Impact of Upskilling and Reskilling of Workforce in Manufacturing Companies

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ABSTRACT

The advancements in technology such as automation, Industry 4.0 applications, artificial intelligence, and smart manufacturing systems, have greatly influenced the functioning of motor companies in the manufacturing sector. In this dynamically changing environment, only those organizations can maintain their position in the market by continuously improving the skills of their employees through well-structured upskilling and reskilling initiatives. This study explores the effectiveness of such training programs in developing employees in manufacturing sector, with a special focus on understanding the perceptions of employee, the relevance of acquired skills, the overall impact of training on performance, and the level of support from the organization for continuous learning. The primary data was collected from the employees of various functional departments of the organization through a structured questionnaire designed to collect the real time workplace experiences. The data was analysed using statistical techniques such as percentage analysis, mean score analysis, and chi-square test to interpret the findings. The results clearly suggest that well structured training programs have a crucial role in improving the productivity of the employees, their adaptability to technological changes and the overall job satisfaction. The study emphasizes the importance of continuous skill development of workforce ensuring long-term growth and stability in organizations.

Keywords: Upskilling, Reskilling, Manufacturing Sector, Industry 4.0, Training Outcomes

INTRODUCTION

The manufacturing sector is undergoing sustained transformation as a result of fast pace technological, automated and innovative ways of making things. These changes have reshaped job roles and significantly altered the competencies required to perform effectively in modern manufacturing environments. As the world of business looks to increasingly utilize cutting edge technologies, the need for a workforce that can adapt to new tools, systems, and processes has become more pronounced. Consequently, employee skill development has emerged as a strategic priority rather than a routine human resource function.

Upskilling refers to the process of leveraging the existing skills and knowledge to enhance employee performance within current job roles and prepare individuals for future responsibilities. It focuses on continuous learning to align employee capabilities with changing technological and operational demands. Reskilling, in contrast, involves training employees to acquire entirely new competencies that enable them to transition into different roles within the organisation. This approach is particularly important in situations where automation, digitalization, or organisational restructuring reduces the relevance of existing roles. Together, upskilling and reskilling are essential for maintaining workforce relevance, improving organisational flexibility, and sustaining competitiveness in a rapidly changing industrial landscape.

REVIEW OF LITERATURE

Garg (2025)[1] highlights the widening skills gap caused by rapid advancements in automation, artificial intelligence, and digital technologies. The study notes that in India, accelerated digital adoption across sectors such as manufacturing, information technology, and services has intensified the demand for continuous skill

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development. The research emphasizes the strategic role of human resource management in aligning upskilling and reskilling initiatives with organisational objectives. While large organisations—particularly in IT and BFSI sectors—have successfully implemented structured skill development programs, small and medium enterprises and traditional industries show comparatively lower engagement. The study also observes that active HR involvement positively influences employee performance, retention, and organisational competitiveness, although limited attention to employee perspectives may restrict a holistic evaluation of training effectiveness.

Hajam (2024)[2] examines the impact of automation and artificial intelligence on global workforce transformation. The study discusses how technological advancements simultaneously displace traditional job roles and create demand for new, skill-intensive positions. Through a review of recent literature and case studies, the research identifies challenges such as financial constraints, employee resistance, and difficulties in assessing training outcomes. The study stresses the need for a human-centred approach to workforce development to improve adaptability and inclusiveness in the digital era.

Samuvel (2023)[3] investigates upskilling and reskilling practices in the IT services sector, where rapid technological change necessitates continuous skill enhancement. Using primary data collected through an online survey, the study evaluates the influence of training initiatives on employee performance, productivity, and retention. The findings reveal that organisations adopt a mix of formal training, informal learning opportunities, and educational support schemes to promote continuous professional development and sustain workforce competitiveness.

Statement of the Problem

In an increasingly dynamic employment environment, continuous skill development is critical for employees to remain productive and employable. Despite recognizing this need, many organisations face difficulties in effectively implementing upskilling and reskilling initiatives. Common challenges include employee resistance to change, limited time available for training, rising costs of development programs, and insufficient alignment between training content and actual job requirements. In addition, restricted access to quality learning resources and unclear career progression pathways often reduce employee motivation to participate in skill development initiatives. Failure to address these issues may result in persistent skill gaps, reduced productivity, and weakened organisational competitiveness. Therefore, understanding and overcoming the barriers to effective upskilling and reskilling is essential for enhancing workforce adaptability, ensuring job security, and supporting long-term organisational growth.

Objectives of the Study

1. To examine the importance of upskilling and reskilling initiatives for employees.
2. To analyze employees' perceptions of existing training and development programs.
3. To assess the effectiveness of upskilling and reskilling initiatives in enhancing employee capabilities.

RESEARCH METHODOLOGY

A descriptive research design was adopted to assess employee perceptions and the effectiveness of upskilling and reskilling initiatives. Simple random sampling was used to select 120 employees for the study. Primary data were collected through a structured questionnaire, while secondary data were obtained from academic journals, books, and relevant online sources. The collected data were analysed using percentage analysis, ranking techniques, weighted average method, mean score analysis, and chi-square tests.

Data Analysis and Interpretation

Table 1: Demographic Distribution of Respondents

S. No	Variable	Category	Frequency	Percentage (%)
1	Age	19–25 years	26	22
		25–35 years	46	38

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		35–45 years	34	28
		Above 45 years	14	12
2	Gender	Male	83	69
		Female	37	31
3	Education Level	Diploma	21	18
		UG	52	43
		PG	47	39
4	Monthly Income	₹15,000–₹20,000	28	23
		₹20,000–₹30,000	47	39
		₹30,000–₹40,000	33	28
		Above ₹50,000	12	10
5	Resident type	Urban	43	36
		Semi Urban	53	44
		Rural	24	20
Total			**120**	**100**

The demographic characteristics of respondents provide essential context for evaluating the effectiveness of upskilling and reskilling initiatives. The age distribution indicates that 38% of employees fall within the 25–35 age groups. 69% of employees are male and 31% are female. The majority of respondents hold undergraduate and postgraduate degrees of 43% and 39%. Most of the employees of 39% fall under ₹20,000–₹30,000 income category. 44% of employees reside in Semi Urban area.

Table 2: Management Support for participating in Upskilling and Reskilling Programs

Support level	**Score**	**Respondents**	**Weighted Score**
Very Satisfied	4	41	164
Satisfied	3	44	132
Neutral	2	24	48
Dissatisfied	1	11	11
Total		**120**	**355**
Weighted Mean			**3.0**

The mean score of 3.0 indicates that employees are generally satisfied with the level of management support provided for participation in upskilling and reskilling initiatives. A majority of respondents fall within the "Satisfied" and "Very Satisfied" categories.

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Table 3: Ranking of Motivational Factors related upskilling and reskilling

Factor	Ranking by the Respondents				Total Score	Mean Score	Rank
Career Advancement	43	37	27	13	350	**2.92**	**I**
Personal Development	34	35	32	19	324	**2.70**	**II**
Job Security	29	31	39	21	308	**2.57**	**III**
Management Encouragement	22	25	32	41	268	**2.23**	**IV**

Ranking analysis reveals that career advancement is the most influential factor followed by personal development and job security that is motivating the employees to participate in training programs.

Chi-Square Analysis

Table 4: Age and Satisfaction Level towards Training Programs

Age Group	Highly Satisfied	Satisfied	Neutral	Dissatisfied	Highly Dissatisfied	Total
19–25	21 (63.6%)	10 (30.3%)	2 (6.1%)	0 (0.0%)	0 (0.0%)	33 (100%)
25–35	10 (20.0%)	29 (58.0%)	11 (22.0%)	0 (0.0%)	0 (0.0%)	50 (100%)
35–45	0 (0.0%)	6 (20.7%)	21 (72.4%)	2 (6.9%)	0 (0.0%)	29 (100%)
Above 45	0 (0.0%)	0 (0.0%)	2 (25.0%)	5 (62.5%)	1 (12.5%)	8 (100%)
Total	**31 (25.8%)**	**45 (37.5%)**	**36 (30.0%)**	**7 (5.8%)**	**1 (0.8%)**	**120 (100%)**

Test	Value	df	Asymptotic Sig. (2-tailed)
Pearson Chi-Square	54.87	12	.010
Likelihood Ratio	52.41	12	.010
Linear-by-Linear Association	24.96	1	.010
N of Valid Cases	120		

H_0 (Null Hypothesis): There is no significant association between age and satisfaction with training programs.

H_1 (Alternative Hypothesis): There is a significant association between age and satisfaction with training programs.

The Chi-square test results reveal a Pearson Chi-Square value of 54.87 (df = 12, p = 0.01), which is statistically significant at the 1% level. Hence, the null hypothesis is rejected, confirming that age and satisfaction towards training programs are significantly associated.

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Table 5: Satisfaction with Training Programs towards Retention of work force

Satisfaction Level	**High Impact on Retention**	**Low Impact on Retention**	**Total**
Very Satisfied	30 (78.9%)	8 (21.1%)	38 (100%)
Satisfied	26 (68.4%)	12 (31.6%)	38 (100%)
Neutral	14 (46.7%)	16 (53.3%)	30 (100%)
Dissatisfied	8 (57.1%)	6 (42.9%)	14 (100%)
Total	**78 (65.0%)**	**42 (35.0%)**	**120 (100%)**

Test	**Value**	**Df**	**Asymptotic Sig. (2-tailed)**
Pearson Chi-Square	8.67	3	.034
Likelihood Ratio	8.52	3	.036
Linear-by-Linear Association	5.91	1	.015
N of Valid Cases	120		

H_0 (Null Hypothesis): There is no significant association between employee satisfaction with training programs and retention of work force**.**

H_1 (Alternative Hypothesis): There is a significant association between employee satisfaction with training programs and retention of work force.

The Chi-Square test result shows a Pearson Chi-Square value of 8.67 with 3 degrees of freedom, with the significant level of 5% ($p = 0.034$). Hence, the null hypothesis is rejected by accepting the alternate hypothesis that employee satisfaction with training and development programs is significantly associated with their perception of employee retention.

Table 6: Monthly Income with Participation in Training Programs

H_0 (Null Hypothesis): There is no significant relationship between monthly income and participation in upskilling and reskilling programs.

H_1 (Alternative Hypothesis): There is a significant relationship between monthly income and participation in upskilling and reskilling programs.

Monthly Income	**Participated (Yes)**	**Not Participated (No)**	**Total**
₹15,000–₹20,000	18 (64.3%)	10 (35.7%)	28 (100%)
₹20,000–₹30,000	30 (75.0%)	10 (25.0%)	40 (100%)
₹30,000–₹40,000	24 (75.0%)	8 (25.0%)	32 (100%)
Above ₹50,000	12 (60.0%)	8 (40.0%)	20 (100%)
Total	**84 (70.0%)**	**36 (30.0%)**	**120 (100%)**

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Test	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.230	3	0.101
Likelihood Ratio	6.487	3	0.090
Linear-by-Linear Association	2.144	1	0.143
N of Valid Cases	120		

The Chi-Square test result shows a Pearson Chi-Square value of 6.230 with 3 degrees of freedom, with the significant level of 5% ($p = 0.101$) and the null hypothesis is accepted. There is no significant relationship between monthly income and participation in upskilling and reskilling programs.

FINDINGS

- The study reveals that employees in manufacturing organisations largely belong to the mid-career age group (25–45 years), highlighting a strong need for continuous upskilling and reskilling to maintain employability.
- Most respondents possess undergraduate and postgraduate qualifications, and significant proportion of employees fall within the middle-income category indicating a workforce with the academic foundation necessary to adopt advanced manufacturing skills.
- Employees generally express satisfaction with management support for training programs, as reflected by a weighted mean score of 3.0.
- Career advancement ranks first as the primary motivation for participation in training, followed by personal development and job security.
- Statistical analysis confirms a significant relationship between age and satisfaction towards training programs at the 1% level, as well as a significant association between employee satisfaction with training and workforce retention at the 5% level and there is no significant relationship between monthly income and participation in upskilling and reskilling programs.

Suggestions

- Manufacturing organisations should develop age-specific and role-oriented training programs to address the diverse needs of employees more effectively.
- Increased involvement and encouragement from management can further enhance employee participation in training initiatives.
- Continuous communication strategies should be strengthened to ensure that all employees are adequately informed about available upskilling and reskilling opportunities.
- Regular evaluation and feedback mechanisms should also be implemented to improve the relevance and effectiveness of training outcomes.

CONCLUSION

The study concludes that upskilling and reskilling initiatives play a significant role in improving employee satisfaction and workforce retention in manufacturing organisations. Employees realize that they need this to advance and feel safe in the future long-term prospects of the organization. The strong relationship between

employee satisfaction and employee age suggests that there is a need to provide diverse and tailored training, but overall, a well-executed reskilling and upskilling strategy is well worth executing to benefit employee satisfaction and overall organizational competitiveness within the ever-changing landscape of manufacturing organizations.

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