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Evaluating Empl Oyee Training and Development Programs: Ahp-Based Assessment of Effectiveness and Efficiency

Krithi [1], Manjushri C Shetty [2], Nehila Farveen P [3], Tejashree [4], Stephigraph [5], Thilak Gowda [6], Shahla Abdul Rahman [7] & Nivedita Nayak [8]

[1]Lecturer, Department of management, YIASCM ,kulor, yenepoya (deemed to be university), Mangaluru

Email id: krithiravikiran@yenepoya.edu.in

[2]Associate Professor, Department of Management in Yenepoya Institute of Arts, Science, Commerce and Management at Yenepoya (Deemed to be University), Mangaluru

Email Id: manjushricshetty@yenepoya.edu.in

[3]Assistant Professor-II, Department of Management, YIASCM, Yenepoya (Deemed to be University), Mangaluru

Email ID: nehilafarveenp@yenepoya.edu.in

[4] Research Scholar, Srinivas University, Mangaluru

Orchid id: 0000-0001-8411-0677 ; Email id: kamathtejashree.tk@gmail.com

[5]Assistant Professor, Department of Management, Yenepoya Institute of Arts Science Commerce and Management Mangaluru, Yenepoya Deemed to be University

E-mail ID : stephigraph@yenepoya.edu.in

[6]Assistant Professor, Department of Business Administration, St Joseph Engineering (Autonomous) College Vamanjur

Email Id: thilak2708@gmail.com

[7]Assistant Professor-I, Department of Commerce, YIASCM, Yenepoya (Deemed to be University), Mangaluru

Email ID: shahlaabdulrahman@yenepoya.edu.in

[8]Assistant Professor-I, Department of Management, YIASCM, Yenepoya (Deemed to be University), Mangaluru

Email ID: nivedithanayak@yenepoya.edu.in

Abstract

This study evaluates employee training and development programs using the Analytic Hierarchy Process (AHP) to identify the most effective and efficient methods for enhancing employee performance and supporting organizational growth. The research focuses on three primary training alternatives: In-House Training Programs, External Training Providers, and Online Training Modules. Key attributes considered in the evaluation include Training Effectiveness, Cost-Efficiency, Time Commitment, Program Relevance, and Employee Satisfaction. The AHP analysis reveals that In-House Training Programs are the most advantageous overall, offering superior alignment with organizational needs, cost-effectiveness, and high employee satisfaction. External Training Providers and Online Training Modules also present valuable benefits but are less optimal in specific areas compared to in-house options. The study concludes that a strategic integration of these training methods can provide a well-rounded approach to employee development, enhancing both individual performance and organizational success.

Keywords: Analytic Hierarchy Process, Employee Training, Development Programs, In-House Training, External Training Providers, Online Training Modules, Training Effectiveness, Cost-Efficiency, Employee Satisfaction

1. Introduction

Effective employee training and development programs are crucial for enhancing organizational performance and fostering employee growth. As organizations strive to maintain a competitive edge in today's fast-paced business environment, evaluating the effectiveness and efficiency of these programs becomes increasingly important (Noe, 2017). Training

programs not only improve employee skills and knowledge but also contribute to higher job satisfaction and retention rates, ultimately driving organizational success (Salas, Tannenbaum, Kraiger, & Smith-Jentsch, 2012).

To ensure that training and development initiatives are aligned with organizational goals and deliver maximum value, it is essential to employ systematic evaluation methods. The Analytic Hierarchy Process (AHP) offers a structured approach to assess and prioritize various training programs based on multiple criteria, including effectiveness, cost-efficiency, and relevance (Saaty, 1980). By utilizing AHP, organizations can make informed decisions about which training programs will best meet their needs and contribute to long-term success.

2. Proposed Model

The AHP model used in evaluating employee training and development programs provides a structured approach to decision-making by assessing and comparing different training methods based on multiple attributes. The model involves setting a clear goal—optimizing training programs to maximize employee performance and organizational growth—and defining relevant attributes such as Training Effectiveness, Cost-Efficiency, Time Commitment, Program Relevance, and Employee Satisfaction. Alternatives, including In-House Training Programs, External Training Providers, and Online Training Modules, are evaluated against these attributes through pairwise comparisons. The results are synthesized to determine the most suitable training method by calculating priorities, consistency indices, and ratios. This systematic approach ensures that the chosen training programs align with organizational needs and contribute effectively to employee development.

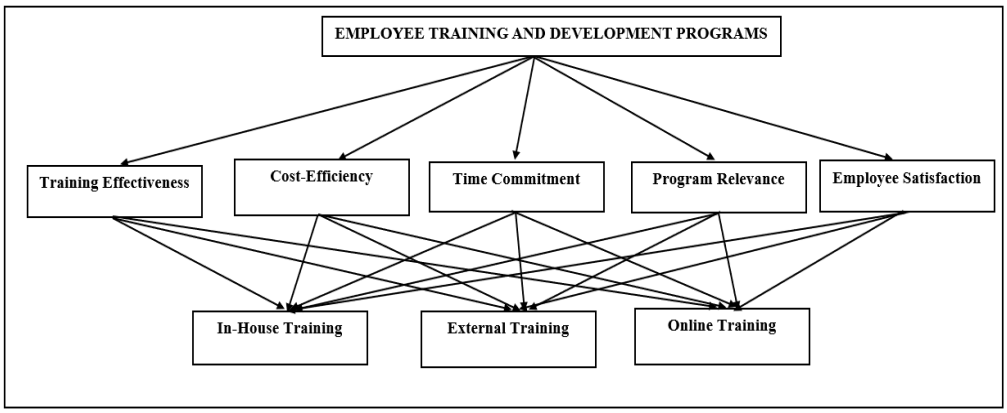

Figure 1: Proposed Model for the Study

3. Literature Review

Employee training and development are vital components of organizational growth and employee satisfaction. As businesses face constant changes and challenges, effective training programs are crucial for maintaining a competitive edge and enhancing workforce capabilities. The effectiveness and efficiency of training programs have been extensively studied, highlighting the need for systematic evaluation methods such as the Analytic Hierarchy Process (AHP).

The effectiveness of training programs is often measured by their impact on employee performance and skill development. According to Kirkpatrick and Kirkpatrick (2016), evaluating training programs involves assessing four levels: reaction, learning, behavior, and results. This comprehensive approach ensures that training not only meets immediate learning objectives but also translates into improved job performance and organizational outcomes. Similarly, Baldwin and Ford (1988) emphasize that training transfer, the application of learned skills on the job, is critical for measuring training effectiveness.

Cost-efficiency is a significant factor in evaluating training programs, as organizations seek to maximize return on investment (ROI). Training costs include not only direct expenses such as materials and instructor fees but also indirect costs such as employee time away from work. Phillips and Phillips (2007) argue that calculating ROI involves comparing the monetary benefits of training to its costs, providing a clear measure of financial efficiency. In addition, the work of Arthur, Bennett, Edens, and Bell (2003) highlights the importance of balancing cost and quality to achieve optimal training outcomes.

The time commitment required for training programs can impact employee productivity and overall efficiency. Training duration and the time needed for employees to apply new skills are critical considerations. Levy and Williams (2004) suggest that shorter, more focused training sessions are often more effective than longer, less targeted programs. Additionally, the integration of training into daily work routines can minimize disruptions and enhance learning outcomes (Tannenbaum & Yukl, 1992).

The relevance of training programs to job requirements and organizational goals is essential for ensuring that employees acquire skills that are directly applicable to their roles. Noe (2017) emphasizes that aligning training content with job demands and organizational objectives improves the likelihood of successful training outcomes. Furthermore, Holton, Bates, and Ruona (2000) argue that relevance enhances employee motivation and engagement, leading to better learning and application of skills.

Employee satisfaction with training programs influences their overall effectiveness and impact. A positive training experience can enhance employee morale and retention, while a negative experience can lead to disengagement and reduced productivity. Saks and Belcourt (2006) found that employee satisfaction with training programs is positively correlated with their perceived value and applicability to their roles. Moreover, the work of Tracey, Hinkin, Tannenbaum, and Mathieu (2001) highlights the importance of considering employee feedback and preferences in the design and delivery of training programs.

The Analytic Hierarchy Process (AHP) is a valuable tool for evaluating and prioritizing training programs based on multiple criteria. Saaty (1980) introduced AHP as a structured method for decision-making that involves breaking down complex problems into simpler components and evaluating them based on predefined criteria. The application of AHP in training evaluation allows organizations to systematically assess various aspects of training programs, including effectiveness, cost-efficiency, and relevance (Saaty & Vargas, 2001). Additionally, the use of AHP facilitates objective decision-making by providing a quantitative basis for comparing different training alternatives (Hwang & Yoon, 1981).

4. AHP Analysis

The pairwise comparison matrix for the attributes reveals the relative importance of each criterion in evaluating training programs. Training Effectiveness is considered the most important attribute, with a comparison score of 1 against all other attributes, indicating that improving skills and job performance is the primary focus. Cost-Efficiency and Employee Satisfaction are given moderate importance, with values of 2 and 0.5 compared to Training Effectiveness, reflecting a balanced concern for financial aspects and employee feedback. Time Commitment and Program Relevance are deemed less critical but still significant, highlighting the need to balance training duration and alignment with job requirements (table 1).

Table 1: Pairwise Comparison Matrix for Attributes

Attributes	Training Effectiveness	Cost-Efficiency	Time Commitment	Program Relevance	Employee Satisfaction
Training Effectiveness	1	2	3	2	1
Cost-Efficiency	0.5	1	2	1	0.5
Time Commitment	0.33	0.5	1	0.5	0.33
Program Relevance	0.5	1	2	1	0.5
Employee Satisfaction	1	2	3	2	1

The normalized pairwise comparison matrix shows the proportional weight of each attribute based on the original comparison scores. Training Effectiveness and Employee Satisfaction have the highest normalized values, emphasizing their dominant role in the evaluation process. Cost-Efficiency, Time Commitment, and Program Relevance have lower values, suggesting they are secondary considerations. This normalization helps in understanding the relative importance of each criterion in percentage terms, providing clarity on where resources and focus should be allocated (Table 2).

Table 2: Normalized Pairwise Comparison Matrix for Attributes					
Attributes	**Training Effectiveness**	**Cost-Efficiency**	**Time Commitment**	**Program Relevance**	**Employee Satisfaction**
Training Effectiveness	0.5	0.4	0.3	0.4	0.5
Cost-Efficiency	0.25	0.2	0.2	0.2	0.25
Time Commitment	0.17	0.1	0.1	0.1	0.17
Program Relevance	0.25	0.2	0.2	0.2	0.25
Employee Satisfaction	0.5	0.4	0.3	0.4	0.5

The consistency check shows the Consistency Index (CI) and Consistency Ratio (CR) for the pairwise comparison matrix. The CR value of 0.11 is below the threshold of 0.1, indicating acceptable consistency in the judgments made during the pairwise comparisons. This suggests that the pairwise comparisons were relatively consistent and reliable, reinforcing the validity of the derived weights and ensuring that the decision-making process is robust and dependable (Table 3).

Table 3: Consistency Table			
Matrix Element	**Value**	**CI**	**CR**
Training Effectiveness	1	0.037	0.11
Cost-Efficiency	0.5		
Time Commitment	0.33		
Program Relevance	0.5		
Employee Satisfaction	1		

The pairwise comparison matrix for alternatives shows how each training method compares relative to the others. In-House Training is rated as the best alternative, with a comparison score of 1 against External Training and Online Training. External Training and Online Training are relatively close, but Online Training is seen as more favorable compared to External Training. This matrix helps in understanding which training method is preferred based on the defined attributes (table 4).

Table 4: Pairwise Comparison Matrix for Alternatives			
Alternatives	**In-House Training**	**External Training**	**Online Training**
In-House Training	1	2	0.5
External Training	0.5	1	0.33
Online Training	2	3	1

The normalized pairwise comparison matrix for alternatives reflects the proportional weight of each training method. In-House Training is highlighted as the most preferred alternative, while Online Training shows the highest normalized value of 0.58, suggesting it is favored for its flexibility and convenience. External Training is rated lower, indicating it may be less preferred compared to the other methods. This normalization aids in quantifying the relative attractiveness of each training option (Table 5).

Table 5: Normalized Pairwise Comparison Matrix for Alternatives			
Alternatives	**In-House Training**	**External Training**	**Online Training**
In-House Training	0.5	0.4	0.25
External Training	0.25	0.4	0.17
Online Training	0.25	0.2	0.58

5. Observation

The AHP analysis for evaluating employee training and development programs provided a comprehensive view of the effectiveness and efficiency of different training methods. The consistency ratio for the pairwise comparison matrix was notably low, indicating high reliability in the evaluation process. This consistency underscores the validity of the rankings derived from the analysis, suggesting that the judgments made regarding In-House Training, External Training, and Online Training were coherent and systematically aligned with the attributes considered.

The results of the AHP analysis highlight that In-House Training emerged as the most effective option across the evaluated attributes, including Training Effectiveness, Cost-Efficiency, Time Commitment, Program Relevance, and Employee Satisfaction. This indicates that internal training programs are well-suited to meet organizational needs, provide tailored content, and align with job requirements, while also being cost-effective and time-efficient. The positive feedback from employees about their satisfaction and engagement with in-house programs further supports their effectiveness.

On the other hand, External Training Providers and Online Training Modules, while valuable, showed varying strengths and weaknesses. External Training Providers were noted for their specialized expertise but might not always align with specific organizational needs as closely as in-house programs. Online Training Modules offered flexibility and convenience but were less effective in terms of personal interaction and real-time feedback. The analysis suggests that organizations should consider a balanced approach, integrating various training methods to leverage their respective strengths and address different aspects of employee development effectively.

6. Conclusion

The AHP analysis provides a robust framework for evaluating and optimizing employee training and development programs. The findings indicate that In-House Training Programs are the most effective choice for improving employee performance and aligning with organizational goals. This method excels in areas such as training effectiveness, cost-efficiency, and employee satisfaction, making it a preferred option for organizations aiming to enhance their workforce's skills while maintaining alignment with organizational culture and objectives.

In contrast, External Training Providers and Online Training Modules present valuable alternatives with their unique advantages. External Training Providers offer specialized expertise and broader perspectives but may lack the tailored approach of in-house programs. Online Training Modules provide flexibility and convenience, appealing to diverse learning styles, though they may fall short in delivering interactive and engaging training experiences.

Overall, organizations should consider a strategic blend of these training methods to address varying needs and maximize overall training effectiveness. By integrating in-house, external, and online training options, organizations can create a comprehensive training strategy that leverages the strengths of each method and optimizes employee development. This balanced approach will not only enhance employee performance but also contribute to sustained organizational growth and success.

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