

Impact of Six Sigma Training Program on the Performance of Employees: An Empirical Study

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Abstract

The Six Sigma Management System promotes transparency around the business strategy and the indicators that best reflect its success. It provides a framework for allocating resources to projects that will improve metrics, and it leverages leaders to manage efforts for rapid, sustainable, and improved business results.¹ Six Sigma is used as an all-encompassing business performance methodology in organisations ranging from local government departments to prisons, hospitals, the armed forces, banks, and multinational corporations all over the world. Six Sigma is used as an all encompassing business performance methodology in organisations ranging from local government departments to prisons, hospitals, the armed forces, banks, and multinational corporations all over the world. While Six Sigma implementation continues in many of the world's largest corporations, many organisations and suppliers in the consulting and training communities have seized on the Six Sigma concept, packaging and providing a variety of Six Sigma 'branded' training products, consultancy, and services.⁶ The study was conducted among 132 respondents using stratified sampling technique and Descriptive research design. The study aimed at identifying the impact of six sigma training on the performance of employees. It was found that the six sigma training program has immensely improved the performance of the employee.

Keywords: Six Sigma; Performance; Employees; Organisation; Impact.

INTRODUCTION

Indian businesses now have access to the global market due to globalisation, which

has forced them to raise the calibre of their goods and services. Six Sigma is gaining popularity in India for this reason, along with a variety of tools. To advance Six Sigma in India, the Indian Statistical Institute is doing a good job. However, a different implementation strategy is needed for India due to the cultural, work environment, and economic differences between India and western countries.² An extensive study of the Indian work & organisational environment in Indian industries is necessary to develop this strategy & model for implementation. The history of these process initiatives reveals that implementation of these initiatives is successful only in a few organisations; a thorough analysis is required to study the success

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and failure of implementation of these initiatives.⁴ Many organisations in India are also implementing Six Sigma to improve business processes; however, geographic, cultural, and work environment differences influence this implementation process. Six Sigma is arguably a very clever way of branding and packaging many aspects of Total Quality Management that exist independently of Six Sigma's development.⁸ Six Sigma is a lot of different things because it has different meanings over time and is now interpreted in a variety of ways. Six Sigma is still in its infancy. Six Sigma appears to be the original and technically correct spelling, rather than Six Sigma.³

Objectives of the Study

- To study the impact of Six Sigma training program on performance of employees.
- To study the level of employees satisfaction on the towards the effectiveness of Six Sigma training program.

Review of Literature

Hsiang-Chin Hung and Ming-Hsien Sung (2017)⁵ used the DMAIC training approach in six sigma (define, measure, analyse, and improve control) in a Taiwanese food company. He solved an underlying problem of reducing process variation using this methodology. As a result, he was able to reduce the high defect rate associated with it. They were able to reduce the major issues through this training and thus provide an effective output of appropriate quality. When it comes to quality, six sigma has played a significant role and has made a significant difference in the career and growth of employees.

Tushar N Desai and Dr. R L Shrivastava (2016)¹⁰ discuss the application of Six Sigma DMAIC methodology in an industry, which provides a framework for identifying, quantifying, and eliminating sources of variation in an operational process in question, optimising operation variables, improving and sustaining performance, viz. process yield, with well executed control plans. It was discovered that the various training that was provided during the period was effective, and as a result, they were able to achieve their goals. As a result of implementing this methodology, the process yield increased. It has the effect of improving and better utilising resources while decreasing variations. It also aided in maintaining consistent process output quality.

Md. EnamulKabir, S. M. Mahbubul Islam Boby, and MostafaLutfi (2017)⁷ studied and evaluated

the case organization's processes in order to determine the current sigma training level and, finally, to improve the existing sigma level through productivity improvement. The six sigma cycle was used to accomplish this. It was possible to improve productivity by lowering the defect rate by using DMAIC methodology. This study was conducted in a fan manufacturing company to demonstrate how Six sigma can be used to improve productivity and quality. This work related paper can be used in any type of organisation, not just a fan manufacturing company.

T. N. Goh (2017)⁹ conducted a strategic assessment of the Six Sigma training programme in his paper, highlighting the potential and potential limitations of Six Sigma training that may cause many issues in the organisation, particularly in a knowledge based environment. With the help of a literature review, he discussed some of Six Sigma's inherent limitations. According to his paper, the employees were not given adequate and sufficient training in the organisation, so the training was ineffective in preparing them to take the various quality based tests. Sigma is used to improve safety levels. Six Sigma training was provided for DMAIC methodology, which has not previously been used in service industries such as hospitals.

METHODOLOGY

Research Design: The descriptive research design was used in this study. It includes various types of surveys and fact finding inquiries.

Sampling Method: A questionnaire is used in this study to collect primary data using a systematic sampling method. This study has a total sample size of 132 respondents. Employees of both genders have been interviewed.

Pilot Study: A pilot study is a small scale preliminary study conducted to evaluate feasibility, time, cost, adverse events, and affect size (statistical variability) in order to predict an appropriate sample size and improve the study design prior to performing a full scale study. A pilot study with 15 respondents was carried out.

Reliability Test

Table 1: Showing Reliability Statistics

Cronbach's Alpha	N of Items
0.940	44

Inference

Pilot study was conducted from 30 respondents

and the reliability test shows Cronbach alpha value of 0.940 which is more than 0.75%. Hence the questionnaire is highly reliable for the study.

Data Analysis & Interpretations

Null Hypothesis (H0): There is no significant

difference between the impact of Six Sigma training program with gender.

Alternate Hypothesis (H1): There is a significant difference between the impact of Six Sigma training program with gender.

Table 2: For six sigma training on impact of six sigma training program and gender

Group Statistics	Gender	N	Mean	Std. Deviation	Levene's Test for Equality of Variances	
					F	Sig.
All key players (managers, engineers, technicians, supervisors, and heads of departments) are well trained in the use of a common methodology for analysis and problem solving.	Male	64	4.5	1.015	6.232	0.352
	Female	68	3.304	0.673		
Employees are able to do the projects with given time limit	Male	64	4.55	0.719	1.988	0.161
	Female	68	4.3	0.962		
Employees know how to use the basic process improvement tools for Quality implementation to improve their work processes.	Male	64	4.4	0.712	1.358	0.246
	Female	68	4.24	0.894		
Employees have high confidence level to face any higher responsibility after the Six sigma	Male	64	1.967	1.127	7.043	0.009
	Female	68	2.543	1.403		
Objectives of the six sigma are being aware	Male	64	2.131	1.166	2.847	0.094
	Female	68	2.863	1.4		
Do you get trained periodically in Six sigma methods on quality?	Male	64	1.9017	1.112	8.425	0.004
	Female	68	2.1634	1.425		

Inference

Since the significance level is less than 0.05 the null hypothesis is rejected. There is a significant difference between the impact of Six Sigma training program with gender, since the Employees have high confidence level to face any higher responsibility after the Six sigma and proper training is done periodically in Six sigma methods on quality.

Since significance level is more than 0.05 the null hypothesis is accepted. There is no significant difference between the impact of Six Sigma training program with gender with key players (managers, engineers, technicians, supervisors, and heads

of departments) are well trained in the use of a common methodology for analysis and problem solving, Employees are able to do the projects with given time limit, Employees know how to use the basic process improvement tools for Quality implementation to improve their work processes and Objectives of the six sigma are being aware.

Null Hypothesis (H0): There is no significant difference between duration of the employees working in the organization and employees experience with six sigma.

Alternate Hypothesis (H1): There is a significant difference between duration of the employees working in the organization and employees experience with six sigma.

Table 3: One-way anova for duration of the employees working in the organization and employees experience with six sigma

ANOVA						
Attributes		Sum of Squares	df	Mean Square	F	Sig.
What is the level of satisfaction on the facilities provided during Six Sigma?	Between Groups	10.051	4	4.017	5.737	0.008
	Within Groups	78.029	128	0.716		
	Total	88.08	132			

What is your level of satisfaction of the reading material provided to you during the Six sigma period?	Between Groups	10.571	4	3.172	9.291	0.002
	Within Groups	36.402	128	0.337		
	Total	46.973	132			
How satisfied are you with your Six Sigma results?	Between Groups	29.663	4	9.888	20.375	0.023
	Within Groups	53.444	128	0.495		
	Total	83.107	132			
How much did you learn from Six Sigma?	Between Groups	20.316	4	6.772	10.114	0.001
	Within Groups	72.102	128	0.668		
	Total	92.418	132			
How much did your competencies increase?	Between Groups	26.504	4	8.835	11.329	0.011
	Within Groups	85	128	0.78		
	Total	111.504	132			

Inference

Since the significance level is less than 0.05 the null hypothesis is rejected. There is a significant difference between duration of the employees working in the organization and employees experience with six sigma.

Null Hypothesis (H₀): There is no significant association between the current classification and selection criteria for six sigma.

Alternate Hypothesis (H₁): There is a significant association between the current classification and selection criteria for six sigma.

Table 4: Chi Square Test for Current Classification and Selection Criteria for Six Sigma

Current classification* What is the selection criteria for Six Sigma? Crosstabulation					
		Count			
		What is the selection criteria for Six Sigma?			
		By the Department	By the superior	By the Company	All of the above
<i>Current Classification</i>	Staff	6	19	20	10
	Management	11	9	14	19
	Others	3	12	9	0
Total		20	40	43	29

Table 5: Showing Chi- square Test

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	28.032a	6	.000
Likelihood Ratio	32.918	6	.000
Linear-by-Linear Association	2.253	1	.133
N of Valid Cases	132		

Table 6: Showing Symmetric Measures

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Phi	.378	.000
	Cramer's V	.267	.000
N of Valid Cases		132	

Inference

Since the significance level is less than 0.05 the null hypothesis is rejected. There is a significant association between the current classification and selection criteria for six sigma.

DISCUSSIONS AND RESULTS

- There is a significant difference between the impact of Six Sigma training program with gender, since the Employees have high confidence level to face any higher responsibility after the Six sigma and proper training is done periodically in Six sigma methods on quality.
- There is no a significant difference between the impact of Six Sigma training program with gender with key players (managers, engineers, technicians, supervisors, and

heads of departments) are well trained in the use of a common methodology for analysis and problem solving, Employees are able to do the projects with given time limit, Employees know how to use the basic process improvement tools for Quality implementation to improve their work processes and Objectives of the six sigma are being aware.

- There is a significant difference between duration of the employees working in the organization and employees experience with six sigma.
- There is a significant association between the current classification and selection criteria for six sigma.

CONCLUSION

The team working on the study on the impact of employee training using six sigma on their performance is a dynamic and enthusiastic group dedicated to achieving the company's long term and short term goals. Employees and various levels of management are both very active in keeping track of various training programmes to keep their levels up to date. The organisations frame their policies in such a way that they are accepted by their internal customers, resulting in increased productivity. Employee training programs at various levels in the organisation are based on the employee's experience and feedback at various levels in the organisation. Six sigma assists us in achieving required standards for the organisation in a short period of time. As a result, an employee training programme based on six sigma is critical in an organisation, as it has a significant impact on performance, and top management should take care of various measures and strategies to improve the employee training programme.

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