

# Safe Work Culture and its Impact on Productivity of the Employees in Manufacturing Companies in Bengaluru

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**Abstract:** *Safety performance is a very complex and sensitive area of interest in the organization because it depends on the individual characteristics of the respective person, his/her abilities and competence, which also influences decision-making and performance. To examine the safe work culture and its impact on productivity of the employees in manufacturing industries in Bengaluru. The structured questionnaire was prepared and issued to the production managers of manufacturing companies in Bengaluru. 152 manufacturing companies such as auto mobile manufactures, component manufacturers, chemicals manufacturers electronic products manufacturers etc., were targeted as respondent companies. The data which is collected through survey was analyzed by using regression model through SPSS software. The present study has revealed that, communication, safety priority, safety policy, incentives for accident free work, training related to safety, use of advanced technology, safety tools and equipment's and establishment of safety department are the key variable having significant relationship with employee's productivity in manufacturing industries in Bengaluru.*

**Keywords:** Safety, Culture, Manufacturing, Employees, Productivity

## 1. Introduction

Employees play important roles regarding safety culture in the manufacturing industry. The manufacturing industry has been identified as one of the major economic forces that have contributed to India's progress toward becoming a developed nation in the future (Griffin, M. A., & Neal, A. 2000). Unfortunately, the high rates of accidents and fatalities that have occurred on the sites have swept away its image and reputation (Uttal, B. 2013). Even though the number of cases in the manufacturing industry has decreased in some years, it is still regarded as a highly dangerous and risky industry in India (Unnikrishnan, S., Iqbal, R 2015). Development in labor security could be a major challenge for areas of development around the world. Keeping up a positive security culture is fundamental for any organization to avoid mishaps on development sites (Farrington-Darby 2005). An organization's well-being and security culture could be an item of the person and can bunch values, demeanors, recognition, competencies, and behavioral styles that drive the commitment, design, and ability of the organization's wellness and safety management (United States. 1996). A positive security culture can progress security execution to an extent because it straightforwardly relates to security execution. Safety culture and safety climate are distinct concepts, with safety culture referring to the fundamental principles guiding safety practices within an organization, and safety climate pertains to employees' perceptions and attitudes toward safety in their work environment (Manning, L. 2018). Both concepts are interconnected and important in promoting safety and reducing the risk of accidents and injuries (Clarke, S., 2006).

## 2. Literature Review

The safety climate of workers needs to be examined because the safety climate can influence the behavior and involvement of workers in safety practices (Van den Heuvel, J 2005) Safety climate is the workers' perception of policies,

procedures and work practices related to workplace safety (Whitaker, S., & Yule, S.J. 2010). Other than that, the safety climate can also inform the organization of potential problems and allow preventive actions to be taken before an incident occurs (Misiurek, K., & Misiurek, B. 2017). Workplace safety climate is thus seen as an area which allows for the identification of elements perceived by employees as problems in terms of occupational health and safety (Department, T.H.L.C., 2002). The safety climate in a company, treating it as an important element of the overall safety culture of this organization (Tomas, J. M., Melia 2012). Among the unsafe conditions are lighting, ventilation that introduces dust and gas, dangerous layouts placed close to workers, inadequate machine guards, damaged equipment, insufficient protective equipment, such as helmets, and poor warehouses (Geller, E.S., 1994). Among the unsafe actions, one of them is training as failure to use safety equipment, operating machine guards without the supervisor's permission, using full speed, increasing power, and others. Most accidents usually occur because they are negligent or in unsafe working conditions, not just one (Fedorycheva, I., Hammer, M., 2015). Safety can be implemented as early as possible, but workers should be trained using safety equipment for maximum effectiveness. Many debates have emerged among researchers on the definitions of safety culture (Flin, R., 2007). This paper particularly adopts definitions by Fang et al. in which safety culture is referred as a set of prevailing indicators, beliefs and that the organization owns its safety (Weick, K. E. 2011). In practice, organizations can engineer a safety culture at workplace through various organizational goals governed by considering their effects on (Mohammad, A. A. A. 2014).

Many companies throughout the world are becoming more interested in the concept of "safety culture" as a way to reduce the risk of large-scale disasters and accidents that occur during ordinary work (Vaughan, D. (2011). Its expanding relevance is evidenced by publicly declared goals

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in the offshore, shipping, and nuclear industries to achieve consistent global safety cultures. Companies are motivated to find solutions to prevent workplace injuries because of the costs connected with them and the time necessary for accident investigations. Improved culture and behaviors of operating personnel play a vital role in safe operations (Dong, X., Entzel, P 2004). Visible leadership motivates personnel and enhances the performance of the company. It also enhances the commitment of the operating personnel (Morrow, S. L., Koves 2014). According to the same authors, a considerable number of studies show that managers' commitment to safety is a determining condition of workers' attitudes and behaviors regarding risk (Ummu Kolsome Farouk 2011). For example, if a manager engages in safety-enhancing activities, revealing concern about safety-related issues, he/she more easily influences workers' behaviors in a positive way, who will, for example, display greater respect for safety regulations (Fornell, C., & Larcker, D. F. 1981).

**Statement of the Problem**

Safety measures are rapid industrial with its complexities in manufacturing process and layout, expansion or modifications in existing factories, setting up of new industries involving hazards not known earlier, lack of safety consciousness on the part of both workers and management, inadequate realization of the financial implications of accidents. The law also regulates work safety requirements starting from planning, manufacturing, transporting, distributing, trading, installing, using, maintaining, and storing materials, technical products, and production apparatus that contain and can cause accident hazards. Although many regulations have been issued, in their implementation, there are still many shortcomings and weaknesses due to the limited supervision personnel, low s killed human resources, and existing limited facilities. Number of research article were reviewed to identify the factors related to safety culture, eventually there were no

research articles available on the specific issue i.e., safe work culture and its impact on productivity of the employees in manufacturing industries in Bengaluru.

**Objectives of the study**

- 1) To study the previous research related to safety culture in manufacturing industries.
- 2) To examine the safe work culture and its impact on productivity of the employees in manufacturing industries in Bengaluru
- 3) To develop integrated research model for safety culture in manufacturing industries.

**Hypothesis of the study**

H1: There is a significant relationship between safe work culture and productivity of the employees in manufacturing industries in Bengaluru

H0: There is a no significant relationship between safe work culture and productivity of the employees in manufacturing industries in Bengaluru

**Research methodology**

The present study was a field research. For measuring variables related to safety culture in the manufacturing companies, the structured questionnaire was prepared and issued to the production managers of manufacturing companies in Bengaluru. The questionnaire was scored based on a 5-point Likert scale (option 1: strongly agree to option 5: strongly disagree). The questionnaire's reliability was confirmed using Cronbach's alpha (0.89), and its validity has been confirmed using an exploratory and confirmatory factor analysis. 152 manufacturing companies such as auto mobile manufactures, component manufacturers, chemicals manufacturers electronic products manufacturers etc were targeted as respondent companies.

**3. Data Analysis**

**Table 1: Relationship between safe work culture and productivity of the employees in manufacturing industries**

Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.966 <sup>a</sup>	0.934	0.928	0.29412		
ANOVA <sup>b</sup>						
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	168.666	13	12.974	149.981	.000 <sup>a</sup>
	Residual	11.938	138	0.087		
	Total	180.604	151			

b. Dependent Variable: Employees Productivity

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.649	0.166		-3.904	0
	Management commitment	-0.011	0.021	-0.012	-0.521	0.603
	<b>Communication</b>	<b>0.037</b>	<b>0.017</b>	<b>0.052</b>	<b>2.214</b>	<b>0.028</b>
	<b>Safety priority</b>	<b>0.105</b>	<b>0.029</b>	<b>0.118</b>	<b>3.679</b>	<b>0</b>
	Supportive environment	-0.02	0.031	-0.019	-0.642	0.522
	Employees involvement	0.077	0.045	0.068	1.7	0.091
	<b>Safety policy</b>	<b>0.067</b>	<b>0.028</b>	<b>0.074</b>	<b>2.419</b>	<b>0.017</b>
	<b>Incentives for accident free work</b>	<b>0.364</b>	<b>0.046</b>	<b>0.298</b>	<b>7.882</b>	<b>0</b>
	<b>Training related to safety</b>	<b>0.105</b>	<b>0.048</b>	<b>0.12</b>	<b>2.198</b>	<b>0.03</b>
	Accident Prevention	-0.098	0.053	-0.117	-1.858	0.065
	<b>Use of Advanced technology</b>	<b>0.131</b>	<b>0.038</b>	<b>0.155</b>	<b>3.445</b>	<b>0.001</b>

<i>Safety tools and equipment's</i>	<i>0.259</i>	<i>0.044</i>	<i>0.361</i>	<i>5.923</i>	<i>0</i>
Presenting safety manual	0.01	0.017	0.014	0.588	0.557
<i>Establishment of Safety department</i>	<i>0.125</i>	<i>0.054</i>	<i>0.101</i>	<i>2.324</i>	<i>0.022</i>

a. Dependent Variable: Employees Productivity

The regression analysis shows that, the value of “R” indicates high degree of correlation co-efficient (.966a) between safe work culture and productivity of the employees in manufacturing industries. R2 measure the variation explained by the regression model is (.934) being high indicating model fits the data well. Significant of F change is less than 0.05 which indicates factors related to safe work culture have significant relationship with productivity of the employees in manufacturing industries. 13 variables of safe work culture factors were used to predict level of productivity of the employees.

Productivity of the employees = (-.649) + (-.011\* Management commitment) + (.037\* Communication) + (.105\* Safety priority) + (-.020\*Supportive environment) + (.077\*Employees involvement) + (.067\*Safety policy) + (-.098\*Accident Prevention) + (.364\*Incentives for accident free work) + (.105\*Training related to safety) + (.131\*Use of Advanced technology) + (.259\* Safety tools and equipment's) + (.010\* Presenting safety manual) + (.125\*Establishment of Safety department).

Since the above regression model indicates the safe work culture factors and the significant values are < than p value 0.05. Therefore, hypothesis statement H1. i.e, there is a significant relationship between safe work culture and productivity of the employees in manufacturing industries in Bengaluru is accepted.

Regression equation:  
 Productivity of the employees =  $\alpha + \beta_1(Mc) + \beta_2(Cm) + \beta_3(Sp) + \beta_4(Se) + \beta_5(Ei) + \beta_6(Spy) + \beta_7(Ap) + \beta_8(Aafw) + \beta_9(Trf) + \beta_{10}(Uat) + \beta_{11}(Se) + \beta_{12}(Psm) + \beta_{13}(Esd) + \mu$

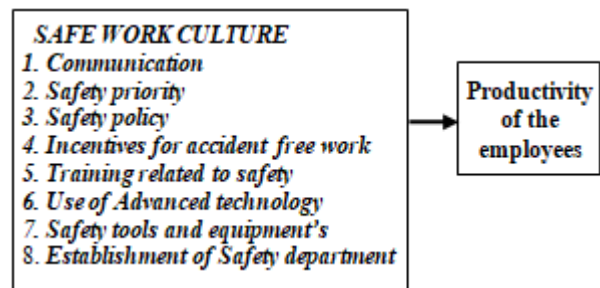
**4. Research Findings**

The present study has revealed that, communication, safety priority, safety policy, incentives for accident free work, training related to safety, use of advanced technology, safety tools and equipment's and establishment of safety department are the key variable having significant relationship with employee's productivity in manufacturing industries in Bengaluru.

**5. Suggestions**

The management should have Effective communication with employees regarding safety measures stringently. Organization should Installation all protection system in the production department to avoid accidents for example alarm and fool proofing systems. There should be an implementation of Regular safety inspection periodically. It is advices to have Safety reward scheme in the organization. Training must be provided to all the employees to face emergency. Government should have a scheme of Reorganization for accident free manufacturing companies in a specified period of time. Accidents must be avoided by

implementing prevention through Design (PtD). Safety promotion in an organization is considered as key element. Analysis of safety reports (frequency of reports of near misses, identification of problems and areas of interest as indicators of employees' interest in the development and improvement of production). Periodical accident data should be evaluated particularly in Bengaluru manufacturing there is dire need to conduct a comprehensive study to identify the safety issue facing by workers and need to mitigate or propose a strategy to deal with all these issues. Moreover, there should be compulsion to use safety culture (SC) by the originator of safety performance (SP).In cooperation with the company management, it is necessary to implement specific measures. Over a period of time (1-1.5 years), it is necessary to carry out a reassessment of the state of safety culture, assessment of effectiveness of the measures taken, and reimplementaion of new specific measures.



Graph 1: Integrated research model

**6. Limitations of the Study**

The present study is confined to manufacturing industry only. The results of obtained in this study based on survey so that there might be deviation from time to time. There may be number of pertinent variables which might ignored on this study. The area for the study is confined only for manufacturing industries in Bengaluru city. Absence of use of advance statistical tools is one more limitations for the study. The sample size is only 152 which may not give exact picture of the universe.

**Directions for the future research**

Similar research can be conducted in the other industry for ex. study on quality management techniques in manufacturing industries. Research on industrial accidents and profitability of the selected companies can be conducted. Multidimensional variables can be used for the future research other than the selected variables in the present study. The research can be conducted by doing comparative analysis between service industry and manufacturing industry in the light of safety aspects.

**7. Conclusions**

The implementation of effective workforce safety programmes ought to be linked to an understanding of the specificity of the work in the organisation concerned, taking into consideration the assessment of the level of safety

expressed by the professional group representing it at the executive level. Minimizing accident and injuries are among the main goals of most companies, especially those with high risks such as manufacturing companies. Despite the strives, statistics still shows a high rate in accidents and injuries in India, dominated by manufacturing and construction sectors. However, it was noticed that an appropriate safety culture could surely be support to industries in attaining outstanding SP and carry constructive consequences to the people and industries. Besides that, Government must raise the awareness for the employee's attention as to complete the overhead aim. It could be beneficial for planning to reduce accidents in workplaces and it could also detect the prevention for the future accidents. At the present study it is understood that, communication, safety priority, safety policy, incentives for accident free work, training related to safety, use of advanced technology, safety tools and equipment's and establishment of safety department are the key variable having significant relationship with employee's productivity in manufacturing industries in Bengaluru.

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