

Effectiveness of Training and Development Programs on Employee Productivity

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ABSTRACT

This study explores the effectiveness of the T&D program with regard to the productivity of employees using direct and indirect factors that influence it. The research is designed in the mixed method way since it involves data gathering via structured Likert scale questionnaire, semi-structured interviews, as well as document analysis from the organization. The model that was chosen to measure the effectiveness of the training includes Kirkpatrick Four Level Training Evaluation. In addition, there will be several statistical methods that will be applied in the research to measure the relationships between the variables such as training, human resources management competence, job satisfaction, organizational commitment, and employee productivity. It should be stated that there is a significant increase in employee performance after the implementation of the training since its score has grown from 60 to 80 and the productivity reached a mean value of 4.0. From the regression analysis conducted, it is evident that job satisfaction (0.50) and training (0.45) have the highest impact on productivity. Moreover, there have been certain improvements in KPIs, for example, output grew from 60 to 80, efficiency increased to 65 to 85, while the error rate fell down to 20 to 10.

Keywords: Training and Development, Employee Productivity, Job Satisfaction, Organizational Commitment, HR Competence, Kirkpatrick Model, Structural Equation Modeling (SEM), Performance Improvement.

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1. Introduction

The productivity of employees is a very important factor that dictates the success of the organization, its competitiveness and sustainability [1]. In the current dynamic and technology-driven business world, companies are more and more appreciating the need to invest in employee potentials in order to prepare them to address the changing requirements of jobs [2]. Training and development programs are strategic measures which prepare employees with the knowledge, skills and competencies needed in order to carry out tasks effectively [3]. These programs directly affect the overall organizational productivity and operational excellence by enhancing the performance of individuals [4].

Training is a planned undertaking to enhance the present job performance of employees whereas development is a long-term growth and career

progression [5]. They all constitute a holistic approach to human resource development [6]. Companies dedicate a lot of resources to these programs in order to close the gap in skills, keep up with technological change and become innovative. Effective training programs are not only designed to increase technical skills but also soft skills like communication, leadership and problem-solving that are crucial to successful performance at the workplace [7].

Training and the productivity of employees have been extensively researched and the results of this research indicate that ongoing learning prospects result in increased efficiency, minimized errors, and enhanced job satisfaction [8]. Properly trained employees are more confident, motivated and interested in their job. This will in turn translate to higher output, quality of work and performance of the organisation [9]. Further, training allows the employees to make their personal

objectives and the organizational objectives congruent, which makes the working environment more cohesive and productive.

Although the advantages have been identified, training programs are effective based on a number of issues such as program design, way of delivery, involvement of employees and assessment mechanisms [10]. Companies should make sure that training programs are applicable, realistic and are focused on business objectives. These modern methods of training, e-learning, simulation and on-the-job training, have also increased the effectiveness of these programs [11]. Furthermore, frequent evaluation and feedback is needed to gauge the results and make the required corrections.

To sum up, training and development initiatives are very crucial in improving the productivity of employees and the performance of the organization. With the world growing competitive and fast changing in technology, human capital development is becoming more valuable as a business continues to struggle in competition [12]. This research will focus on the effectiveness of such programs in enhancing employee productivity to shed some light on the best practices and the key factors which can be used to ensure successful training outcomes.

1.1 Key objectives

Some of the major objectives of the study are given as follows,

- To evaluate the effectiveness of T&D programs
- To analyze factors influencing employee productivity
- To identify mediating variables like job satisfaction, motivation, and commitment

2. Literature review

Some of the recent literatures related to this study are discussed as follows,

According to Azeem et al. (2024), training and development programs are not always productive to the employees as there are those employees who perform the same even after training. The paper brings out the fact that organizations invest money in training and never bother to measure the actual effect of the training. Based on the Kirkpatrick Four-Level Model, the authors have discovered that in order to know whether training has improved performance, evaluation is significant. This paper indicates that training design and program implementation are crucial and unless it is well evaluated, training will not result into anticipated productivity increases.

According to Kasmin et al. (2025), training and development play a crucial role in enhancing the effectiveness of the organization. They interviewed, observed and analyzed documents to gain knowledge about the effect of training on employees. They discovered that training improves the skills, performance and innovation of the employees that translates into improved organizational performance. But the research also indicates that to be successful, organizations should be keen to plan and execute training programs. Constant learning and appropriate performance allows the employees to remain flexible and effective within a competitive world.

Mustafa & Lleshi (2024) highlight the significance of lifelong learning as it enhances employee performance and productivity. Their research reveals that employees are more flexible, creative, and productive at their work when they constantly learn and improve their skills. Problem solving and employment are also enhanced with lifelong learning. The authors point out that entities that embrace lifelong learning have increased employee engagement, reduced turnover, and improved overall performance, which gives them a competitive edge.

In this work, Keltu (2024) investigates the impact of the human resource development practices on the employee performance with the mediating role played by the job satisfaction. The research concluded that training, teamwork and career development have a positive impact on performance, and job satisfaction is an important factor that enhances the connection between them. Nevertheless, certain variables such as career development and counseling had both effects. The results indicate that companies ought to emphasize on enhancing job satisfaction and training programs to yield improved employee performance results.

Hosen et al. (2024) concentrate on the interconnection between the training, career development, and performance of employees and emphasize the importance of organizational commitment. In their study, they discovered that the employees will be motivated to work better when they feel committed to the organization, and that commitment is enhanced by an appropriate training and development programme. The authors conclude that companies ought to develop policies that enhance employee development and dedication since both enhance overall job performance in particular in the service sector such as in hotels.

Rony et al. (2024) evaluate the relationship between human resource competence and work motivation and employee performance in a statistical manner. The research indicates that competence and motivation are

resulting in a strong positive impact on performance. According to their results, these factors impact on roughly 31 percent of the employee performance, although the other factors such as personality and commitment are also involved. This implies that training on its own is inadequate and motivation and skill enhancement should be integrated to bring improved productivity.

Ghedabna et al. (2024) explain the transformations in human resource management (including training and development) as a result of artificial intelligence. AI assists organizations to find gaps in skills, prescribe personal training, and optimize the process of employee development. This will result in improved performance and efficiency. Nevertheless, ethical issues, bias, and privacy concerns are also mentioned in the study as some of the challenges. All in all, AI can be a powerful tool to enhance training as long as it is done cautiously.

Rojak et al. (2024) highlight the importance of leadership and organizational culture in improving employee performance. They found that transformational leadership and positive organizational culture have a significant impact on employee performance. Training programs do not make employees independent and require a favorable environment and good leadership to deliver improved outcomes. It demonstrates that the effectiveness of training is not just determined by the program itself but also the organizational environment where the employees operate.

3. Materials and methods

3.1 Problem definition

The problem statement starts with defining an important problem that there is no guarantee of increased productivity of employees because of T&D activities. Regardless of the amount invested, it may fail to produce the anticipated performance outputs. This could be due to poor training design, inadequate employee participation, or failure to evaluate the training program. Gap analysis and root cause analysis (RCA) are some of the methods that help in pinpointing areas of differences between the performance outcomes and performance targets.

3.2 Conceptual Framework Development using SEM

The conceptual framework adopted in this research is generated and established through Structural Equation Modelling (SEM) approach. SEM is very efficient in testing complex interactions between a number of independent and dependent variables. In this particular case, the concepts of Training and Development and

HR Competence are independent (exogenous) variables since they directly impact on the endogenous concept of Employee Productivity. However, Job Satisfaction and Organizational Commitment play roles of mediator variables because they moderate the effect of training activities and consequently influence employee performance.

Through the SEM approach, the study is able to investigate both direct influences (Training -> Productivity) and indirect influence (Training -> Job Satisfaction -> Productivity). Thus, the influence of training activities on employee performance can be better understood. The SEM framework comprises two parts; the measurement model and structural model. The measurement model is used to validate construct reliability and validity via the indicators such as factor loadings, Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE).

The proposed conceptual framework will be evaluated using the Structural Equation Modelling (SEM) approach through techniques such as SmartPLS or AMOS. Through SEM techniques, the research will determine the extent to which each variable influences employee productivity. For example, a high positive path coefficient between training and job satisfaction means that training increases job satisfaction, hence increasing productivity. In addition, the study will conduct mediation analysis to establish whether job satisfaction and organizational commitment act as partial or complete mediators between the independent variables and employee productivity.

The model fit indices, including Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR), will help in evaluating the validity of the proposed framework. If the model has an excellent model fit, then the proposed conceptual framework is valid and theoretically sound.

3.3 Research Design Selection

The study will use a mixed-method research design to come up with a balanced perspective of the impact of training and development programs on employee productivity. The combination of quantitative and qualitative will make the research not only reflect the measurable results but also the behavioral and perceptual details of the employees. The quantitative part is based on structured surveys on Likert scale surveys that will enable gathering of standard data on the perception of the employees as far as the training process is concerned in terms of the effectiveness and skills development and level of productivity. This

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provides statistical comparison and generalization of results.

Simultaneously, the qualitative element will consist of semi-structured interviews and on-site observations that will aid in exploring the experiences of the employees, their attitudes, and issues further. These approaches offer contextual deep information that would not be expressed by numerical data. Also, a case study methodology is used in order to observe the training practices in a particular organizational context providing the possibility of a more detailed analysis of the real-life implementation and results.

To make the research design credible and robust, the study uses triangulation techniques, in which various sources of data, different approaches, and viewpoints are used. This will increase the validity and reliability of the results because the results will be cross-verified and the chances of bias will be minimized. Altogether, the mixed-method design will provide a comprehensive consideration of training effectiveness, and thus, the research will be more extensive and practical.

3.4 Data Collection

The collection procedure will aim at having a comprehensive and precise picture of training effectiveness through engaging various stakeholders such as employees, HR managers, and trainers. This multi-source method will allow taking into account other viewpoints, which will lead to more credible and extensive results. Structured questionnaires are used to gather the primary data, which gives measurable data about the perceptions of the employees, their level of satisfaction and productivity improvements. These questionnaires are structured well and on Likert scale to make them consistent and easy to analyze.

Besides quantitative data, semi-structured interviews are also used to provide qualitative information on the experiences of employees, training difficulties and organizational practices. These interviews are flexible in that the respondents can elaborate their opinions in detail thus making the data rich. In addition, secondary data sources include organizational training records and reports to confirm and substantiate the main findings.

Random sampling or stratified sampling techniques are used to make the sample representative and minimize the sampling bias depending on the organization structure. A pilot study is carried out before full-scale data collection to ensure the reliability and clarity of the research tools, as well as address and rectify any problems. This is a well-organized and organized data collection method that improves the accuracy,

consistency and validity of the study that makes the findings credible and meaningful.

3.5 Training Evaluation Model Application

The evaluation of the training and development programs conducted in this study will be based on the use of the Kirkpatrick Four-Level Training Evaluation Model. The Kirkpatrick Four-Level Training Evaluation Model is one of the best models used for evaluating the success of training and development programs due to its comprehensiveness and systematicity. Through the use of all four levels of the model, the study will provide a holistic evaluation of the training and development programs.

The first level of the Kirkpatrick Four-Level Training Evaluation Model involves evaluating employee perceptions about the training and development program. Employee perception regarding the training program can be captured using various techniques including satisfaction scoring and feedback analysis. Through this technique, it is determined whether the training content, delivery, and the effectiveness of the training facilitator met the needs of the trainees. When the employees react positively to the training program, they become more engaged with the program, providing a basis for future learning activities.

Level 2 (Learning) focuses on the degree to which the employees acquire new knowledge, skills, or competencies. This can be determined by using a pre-test and post-test approach where the level of knowledge of the employees is compared based on the results obtained before and after the training. Methods employed include score comparison, skill assessment tests, and competency mapping. This level of training helps ensure that knowledge or skills imparted during training sessions have been acquired by employees.

Level 3 (Behavior) involves evaluating whether the employees use the learned skills at work. Behavior can be evaluated by using methods such as performance appraisals and supervisor feedback. Performance appraisals involve measuring the performance of the employees both before and after training. The improvement in their performance is measured to establish whether the employees are able to apply the skills learned during training. Workplace observations are conducted to measure any behavior change among employees.

Lastly, Level 4 (Results) measures the overall effects of the training program on organizational goals, especially regarding productivity among employees. It involves the assessment of changes in relevant KPIs such as quality, efficiency, mistake reduction, and total performance metrics. Methods such as KPI

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assessments, productivity analysis, and cost-benefit analyses can be applied to measure ROI from the training program. At this level, the study will determine the contribution of training to organizational success. In conclusion, the use of the Kirkpatrick model in the study ensures an objective and systematic evaluation of training activities' effect on performance. With the inclusion of feedback analysis, test comparisons, performance appraisals, and KPIs, the study can effectively determine the effectiveness of training programs. Besides identifying areas of improvement, the evaluation technique can offer insight into more effective future training practices.

4. Analysis

The process involved in analyzing the data in this research will entail a detailed and accurate analysis of the quantitative and qualitative data collected. The first approach that will be used in analyzing the data is the application of the descriptive statistics including the average, percentage, and standard deviation to describe the obtained data in the research as well as to determine how employees perceive the training programs in terms of productivity, satisfaction, and effectiveness.

The relationships among variables will be analyzed using sophisticated approaches such as regression and structural equation modeling (SEM). Using the regression analysis, it will be possible to identify the direct effects of the independent variables (training programs and human resource competence) on the dependent variable (employee productivity). Using the SEM, there will be an opportunity to analyze the direct and indirect relationship among the variables, especially the mediating role of the independent variables. Analysis of qualitative data gathered using interview techniques involves identifying common trends, themes, and patterns associated with employee perspectives and training programs. The combination of both data types provides an overall interpretation. To increase precision and speed, statistical software packages including SPSS and SmartPLS are used. Such tools help in performing accurate calculations, validating models, and presenting results in a comprehensive manner.

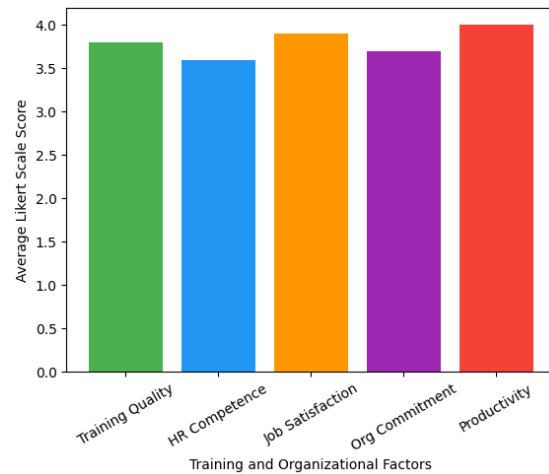


Figure 1: Training Effectiveness by Dimension

Figure 1 shows the average scores of the crucial variables which affect employee productivity. The highest score in the productiveness (4.0), job satisfaction (3.9), training quality (3.8), organizational commitment (3.7) and HR competence (3.6). This shows that although training programs work, employee satisfaction is more influential in the improvement of productivity. The fact that the HR competence score is relatively low implies that skill improvement initiatives are required. In general, the findings indicate a moderate yet slightly satisfaction-based productivity improvement.

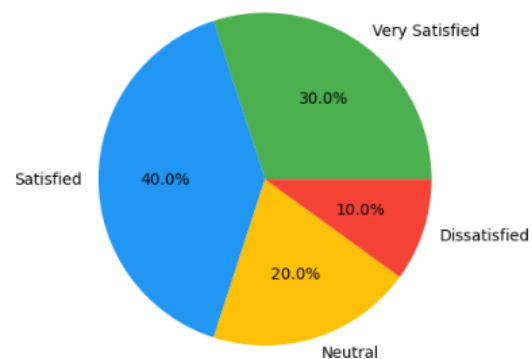


Figure 2: Employee Reaction to Training

Figure 2 shows the response of employees to training programs with 40% and 30% satisfied and very satisfied respectively, which demonstrates a good positive perception. Nevertheless, 2 out of 10 are neutral and 1 out of 10 is dissatisfied implying that there is some scope of improvement. The positive levels of satisfaction prove that the delivery of training and its content are usually effective. Nevertheless, the fact that the percentage of indifferent and unsatisfied reactions is significant suggests that more interactive and personalized training strategies should be used to guarantee a greater level of involvement among the participants and their better learning results.

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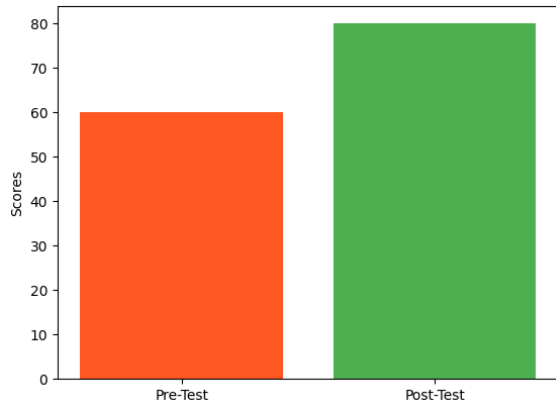


Figure 3: Pre-test vs Post-test Comparison

In Figure 3, performance of the employees is compared to their performance prior to and following the training and the result indicates that their performance before the test is 60 and after the test is 80. This 20-point increase proves that training is effective to increase the knowledge and skills of employees. The results confirm that the training programs successfully achieved their learning objectives. This marked growth suggests good content delivery and understanding of the participants, and the need to have structured training in enhancing the level of competency among employees.

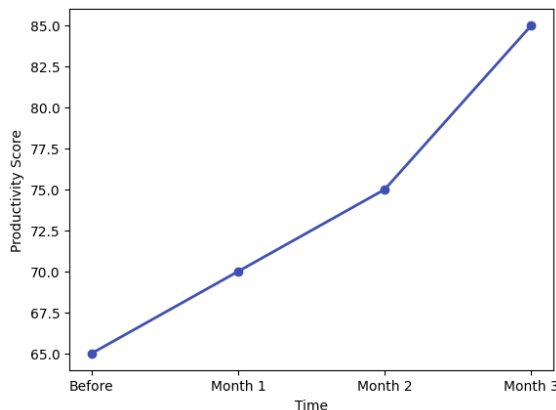


Figure 4: Performance Improvement Over Time

Figure 4 indicates that employee productivity has been on the rise with time starting with 65 at the start of the training and increasing to 70 in Month 1 and 75 in Month 2, and finally, to 85 in Month 3. This slow increment reflects that training has a long-term effect on the performance of employees. The upward trend has been maintained leading to a good implementation of acquired skills in the workplace. It also emphasizes the fact that changes in behavior are not quick and justifies the role of follow-up support and constant development programs.

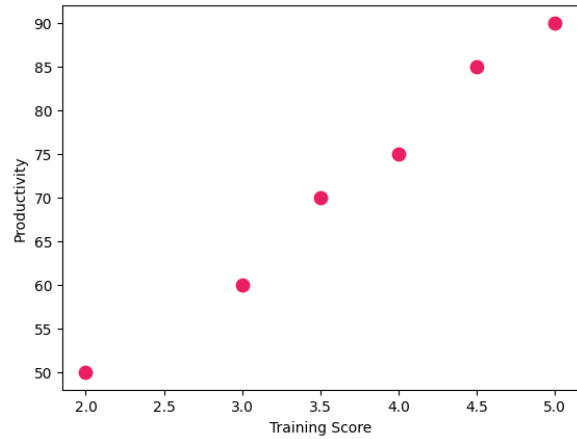


Figure 5: Training vs Productivity

Figure 5 shows that there is a positive correlation between training scores and productivity levels. The higher the training scores (between 2 to 5) the higher the productivity (between 50 to 90). This is an obvious upward trend that implies that there is a close relationship between good training and better employee performance. The better-trained employees are involved, the higher the productivity. The findings highlight the significance of quality training programs towards achieving organizational objectives and enhancing efficiency of workforce.



Figure 6: Regression Coefficients

Figure 6 shows the impact strength of different variables on employee productivity. The coefficient of job satisfaction is the greatest (0.50), followed by training (0.45), organizational commitment (0.40) and HR competence (0.30). This means that job satisfaction has the greatest impact in enhancing productivity. Although training and commitment are also important factors, the impact of HR competence is relatively low. The results imply that to obtain the best productivity, organizations need to concentrate on employee satisfaction as well as skill development.

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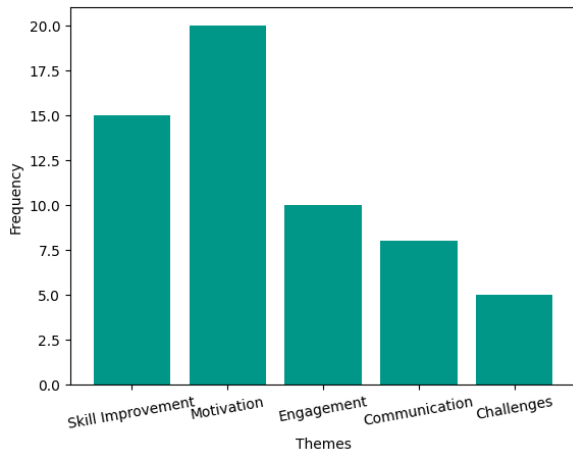


Figure 7: Thematic Analysis

The important themes in qualitative data are identified in figure 7, with motivation (20) and skill improvement (15) being the most common ones. They are engagement (10), communication (8), and challenges (5). This means that motivation and development of skills are most important to employees in training programs. The fact that there are challenges implies that there are some obstacles to implementation. In general, the findings highlight the role of motivation techniques and the need to develop skills continuously as the key factors of effective training.

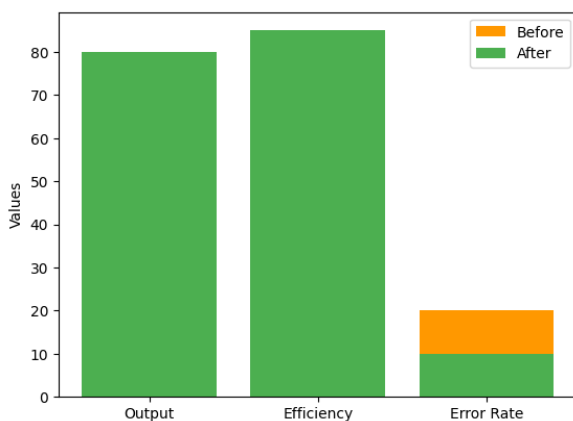


Figure 8: KPI Improvement

Figure 8 is a comparison of key performance indicators at pre- and post-training levels. The output grows up to 80, the efficiency grows up to 85 and the error rates grow down to 10. These changes suggest that training has a great positive effect on organizational performance. The enhanced efficiency and minimization of errors underscore the improved use of skills. On the whole, the findings prove that the training programs have a direct impact on the quantifiable productivity improvements and operational efficiency. The overall results of the study show that training and development have a strong positive effect on productivity because there is an improvement in the mean scores (productivity = 4.0), improved post-

training performance (improved from 60 to 80), and positive key performance indicator (KPI) results like increased production (60→80), increased efficiency (65→85), and decreased error rate (20→10). From the SEM and regression results, job satisfaction (0.50) and training (0.45) are shown to be the most effective variables. One of the strengths of this research paper is the use of both quantitative and qualitative data analysis with structured evaluations using the Kirkpatrick model, making it an all-inclusive and reliable study. The research has some limitations, such as self-reporting bias and lack of generalization due to a unique study sample/case. There could also be an issue of uncontrolled extraneous variables like organizational culture and leadership.

5. Conclusion

Overall, this study confirms that training and development interventions have a strong impact on increasing employees' productivity when well-designed and implemented. Specifically, training has been found not only to improve the skills of workers but also to lead to positive changes in their behavior and organizational performance. Through the use of the Kirkpatrick Model, the researcher was able to evaluate training's effectiveness across four levels: reactions, learning, behavior, and results. Quantitative data shows a significant increase in post-training test scores (from 60 to 80 points) and an improvement in key performance indicators. Importantly, this study emphasizes the crucial importance of mediating variables such as job satisfaction and organizational commitment, with job satisfaction demonstrating the highest predictive power in terms of productivity ($\beta = 0.50$). Therefore, organizations need to consider more than just training interventions; they should create a supportive work environment as well. While this study has some limitations, such as sample size restrictions and subjective measurements, it provides valuable information for companies looking to improve workforce performance. In the future, research could examine other training technologies such as artificial intelligence.

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