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A Study On Upskilling And Reskilling In The Era Of Automation

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ABSTRACT

A manufacturing business with a staff of 1200 people and a study sample of 292 participants is the focus of this study, which examines the importance of upskilling and reskilling in the context of automation. The core objective is to examine how automation accelerates the need for continuous skill enhancement within the organization. Additionally, the study explores employees' development of critical thinking, their views on technological advancements, the role of emotional intelligence in adapting to change, and the impact of creativity on the success of upskilling initiatives. The research is structured around four key factors: critical thinking, technological advancement, emotional intelligence, and creativity. To ensure the accuracy of findings, statistical tools including the Mann-Whitney Test, Kruskal-Wallis Test, Chi-Square Test, and Confirmatory Factor Analysis were employed. The study ultimately emphasizes the vital role of targeted learning strategies in equipping employees to remain competent and adaptable in the face of industrial automation.

Keywords: Critical thinking, Technology advancement, Emotional intelligence, Creativity.

1. INTRODUCTION

Automation, AI, and machine learning are rapidly transforming the manufacturing industry. While automation offers improved efficiency and reduced costs, it also displaces certain job roles. To remain competitive, organizations must adopt proactive strategies to upskill and reskill employees. Human-centric capabilities such as creativity, critical thinking, and emotional intelligence become invaluable in tasks that machines cannot replicate. This study focuses on manufacturing company, a major player in electronics manufacturing, to understand how it navigates the challenges of automation through workforce development initiatives.

2. OBJECTIVES OF THE STUDY

1) To evaluate how an employee's enhance upskilling & reskilling through critical thinking in the era of automation.
2) To examine an employee's perspective on technology advancement in automation.
3) To find out the influence of Emotional intelligence on employes adaptability to automation.
4) To analyse the effectiveness of upskilling & reskilling initiatives by leveraging creativity.

3. SCOPE OF THE STUDY

The scope of this study includes an in-depth analysis of companies workforce development strategies amidst increasing automation. It focuses on how technical skills are complemented by soft skills such as creativity and emotional intelligence. The research also evaluates employee readiness for automation and identifies training barriers, ultimately offering insights for other organizations facing similar transitions.

4. REVIEW OF LITERATURE

Several scholars have emphasized the urgency of equipping workers with skills that complement automation. Brynjolfsson & McAfee (2014) highlighted the role of reskilling in bridging the gap caused by AI-induced job displacement. Schwab (2016) advocated for digital and entrepreneurial competencies. Studies by Frey & Osborne (2017) and Autor (2019) illustrated how low-skill jobs are at risk, emphasizing creativity and adaptability as key differentiators. UNESCO (2021) and Kumar et al. (2022) stressed the importance of scalable and gamified learning platforms. These findings collectively point to a global shift toward personalized, human-centric workforce development.

5. RESEARCH METHODOLOGY

Design: Descriptive Research
Sample Size: 292
Population: 1200 diploma apprentices
Sampling Technique: Convenience and Probability Sampling
Data Tools: Mann-Whitney U Test, Kruskal-Wallis Test, Chi-square Test
Software: SPSS and MS Excel
Data Sources:

- Primary: Questionnaire
- Secondary: Company reports, journals, online databases

6. DATA ANALYSIS AND INTERPRETATION

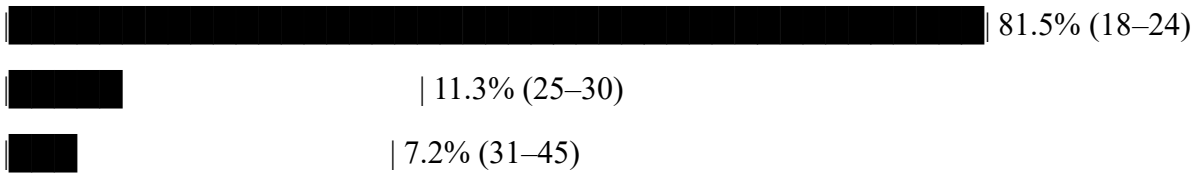
6.1 Demographic Profile

Table 1: Age of Respondents

Age Group	No. of Respondents	Percentage (%)
18–24	238	81.5
25–30	33	11.3
31–45	21	7.2
Above 50	0	0

Age Group	No. of Respondents	Percentage (%)
Total	**292**	**100**

Chart 1: Age Distribution of Respondents



Inference: The majority of employees are young (18–24), indicating a workforce early in their careers and likely more adaptable to training.

6.2 Impact of Critical Thinking

Table 2: Belief in Critical Thinking as a Tool for Reskilling

Response	No. of Respondents	Percentage (%)
Yes	254	87%
No	38	13%
Total	**292**	**100**

Inference: A large majority (87%) affirm that critical thinking enhances reskilling capacity.

6.3 Technological Advancement Perception

Chart 2: Technology Impact on Career Growth

Strongly Disagree – 17%

Disagree – 10%

Neutral – 30%

Agree – 27%

Strongly Agree – 16%

Inference: While over 40% of respondents see a positive career impact from automation, a notable 27% remain neutral, indicating uncertainty about benefits.

6.4 Emotional Intelligence Findings

Table 3: Managing Emotions in Automation-Related Changes

Level of Agreement	Respondents	Percentage (%)
Strongly Agree	70	24%
Agree	85	29%
Neutral	58	20%
Disagree	32	11%

Level of Agreement	Respondents	Percentage (%)
Strongly Disagree	47	16%

Inference: Over 50% of employees feel emotionally equipped to handle automation-related stress, highlighting EI as a key coping mechanism.

6.5 Creativity and Reskilling

Chart 3: Creativity for Learning New Skills

Strongly Agree – 30%

Agree – 27%

Neutral – 16%

Disagree – 17%

Strongly Disagree – 10%

Inference: Majority affirm that creativity aids in learning and adapting to automation-related changes.

7. HYPOTHESIS TESTING

- **Mann-Whitney U Test**:
  - *Technology advancement by gender*: p = 0.008 → significant
  - *Critical thinking by gender*: p = 0.064 → not significant

	Technology advancement	Critical thinking
Mann-Whitney U	4434.000	4873.500
Wilcoxon W	34324.000	34763.500
Z	-2.673	-1.851
Asymp. Sig. (2-tailed)	.008	.064

a. Grouping Variable: GENDER

- **Kruskal-Wallis Test**:
- There is significance difference between Current employment status and technology advancement, critical thinking, emotional intelligence, creativity.

	Technology advancement	Critical thinking	Emotional intelligence
Chi-Square	.154	.524	.051
df	1	1	1
Asymp. Sig.	.695	.469	.821

a. Kruskal Wallis Test

b. Grouping Variable: current employee status

- **Chi-Square Test**:
  - Age significantly affects technology adaptation, creativity, and emotional intelligence ($p < 0.05$).

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
age *technology advancement	292	100.0%	0	.0%	292	100.0%
age * critical thinking	292	100.0%	0	.0%	292	100.0%
age * emotional intelligence	292	100.0%	0	.0%	292	100.0%
age * creativity	292	100.0%	0	.0%	292	100.0%

8. SUMMARY OF FINDINGS

- 81.5% of respondents are aged 18–24.
- Most employees have a Master's degree and <2 years' experience.
- 87% believe critical thinking enhances skill development.
- Emotional intelligence and creativity are viewed as critical for adapting to automation.
- Gender and employment status showed no significant difference; age did.

9. SUGGESTIONS

1. The company should create a structured program to reskill employees whose roles are affected by automation, helping them transition to new positions in areas such as robotics, AI, and data analytics.
2. The company must foster a culture of lifelong learning by encouraging employees to engage in continuous professional development through workshops, webinars, and online courses
3. The company should provide employees with access to high-quality training and certifications in advanced tech fields, ensuring the workforce stays aligned with current technological trends.
4. The company should implement job rotation programs, allowing employees to move across different roles and departments, especially those utilizing automation technologies, to expand their skill sets.

10. CONCLUSION

The future of manufacturing depends not just on automation technologies but on the human workforce's adaptability. This study confirms that critical thinking, creativity, and emotional intelligence are as crucial as technical know-how in preparing for an automated future. Companies like Salcomp must not only train for machines but nurture human capabilities that machines cannot replace.

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