



## Original research Article

# Evaluating the efficacy of employee training and development using Kirkpatrick's four-level training model: A quantitative approach

Anoop Gurunathan A<sup>1\*</sup> 

<sup>1</sup>Dept of Marketing, ISBR Business School, Bangalore, Karnataka, India

## Abstract

**Background:** A structured training and development programme can enhance employees' drive by allowing them to adapt and thrive in a constantly evolving competitive business environment. Training and development programmes are essential in improving the performance of the workforce and organisational success.

**Aim:** This study evaluates the effectiveness of training programmes using Kirkpatrick's Four-Level Training Evaluation Model, assessing Reaction, Learning, Behaviour, and Results. A quantitative research approach has been employed with a questionnaire based on the detailed literature survey to measure employee perceptions of training effectiveness, knowledge acquisition, behavioural changes, and overall impact on productivity.

**Materials and Methods:** Statistical methods such as Correlation and Weighted Average Method have been adopted to examine the relationship between training satisfaction, confidence, productivity and motivation.

**Results:** The findings suggested that systematic training evaluation is required to enhance employee engagement, motivation, and organisational performance.

**Conclusion:** In conclusion training impacts productivity, post-training reinforcement strategies are needed to sustain results.

**Keywords:** Training and Development, Training Effectiveness, Kirkpatrick's Training Model, Employee Performance

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## 1. Introduction

Training and development is a key function in an organisation that needs a systematic and scientific approach with an aim to acquire knowledge, skills and attitudes. Proper planning, designing, delivering, and implementing training programmes are required so that the desired outcomes can be obtained (Adula et al., 2023). Employee training programmes serve as a foundation for organisational growth as they bridge the gap between current capabilities and desired competencies. Organisations need to invest in training and development programmes to enhance the efficiency, adaptability, and job satisfaction of the workforce (Anoop, 2021).

Employee training and development is imperative for maintaining a competitive workforce and helping to enhance their knowledge, skills and job performance. It contributes to improving employee motivation and organisational success. Training programmes also need to stress decision-making

and problem-solving abilities in the job environment (Florea et al., 2016).

It is important to ensure that training programmes conducted yield tangible benefits to the organisation's development and work culture, which remains a challenge. Ensuring the effectiveness of training programmes requires systematic evaluation (Kuchеров and Manokhina, 2017). Hence, this study explored the training programmes using Kirkpatrick's Four-Level Training Model to assess training outcomes, its effectiveness and examines how training satisfaction correlates with confidence and motivation through a structured questionnaire-based survey.

## 2. Literature Review

A systematic literature review was conducted by analysing previous research articles related to training and development programmes. To gather relevant studies related to training

\*Corresponding author: Anoop Gurunathan  
Email: [anoop.g24365@gmail.com](mailto:anoop.g24365@gmail.com)

and development, databases such as Google Scholar, ResearchGate, and ProQuest were searched using keywords like "Training and Development", "Training Evaluation Models", "Importance of Training Evaluation", "Kirkpatrick's Training Model", and "Employee Training and Development Programmes". This process adhered to the PRISMA technique (Anoop and Lakshmi, 2024) to ensure comprehensive coverage of the topic that included all relevant citations. Only English articles were selected for review. A total of 19 articles were included in the final analysis.

The review of literature is organised into four main sections: Training and Development, Importance of Training Evaluation, Training Evaluation Models, and Kirkpatrick's Training Model.

### *2.1 Training and development*

Training is a key strategic HR function that focuses on improving employees' competencies and skills that align with organisational goals. Well-executed training programmes lead to higher productivity, greater job satisfaction, and lower employee turnover. The primary goal of training programmes is to help organisations achieve their goals and objectives by adding value and enhancing their most key resource – its workforce. Training involves investing in people to improve their performance and empower them to fully utilize their abilities for the betterment of the organisation (Hendriati et al., 2024).

In the earlier days, most of the organisations did not believe in training and were of the view that managers are born and not made. They considered training as a costly affair. Training is now considered as a retention and development tool. It is believed to create a smarter workforce and yield the best results. Training also contributes to the attainment of both personal and organisational goals (Mehedi and Sharmin, 2023).

Organisations should design their training policies based on their goals and priorities. Training and development initiatives need to be taken by organisation leaders by facilitating a suitable learning and training environment, ensuring that training improves the competencies of employees by becoming more skilled and knowledgeable in performing their job roles effectively (Mohamed and Alias, 2012). Training and development programmes need timely monitoring and evaluation to gauge their effectiveness so that timely modifications and upgradation can be implemented in the training and development programme (Niati et al., 2021).

### *2.2 Importance of training evaluation*

Organisations must measure the effectiveness of their training programmes on a routine basis to ensure whether these programmes translate into improved job performance and positive business outcomes (Bhattacharyya, 2015).

Organisations prioritize employee training and development programmes as a strategic investment that improves employees' skills, knowledge, and competencies. Further, management has to evaluate the efficacy of training by analysing the work performance, organisational culture and feedback sessions. Organisations that constantly conduct employee training and development programmes with timely modification tend to have higher productivity and employee satisfaction rates (Kennedy et al., 2014).

The effectiveness of the training programmes can be assessed based on improved morale, higher job performance, commitment, better interpersonal relationships, and good work ethics. Relevant training programmes related to work roles and post-training feedback mechanisms can help organisations know the effectiveness of training (Nawaz et al., 2022).

Evaluation of the effectiveness of training programmes helps to ensure that the learning objectives are achieved and to gather feedback for continuous improvement. The evaluation process needs to examine knowledge retention, behavioural changes, and organisational outcomes. Evaluating the effectiveness of training programmes can help organisations to identify skill gaps and refine training content to better meet employee needs (Bashar et al., 2024). Hence, there is a need for a proper training evaluation framework that would aid in evaluating the training and development programmes effectively.

### *2.3 Training evaluation models*

Evaluation is an important part of the training as it is imperative to measure the extent to which the training objectives have been achieved. A holistic evaluation of the learning objectives achieved, the effectiveness of the training methodologies, how effectively the employee has been able to transfer the knowledge to his work, how the organisation has benefitted, or what is the return on investment for a particular training, are the questions which an evaluation model should be able to answer (Chong and Peter, 2016).

Evaluating the training and development process is crucial as it helps to determine the extent to which training objectives have been achieved. Training evaluation needs to be done in a comprehensive manner which should address factors such as whether the intended learning outcomes have been met or not, whether the effectiveness of training methodologies followed in facilitating proper learning and growth, has the workforce transferred the training knowledge into their work, the advantages the organisation has gained from the training and Return on Investment (ROI) for a specific training programmes (Amjad et al., 2024). An effective training evaluation model should be able to answer these questions to provide a clear understanding of the training's impact. There are various training evaluation models exist, that include.

### 2.3.1 ADDIE, model

The ADDIE Model was developed in the 1970s by the Center for Educational Technology at Florida State University for the U.S. Army. ADDIE Model is a widely adopted framework that emphasizes systematic training design and assessment. ADDIE stands for Analysis, Design, Development, Implementation, and Evaluation, representing the five key phases of the model. It is best suited for structured training design and incremental upgradation (Dhankhar, 2020).

### 2.3.2 Phillips ROI model

Phillips ROI Model was developed by Philips in the year 1997. It is an extension of the Kirkpatrick model that follows a goal-based approach with the addition of the ROI concept in training evaluation. The financial dimension is added to evaluate the training process. The measurement levels include Reaction and planned action, Learning, Job applications, Business results and ROI (Putra and Tehedi, 2025).

### 2.3.3 COMA model

COMA Evaluation Model is a framework used to assess the effectiveness of training programmes that emphasizes on motivation and organisational support for learning. It highlights the need for proper communication during the evaluation process and encourages accurate data collection to understand employees' situations. It involves the measurement of Cognitive, Organisational, Motivational and Attitudinal variables (Hartika et al., 2023).

There are many more training evaluation models like, Hassett's training investment analysis approach, the CIPP approach to evaluation, Kaufman's Five model evaluation of training impact, CIRO model of training Evaluation. IPO Model, Training valuation system (TVS) Model, Financial utility model, etc (Zeb et al., 2021).

Out of the various training evaluation models, Kirkpatrick's four-level model is widely accepted due to its structured approach. Further, most of the models are considered to be extensions of the Kirkpatrick model where the researchers have added value to the training evaluation scheme (Lamsir, 2025).

### 2.4 Kirkpatrick's training model

Kirkpatrick's Four-level Training Model is one of the most widely used framework for evaluating training effectiveness which was introduced by Kirkpatrick in 1959 and was further upgraded in 1975 and 1994. Kirkpatrick model is considered to be a systematic and simplistic approach to training models towards evaluating the complex process of training in organisations (Kirkpatrick and Kirkpatrick, 2009). Kirkpatrick's model assesses training effectiveness across four levels:

1. **Level 1: Reaction:** This level measures what the participants thought and felt about the training they received, and reacted to the training. It mainly looks into participants/ employees satisfaction and the relevance of training.
2. **Level 2: Learning:** This level measures what the participants have learned. It mainly assesses the knowledge and skills acquired by employees.
3. **Level 3: Behaviour:** This level evaluates the extent to which participants have modified their behaviour, based on the training received. Also assess the application of learned skills from training in the workplace (Rivaldo and Nabella, 2023)
4. **Level 4: Results:** This is the final level which would analyse the final results of training, The impact of training on business, the organisation's performance and the participants' mindset (Ikramina and Gustomo, 2014)

Kirkpatrick's Training Model follows a goal-based approach and evaluates primarily from the trainee's perspective.

In this study, we have adopted Kirkpatrick's Training Model to draft the questionnaire to evaluate the effectiveness of employee training and development programmes.

### 2.5 Research gap

Despite extensive research on training evaluation, limited studies integrate statistical methods like Correlation Analysis and Weighted Average Method to measure the direct impact of training satisfaction on confidence building and motivation. This study aims to bridge this gap by conducting questionnaire-based survey.

## 3. Research Methodology

A quantitative approach was adopted using a structured questionnaire. Data were collected from employees who underwent training in Star PVC Pipes & Fittings Pvt Ltd, Thrissur, analysing training programmes' effectiveness based on Kirkpatrick's Model.

### 3.1 Context and rationale

Employees are considered to be the most valuable assets of an organisation. So, to equip the employees to adjust to the changing work environment and technology, training is essential. With this purpose, every organisation is conducting various training programmes with an aim for job enrichment of the employees and to increase the productivity.

Hence, this present study is an attempt to understand and evaluate whether the training programmes conducted at Star PVC Pipes & Fittings Pvt Ltd, Thrissur on analysing training programmes' effectiveness based on Kirkpatrick's Model.

### 3.2 Research questions

1. How effectively do training programmes enhance employees' confidence, skill acquisition, and job performance?
2. What is the relationship between training satisfaction and motivation?
3. How do employees perceive the relevance of training programmes and their impact on productivity?
4. What improvements can be made in training programmes based on employee feedback and statistical evaluation?

### 3.3 Objectives

1. To assess the effectiveness of training programmes in enhancing employees' confidence, skills, and overall job performance using Kirkpatrick's Four-Level Model.
2. To analyse the impact of training satisfaction on confidence and motivation.
3. To evaluate the impact of training on productivity, morale, and behavioural change in the workplace.
4. To identify key areas for improvement in training programmes and suggest actionable recommendations for enhancing employee learning experiences.

### 3.4 Data collection

Primary Data was collected via questionnaire-based surveys from employees of Star PVC Pipes & Fittings Pvt Ltd, Thrissur.

Secondary Data was collected from previous research papers, theses and articles.

### 3.5 Sampling technique

Simple Random Sampling was used to collect responses from employees who attended training sessions at Star PVC Pipes & Fittings Pvt Ltd. The sample size for the study was 50.

### 3.6 Questionnaire preparation

The findings derived from existing literature (Sal and Raja, 2016., Willie, 2025., Nda and Fard, 2013., Dhankhar, 2020., Ukraine and Gustomo, 2014) helped in preparing the questionnaire for the survey which aligned with Kirkpatrick's Four-level Training Model. Further, the Questionnaire is classified as mentioned in Table 1.

**Table 1:** Questionnaire classification based on Kirkpatrick's four-level training model

Kirkpatrick's Training Model Levels	Interview Question Scope
Level – 1: Reaction	i. Satisfaction level regarding the content, training methods, time duration, overall rating and

	opinion about the training received
	ii. Relevance of training obtained with regard to the job
Level–2: Learning	i. Awareness regarding the participants' strengths & weaknesses.
	ii. Skill acquisition occurred after training
	iii. Confidence level after training and the person conducting the training programmes
Level–3: Behaviour	i. Change in work performance after attending the training
	ii. Overall change in attitude like improvement in inter-personal relationships, team spirit, and attitude towards work and colleagues
	iii. Opportunities to share ideas and suggestions regarding the training
Level – 4: Results	i. Improvement in productivity after training
	ii. Level of Morale after training
	iii. Support of Management in attending training programmes

### 3.7 Statistical analysis

Data were analysed using statistical methods including Tabulation, Diagrammatic Representation, Correlation analysis and Weighted Average Method.

## 4. Data Analysis

After distributing the questionnaire to the employees, their responses were studied in detail and analysed to understand the efficacy of the training programmes conducted.

The questionnaire was distributed to employees across various departments—including HRD, Finance, R&D, Production, and Marketing—and across different job levels (Lower, Middle, and Management). The distribution was balanced between male and female employees (80:20 ratio) and covered a wide age range (20–60 years). Analysis of the responses revealed that 45% of employees have 1–5 years of experience, while 32% have 15 or more years of experience.

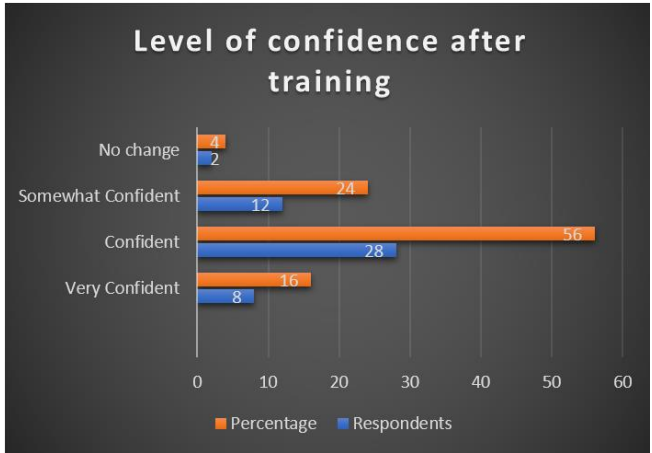
Various factors were enquired among employees which included:

#### 4.1 Level of confidence level

The level of confidence of employees in managing their job role after attending the training programme is depicted in Table 2 and Figure 1.

**Table 2:** Level of confidence level

Level of confidence after training	Respondents	Percentage
Very Confident	8	16
Confident	28	56
Somewhat Confident	12	24
No change	2	4
Total	50	100



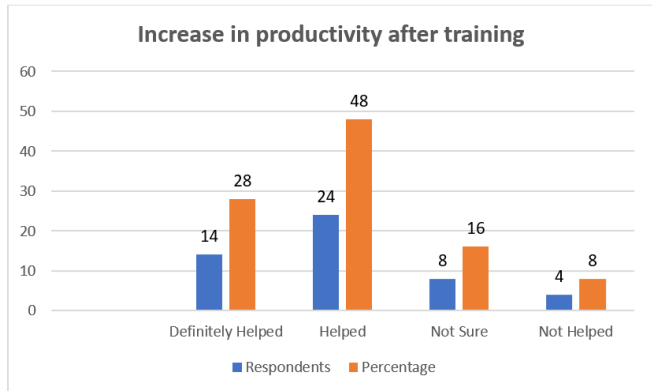
**Figure 1:** Level of confidence level after training

*4.2 Increase in productivity after training*

The impact of training programmes attended by employees on their productivity is depicted in Table 3 and Figure 2.

**Table 3:** Increase in productivity after training

Increase in productivity after training	Respondents	Percentage
Definitely Helped	14	28
Helped	24	48
Not Sure	8	16
Not Helped	4	8
Total	50	100



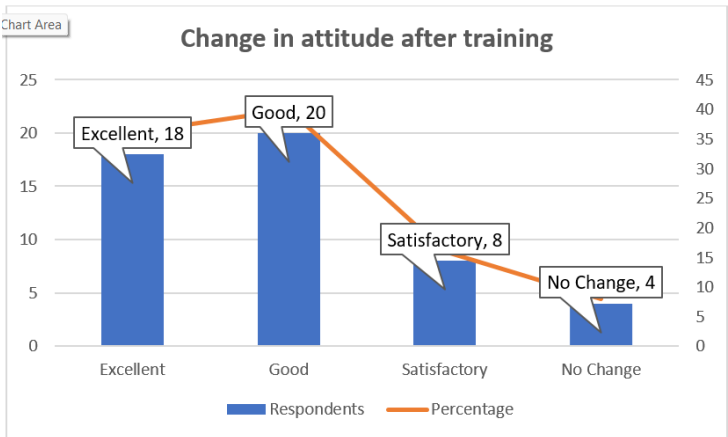
**Figure 1:** Level of confidence level after training

*4.3 Change in attitude after training*

The change in the attitude of employees after attending training programmes was enquired and the responses are depicted in Table 4 and Figure 3.

**Table 4:** Change in attitude after training

Change in attitude after training	Respondents	Percentage
Excellent	18	36
Good	20	40
Satisfactory	8	16
No Change	4	8
Total	50	100



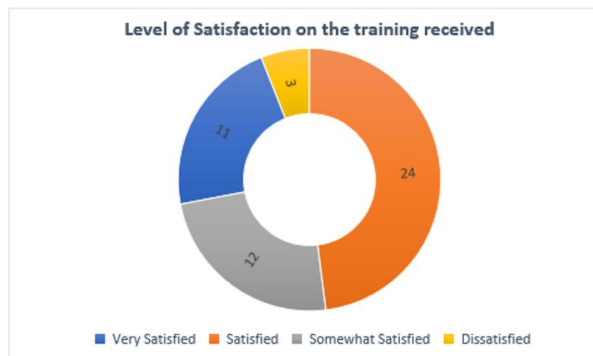
**Figure 2:** Change in attitude after training

*4.4 Level of Satisfaction on the Training Received*

The level of satisfaction of employees who received the training programmes are represented in Table 5 and Figure 4.

**Table 5:** Level of satisfaction on the training received

Level of Satisfaction on the training received	Respondents	Percentage
Very Satisfied	11	22
Satisfied	24	48
Somewhat Satisfied	12	24
Dissatisfied	3	6
Total	50	100



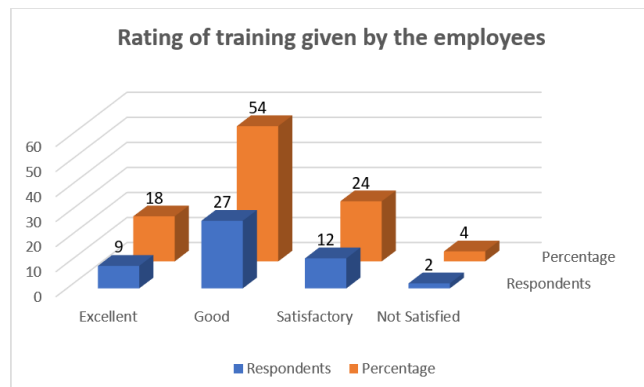
**Figure 3:** Level of satisfaction on the training received

#### 4.5 Ratings given by Employees on the Training Received

Employees' ratings regarding the training received are represented in Table 6 and Figure 5.

**Table 6:** Ratings given by employees on the training received

Rating of training given by the employees	Respondents	Percentage
Excellent	9	18
Good	27	54
Satisfactory	12	24
Not Satisfied	2	4
Total	50	100



**Figure 4:** Ratings given by employees on the training received

#### 4.6 Correlation analysis

Pearson's correlation coefficient ( $r$ ) was used to measure relationships between training satisfaction, confidence, and motivation. The  $p$ -value determines the statistical significance of the correlation:

$p < 0.05$ : The correlation is statistically significant.

$p > 0.05$ : The correlation is not statistically significant.

##### 4.6.1 Training satisfaction vs confidence

The researcher assumed that employees who reported higher satisfaction with the training program received tend to have

higher confidence in their work. Based on this understanding, the hypothesis is drafted.

**Null Hypothesis ( $H_0$ ):** There is no significant correlation between Training Satisfaction and Employee Confidence.

**Alternative Hypothesis ( $H_1$ ):** There is a significant positive correlation between Training Satisfaction and Employee Confidence.

**Table 7:** Training satisfaction vs confidence

Factor	Pearson's $r$	p-value
Training Satisfaction vs Confidence	0.986	0.014

Pearson's  $r = 0.986$  indicates an extremely strong positive correlation between training satisfaction and confidence.  $p$ -value ( $p$ ) = 0.014 ( $< 0.05$ ) suggests that the correlation is statistically significant at a 95% level of confidence between training satisfaction and employee confidence.

Hence, we reject the Null Hypothesis and conclude that there is a strong positive correlation between training satisfaction and employee confidence.

This summarizes the fact that effective training boosts employees' self-assurance, making them feel better equipped to handle job responsibilities.

##### 4.6.2 Training satisfaction vs. motivation

The researcher assumes that employees who are satisfied with training programmes are likely to experience higher motivation levels. Based on this understanding, the hypothesis is drafted.

**Null Hypothesis ( $H_0$ ):** There is no significant correlation between Training Satisfaction and Employee Motivation.

**Alternative Hypothesis ( $H_1$ ):** There is a significant positive correlation between Training Satisfaction and Employee Motivation.

**Table 8:** Training satisfaction vs. motivation

Factor	Pearson's $r$	p-value
Training Satisfaction vs. Motivation	0.953	0.047

Pearson's  $r = 0.956$  indicates an extremely strong positive correlation between training satisfaction and motivation

$p$ -value ( $p$ ) = 0.047 ( $< 0.05$ ) suggests that the correlation is statistically significant at the 95% level of confidence between training satisfaction and employee motivation

Hence, we reject the Null Hypothesis and conclude that there is a strong positive correlation between training satisfaction and employee motivation.

This summarizes the fact that organisations need to focus on conducting continuous training and learning programmes to maintain high motivation levels of employees.

The finding from both Correlation Analyses (Training Satisfaction vs Confidence and Training Satisfaction vs. Motivation) aligns with Kirkpatrick's Training Evaluation Model, by reinforcing the importance of employee reaction (satisfaction) in predicting behavioural outcomes (confidence, motivation). Further, quantifies motivation as a behavioural outcome of training and motivation acting as a mediator between training effectiveness and organisational success.

#### 4.7 Weighted average method

The weighted average method has been conducted to calculate the key training outcomes like productivity improvement and motivation.

##### 4.7.1 Weighted Average for Productivity Improvement

By assigning the highest weight for "Definitely Helped (4), followed by Helped (3), Not Sure (2) and Not Helped (1)" to each data point obtained for the Productivity Improvement factor mentioned in Table 9.

**Table 9:** Weighted average for productivity improvement

Response Category	Score (X)	No. of Respondents (W)	Weighted Value (W × X)
Definitely Helped	4	14	56
Helped	3	24	72
Not Sure	2	8	16
Not Helped	1	4	4
Total		50	148

Weighted Average = Total weighted value

Total number of respondents

##### 4.7.2 Weighted average for productivity improvement = 2.96

Hence, it may be concluded that training has a notable impact on productivity improvement and can act as a game-changer in productivity.

##### 4.7.3 Weighted average for motivation increase

By assigning the highest weight for "Highly Increased (4), followed by Increased (3) and No Change (1)" to each data point obtained for the Motivation Increase factor mentioned in Table 10.

**Table 10:** Weighted average for motivation increase

Response Category	Score (X)	No. of Respondents (W)	Weighted Value (W × X)
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Highly Increased	4	10	40
Increased	3	35	105
No Change	1	5	5
Total		50	148

Weighted Average = Total weighted value

Total number of respondents

##### 4.7.4 Weighted average for motivation increase = 3.00

Hence, it may be concluded that training effectively increases employee motivation, enthusiasm and engagement.

The finding from Weighted Average (Productivity Improvement and Motivation Increase) extends Kirkpatrick's model by emphasizing motivation as a behavioural outcome, which influences skill application in the workplace. Further, suggests that while training impacts productivity, post-training reinforcement strategies are needed to sustain results.

## 5. Findings and Discussions

1. Employees expressed high satisfaction with the training programmes, which contributed to improved confidence and motivation.
2. Training positively influences productivity and hence can act as a game-changer in productivity.
3. Both internal and external trainers contributed to the overall effectiveness of the training, with a hybrid approach being the most preferred by employees.
4. Employees who preferred external trainers appreciated their industry expertise, fresh perspectives, and advanced knowledge. Those who preferred internal trainers valued their familiarity with company policies, procedures, and unique challenges.
5. There was a noticeable lack of post-training support mechanisms, which impacted the long-term retention of skills learned.
6. Training programmes tailored to specific job roles resulted in higher productivity and greater job satisfaction.
7. Providing employees with opportunities to share feedback enhanced the relevance and effectiveness of the training programmes.
8. Most employees believed that training had a positive impact on productivity, morale, and motivation.
9. Employees felt that training sessions should focus more on practical applications rather than theoretical ones.
10. Time constraints were a common issue, with employees finding it challenging to balance training with their regular workload.

## 6. Suggestions

1. Enhance Practical Learning by integrating real-time case studies, hands-on training, and mentorship programmes.

2. Improve engagement and participation in training by utilizing gamification, role-playing, and simulations.
3. Implement KPIs to measure training outcomes and track employee progress.
4. Ensuring continuous learning opportunities to access resources to promote continuous employee development.
5. Can implement mentorship programmes to reinforce learned skills and proper guidance.
6. Tailoring personalized training modules content based on job role and responsibilities.
7. Integrate Technology to enhance training delivery and engagement.
8. More focus must be on hands-on training and real-life scenarios to improve skills.
9. Providing training in flexible formats, such as online, weekend, and self-paced learning can help employees accommodate the workloads as well.
10. Need to integrate soft skills training, leadership development, and interpersonal relationship training along with technical job-related training.
11. Encourage Cross-Departmental Training which would foster collaboration and teamwork.
12. Regular Employee Feedback surveys and forums to allow employees to suggest improvements for training need to be conducted.
13. Implementing incentives and reward systems to recognize employees who have successfully applied their training into their work.
14. The focus must be more on practical, real-world applications rather than theoretical sessions.

## 7. Recommendations

1. Strengthen Post-Training Follow-Ups by providing coaching and refresher courses to reinforce learning and ensure knowledge transfer.
2. Organisations should calculate return on investment (ROI) to assess the effectiveness of training programmes.
3. Adopt multi-level evaluation frameworks to assess the impact of training at various levels.
4. Mandatory Post-Training Follow-Ups and tracking are needed to know whether employees are applying what they have learned.
5. Continuous Feedback Mechanism needs to be in place to ensure that training aligns with the evolving needs of the job.
6. Develop Individual Development Plans (IDPs) to guide employees in their skill acquisition and job performance improvement.
7. Ensure Training Tailored to Real-Time Challenges that employees are facing in their respective roles and departments.
8. Active support from managers to employees in applying their newly acquired skills in their daily tasks.
9. Provide supplementary learning resources such as e-learning modules and mentorship programmes to support continuous development.

10. Proper Post-Training Action Plans must be there in place.

## 8. Limitations of the study

1. The study was limited to a single company (Star PVC Pipes & Fittings Pvt Ltd) with a small sample size.
2. Self-reported survey data may introduce response bias.

## 9. Future Scope of Study

1. Further studies should explore the use of AI-driven training assessments.
2. Future research should include qualitative analysis and longitudinal studies to better understand whether the confidence and motivation gained from training are sustained over time.
3. Future studies could explore other training evaluation models to compare their effectiveness and applicability.

## 10. Implications

This study would add to the literature on the effectiveness of training and development programmes. The findings, suggestions, and recommendations can help HR professionals and trainers of organisations to design training programmes with a proper strategy for achieving the desired outcomes from the training.

## 11. Conclusion

Evaluating the effectiveness of training systematically is crucial in the long run to improve employee work culture and the organisation's development. By evaluating training and development programmes, organisations can optimize employee performance and drive business success. Training efforts play a crucial role in shaping employee performance, productivity, and job satisfaction. Hence, organisations should prioritize proper training frameworks that align with both business objectives and employee aspirations.

Training has a significant impact on employee performance, which is measurable at both individual and organisational levels. Kirkpatrick's model is an effective training evaluation method, which offers a structured approach to analyse the training success and pinpoint the areas that need improvement. Hence, training efforts play a pivotal role in the overall growth of both employees and the organisation, though there is always room for refining and structuring training programmes more effectively.

This study confirms the fact that there is a strong correlation between training satisfaction, employee confidence and motivation, which reinforces the importance of using structured methods to evaluate training. By using Kirkpatrick's Four-Level Model, organisations can design training strategies in a better way to maximize engagement,



skill development, and productivity. Future research should focus on exploring the possibilities of implementing AI-driven training assessments and to further refine training practices.

## 12. Source of Funding

None.

## 13. Conflict of Interest

The author declares that there are no conflicts of interest related to this research.

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