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ENHANCING COMPETENCIES OF CONTACT CENTER TEAM LEADERS THROUGH BLENDED LEARNING: EVIDENCE FROM A NATIONAL COMPETITION IN INDONESIA

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ABSTRACT

This study aims to analyze the competency development needs of contact center team leaders based on the evaluation of training and implementation during the Indonesian National Contact Center Competition. A total of 416 participants from various inbound, outbound, and digital positions took part in the program, including 54 Team Leaders. The competency assessment was conducted using a computer-based testing application to ensure measurable and objective results. Participants were prepared through two different approaches: the first group combined e-learning with video conferencing, while the second group combined e-learning with face-to-face sessions. Data analysis focused specifically on team leader participants and applied ANOVA to examine differences in learning outcomes between groups, as well as to identify critical areas requiring competency enhancement. The findings revealed significant differences between the two groups and highlighted the need for strengthening competencies in quality measurement, case analysis, data analysis, performance evaluation, and the strategic role of the contact center. These results emphasize the importance of targeted training for team leaders to enhance their ability to manage contact center operations. The use of blended learning methods combined with computer-based testing provides a more accurate depiction of training effectiveness.

Keywords: competency, contact center, team leader, blended learning, training, analytical skills

INTRODUCTION

Improving the quality of contact center services requires competent team leaders in various managerial and technical aspects. Team leaders who can inspire their teams and drive business forward through adaptation and foresight in the digital era (Mihardjo et al., 2019). Leadership that integrates a transformational leadership style with the utilization of technology to add value to the organization significantly influences employee performance (Musid et al., 2023). This includes the ability to manage geographically dispersed teams, leverage technology for communication and collaboration, and foster innovation in a fast-paced work environment (Andriani et al., 2022) (Pawar & Dhumal, 2024).

Contact center team leaders play a crucial role in guiding agents as the front line to maintain service quality, as well as driving operational efficiency across various interaction channels, including inbound, outbound, and digital (Antwerpen, 2022). However, the dynamics of customer needs and the rapid adoption of digital technology demand continuous improvement in competencies for contact center team leaders.

Contact center team leaders are required to have adaptability, communication skills, data-driven decision-making, and the ability to motivate a new generation of workforce (Li et al., 2024) (Pietrantoni et al., 2024). Research shows that digital leadership must align with technological innovation for organizations to remain relevant (Zia et al., 2024) (Silla & Martínez-Tur, 2022), while also strengthening the role of digital communication which contributes to customer satisfaction (Mulyani, 2024).

One platform for learning and comparing competencies is through the Indonesia Contact Center Competition, which serves as a platform to compare best practices and identify skill gaps among team leaders (Hartini et al., 2021). This competition implements structured evaluation through competency tests and performance-based assessments, preceded by preparatory training with a blended learning approach that includes online modules, video conferences, and face-to-face sessions. The blended learning model has proven effective in professional training because it combines the flexibility of self-paced learning with face-to-face interaction that builds collaborative experiences (Ferdiansyah et al., 2023).

Blended learning has been widely studied in the literature and has shown its effectiveness in increasing engagement, knowledge retention, and participant satisfaction (Wei, 2023). The focus of this research is to identify critical competency areas that require further development in contact center team leaders, especially in adaptive digital leadership (Subramaniam et al., 2024). It also aims to provide literature that specifically highlights the competency development needs of contact center team leaders in Indonesia, particularly in facing the challenges of digital leadership (Silla & Martínez-Tur, 2022).

The blended learning approach provides advantages in skill acquisition by combining self-paced learning and direct instruction (Adinda & Mohib, 2020). In the context of contact centers, problem-solving and real-time leadership skills can be strengthened through practical activities facilitated by this model (Riyantini et al., 2022).

The integration of computer-based testing is applied in this competition to assess participant competencies. The implementation of CBT enhances objectivity, speed, and accuracy of results (Paramartha & Dharsana, 2020). CBT will help reduce human error in assessment, as well as provide immediate feedback that can be used to improve the design of training programs (Yu & Iwashita, 2021). The use of technology such as e-learning, video

conferencing, and learning management systems has been proven to overcome access limitations, increase efficiency, and support career development in the workplace (Pawar & Dhumal, 2024).

Based on this background, this research aims to analyze the competency development needs of contact center team leaders through training and competition evaluation, identify specific competency areas that need improvement, and evaluate the effectiveness of various blended learning modalities using a quantitative approach with t-tests and ANOVA.

The research findings are expected to contribute to the field of educational technology by providing evidence-based recommendations for the design of adaptive technology-based training programs.

RESEARCH METHODS

Literature Review

Blended learning is rooted in Vygotsky's (1978) social constructivism theory, which emphasizes that learning occurs most effectively through social interaction and collaboration. Within this framework, learners construct knowledge through interaction with others, both in discussions and collaborative activities. Woo and Reeves (2007) assert that interaction in learning can be understood through a social constructivist perspective, with collaboration being an important factor in achieving learning outcomes. In line with this, Wang (2009) shows that designing collaborative learning environments that combine online, and face-to-face elements can increase learning effectiveness. Garrison and Vaughan (2008) also add that blended learning can be a strategic framework that integrates the flexibility of technology with face-to-face interaction to create a richer learning experience.

In practice, blended learning facilitates knowledge construction through online discussions, collaboration, and interaction among participants. Through this approach, learners can absorb information and develop understanding that can be applied in a collaborative context (Wang, 2023). Such an approach enables better knowledge transfer and increases information retention, which is highly relevant for contact center team leaders who are required to immediately apply new skills in a dynamic work environment (Qian et al., 2020).

Blended learning can also be seen as an active process built through interaction and reflection, in line with cognitive theory that emphasizes the importance of information processing and working memory. The combination of self-paced e-learning with live sessions, either through face-to-face meetings or video conferences, has been proven to optimize the acquisition of technical knowledge while developing crucial managerial skills (Ratniece, 2018). Various studies support the effectiveness of this approach in facilitating the transfer of learning to real work environments, thereby ensuring that training investment results in sustained performance improvement (Surikova, 2024).

In addition to flexibility, blended learning also offers efficiency in competency development. Participants can learn at their own pace and still gain important direct interaction for developing interpersonal and leadership skills (Zhang, 2018). The combination of online and face-to-face instruction can increase engagement, personalize learning, and improve cost-effectiveness compared to single methods (Wang, 2023). Recent research shows that the integration of e-learning and video conferencing is more effective in improving digital leadership skills than face-to-face methods alone (Ali et al., 2023). Furthermore, the blended

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learning approach also facilitates the practical application of acquired competencies in real work contexts, which is crucial for contact center team leaders to face leadership challenges in the digital era (Rahmani et al., 2018).

Methodology

This research uses a quantitative approach with a quasi-experimental design, as it allows researchers to analyze differences in learning outcomes between participant groups while identifying competency areas that need improvement. Two treatment groups were established: one group received training through a combination of e-learning and video conferencing, and the other group received training through a combination of e-learning and face-to-face sessions. This design was chosen because it is suitable for comparing the effectiveness of different learning methods in the context of professional training in contact centers (Creswell & Creswell, 2023).

A total of 416 participants followed the Contact Center Indonesia competition. The participants in this study consisted of 54 individuals selected specifically from the Contact Center Team Leader group, comprising Digital Team Leaders, Inbound Team Leaders, and Outbound Team Leaders. Participants were proportionally divided into two treatment groups according to the training method received. Inclusion criteria were set for individuals who served as team leaders or team leader candidates with a minimum of one year of experience in the contact center industry and had not previously participated in the competition, thereby ensuring they had adequate background to follow the training.

The main research instrument was a computer-based examination application designed to measure several aspects of competence, namely leadership, contact center service operations, communication skills, digital service, analytical skills, and decision-making. This instrument was developed based on industry-recognized contact center competency standards and referred to leadership and educational technology literature. Content validity was tested by contact center experts and educational technology experts, while instrument reliability was calculated using Cronbach's Alpha with results >0.80, indicating high internal consistency (Gliem & Gliem, 2003).

The research procedure was carried out in several stages. First, participants received training according to their respective groups, using a Learning Management System platform to facilitate flexible online learning, along with additional video conference or face-to-face sessions as per the treatment provided to participants. Second, all participants underwent a CBT-based competency test with case-based questions designed to measure theoretical knowledge, analytical skills, and decision-making abilities in contact center operational cases. Third, competency test result data was collected systematically, including individual scores, completion times, and results per question category. This evaluation of the results will be used to identify competency areas still requiring improvement and to assess the effectiveness of the training provided.

Data collected were analyzed using descriptive statistics to provide an overview of the participants' competency levels, as well as inferential tests through Analysis of Variance to identify competency differences based on the categories of Digital Team Leader, Inbound, and Outbound. All analyses were performed with the help of the XLMiner Analysis ToolPak software in Google Sheets.

This research adhered to ethical principles by ensuring voluntary participation,

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maintaining confidentiality of participant data, and using research results solely for academic purposes and the development of contact center training. With this methodology, the research is expected to provide objective results regarding the effectiveness of training methods and the need for competency improvement among team leaders, thereby serving as a basis for the future development of training designs.

RESULTS AND DISCUSSION

Results

Descriptive Analysis Results

Based on the examination data from 54 participants who took the computer-based competency test, consisting of 27 participants in group 1 and 27 participants in group 2, the participant results focused on 3 groups: Digital Team Leaders, Inbound Team Leaders, and Outbound Team Leaders. The descriptive analysis results show relatively good average competency scores, but there is still variation among the groups.

TABLE 1. Descriptive Analysis of Competency Scores

	Team Leader Digital	Team Leader Inbound	Team Leader Outbound
Median	73	74	73
Mode	82	74	72
Mean	72,7778	72,6667	71,7778
Standard Error	2,4688	3,0379	3,3407
Standard Deviation	10,4744	12,8887	14,1735
Sample Variance	109,7124	166,1176	200,8889
Confidence Level (95%)	5,2088	6,4094	7,0483

The descriptive analysis results indicate that the average competency scores of team leaders are relatively similar across the three groups. The Digital Team Leader group had an average of 72.78, followed by Inbound Team Leaders with an average of 72.67, and Outbound Team Leaders with an average of 71.78. The differences between these groups are very small, less than one point, indicating that the average competency level among the three groups is relatively balanced.

From the median perspective, all three groups show consistent values: 73 for Digital and Outbound, and 74 for Inbound. This indicates that the score distribution is at an almost similar level. However, the mode values show variation: the Digital group has a mode of 82, while Outbound and Inbound each have modes of 72 and 74. These differences in mode indicate different concentration points of values in each group.

Data variation is more clearly seen through standard deviation and variance. The Outbound Team Leader group has the highest standard deviation of 14.17 with a variance of 200.89, indicating that participant scores in this group are more spread out. Conversely, the Digital Team Leader group shows the lowest standard deviation of 10.47 with a variance of 109.71, meaning that competency among participants is more homogeneous. The Inbound Team Leader group is in the middle with a standard deviation of 12.89 and a variance of 166.12.

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The standard error measures support this pattern. The Outbound Team Leader group has the largest error value, followed by the Inbound Team Leader, and the Digital Team Leader. This indicates that the average estimation for the Digital Team Leader group is more stable compared to the other two groups. The 95% confidence interval also shows a similar trend: the Digital Team Leader has the narrowest interval, the Inbound Team Leader is in the middle, and the Outbound Team Leader has the widest interval. Thus, the precision level of the average measurement is higher in the Digital Team Leader group compared to the Outbound Team Leader.

TABLE 2. Descriptive Analysis Training Methods

	Blended	Online
Median	80	66
Mode	74	68
Mean	80,2222	64,5926
Standard Error	1,3089	2,2691
Standard Deviation	6,8012	11,7907
Sample Variance	46,2564	139,0199
Confidence Level (95%)	2,6905	4,6642

Furthermore, a descriptive analysis was performed on the differences between blended and online training methods. Based on the analysis results, there are clear differences between participant groups who underwent training with the blended learning method compared to the pure online learning method. The average competency score of participants in the blended learning group was 80.22, while the online learning group only achieved 64.59. This difference of about 15.6 points indicates that the blended approach yields more optimal learning outcomes compared to a fully online method.

The median value reinforces these findings, with the blended learning group having a median of 80, while the online group only had a median of 66. This shows that most blended learning participants had higher scores compared to the majority of online learning participants. Meanwhile, the mode values show different dominant points: the blended group has a mode of 74, while the online group is at 68, again confirming the consistency of superior scores in the blended group.

In terms of variation, the blended learning group shows a lower standard deviation of 6.80 with a variance of 46.26, compared to the online learning group which has a standard deviation of 11.79 with a variance of 139.02. This means that the score distribution in the blended group is more homogeneous, while the online group shows a higher level of score variability. In other words, blended learning outcomes are not only higher but also more consistent among participants.

The precision of the data is further evident in the standard error values and 95% confidence intervals. The blended learning group has a smaller standard error and a narrower confidence interval range, compared to the online learning group which has a larger standard error with a wider confidence interval. This indicates that the estimation of average competency in the blended group is more stable and reliable compared to the online group.

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TABLE 3. Descriptive Analysis of The Exam

	Mean	Standard Error	Standard Deviation	Sample Variance	Confidence Level (95%)
Contact Center Role	3,6667	0,1733	1,2738	1,6226	0,3477
Service Functions	4,3148	0,1290	0,9482	0,8990	0,2588
Leadership Skills	3,7037	0,1487	1,0925	1,1936	0,2982
Communication Skills	4,0185	0,1254	0,9213	0,8487	0,2515
Service Scripts	4,3333	0,1182	0,8687	0,7547	0,2371
Email Communication	4,4074	0,1138	0,8359	0,6988	0,2282
Performance Indicators	3,6111	0,1820	1,3377	1,7893	0,3651
Quality Assessment	2,0370	0,1495	1,0982	1,2061	0,2998
Case Analysis	3,3519	0,1452	1,0668	1,1380	0,2912
Data Analysis	2,7593	0,1977	1,4528	2,1108	0,3966

The descriptive analysis of the exam results shows variations in competency achievement across several measured aspects, including contact center roles, service functions, leadership skills, communication skills, service scripts, email communication, performance indicators, quality assessment, case analysis, and data analysis. The highest average scores were obtained in the aspects of email communication and service scripts, followed by service functions and communication skills. This indicates that participants have a relatively good mastery of written communication and the application of service scripts, which are important elements in supporting consistent customer interaction.

Conversely, the aspects with the lowest average scores are quality assessment, data analysis, and case analysis. These results reflect weaknesses in analytical and quality control abilities, which require more attention in training programs. The low scores in these aspects also show that although basic operational skills have been well mastered, participants' strategic and evaluative abilities still need improvement.

Score variations are seen from the standard deviation values. Performance indicators and data analysis aspects have a higher score spread compared to other aspects, indicating heterogeneity in participants' mastery of these indicators. Meanwhile, aspects such as email communication and service scripts show relatively low variation, indicating consistency in participants' achievement in these competencies.

These descriptive results illustrate that participants excel in procedural technical operational skills, such as service, script usage, and written communication. However, aspects related to analysis, evaluation, and quality control remain major weaknesses that require further training intervention. Therefore, the academic recommendation from these findings is the need to strengthen the curriculum in analytical aspects and performance measurement so that participants' competencies can be more balanced between operational and managerial skills.

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t-test Results

A two-sample t-test assuming equal variances was conducted to compare the average competency scores of participants who underwent training with Blended Learning and Online Learning methods for the Contact Center Team Leader competency exam. The analysis results indicate that the average score of the Blended Learning group was higher than that of the Online Learning group.

TABLE 4. t-test: Two-Sample Assuming Equal Variances

	Blended	**Online**
Mean	80,2222	64,5926
Variance	46,2564	139,0199
Observations	27	27
Pooled Variance	92,6382	
Hypothesized Mean Difference	0	
df	52	
t Stat	5,9665	
P(T<=t) one-tail	0,0000001087	
t Critical one-tail	1,6747	
P(T<=t) two-tail	0,0000002175	
t Critical two-tail	2,0066	

The obtained t-statistic value was 5.97, which is much larger than the t Critical two-tail value of 2.01. Furthermore, the significance value for the two-sided test was 0.000000217, much smaller than the significance level $\alpha = 0.05$. Thus, the null hypothesis stating no difference in the mean between the two groups was rejected, and the alternative hypothesis was accepted.

These results show a statistically highly significant difference between the two learning methods. Participants who received training using the Blended Learning approach consistently demonstrated higher competency levels compared to participants who only underwent Online Learning.

ANOVA Analysis Results

A one-way ANOVA analysis was conducted to compare the average competency scores between two groups of training participants: Blended Learning and Online Learning. Descriptive summary results show that the average score for the Blended Learning group was 80.22 with a variance of 46.26, while the Online Learning group had a lower average of 64.59 with a variance of 139.02. Both groups consisted of the same number of participants, 27 people.

TABLE 5 : ANOVA Analysis Results

SUMMARY				
Groups	Count	Sum	Average	Variance
Blended	27	2166	80,2222	46,2564

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Online	27	1744	64,5926	139,0199		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	3297,8519	1	3297,8519	35,5992742	0,0000002175	4,0266
Within Groups	4817,1852	52	92,6382			
Total	8115,0370	53				

ANOVA results show an F-statistic value of 35.60, which is much larger than the critical F-value of 4.03 at a significance level of 0.05. Additionally, the obtained significance value was 0.000000217, much smaller than 0.05. Thus, the null hypothesis stating that there was no difference in the average competency between the two groups was rejected, and the alternative hypothesis was accepted.

These findings indicate a statistically highly significant difference between the Blended Learning and Online Learning methods. Participants who underwent training with the blended approach consistently showed higher competency achievement compared to participants who only followed online learning.

These results reinforce the argument that Blended Learning is superior in the context of professional competency development because it combines the flexibility of online learning with the effectiveness of face-to-face interaction. This supports previous literature emphasizing the importance of a mixed approach to enhance engagement, knowledge transfer, and consistency of learning outcomes in competency-based training.

Discussion

The results of this study confirm that the blended learning method, combining e-learning and face-to-face interaction, is more effective than the combination of e-learning and video conferencing. This aligns with findings (Vallée et al., 2019) which emphasize that direct interaction in learning has a positive impact on participants' motivation and achievement. Specifically, the ANOVA significance value of 0.000000217 indicates a significant difference in learning outcomes between project-based blended learning methods and conventional methods, which is consistent with the findings (Marsiti et al., 2023) and (Bandarlipe, 2024).

Furthermore, this study also identified specific competency areas that require improvement for contact center team leaders, including quality measurement, case and data analysis, performance measurement, and understanding the role of the contact center. These areas reflect the need for developing analytical and strategic capabilities that are crucial for team leaders in managing complex contact center operations.

The analysis results show that face-to-face interaction provides greater opportunities to build contextual learning experiences, especially in strengthening leadership competencies and decision-making. Video conferencing, although flexible, still has limitations in building emotional closeness and case analysis. Based on these findings, direct interaction facilitates the understanding of abstract concepts and allows for the repetition of practical activities that enhance creativity and problem-solving abilities.

The ANOVA results indicate that job type contributes to the variation in competencies. Participants from the digital category are stronger in technology-based communication, while inbound participants are more trained in situational leadership due to the intensity of direct

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interaction with customers. Consistent with (Wang, 2023), the success of blended learning in this context aligns with research highlighting its flexibility and effectiveness in creating a learning environment that is flexible, adaptive, and responsive to diverse learning styles and preferences. It also underscores the potential of blended learning to optimize the development of critical skills by effectively integrating traditional and digital pedagogical approaches.

These findings have important implications for the design of technology-based learning in the contact center industry. First, the combination of e-learning with face-to-face interaction remains relevant and effective for leadership competencies. Second, adjusting learning materials based on job type is necessary to close competency gaps. Third, the integration of CBT with statistical analysis has proven to provide an objective overview of training effectiveness. In line with previous research, evaluation and monitoring of training programs are crucial to identify various gaps, weaknesses, and strengths in both implementation and process.

Thus, this study supports previous literature that adaptive technology-based blended learning is an important strategy in professional competency development, especially for contact center team leaders who face complex challenges in the digital era.

Therefore, it can be concluded that there are statistically significant differences between online and blended training results. The average achievement of blended training is higher than online training, indicating that the blended training method is more effective in improving participants' outcomes compared to online training in this research context.

Implications

The primary implication of this research is the emphasis on the importance of a blended learning approach that integrates face-to-face and online elements to optimize the competency development of contact center team leaders. This approach allows for greater flexibility in accessing learning materials and facilitates social interaction and collaboration, which are crucial for developing leadership and analytical skills.

The results of this study contribute to the study of learning method effectiveness, particularly in comparing online and blended methods. These findings reinforce the theory that face-to-face interaction, social engagement, and direct feedback can improve the quality of learning. This research supports the literature on the need for a hybrid approach where online methods are used for access efficiency and flexibility, while offline methods are utilized to strengthen conceptual understanding and practical skills. These findings open opportunities for further research related to moderating factors, such as learning motivation, digital readiness, and participants' work experience, which can influence the effectiveness of online and offline learning.

The results of this study have practical implications for the contact center industry and the field of educational technology. For the industry, these findings can serve as a basis for designing more targeted, data-driven, and organizationally relevant training programs for team leaders. For the field of educational technology, this research demonstrates that efforts can be made to integrate blended learning methods, computer-based testing, and analysis to objectively evaluate the effectiveness of professional learning.

Practical recommendations include designing a hybrid training curriculum that combines the advantages of offline training with direct interaction and the flexibility of online

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training. To reduce the effectiveness gap, online platforms need to be designed to be more interactive with simulation features, gamification, and real-time feedback, so that the learning experience approaches the effectiveness of face-to-face interaction. Theoretical materials can be delivered online, while materials requiring practical skills, role-play, or direct observation should still be delivered offline. Facilitators need to be equipped with digital pedagogical skills to maximize the potential of online platforms and maintain participant engagement.

CLOSING

This research analyzes the need for competency improvement among contact center team leaders through the evaluation of preparation and implementation of the Indonesian Contact Center Competition, which was attended by 54 participants from various Team Leader positions including inbound, outbound, and digital. By using a computer-based examination application and a blended learning approach, this study provides important findings regarding the effectiveness of learning methods and competency gaps that still need to be addressed.

The analysis results show significant differences between participant groups who underwent preparation through e-learning and video conferencing compared to e-learning and face-to-face interaction. The examination results indicate that the group of participants who received blended preparation achieved higher scores across all competency aspects. Meanwhile, the analysis also showed no difference in job position categories influencing the achievement of team leader competencies, whether for digital, inbound, or outbound.

Thus, strengthening the competencies of contact center team leaders is still necessary, especially in the areas of leadership, communication skills, digital services, analytical skills, and decision-making. These findings also reinforce empirical evidence that adaptive technology-based blended learning can enhance training effectiveness while providing a learning experience relevant to industry needs.

Recommendations

Based on the research findings, several recommendations can be proposed as follows:

Training programs for contact center team leaders need to be designed adaptively by adjusting learning materials to the specific needs of each position. This will help reduce competency gaps between job categories.

The combination of e-learning with face-to-face interaction has proven to be more effective in enhancing competence. Therefore, training providers are advised to integrate face-to-face sessions as part of the learning, even if online learning remains dominant.

The use of case-based learning or scenario-based training can improve decision-making and leadership skills that are difficult to acquire solely through e-learning or video conferencing. As digital service channels increase, team leaders need additional training in digital communication, social media management, and the utilization of data analytics for strategic decision-making.

The use of computer-based examination applications needs to be continued and further developed, by adding learning analytics that can provide individual feedback for participants to support continuous development. Future studies are suggested to expand their scope by involving contact center organizations in various industry sectors and using mixed methods to obtain a more comprehensive understanding of the factors influencing training effectiveness.

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