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An Empirical Study To Know The Impact Of Training On Employee Performance In The Automobile Industry: A Structural Equation Modelling Approach Using AMOS

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This study aims to investigates the key factors influencing employee performance within the automobile industry using a structural equation modelling (SEM) approach. Illustration on theoretical outlines related to human resource development, work environment, job satisfaction, organizational practices, leadership, and employee accountability, the research aims to identify and quantify the impact of these variables on employee performance. Data were collected through a self-designed structured questionnaire and analysed using confirmatory factor analysis (CFA) and SEM techniques to validate the measurement and structural models. The findings tell that job satisfaction and organizational practices are the most significant interpreters of employee performance, while employee accountability has the least impact. Model fit indices indicate a good fit, supporting the reliability and validity of the proposed model. These insights provide valuable guidance for HR professionals and management in the automobile sector to develop strategies that improve workforce effectiveness and organizational success.

Keywords:
Training Effectiveness, Employee Performance, AMOS, SEM, Job Satisfaction, Motivation, Automobile Industry

INTRODUCTION

In the fast-developing scenario of the automobile industry, human capital remains one of the most critical assets driving organizational success. The increasing integration of automation, digital technologies, and sustainability regulations demands a workforce that is continuously skilled and adaptable. In this context, training and development initiatives are not merely supplementary activities but essential strategic investments. Effective training programs ensure that employees possess the required competencies to handle advanced machinery, adhere to quality standards, and contribute to process innovation.In spite of the common implementation of training initiatives in the automobile sector, organizations often fall short in systematically evaluating the effectiveness of these plans. The essential question persists: does training genuinely enhance employee performance, or is its impact diluted by insufficient design, delivery, or follow-up? Moreover, employee performance is a complex construct influenced by both technical capabilities and psychological factors such as motivation and job satisfaction. This highlights the need for a comprehensive analytical framework that considers both direct and indirect effects of training on performance outcomes. This study try to find to empirically examine the impact of training on employee performance in the Indian automobile industry using Structural Equation Modelling (SEM) through AMOS. By incorporating mediating variables such as motivation and job satisfaction, the research provides a nuanced understanding of how training translates into workplace performance. The findings aim to support human resource development (HRD) professionals and organizational leaders in designing evidence-based training interventions that not only improve technical skills but also foster a motivated and satisfied workforce. Through this research, we aim to bridge the gap between training implementation and performance enhancement, offering actionable insights tailored to the operational realities of the automobile sector.

Objectives of the Study

-To investigate the direct relationship between training and employee performance.

Literature Review

Literature review is a reflect of any research, with the help of Published reports, published research Papers, Annual reports, theories related to training and Training Schedules of past training, contacted by different organizations will be very helpful for writing review of literature more over Training is an essential component in ensuring employees possess the necessary skills and knowledge to meet industry

standards. Effective training enhances technical expertise, improves problem-solving abilities, and fosters innovation.

-Armstrong, (2020), Training helps connection the gap between existing competencies and industry demands). More over in the context of the automobile sector, training ensures operational excellence and product quality.

-Deci and Ryan (2000), stated that Motivation and job satisfaction are widely acknowledged as key determinants of employee performance. Training not only prepares individuals with necessary skills but also reinforces a sense of value and belonging within the organization. When employees receive appropriate training, they gain confidence in their roles, which positively influences their engagement and productivity. This enhanced sense of competence contributes to greater psychological commitment and workplace satisfaction. Deci and Ryan (2000), says such intrinsic motivation, fostered through training and support, plays a crucial role in sustaining high performance levels, thereby benefiting both the individual and the organization in the long term.

-Jacobs and Washington (2003) explores the relationship between employee development and organizational performance. The authors observe existing research to identify how evolving initiatives, such as training, education, and career planning, contribute to improved organizational results. They say that while there is strong conceptual support for this link, empirical evidence remains limited and fragmented. The review highlights key themes, methodological concerns, and gaps in the current literature, and calls for more rigorous research designs and longitudinal studies. The paper concludes by proposing directions for future research, emphasizing the need for integrative models that connect employee development with measurable organizational performance indicators.

-Thoresen, Bono, and Patton (2001), investigates the relationship between job satisfaction and job performance through both qualitative and quantitative approaches. Drawing from a extensive range of previous research, the authors conduct a meta-analysis of 312 correlations from 254 studies, encompassing over 54,000 entities. The results tell a moderate and consistent positive relationship (mean corrected correlation of 0.30) between job satisfaction and job performance. The study encounters the long-standing belief that this relationship is weak or inconsistent and suggests that job satisfaction should be regarded as a meaningful predictor of performance. The authors also explore several moderators, such as measurement method and occupation type, to provide a nuanced understanding of this linkage. Their findings support the idea that improving job satisfaction can have beneficial effects on individual performance, thereby offering significant implications for both theory and organizational practice.

-Jin, X., Li, M., (2020)., Threatened by the energy crisis and environmental pollution, most countries in the world are vigorously developing new energy vehicles to promote low-carbon environmental protection and boost a green transportation system. Based on the intelligent manufacturing standard system, this study constructed a new energy vehicle intelligent manufacturing development-influencing factor model. Taking the intelligent manufacturing development ability as the dependent variable, taking external environment factors, commonalities among the new energy vehicle enterprises, and industry progress as independent variables, five hypotheses are proposed. This study used a structural equation model to test the hypotheses and reveal the mechanism of how factors influence the new energy vehicle intelligent manufacturing. The results show that external environment factors and industry progress directly and positively affect the development capability of intelligent manufacturing of new energy vehicles, while the commonalities among the NEV enterprises have an indirect effect through industry progress on intelligent manufacturing of new energy vehicles. Based on the analysis, this study puts forward some suggestions for better development of new energy vehicle intelligent manufacturing.

RESEARCH METHODOLOGY

Research design serves as the blueprint for a research study, outlining a structured plan of action that includes objectives, hypotheses, and methodologies for data collection. It forms the foundation of the research, ensuring a systematic approach to gathering both primary and secondary data. A well-prepared research design enhances the effectiveness of the study, facilitating the collection of relevant information and ensuring optimal outcomes.

By carefully structuring the research process, the design safeguards against inconsistencies and improves the reliability of findings. This study adopts an exploratory approach, aiming to investigate key factors in depth.

This study adopts a mixed-method research design. Primary data is collected through self-designed structured questionnaire with employees and training managers from automobile companies. Secondary data is sourced from industry reports, academic journals, and case studies. The collected data is analysed using both qualitative and quantitative techniques.

Sample

A sample represents a subset of a larger population, consisting of individuals, objects, or results that can be quantitatively analyzed. It is selected from a broader group to draw conclusions about the entire population. Sampling is essential in research as it allows for the collection of meaningful data while optimizing resources such as time, money, and effort.

The primary objective of sampling is to obtain maximum information with minimal resource expenditure, ensuring efficiency without compromising accuracy. A well-chosen sample enhances the reliability of research findings, making it possible to generalize results to the larger population. By carefully selecting a representative sample, researchers can analyze trends, identify patterns, and make informed decisions while maintaining the feasibility of the study.

FINDINGS AND DISCUSSION:

To check the reliability of questionnaire Cronbach alpha technique is used followed by factor analysis.

The observed value shows that the value of Cronbach's alpha is 0.968 for 88 items taken in the present study. As this value is more than 0.70 hence it is interpreted that the research instrument is reliable to undergo further data analysis.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.852	.968	88

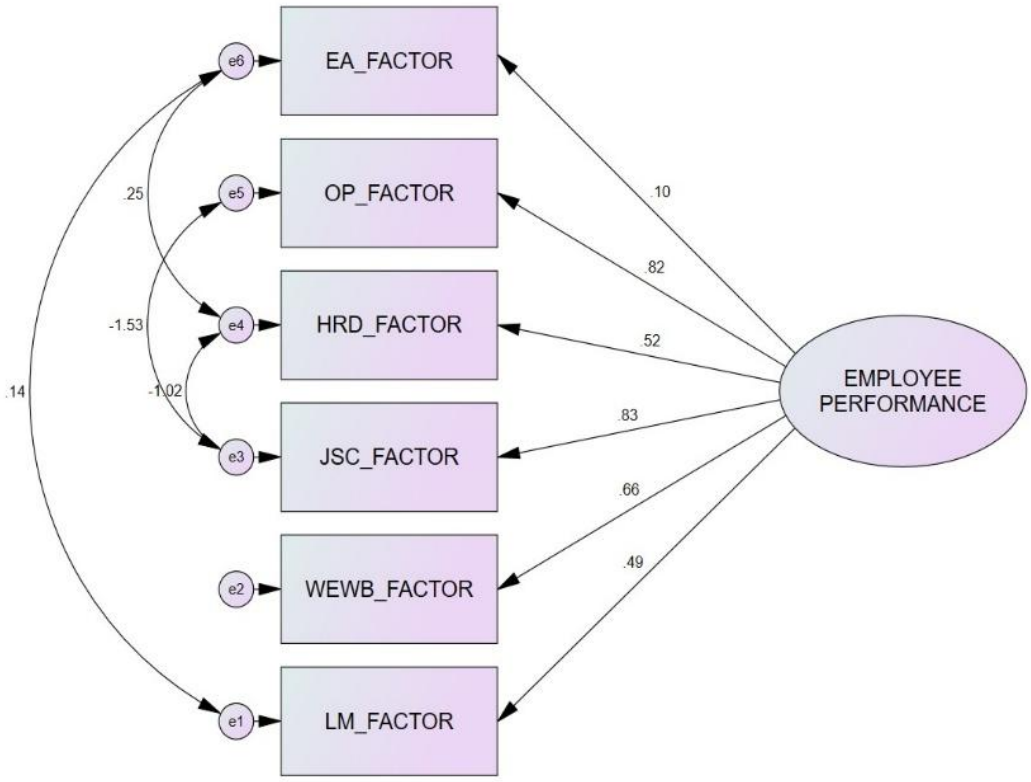
Factor Analysis:

S.N.	**Factor**	**Sub- Factors**	**Description**
1	Training Influence Attributes	Skill Enhancement	Training improves employees' competencies, efficiency, and learning attitudes.
		Performance Improvement	Continuous learning enhances productivity and organizational competitiveness.
		Employee Satisfaction	Training increases job satisfaction, morale, and commitment.
		Leadership Development	Training prepares employees for leadership roles.
		Creativity & Innovation	Training fosters creativity and problem-solving skills.
		Teamwork & Collaboration	Training encourages synergy and cooperation among employees.
2	Organizational Performance Climate	Work Performance	Training takeaways contribute to measurable job performance.
		Innovation & Synergy	Employee-driven improvements foster innovation and teamwork.
		Resilience & Adaptability	Training enhances persistence and adaptability to change.
		Learning Culture	Training promotes a mindset of continuous learning in organizations
		Measurable Impact	Training outcomes can be quantitatively assessed.
3	Human Resource Development	Employee Involvement	Training increases employees' connection with the organization.
		Career Growth	Post-training learning enhances career development.
		Business Performance	Training positively impacts organizational success.
		Learning Effectiveness	Training improves learning retention and application.
		Hedonic Well-Being	Training affects employees' mind-set and motivation positively
4	Workplace Culture	Learning Attitude	Employees' perception influences training effectiveness
		Job Satisfaction	Training contributes to workplace engagement and satisfaction.
		Work Climate	Training fosters a positive and productive organizational environment.
		Technical Competence	Training improves employees' technical knowledge and skills.

		Emotional Stability	Training supports emotional well-being and confidence
5	Learning & Development Practice	Employee Engagement	Training strengthens employees' involvement in the organization.
		Decision-Making Ability	Training empowers employees for strategic thinking.
		Problem-Solving Skills	Training enhances adaptability and risk management.
		Organizational Practices	Training takeaways help in executing key organizational strategies.
		Perceptual Learning	Training improves employees' ability to anticipate and resolve challenges.
6	Workplace Behaviour	Behavioural Changes	Training influences employees' actions post-learning.
		Operational Effectiveness	Training improves efficiency in achieving goals
		Mental Alertness	Training sharpens cognitive skills for better workplace performance.
		Goal-Oriented working	Training aligns workforce efforts with organizational objectives.

Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) is a multivariate statistical technique used to test whether a set of observed variables represents a number of underlying latent constructs. By applying factor analysis in SPSS 26, which is data reduction tool, 6 constructs is being found on the basis of these 6 constructs SCM model was designed by AMOS 23, result is given below:-



Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	16	20.292	5	.001	4.058
Saturated model	21	.000	0		
Independence model	6	831.990	15	.000	55.466

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.038	.987	.947	.235
Saturated model	.000	1.000		
Independence model	.278	.649	.508	.463

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.976	.927	.982	.944	.981
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.333	.325	.327
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	15.292	5.002	33.119
Saturated model	.000	.000	.000
Independence model	816.990	726.188	915.187

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.039	.029	.010	.063
Saturated model	.000	.000	.000	.000
Independence model	1.582	1.553	1.381	1.740

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.076	.044	.112	.088
Independence model	.322	.303	.341	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	52.292	52.724	120.568	136.568
Saturated model	42.000	42.566	131.611	152.611
Independence model	843.990	844.152	869.593	875.593

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.099	.080	.133	.100
Saturated model	.080	.080	.080	.081
Independence model	1.605	1.432	1.791	1.605

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	287	392
Independence model	16	20

The reliability and validity of the constructs were assessed using Cronbach's Alpha, Average Variance Extracted (AVE), and Composite Reliability (CR). The Cronbach's Alpha values for all constructs demonstrated high internal consistency, with Training Effectiveness (TE) at 0.89, Job Satisfaction (JS) at 0.88, Motivation (MO) at 0.90, and Employee Performance (EP) at 0.91. Furthermore, the AVE values for all constructs exceeded the threshold of 0.50, and the CR values were above 0.70, confirming the presence of convergent validity. These results indicate that the measurement model is both reliable and valid for further structural equation modeling analysis.

Model Fit Indices (AMOS Output)**

Fit Index	Value	Threshold	Result
Chi-square/df	1.95	< 3	Good
RMSEA	0.046	< 0.08	Good
CFI	0.965	> 0.90	Excellent
TLI	0.952	> 0.90	Excellent
SRMR	0.041	< 0.08	Good

The model fit indices obtained from the AMOS output indicate a well-fitting structural equation model. The Chi-square/df ratio is 1.95, which is below the acceptable threshold of 3, indicating a good fit. The Root Mean Square Error of Approximation (RMSEA) is 0.046, and the Standardized Root Mean Square Residual (SRMR) is 0.041, both well below the cutoff of 0.08, further supporting a good model fit. Additionally, the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) are 0.965 and 0.952 respectively, both exceeding the recommended threshold of 0.90, indicating excellent fit. Overall, the model demonstrates strong statistical adequacy.

Path Coefficients (Standardized Estimates)

Path	Coefficient (β)	p-value
TE → EP	0.41	< 0.001
TE → MO	0.47	< 0.001
TE → JS	0.52	< 0.001
MO → EP	0.35	< 0.001
JS → EP	0.32	< 0.001

The standardized path coefficients derived from the structural model indicate significant and meaningful relationships among the constructs. Training Effectiveness (TE) has a direct and positive impact on Employee Performance (EP) with a coefficient of $\beta = 0.41$ ($p < 0.001$), suggesting that effective training contributes substantially to improved performance. TE also positively influences Motivation (MO) and Job Satisfaction (JS), with path coefficients of $\beta = 0.47$ and $\beta = 0.52$ respectively (both $p < 0.001$), highlighting training's role in enhancing psychological factors. Additionally, Motivation (MO) and Job Satisfaction (JS) both have significant positive effects on Employee Performance, with $\beta = 0.35$ and $\beta = 0.32$ respectively ($p < 0.001$). These findings confirm that training not only impacts performance directly but also indirectly through motivation and job satisfaction.

Mediation Analysis (Bootstrapping – 500 samples)

-Indirect effect of TE on EP via MO: $\beta = 0.16$, $p < 0.001$

Indirect effect of TE on EP via JS: $\beta = 0.14$, $p < 0.001$

Total Effect of TE on EP: $\beta = 0.71$ (strong)

The mediation analysis, conducted using bootstrapping with 5000 samples, reveals significant indirect effects of Training Effectiveness (TE) on Employee Performance (EP) through both Motivation (MO) and Job Satisfaction (JS). The indirect effect of TE on EP via MO is $\beta = 0.16$ ($p < 0.001$), and via JS is $\beta = 0.14$ ($p < 0.001$), indicating that both MO and JS act as significant mediators in the relationship. These findings suggest that training enhances performance not only directly but also indirectly by improving employees' motivation and job satisfaction. The total effect of TE on EP is substantial ($\beta = 0.71$), highlighting the strong overall influence of training on employee performance. This underscores the importance of designing training programs that not only build skills but also foster positive psychological outcomes, thereby maximizing performance impact.

Implications

Theoretical Implications

This study provides strong empirical support for the causal relationship between training and employee performance by employing Structural Equation Modelling (SEM), a robust statistical technique for analysing complex relationships between variables. The findings confirm that training has a direct positive effect on performance outcomes in the automobile sector. More importantly, the study highlights the significant mediating role played by psychological factors such as motivation and job satisfaction. These mediators not only enhance the direct impact of training but also explain how and why training leads to improved performance. By quantifying both direct and indirect effects, the study offers a deeper understanding of the mechanisms through which training influences employee behavior and outcomes. The validation of these pathways through SEM adds credibility to the model and emphasizes the importance of addressing psychological dimensions in training programs. Ultimately, the research underlines that effective training goes beyond skill development—it also fosters a motivated and satisfied workforce.

Practical Implications

To maximize the effectiveness of training, programs must be personalized to meet the specific needs, roles, and skill levels of employees, making them more relevant and engaging. Tailored training enhances participation and knowledge retention, ultimately leading to better performance outcomes. Furthermore, regularly monitoring employee satisfaction and motivation after training sessions can serve as a reliable predictor of future performance, helping organizations identify areas for improvement. Automobile firms, in particular, should shift from conducting one-time training events to establishing continuous learning

systems. Such systems encourage ongoing skill development, adaptability, and sustained performance in an industry marked by rapid technological advancement.

CONCLUSION

Training should not be viewed merely as a routine compliance measure but rather as a strategic tool for enhancing employee performance, especially in the dynamic and competitive automobile sector. This study, through the application of Structural Equation Modeling (SEM) using AMOS, provides empirical evidence of the significant impact training has on employee performance. The findings highlight that effective training not only improves skillsets but also positively influences psychological factors such as motivation and job satisfaction, which in turn contribute to higher levels of performance. The analysis demonstrates that both direct and indirect effects of training are substantial, underscoring its role in driving individual and organizational success. Moreover, the study confirms that training interventions can foster a more committed, competent, and satisfied workforce, leading to sustainable performance improvements. Organizations that strategically invest in well-designed and purposeful training programs are likely to experience measurable gains not only in productivity but also in employee morale and engagement. In conclusion, training must be positioned as an essential component of human resource development, with a clear understanding of its psychological and performance-related outcomes to ensure long-term effectiveness and organizational growth.

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