	**Classification of respondents**	**Frequency**	Percent
Gender	Female	60	57.1 %
	Male	45	42.9 %
	Total	105	100 %
Age category	≤ 20 years	46	44%
	21 -30 years	39	37%
	31 – 40 years	15	14%
	Above 40 years	5	5 %
	Total	105	100%
Marital status	Married	58	55.2%
	Single	47	44 .8%
	Total	105	100%
Level of education	Less than grade 10^{th}	2	1.9
	Grade 10^{th} completed	4	3.8
	Grade 12^{th} completed	1	1
	TVET completed	52	49.5
	University completed	46	43.8
	Total	105	100
Department(functional unit)	Administration staff	87	82%
	Academic staff	18	18%
		105	100%
Position	General workers/subordinates	87	83%

	Director /Group leaders Total	16 105	17% 100%

Source: Own survey, 2018

As it can be easily seen from the above table 1 majority (dominated) of the respondents (57.1 % %) were females and the rest (42.9 %) were males. The same table (1) indicates that the number of respondents categorized in to four different age groups. Majority of the respondents (44%)were with the age group of less than 20years old, followed by respondents at the age of between 21 and 30 years (37%),15% of the respondents were age group of between 31 and 40 years , and the rest of 5% of respondents were with age group of above 40 years old respectively.

Based on above table the marital status of the respondents, majority (55.2%) of the respondents were married, and the rest (44.8%) of the respondents were single.

Regarding respondents' educational qualification , as table (1),showed that majority of respondents (49.5%) were TVET completed followed by University completed(43.8%) ,Grade 10^{th} completed(3.8), less than grade 10^{th}(1.9%) and Grade 12^{th} completed(1%) respectively.

Concerning staff composition of the respondents, majority (82%) of the respondents were administration staffs, and the rest (18%) of the respondents were academic staffs. As per the same table majority (83%) of the respondents were general workers (or subordinates), and the rest (17%) of the respondents were directors /group leaders (or supervisors).

Descriptive Statistics results and discussion

Descriptive statistics is presented in the form of mean and std. deviation to demonstrate the level of agreement/disagreement of respondents with reference to Assosa university particularly department store, students' cafeteria, library, registrar, and laboratory assistances employees. The responses of the respondents for the variables indicated below were measured on five point Likert scale. While making interpretation of the results the scales are assigned as follows, 1= strongly disagree, 2= disagree, 3 = neutral, 4= agree and 5= strongly agree.

Table 2. Result of Descriptive statistics collective factors

General variables/factors of kaizen philosophy implementation	N	Mean	Std. Deviation
Employees' Training (level of awareness)	105	3.2(1^{st})	.88599
Management support(commitment)	105	2.8 (4^{th})	.88726
Team work	105	3.0 (2^{nd})	.90234
Communication	105	2.84(3^{rd})	.96652

Source: Own survey, 2018

Concerning about collective factors as it is clearly described above table the mean score showed that the influencing factors on kaizen philosophy implementation. As per table the overall perceived mean value and its std. deviation of employees' training (level of awareness) is (3.2) & (0 .88599), management support (2.8) & (0. 88726), team work (3.0) & (0. 90234) and Communication (2.84) & (0. 96652) respectively. In line with above points the overall perceived mean score of the two factors are above the neutral scale which is 2.96. In contrast the rest of two factors are below the neutral scale top management support (2.8) and communication (2.84). Based on descriptive statistics result, factors that influence kaizen implementation could be ordered as the following ranking orders employees training (level of awareness), team work, communication and management support. The study conducted by Wesonga in Kenya revealed that management related factors were leading factors.

Result of inferential statistics

Model adequacy checking

After ordinary least square (OLS) had been performed, statistical assumptions should be evaluated weather some basic common assumptions are satisfied or not. Assumptions explain when it is and isn't reasonable to perform a specific statistical test (Nacy and George, 2005). In this survey the following common statistical assumptions are tested.

Normality *test*

It is important to check skewness or normal because normality assumption assures that the p- value. For the t-tests and f-tests will be valid. As it can be described in histogram presentation, normality can be seen on the data distribution when the curve dose not passes through either the left or the right (Gujarati, 2004). So as it is figure out in the histogram, the data showed that was normally distributed.

Multicollinearity test

Multicollinearity (also called collinearity and inter-correlation). For testing the existence of multicollinearity problem among the explanatory variable the researcher used a method of variance inflation factor which is developed by Maddala (1992) he said that, if the VIF is less than 10 there are no multicollinearity problems. For this particular study the value of VIF is 2.92 which is less than 10 reference value. Therefore, there is no multicollinearity problem meaning that variables are not exactly correlated (See VIF value from the following table).

Table 3. Variance Inflation Factors

Variables	**Collinearity Statistics**	
	VIF	**Tolerance = 1/ VIF**
Employees' training (level of awareness)	2.638	0.379
Management support/commitment	2.510	0.398
Team work	3.609	0.277
Communication	2.914	0.343
Mean	**2.92**	

Source: own survey, 2018

Linearity test

Linearity is the assumption that two variables are related in a linear fashion. If variables are linearly related, then when plotted in a scatterplot, the data will fall in straight line or in a cluster that is relatively straight (Nancy, Karen and George 2005). Based on this concept as one could be understand the data, relatively shaped straight line rather than curve or bend line. Therefore the data is linear.

Reliability test

According to SPSS Version 20, Cronbach's alpha value of concerned variables for this specific study is between 0.867% minimum and 0.908 % maximum. Hence, it was understood that the reliability statistics proves that the collected data reliable and appropriate (See factor load of items in table 4).

Validity test

Researcher used Content Validity Index (CVI) to ensure validity of research findings prior to the administration of the research instruments. According to (Vgot, 2007), content validity ratio was used to calculate the content validity index, using the next formula. A content validity index of 0.7 and above the instrument is valid enough.

$$\text{CVI} = \frac{\text{Total rated items (43 items)}}{\text{Total Number of items in the Instrument (52 items)}} = 0.807$$

Therefore, for this survey CVI (0.807) was qualified instruments to draw acceptable conclusion.

Heteroscedasticity test

The variance of the error variable is required to be constant. One method of diagnosing heteroscedasticity is to plot the residuals against the predicted value. Then look for a change in the spread of the plotted points (Gerald, 2011). As data manifested that there is no sign of heteroscedasticity problem.

Factors influencing Kaizen philosophy Implementation

In this particular survey researcher used employees' training, management Support (or commitment), team Work sprit and communication in the University for the implementation Kaizen as the main predictor variables and kaizen implementation as dependent variable. Factor analysis was employed for all variables with multi-item scales. The factors extracted for each of the scales, which had factor loading value greater than 0.4, were used in a subsequent analysis. Items with factor loadings of less than 0.4 were excluded from further analysis.

Multiple Regression Analysis

Multiple regressions were also used for the purposes of determining the extent to which the explanatory variables explain the variance in the explained variable because, multiple regression equation identifies the best-fitting line based on the method of least squares (Leonard, 2004). Four independent variables are used to determine to what extent they are predict of the dependent variable. The results of the regression analysis are shown on table below.

Table 5. Multiple Regression analysis result factors and Kaizen events implementation

Model Summary [b]

Mode	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.897[a]	.805	.780	.41268	.805	31.681	12	92	.000	1.736

a. Predictors: (Constant), Employees' training, management support / commitment , team work , communication

b. Dependent Variable: implementation N= 105

Source: Own survey, 2018

Based on above table (5) indicated that the results of multiple regressions shows that the model tested is significant at ($p<0.01$). As table (5) is explained, the adjusted R square 0.78 indicates that 78 percent of the variance in kaizen implementation is attributed to the four independent variables entered into the regression and the remaining 22 percent of the variance in implementation may be explained by other factors not included in this specific study. And in F-test ration of ANOVA (next table) the predictor variables explained that 31.681 of dependent variable with its significant level at ($p<0.01$). As Maddala (1992), stated that the calculated value of-F- must be greater than 5. In this particular study as researcher summarized in table above the value of –F- (31.681) which is greater than referenced value. According to R^2 value shows the overall goodness of fit of the model. It tells what proportion of the variation in the dependent (response) variable is statistically explained by the explanatory or independent variables. The adjusted coefficient of determination shows the degree at which employees' training, management support, team work and communication can explain the kaizen implementation in Assosa University.

Table 6. test result of ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	64.747	12	5.396	31.681	.000[b]
	Residual	15.668	92	.170		

a. Dependent Variable: implementation , N= 105

b. Predictors: (Constant), employees' training, management support , team work , communication

Source: Own survey, 2018

Table 7. T-test regression analysis result for influencing factors and kaizen implementation

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	**Std. Error**	Beta		
(Constant)	-.021	.159		-.134	.894
Employees' Training	.300	.075	.303	3.988	.000
Management support	.176	.073	.178	2.404	.018
Team work	.249	.086	.255	2.875	.005
Communication	.232	.073	.255	3.201	.002

Source: Own survey, 2018

The above table reveals that the statement of t- tests to measure the scale of response of respondents' towards their influencing factors and kaizen implementation. Use of t -tests are used to determine significant contribution to the overall model (Leonard, 2004). As -t-test, proved that there is a connection between kaizen implementation and predictor factors. All independent variables have a positive influence and they are statistically significant at ($p<0.01$).The result of this study indicates all independent variables have a positive and significant effect on the outcome variable with unstandardized beta (β) value and standardized beta (β) value had explained .A factor which has high beta value is contributing a lot compared to other factors which having fewer beta value.

Table 7.Correlation results between kaizen implementation and influencing factors

Correlations

Variables	1	2	3	4	5
1. Employees' training	1				
2. Management support	.697**	1			
3. Team work	.741**	.737**	1		
4. Communication	.703**	.673**	.786**	1	
5. Implementation	.795**	.749**	.811**	.788**	1

**. Correlation is significant at the 0.01 level (2-tailed), N = 105

Source: Own survey, 2018

As above table explained that, correlation results, was concluded that dependent variable (kaizen philosophy implementation) there was a correlated with all mentioned predictor variables with among one another it lies between (-1 and +1). Based on the above table level of employees' training, management support, team work and communication factors are significantly relate with kaizen philosophy implementation with 1% significance level (p<.01).The highest correlation is signified by level of team work(r = 0.811) followed by training (r=0.795), communication (r=0.788) and management support factors(r= 0.749). Based on the above table (7) the Pearson correlation test, the correlation coefficient between team work and kaizen implementation is the highest strong correlation results which is (r = 0.811) . This indicates that team work plays a great role on enhancing for kaizen implementation in the future.

Conclusion

Out of findings and discussions, researcher finally concluded that, in this specific survey the most important factors which influence the implementation of kaizen philosophy in Assosa University are employees' training, management support, team work and communication. So first, these factors should be given due consideration to encourage kaizen implementation and to reduce waste, and also increases customer satisfaction to the university among employees and university's customers. The statistical result indicated that, there is a strong and positively significant correlation between all specified variable in this particular survey. This leads to conclude as training, management support, team work and communication are most important factors to enhance and encourage kaizen implementation in Assosa University. The survey examined that employees' training is a critical factor in kaizen implementation. As result revealed that top management commitment is also an influential factor in implementation of kaizen system. It has a positive influence on implementation. So with increased top management commitment, the implementation is likely to be more successful. The survey concluded that communication is a third critical factor of kaizen implementation. It positively influence implementation. This inferred that implementation of kaizen is directly affected by communication.

Recommendations

Based on the findings researcher forwarded the following possible recommendations.

Researcher recommended that University train its employees on kaizen implementation initiatives. It is also recommended that these trainings are conducted frequently and at all levels in the university. University shall be take strategic measures in ensuring management participation and commitment to kaizen implementation initiatives. Management's commitment themselves in providing leadership and important resources needed in kaizen philosophy implementation.

Since socialization is the dominant mode of knowledge transfer, University must encourage cross functional team cooperation among departments. Management also shall be develop appropriate, effective and flexible communication systems that allow free flow of relevant information at all levels in the university . The study was conducted in a single university, limited variables as well as in very few functional unit departments, so this study may be limited in its generalizability of the findings to other universities and factors. Therefore, future research should have to incorporate different universities, functional units and variables for the sake of compare and generalizing the findings of the study.

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