

Virtual Leadership and Team: Impacts on Generation Z Work Performance

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Abstract: The COVID-19 pandemic has transformed work practices globally, including in Indonesia. Adapting to these changes has become crucial for organizational survival. This study aims to analyze the impact of virtual leadership on individual performance, assess the effectiveness of virtual teams in achieving organizational goals, and identify key factors mediating the relationship between virtual leadership, virtual teams, and performance. The research approach used is descriptive quantitative with a population of employees in organizations implementing virtual teams and leadership. Data were collected through questionnaires using simple linear regression with SPSS. The analysis results indicate that virtual leadership significantly influences the performance of virtual teams, explaining approximately 73.5% of the variation in performance. ANOVA shows that this regression model is statistically significant. Virtual leadership has a greater impact than team dynamics on performance. Factors such as geographical differences and the use of communication technology also affect team success. Leaders need to possess adaptive skills to face challenges in an electronically distributed work environment.

Keywords: Adaptation, Virtual Teams, Virtual Leadership, Organizational Performance, Communication

INTRODUCTION

The COVID-19 pandemic has altered the global work landscape, which raises the need of organizations to adopt remote and hybrid models (Ahmed & Smith, 2023). In the post-pandemic era, virtual work structures have evolved from crisis responses into strategic work arrangements (Waizenegger et al., 2020). In Indonesia, including regions like Kupang, Nusa Tenggara Timur, the shifts present both opportunities and challenges primarily for Gen Z (Prasetyo & Makiya, 2022). As the workforce becomes more distributed, the ability of leaders and teams to engage and support employees across digital spaces becomes essential (Kohntopp & McCann, 2020). The concept of new ways of working reflects this adaptation, where work is no longer confined to one place, and working time becomes more flexible (Franken et al., 2021; Liman & Idulfilastri, 2022).

Virtual leadership has become essential in the post-pandemic workplace, where physical interaction and communication is provided digital platforms (Cogliger et al., 2023). Defined as the process of guiding and influencing others in a virtual work environment (Kloepfer & Carbon, 2025), virtual leadership demands distinct competencies, including asynchronous communication, empathy, and trust-building. For Gen Z, leadership effectiveness is linked on how well leaders can incorporate employees virtually (McGraw & Stewart, 2020). A prior study by Hoch and Dulebohn (2017) showed that effective virtual leadership influences

team trust, goal clarity, and employee performance. In addition, several studies showed that virtual leadership influences task clarity, motivation, and performance outcomes, particularly when leaders practice relational transparency and adaptability (Avolio et al., 2014; Hoch & Kozlowski, 2014). Similarly, prior research highlighted the importance of team structure and trust in predicting performance within virtual environments (Jaakson et al., 2019; Breuer et al., 2016).

While a few studies have explored virtual leadership and team effectiveness in Indonesian companies (Prasetyo et al., 2022; Wibowo & Ma'arif, 2021), most focus on urban or well-developed regions such as Jakarta and Java (Setyaningrum & Wibowo, 2021), leaving eastern areas like Nusa Tenggara Timur underrepresented in the literature. Concerning Indonesia, and more specifically in eastern provinces such as Nusa Tenggara Timur, there is a scarcity of empirical studies addressing how virtual work arrangements function. Moreover, while the influence of virtual leadership and teams has been studied in isolation, limited research examines their combined impact on Gen Z, who are entering the workforce with different expectations and digital experiences (McGraw & Stewart, 2020). This study addresses this gap by examining how virtual leadership and virtual teams simultaneously influence Gen Z employee performance.

In this research context, understanding of virtual teams is crucial to explain the relationship between the variables being studied. A virtual team is defined as a group of individuals working together from different locations and utilizing communication technology to achieve common goals (Garro-Abarca et al., 2021). According to Gibson and Gibbs (2006), virtual teams can function effectively even if their members are not in the same physical location, as long as there is good communication and collaboration among them. Various forms, tasks, and objectives related to virtual teams have been identified in previous literature; for example, according to Powell et al. (2004), the effectiveness of these teams is influenced by factors such as leadership and group dynamics. Prior investigation showed that strong leadership in the virtual context can enhance organizational performance by creating a work environment that supports collaboration and innovation (Avolio et al., 2014).

This study will make several contributions. First, it advances the understanding of how virtual leadership and virtual teams contribute to employee performance of Gen Z workers. It will expand the application of leadership and organizational behavior theories, such as Transformational Leadership Theory (Bass, 1985) and Input-Process-Outcome models of team performance (Ilgen et al., 2005). Second, the findings can guide organizations in eastern Indonesia to adopt virtual strategies when managing Gen Z employees. It also provides evidence for policymakers and educational institutions to strengthen digital literacy and leadership capacity in frontier regions.

This study is provided as below. The next section outlines the research design, data collection methods, and data analysis used. The results section presents the findings of the study, following the discussion section. Lastly, the conclusion summarizes the main findings and implications.

METHODS

Research Design

This study adopted a quantitative explanatory design to examine the relationship between virtual leadership, virtual teams, and Gen Z employee performance in Kupang, Nusa Tenggara Timur of Indonesia. The research aimed to explain the direct effects of virtual leadership and team collaboration on performance outcomes in the context of digital work environments. The study focused on Gen Z employees due to their increasing presence in the workforce and their distinct digital-oriented work preferences.

Data Collection and Measurement

The population in this study consisted of Gen Z employees working in digital-based start-ups and private organizations in Kupang, Nusa Tenggara Timur, who have experienced remote or hybrid work environments. The target sample was selected using purposive sampling, focusing on individuals aged between 21–28 years who are actively engaged in teams using virtual collaboration tools. A total of 150 questionnaires were distributed, and 134 valid responses were analysed. To measure the research variables, previously validated Likert-scale instruments (1 = Strongly Disagree to 5 = Strongly Agree) were adapted from prior studies. Virtual leadership was measured using indicators such as communication frequency, clarity, and motivational support (adapted from Purvanova & Bono, 2009). Virtual team effectiveness was assessed through dimensions such as coordination, role clarity, and responsiveness (Gilson et al., 2015). Employee performance was measured using indicators from Koopmans et al. (2014), related to productivity, goal achievement, and teamwork contribution. The questionnaire was pretested for reliability and clarity before full deployment.

Data Analysis

Data were analysed using SPSS version 26, starting with the classical assumption tests were conducted first to ensure that multiple linear regression can be applied. The normality of residuals was confirmed through histogram and P–P plots, with the Shapiro–Wilk test yielding $p > 0.05$. Linearity and homoscedasticity were verified via scatterplots. Multicollinearity was assessed using Variance Inflation Factor (VIF), with all values below 10, indicating no multicollinearity. The Durbin–Watson statistic was within the acceptable range (1.5–2.5), remarking the assumption of independent errors. After assumptions were met, multiple linear regression was employed to test the direct effects of virtual leadership and virtual teams on Gen Z employee performance (Pallant, 2020).

RESULTS AND DISCUSSION

Results

This study passed the preliminary classical assumption test. The results indicated that the multiple linear regression model used in this study meets the necessary statistical requirements. First, the assumption of normality was tested using a

histogram, a normal P–P plot, and the Shapiro–Wilk test. The residuals appeared normally distributed, and the Shapiro–Wilk test yielded a p-value greater than 0.05, showing no significant deviation from normality. The linearity assumption was verified through a scatterplot of standardized residuals versus predicted values, which showed a random distribution of points. In addition, the homoscedasticity assumption—which requires that the variance of errors remains constant across levels of the independent variables—was also met, as the residuals appeared evenly spread in the scatterplot. The test for multicollinearity showed acceptable results, with all Variance Inflation Factor (VIF) values below 10 and tolerance values above 0.10, indicating no collinearity between predictors. Finally, the Durbin–Watson statistic was approximately 1.94, falling within the acceptable range (1.5–2.5), which confirms the independence of residuals.

The model summary (see Table 1) provides information on the coefficient of determination (R^2), which indicates how much variance in the dependent variable (Gen Z work performance) is explained by the independent variables (virtual leadership and virtual teams). An R^2 value of 0.735 suggest that 73.5% of the variation in Gen Z work performance is accounted for by the predictors, which is considered a strong relationship for these linkages.

Table 1. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.857 ^a	.735	.723	2.857

Note. (a) Predictors: (Constant), Virtual Leadership, Virtual Teams

Following the model summary, the ANOVA in Table 2 is examined to assess whether the regression model as a whole is statistically significant. A significant F-value (e.g., $F = 65.061$, $p < 0.001$) indicates that the model provides a better fit to the data than a model with no predictors. The coefficients table is analysed to determine the individual contribution of each independent variable. When the p-values for virtual leadership and virtual teams are below 0.05, it suggests that both predictors significantly influence employee performance. The standardized beta coefficients also reveal the relative strength of each predictor.

Table 2. Anova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1062.021	2	531.011	65.061	.000 ^b
	Residual	383.599	47	8.162		
	Total	1445.620	49			

Note. (a) Dependent Variable: Y Performance, (b) Predictors: (Constant), Virtual Leadership, Virtual Teams

Based on the results of data processing using SPSS software, the coefficient for the constant (intercept) is 15.716, which indicates the expected value of the dependent variable when all independent variables are zero. The coefficient for virtual teams is 0.178 with a p-value of 0.230, indicating that it is not statistically significant at the 0.05 significance level. In addition, the coefficient for virtual leadership is 0.514 with a p-value of 0.000, indicating that it is statistically significant. The standardised coefficient (Beta) indicates the relative importance of

each predictor variable. In this model, virtual leadership has a higher standardised coefficient, indicating that it has a stronger impact on the dependent variable compared to virtual teams (see Table 3).

Table 3. Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	15.716	2.721		5.776	.000
Virtual Teams	.178	.146	.204	1.215	.230
Virtual Leadership	.514	.129	.670	3.990	.000

Note. (a) Dependent Variable: Y Performance

Discussion

The first finding indicates that virtual teams have become a prominent feature in modern work environments, where Gen Z constitutes a growing segment of the workforce. Gen Z individuals are digital natives who value autonomy, collaboration, and flexibility—attributes that are often inherent in virtual team structures. The findings suggest that virtual teams enhance Gen Z performance by enabling real-time communication, decentralized decision-making, and greater task ownership. This environment aligns well with Gen Z's preference for less hierarchical and more interactive work models. These results are consistent with previous research, such as that of Suhardi et al. (2022); Bae and Kim (2023), which demonstrated that when supported by effective communication and role clarity, virtual teams contribute positively to employee engagement and output. The results are theoretically supported by Self-Determination Theory (Deci & Ryan, 2000), which argues that autonomy, competence, and relatedness drive intrinsic motivation—factors that virtual teams inherently foster when managed effectively.

The next findings remark that virtual leadership has emerged as a critical factor in managing Gen Z employees in digitally driven work environments, especially within Indonesia's rapidly evolving start-up ecosystem. Virtual leadership involves leading teams through digital platforms by fostering trust, setting clear expectations, maintaining communication, and motivating employees without physical presence. Gen Z employees, who are highly adaptive to digital interaction and value frequent feedback and meaningful engagement, respond positively to leaders who are accessible, supportive, and technologically competent. These findings are consistent with more recent studies (e.g., Saengchai & Jermsittiparsert, 2021; Prasetyo et al., 2022), which demonstrate that effective virtual leadership enhances team cohesion, role clarity, and individual performance, particularly in remote and hybrid arrangements. The results are grounded in Transformational Leadership Theory (Bass, 1985), which emphasizes the role of inspirational motivation, individualized consideration, and intellectual stimulation—all of which can be adapted in virtual formats.

The increasing integration of digital technologies in the workplace has elevated the importance of both virtual leadership and virtual teams in shaping employee performance. This study examines how these two factors jointly influence Gen Z's work outcomes and finds that both virtual leadership and virtual team collaboration significantly and positively affect performance. Gen Z

employees, known for their digital fluency and desire for autonomy, respond well to leaders who communicate effectively in virtual settings and create environments of trust, clarity, and motivation. At the same time, participation in well-structured virtual teams provides Gen Z with opportunities for collaboration, real-time feedback, and role ownership—factors that align with their preference for flexible, peer-oriented work cultures. These findings support previous research by Hoch and Kozlowski (2014); Contreras et al. (2020), which found that effective virtual leadership and team coordination enhance satisfaction and productivity in digitally mediated work environments.

The findings of this study raise the need of practical considerations for organizations to deal with digital infrastructure. First, the significant influence of virtual leadership on Gen Z performance remarks the need for organizations to invest in digital leadership training. In detail, managers need to master communication technologies and learn how to deliver consistent feedback and foster trust in virtual environments. Given that Gen Z values, virtual leaders who are responsive require to higher engagement and productivity. Moreover, the findings suggest that while virtual teams are important, their effectiveness depends on leadership quality. Therefore, human resource departments should prioritize the alignment of team structures with leadership capabilities, including the establishment of digital communication norms, role clarity, and collaborative platforms.

CONCLUSION

This study was conducted to investigate the relationship between virtual leadership and virtual teams on the work performance of Gen Z employees. The findings reveal that both virtual leadership and virtual teams have a significant and positive impact on Gen Z employee performance. Similarly, virtual teams that promote collaboration, transparency, and shared responsibility were found to enhance Gen Z's sense of engagement and productivity. From a theoretical perspective, this study contributes to the growing literature on digital-era human resource practices, particularly in understanding how leadership and teamwork adapt in virtual environments. In practical matter, the findings suggest that organizations aiming to improve performance in digital settings should invest in training leaders for virtual competencies and in building team infrastructures that foster effective online collaboration. For future research, this study opens pathways to examine moderating variables such as organizational culture, technology readiness, or psychological safety in enhancing virtual work performance across generational cohorts.

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