

A Comparative Study of E-Learning and In-Person Training: Effectiveness in Enhancing Employee Skills and Productivity

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Abstract

In the current rapid paradigm for staff development, organizations are using alternative training strategies to enhance workforce abilities. This research aimed to establish what is more effective at enhancing employee capability and productivity: e-learning, conventional training, or blended methods. From a quantitative, comparative, and correlational strategy, this research compared comments from 150 working professionals from a range of industries. Findings reveal that while e-learning is perceived to be more effective for acquiring technical skills due to flexibility and accessibility of resources, classroom training significantly builds soft skills through face-to-face communication and experiential learning. Statistical tests like descriptive statistics, chi-square test, and ANOVA were applied to test five hypotheses. Implications of the findings provide pragmatic recommendations for HR professionals and organizational executives to optimize training methods. This paper contributes to the budding debate regarding learning modes during the era of the internet and lays out hybrid options as a strategy of equilibrium to build broad skills.

Keywords

E-learning, Face-to-face training, Hybrid learning, Employee productivity, Skill development, Learning effectiveness, Organizational training, Comparative Analysis, and Human resource development.

1. Introduction

In today's competitive business environment, upskilling and reskilling of individuals by an organization is important to sustain performance and productivity. With access to digital content and the rapid pace at which technology changes, e-learning has become a front-runner to dethrone traditional face-to-face training. Nevertheless, there has always been a debate over which mode of delivery is optimal, especially in relation to building skills and enhancing productivity.

The COVID-19 pandemic accelerated the utilization of online learning platforms to a very large extent, forcing organizations and employees to experiment with online forms of learning. Although some studies show that e-learning is adaptable, scalable, and cost-effective, other studies show that learning through face-to-face communication aids better participation, experiential learning, and more precise interpersonal skills development.

This research endeavors to critically evaluate the comparative effectiveness of face-to-face and e-learning training approaches. Based on primary data collected through a structured questionnaire, we examine if



training modality is important to achieve technical and soft skills and if training results in measurable productivity increments among employees.

The research also aims to determine:

- Which type of training technique—face-to-face or e-learning—is most effective in fostering specific types of skills?
- What is the impact of type of training, level of experience, and field on perceived performance?

The contributions of this study will not only enrich academic knowledge but also provide strategic guidance to training and development professionals.

2. Literature Review

2.1 Overview of Training Modalities

Employee training is a strategic organizational activity that focuses on maximizing knowledge, performance, and preparation of employees for role transfer. Training methods usually come in three types: face-to-face, e-learning, and blended methods. Face-to-face training or face-to-face learning is presence-based and people interaction-based. E-learning, on the other hand, is technology-based and dependent on digital media and tools, which allow the learners to gain access remotely and asynchronously. A blended method is employed in hybrid learning, providing an optimal mix.

2.2 E-Learning and Competence Building

E-learning has been universally accepted to be flexible, cost-effective, and supportive of self-paced learning. According to Rosenberg (2001), e-learning supports constant learning and enables efficient resource management. Research work by Clark and Mayer (2016) reveals that multimedia features, if properly designed, can enhance retention and engagement, particularly for technology topics such as coding, data science, and compliance training.

There are, however, some limitations. The learners are likely to receive low degrees of motivation and lower personal engagement, which are critical in the development of soft skills (Kirkpatrick & Kirkpatrick, 2006). They have been accountable for inconclusive results in learner satisfaction and training ROI.

2.3 Face-to-Face Training and Skill Acquisition

Face-to-face training offers experiential learning, peer interaction, and instantaneous feedback. Kolb's (1984) experiential learning theory confirms that face-to-face settings facilitate more intense cognitive engagement. Soft skills like communication, leadership, and emotional intelligence typically demand the subtlety of human interaction, best provided in live settings (Garrison & Vaughan, 2008).

That being said, face-to-face training could be more expensive, logistically challenging, and rigid, particularly for large or remotely dispersed teams.

2.4 Hybrid Learning and Organizational Contexts

Hybrid learning strives to mix the best of both worlds. Hybrid learning enables organizations to tailor learning for content complexity, learner preference, and skill objectives. In reality, most companies are marrying synchronous virtual workshops with asynchronous modules to build a blended course.



2.5 Research Gaps

Although several studies have compared the relative effectiveness of e-learning and conventional training independently, few have compared them within a single study employing a statistically significant sample of employees from a range of industries. There has also been limited interest in the impact of different training media on different categories of skills (technical vs. soft skills). This study bridges this gap by providing primary data analysis and hypothesis testing based on skill performance and perceived increases in productivity.

3. Research Methodology

3.1 Introduction

Following is the methodological approach for the study that defines comparative effectiveness of elearning, classroom, and blended training towards enhancing employee skills and productivity. The study is based on primary data obtained from a specially designed questionnaire and employs quantitative analysis methods for testing pre-defined hypotheses.

3.2 Research Design

A comparative correlational and quantitative research design is used. The design facilitates systematic testing of more than a single hypothesis as well as the specification of patterns and relationships among various training modalities and outcome measures like employee skills, productivity, cost-effectiveness, and satisfaction.

3.3 Research Objectives

- To establish whether e-learning is more effective than classroom training in enhancing technical and soft skills.
- To determine the cost-effectiveness and scalability of e-learning compared to classroom training.
- To determine if blended training approaches result in greater employee motivation, knowledge retention, and employee satisfaction.
- To determine the optimal training approach for multiverse employee development.

3.4 Hypotheses

The research attempted the following hypotheses:

H1: E-learning is at least as good as, if not superior to, traditional in-classroom training in enhancing employee competencies, knowledge retention, and overall productivity.

H2: Traditional training outperforms e-learning in leadership competencies, working in teams, and interpersonal communication.

H3: Combined practice training has higher worker motivation, retention of skills learned, and productivity than traditional training or e-learning individually.

H4: E-learning is a cheaper and more scalable means of employee training compared to training in classrooms.

H5: E-learning performs better at learning technical skills, whereas face-to-face training performs better at teaching soft skills.



H6: Organizations employing blended learning experiences more engaged employees, increased job satisfaction, and increased learning outcomes.

3.5 Data Collection Method

Primary data were gathered through a guided online questionnaire distributed to employees across various industries. The questionnaire employed multiple-choice, Likert-scale, and open-ended questions to record experiences, perceptions, and results of various training methods.

3.6 Sampling Technique

A non-probability purposive sampling approach was used. Participants were corporate professionals representing various industries who received either e-learning, face-to-face training, or blended training within the past two years. The sample size was 150 responses, and it was feasible to have a statistical analysis sample size.

3.7 Questionnaire Design

- 1. The questionnaire was categorized into the following:
- 2. Demographics: Age, gender, industry, job function, experience in years.
- 3. Training Exposure: Training type received (e-learning, face-to-face, blended).
- 4. Effectiveness Parameters: Skill development, knowledge retention, change in productivity, level of motivation.
- 5. Cost and Scalability: Perceived cost-effectiveness and size of implementation.
- 6. Satisfaction Metrics: Level of satisfaction with training modality, engagement, and quality of feedback.

3.8 Statistical Tools Used

- Descriptive Statistics: Mean, median, mode, standard deviation.
- Inferential Statistics
- Chi-Square Test (for independence between training type and skill improvement).
- ANOVA (for differences among three training methods on productivity outcomes).
- T-tests (for mean comparison among groups).
- Correlation Analysis (to determine relationships between satisfaction and performance).
- Data Visualization:
- Bar Graphs
- Pie Charts
- Heat Maps
- Box Plots

Statistical analysis was done using Excel and SPSS to validate findings rigorously.

3.9 Ethical Considerations

The research purpose was communicated to the participants, ensuring anonymity and confidentiality. Participation was cost-free, and data was used only for academic and analytical purposes.



4. Data Analysis and Discussion

4.1 Introduction

The chapter gives the outcomes of the substantial data gathered from systematic questionnaires and assesses the performance of face-to-face and e-learning methods in enhancing employee competencies, knowledge preservation, and office productivity. Descriptive and inferential statistical analysis is used to analyze the data. All hypotheses presented in Chapter 2 have been examined using appropriate statistical analysis, and their results explained accordingly as per the study goals.

4.2 Descriptive Statistics:

The sample size consisted of 150 respondents spread across different organizational departments and backgrounds. Demographic spread is presented below:

4.2.1 Respondent Demographics

Variable	Categories	% of Respondents
Gender	Male (45%), Female (55%)	45% / 55%
Age Group	18–25 (30%), 26–35 (50%), 36+ (20%)	30% / 50% / 20%
Employment Level	Entry (35%), Mid (45%), Senior (20%)	
Industry Type	IT (30%), Services (40%), Others (30%)	

4.3 Comparative Summary of Training Modalities

Respondents were asked to evaluate e-learning, in-person, and hybrid models based on various parameters:



Parameter	E-Learning	In-Person	Hybrid
Knowledge Retention	3.8/5	3.9/5	4.4/5
Skill Application	3.6/5	4.1/5	4.5/5
Convenience	4.6/5	2.8/5	4.3/5
Productivity Improvement	3.9/5	4.0/5	4.5/5
Cost-Effectiveness	4.7/5	3.0/5	4.2/5
Engagement	3.4/5	4.2/5	4.6/5
Soft Skills Development	3.2/5	4.6/5	4.4/5

Note: Scores are based on a 5-point Likert scale.

4.4 Hypothesis Testing

We established six primary hypotheses (H1–H6). The Chi-square test of independence was used to identify statistically significant relationships between training modality and outcome measures.

4.4.1 Hypothesis 1 (H1):

E-learning is as effective or superior to in-classroom training.

- **Outcome:** Mean scores on knowledge retention and productivity were ever so slightly greater for a hybrid but comparable between e-learning and face-to-face.
- Test Applied: Chi-Square Test
- $X^2 = 8.34, p = 0.038$
- **Interpretation:** Since p < 0.05, we reject the null hypothesis.
- Conclusion: E-learning is significantly effective, though hybrid models outperform both.

4.4.2 Hypothesis 2 (H2):

Face-to-face training is better in leadership and interpersonal development.

- Outcome: In-person training worked best on soft skills tests.
- $\chi^2 = 12.15, p = 0.004$
- Conclusion: There is strong evidence for in-person training for soft skill development.

4.4.3 Hypothesis 3 (H3):

Hybrid models are better.

- highest mean scores for almost all categories for hybrid training.
- $\chi^2 = 16.82, p < 0.001$
- **conclusion:** Strongly supported—single-format models are not as good as hybrid models.



4.4.4 Hypothesis 4 (H4):

E-learning is scalable and cost-effective.

- 72% of those who responded said e-learning was more cost-effective and more flexible.
- $\chi^2 = 10.77, p = 0.012$
- Cur conclusion: E-learning is viewed as being more cost-effective and scalable.

4.4.5 Hypothesis 5 (H5):

E-learning is technical skill-based; face-to-face is soft skill-based.

- **Result:** 81% concurred with this distinction.
- $\chi^2 = 14.09, p = 0.006$
- Conclusion: The hypothesis holds—apt specializing in training modalities.

4.4.6 Hypothesis 6 (H6):

Blended learning leads to higher motivation, satisfaction, and performance.

- **Result:** 84% of respondents chose hybrid highest for satisfaction.
- $\chi^2 = 18.41, p < 0.001$
- **Conclusion:** Blended learning drives higher outcomes.

4.5 Graphical Representation



Bar Graph: Illustrates the mean satisfaction scores — lower is greater satisfaction. In-Person training slightly higher on average.





Box Plot: Shows the range of satisfaction scores — In-Person training has a slightly wider range of answers



Respondents' Training Preference

Pie Chart: Demonstrates the split in the respondents' preferences — the majority preferred In-Person or Blended.

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Heat Map: Demonstrates the correlation between E-Learning and In-Person satisfaction scores — very poor correlation, which means participants thought of them very separately.

4.6 Summary of Overall Conclusions

- 1. Hybrid training outranked e-learning and face-to-face across the board.
- 2. E-learning is scalable, cost-efficient, and more flexible.
- 3. Face-to-face cannot be beat when it comes to learning soft skills and motivation.
- 4. The best approach for contemporary organizations that desire high productivity, satisfaction, and skill acquisition is a hybrid one.
- 5. Statistical validation with chi-square tests verifies findings across hypotheses.

5. Conclusion, Discussion, and Recommendations

5.1 Discussion

The objective of this research was to make a comparison of the effectiveness of e-learning versus traditional training in improving employee competence and efficiency. As per the survey data gathered from 150 respondents, the conclusions established from the findings are intuitive.

The research supported Hypothesis 5 (H5): E-learning is better in technical skill development, and faceto-face training is better to develop soft skills. This segregation is crucial for organizations looking to optimize their training interventions.

- The benefit of technical skill e-learning is that it is flexible, multi-media-rich, and enables the employee to learn at his own pace. Technical training is usually done through repetitive instances and correct information that can be delivered effectively by e-learning sites.
- The advantage of face-to-face training in soft skills is derived from the face-to-face nature of training, where impromptu feedback, collaborative work, and role-playing exercises improve



communication, teamwork, and leadership skills. These subtleties are difficult to wholly replicate with digital technologies.

Further, the research noted that the productivity of the staff overall also increased irrespective of the training mode but the nature of the skill focused had a deciding role to play in determining the efficacy of each training platform.

5.2 Conclusion

The study advocates for the use of a blended training model that exploits the advantages of both face-toface and e-learning training to attain maximum skill development and enhanced productivity.

Some of the main findings include:

- e-learning is an affordable and scalable way to train for technical skills, which is highly beneficial for remote or geographically distributed employees.
- face-to-face training is still necessary for the development of face-to-face required soft skills as well as emotional intelligence.
- Organizations need to determine the specific training needs and skill gaps of their employees to choose the right mode or mix of training styles.

Employee satisfaction in both methods was high as a whole, showing acceptance and flexibility in diverse learning settings.

Based on training program segmentation by the type of skills to be acquired, organizations can achieve higher employee motivation, better knowledge retention, and organizational performance.

5.3 Recommendations

The following are the recommendations based on the findings for training practitioners and organizations:

1. Employ a hybrid approach: Integrate e-learning modules for technical training with workshops in class for soft skills to leverage the strengths of both.

2. Tailor training material: Create material based on employee job functions and skill needs to ensure optimum relevance and efficacy.

3. Enrich e-learning platforms: Add interactive features such as quizzes, simulations, and forums to enhance learner participation and transfer in real-life situations.

4. Invest in good trainers: Trainers for classroom classes must be able to facilitate and encourage participation, feedback, and problem-solving in real life.

5. Continuous evaluation: Continuously assess training effectiveness using feedback and performance metrics to rectify and improve learning approaches.

6. Encourage employee autonomy: Provide employees with the option of choosing learning pathways that best suit their preferred modes and schedules.

5.4 Study Limitations

Although giving insightful findings, certain limitations should be noted:

• The research utilized self-reported questionnaire responses, which can be biased.



- The size of the sample, though sufficient, consisted only of particular industries and geographical areas, which may influence generalizability.
- The research was mostly focused on short-run skills building and productivity intervention without monitoring long-run performance.

Future studies will be able to overcome these limitations by utilizing a larger, more representative sample, by utilizing longitudinal study designs, and by applying objective performance measures.

5.5 Directions for Future Research

Future research can investigate:

- The application of newer technologies such as Virtual Reality (VR) and Augmented Reality (AR) in training employees.
- Variations in training performance across industries and jobs.
- Comparison of cost-benefit analyses of the conventional, e-learning, and blended training models.
- Long-term impact of various training modalities on employee retention and career growth.

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