

สภาพแวดล้อมการทำงานและภาวะผู้นำเชิงการเปลี่ยนแปลงที่มีต่อประสิทธิภาพ การปฏิบัติงานของพนักงานในบริษัท Zhanchen New Materials Group Co., Ltd.

เต๋อหัว หวัง¹

จิตรลดา ตริสาคร^{2*}

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาสภาพแวดล้อมการทำงานที่มีอิทธิพลต่อประสิทธิภาพการทำงานของพนักงานในบริษัท Zhanchen New Materials Group Co., Ltd. และเพื่อศึกษาภาวะผู้นำการเปลี่ยนแปลงที่มีอิทธิพลต่อประสิทธิภาพการทำงานของพนักงานในบริษัทเดียวกัน ประชากรที่ใช้ในการวิจัยคือพนักงานของบริษัท Zhanchen New Materials Group Co., Ltd. โดยมีกลุ่มตัวอย่างจำนวน 300 คน สุ่มตัวอย่างด้วยวิธีการสุ่มแบบอาศัยความน่าจะเป็นแบบการสุ่มแบบชั้นภูมิ เครื่องมือที่ใช้ในการเก็บรวบรวมข้อมูลคือแบบสอบถาม และวิเคราะห์ข้อมูลด้วยสถิติเชิงพรรณนา ได้แก่ ความถี่ ร้อยละ ค่าเฉลี่ย และส่วนเบี่ยงเบนมาตรฐาน และสถิติเชิงอนุมานโดยใช้วิธี Partial Least Square Structural Equation Modeling (PLS-SEM) ผลการวิจัยพบว่า สภาพแวดล้อมการทำงานและภาวะผู้นำการเปลี่ยนแปลงมีอิทธิพลต่อประสิทธิภาพการทำงานของพนักงานอย่างมีนัยสำคัญทางสถิติ โดยมีอำนาจการพยากรณ์ร้อยละ 83.9 และยังพบว่าภาวะผู้นำการเปลี่ยนแปลงมีอิทธิพลมากกว่าสภาพแวดล้อมการทำงานต่อประสิทธิภาพการทำงานของพนักงาน ดังนั้น องค์กรสามารถนำข้อมูลไปใช้เพื่อปรับปรุงสภาพแวดล้อมการทำงาน โดยเน้นที่การจัดหาอุปกรณ์ที่ทันสมัย การจัดการสภาพแวดล้อมทางกายภาพ และการวางผังพื้นที่ทำงานอย่างเหมาะสม นอกจากนี้ ภาวะผู้นำการเปลี่ยนแปลงยังแสดงให้เห็นถึงความสำคัญในการสร้างแรงบันดาลใจ ส่งเสริมการคิดเชิงวิพากษ์ และการมีส่วนร่วมในการตัดสินใจของพนักงาน การส่งเสริมให้ผู้นำมีอิทธิพลเชิงบวกสามารถนำไปสู่การพัฒนาความสามารถของพนักงาน และเพิ่มประสิทธิภาพการทำงานโดยรวมขององค์กร

คำสำคัญ: สภาพแวดล้อมการทำงาน ภาวะผู้นำเชิงการเปลี่ยนแปลง ประสิทธิภาพการปฏิบัติงานของพนักงาน

^{1 2} คณะบริหารธุรกิจ วิทยาลัยทองสุข เลขที่ 99/79 ถนนบรมราชชนนี แขวงศาลาธรรมสพน์ เขตทวีวัฒนา กรุงเทพมหานคร 10171

E-mail: wangdehua1979@gmail.com

* Corresponding author email: ap.chitralada@thongsook.ac.th

WORK ENVIRONMENT AND TRANSFORMATIONAL LEADERSHIP ON EMPLOYEE PERFORMANCE AT ZHANCHEN NEW MATERIALS GROUP CO., LTD.

Dehua Wang¹

Chitralada Trisakhon^{2*}

Abstract

The purpose of this study is to investigate the work environment factors that affect employee performance at Zhanchen New Materials Group Co., Ltd. and to examine the impact of transformational leadership on employee performance in the same organization. The study population includes the employees of Zhanchen New Materials Group Co., Ltd. and a sample of 300 people selected by stratified random sampling on a probability basis. Data collection was conducted through a questionnaire and data analysis used descriptive statistics, including frequency, percentage, mean and standard deviation, and inferential statistics through Partial Least Square Structural Equation Modeling (PLS-SEM). The research results show that both work environment and transformational leadership significantly influence employee performance, with a predictive power of 83.9%. Furthermore, transformational leadership was found to have a greater impact on employee performance than the work environment. Therefore, organizations can use this information to improve the work environment by focusing on providing modern equipment, managing physical workplace conditions, and designing optimal workplace layouts. In addition, transformational leadership emphasizes the importance of inspiring employees, encouraging critical thinking and involving them in decision-making processes. Encouraging leaders to be a positive influence can help develop employees' skills and improve the overall performance of the organization.

Keywords: Work Environment, Transformational Leadership, Employee Performance

^{1 2} Faculty of Business Administration, Thongsook College. 99/79, Borommaratchachonnani Rd., Sala Thammasop, Thawi Watthana, Bangkok 10170 Thailand.

E-mail: wangdehua1979@gmail.com

* Corresponding author email: ap.chitralada@thongsook.ac.th

Introduction

The work environment and leadership style within an organization are widely acknowledged as pivotal factors influencing employee performance and organizational success. Historically, leadership approaches often centered on transactional or autocratic models, which emphasized task completion, order maintenance, and rule enforcement. While effective in certain scenarios, these approaches frequently fostered environments driven by extrinsic motivators, such as rewards or penalties, rather than intrinsic engagement. Such environments often faced challenges including limited innovation, high turnover rates, and diminished employee satisfaction (Burns, 1978; Bass, 1985).

The emergence of transformational leadership has marked a paradigm shift in leadership theory and practice. Transformational leaders inspire employees to transcend self-interest for the collective good of the organization. This leadership style is defined by visionary thinking, intellectual stimulation, and individualized consideration, fostering innovation, employee engagement, and a strong sense of belonging. Ultimately, transformational leadership contributes to enhanced employee performance and organizational success (Bass & Riggio, 2006).

Similarly, a supportive work environment is critical for fostering employee satisfaction and retention. Modern workplaces emphasize flexibility, inclusivity, and collaboration, moving away from rigid and hierarchical structures. These improvements in workplace dynamics have been shown to increase satisfaction, reduce turnover, and enhance productivity (Armstrong, 2020). Psychological, social, and cultural factors are increasingly recognized as significant contributors to creating such environments (Pinder, 2014).

Transformational leadership and a dynamic work environment together enable organizations to maintain competitive advantages and achieve strategic objectives. Transformational leaders, through their inspirational and innovative approaches, shape organizational culture and create work environments conducive to high performance and innovation (Bass & Riggio, 2006). Empirical studies, such as those by Avolio and Yammarino (2013) and Yukl (2013), have highlighted the synergy between transformational leadership and work environment influencing employee behavior and performance.

Zhanchen New Materials Group Co., Ltd., a leader in China's wood coating industry with operations across China and abroad, exemplifies an organization where innovation and performance are essential. With over 710 patents and contributions to 41 national and industrial technical standards, the company's success is built on a foundation of technological innovation and environmental protection. As a company of this scale, understanding the

interplay between the work environment and transformational leadership is crucial for sustaining competitive advantage and driving innovation.

This study aims to investigate the work environment and transformational leadership affect employee performance at Zhanchen New Materials Group Co., Ltd. The research findings will contribute to the academic discussion on organizational behavior and leadership, while also offering practical recommendations for Zhanchen New Materials Group Co., Ltd. and other companies in the same industry. These recommendations will propose specific leadership strategies and work environments conducive to transformational leadership, thereby stimulating performance and fostering innovation.

Research Objectives

1. To study the work environment that influences employee performance at Zhanchen New Materials Group Co.
2. To investigate the influence of transformational leadership on employee performance at Zhanchen New Materials Group Co., Ltd.

Research Hypothesis

1. Work environment influences employee performance at Zhanchen New Materials Group Co., Ltd.
2. Transformational leadership influences employee performance at Zhanchen New Materials Group Co., Ltd.

Literature Review

Work environment and employee performance

The work environment is a critical determinant of employee performance, encompassing physical, emotional, and psychosocial factors that influence employees' behaviors and outcomes. Shammout (2021) highlights that the work environment includes elements affecting employees' emotions and interactions, which can enhance productivity or, conversely, lead to workplace stress. Similarly, Ashkanasy et al. (2014) emphasize the significance of perception and awareness within the work environment, noting their impact on employee behavior and engagement. Blahová and Pauliková (2021) examine both physical and emotional dimensions of the workplace, identifying how these aspects contribute to employee commitment or, alternatively, act as barriers to performance. Moreover, Patel et al. (2022) and Sander et al. (2019) emphasize the psychosocial

and physical components, such as relationships with supervisors and the quality of working conditions, as pivotal in creating a supportive work environment. Sheikh et al. (2021) identifies ten essential elements, including job security, opportunities for career growth, and favorable working conditions, that collectively promote employee satisfaction and performance. These findings illustrate the multidimensional nature of the work environment and its direct implications for employee outcomes. Employee performance, commonly defined as the capacity of an individual to achieve organizational objectives while utilizing resources effectively, is influenced by multiple factors. Tariansyah et al. (2023) identifies knowledge, skills, and task accuracy as core components of performance, aligning with Bushiri's (2014) emphasis on resource efficiency and effectiveness. Furthermore, studies such as those by Szabo et al. (2017) and Rivaldo and Nabella (2023) stress the importance of timely, accurate, and high-quality work outputs as indicators of strong employee performance. The relationship between the work environment and employee performance is integral to achieving organizational success. A supportive work environment fosters satisfaction, enhances employee capabilities, and improves overall performance. These insights substantiate the research hypothesis:

H1: Work environment influences employee performance at Zhanchen New Materials Group Co., Ltd.

Transformational leadership and employee performance

Transformational leadership is a leadership style where leaders inspire and motivate employees to transcend their immediate self-interests to achieve organizational goals, fostering development and alignment with the organization's vision. Li et al. (2019) emphasizes the importance of transformational leaders in enhancing employee performance by connecting individuals to the broader mission and vision of the organization. Similarly, Sun and Henderson (2016) highlight the role of transformational leaders in influencing employee attitudes and fostering commitment to organizational goals, empowering employees to act as "agents of change" within the workplace. Reza (2019) and Gomes (2014) further underscore the significance of moral development and mutual commitment between leaders and followers, emphasizing how shared values contribute to collective success. Bass (1985), a pioneer of transformational leadership theory, noted that such leaders address the needs of their followers while adapting to diverse organizational contexts, thereby fostering heightened engagement and performance. Koh et al. (2019) identified five core components of transformational leadership: charisma,

inspirational motivation, individualized consideration, intellectual stimulation, and contingent reward. These components enable leaders to serve as role models, nurture intellectual and personal growth, and inspire employees to achieve excellence. Employee performance, a critical organizational outcome, is often assessed through measures of efficiency and effectiveness. Bushiri (2014) categorizes performance metrics into quality, quantity, timeliness, and cost-efficiency, highlighting the importance of meeting organizational standards without unnecessary resource expenditure. Diamantidis and Chatzoglou (2019) identify three primary components of performance: the quality of work, the quantity of output, and the efficiency of task completion. Transformational leaders, by fostering trust, creativity, and a high-performance culture, significantly enhance these aspects of employee performance. The interplay between transformational leadership and employee performance is fundamental to organizational success. By inspiring employees and creating a supportive environment, transformational leaders drive higher performance levels. These insights support the following hypothesis:

H2: Transformational leadership influences employee performance at Zhanchen New Materials Group Co., Ltd.

Conceptual Framework

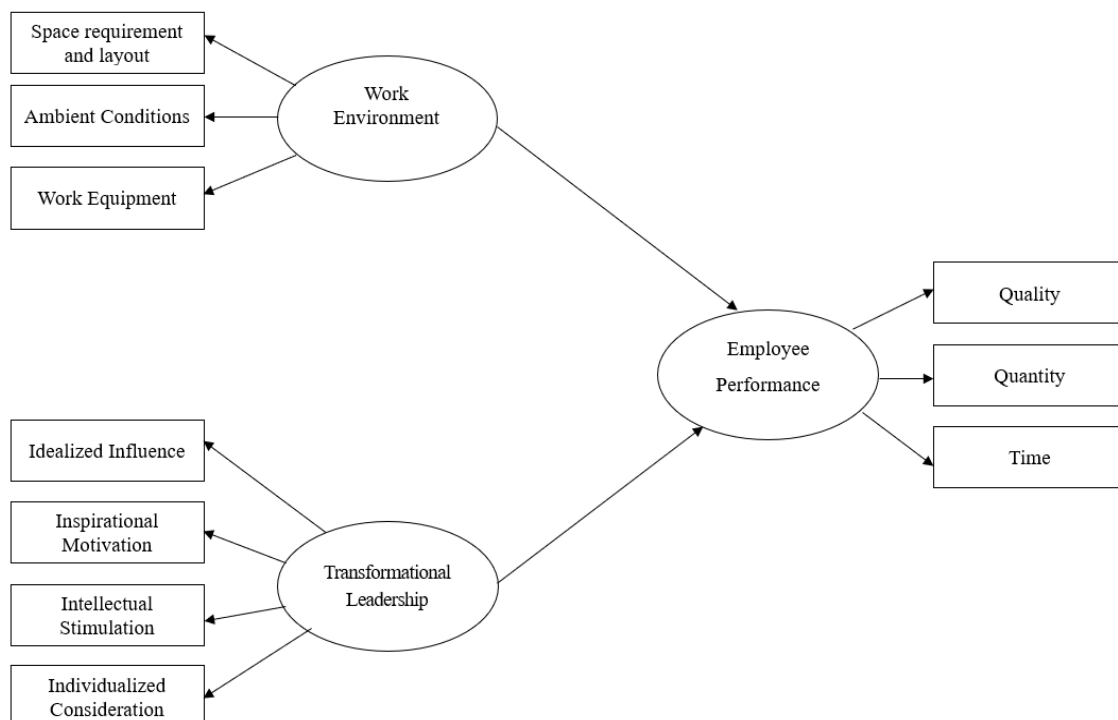


Figure 1 Conceptual framework

Research Methodology

1. The population for this study consists of the employees of Zhanchen New Materials Group Co., Ltd., with a total population of 1,586. The sample size was determined based on the criteria outlined by Hair et al. (2010), which states that for path analysis in structural equation modeling (SEM), an appropriate sample size is required to ensure reliable and accurate results. The recommended formula suggests a sample size of 20 times the number of observed variables. In this study, a total of 10 observed variables were used, resulting in a required sample size of 200. However, to account for potential non-response rates and data inaccuracies, an additional 50% of the calculated sample size was included. This adjustment aligns with recent recommendations in survey methodology, which emphasize oversampling as a strategy to mitigate incomplete responses and enhance the reliability of findings (Stockemer et al., 2019). Increasing the sample size from 200 to 300 participants ensures greater representation of the target population and robust results. Stratified random sampling, a type of probability sampling method, was employed. The sample group was proportionally selected according to the number of employees in each department.

2. In this study, the data collection tool used was a questionnaire, which was an effective method for gathering information from the sample group. The researcher developed the questionnaire based on the study and review of various concepts, theories, and related research to create an appropriate and comprehensive questionnaire. The questionnaire was divided into four sections: 1) personal information, gathering demographic data such as gender, age, marital status, education, average monthly income, work experience; 2) work environment, assessing employees' perceptions of their work surroundings with items rated on a 5-point Likert scale from "1 = Strongly Disagree" to "5 = Strongly Agree," including sample statements like "I feel comfortable with the current workspace layout"; 3) transformational leadership, measuring employees' views on leadership qualities with items such as "My leader encourages me to think analytically and creatively," also rated on the 5-point Likert scale; and (4) employee performance, evaluating self-reported performance with items like "I can consistently produce high-quality work," using the same 5-point Likert scale. Scores across sections were interpreted as follows: 4.21-5.00 = Very High, 3.41-4.20 = High, 2.61-3.40 = Moderate, 1.81-2.60 = Low, and 1.00-1.80 = Very Low. This questionnaire has undergone testing for content validity and reliability, with the index of item-objective congruence (IOC) found to be greater than 0.6 and the Alpha Coefficient greater than 0.7, ranging between 0.751 and 0.811, indicating that the questionnaire is reliable.

3. The data analysis in this research consists of two main steps: (1) Descriptive Statistics is aimed to describe basic information about the sample, using the frequency, percentage, mean, and standard deviation. (2) Inferential Statistics is used to test the research hypotheses. The Partial Least Square Structural Equation Modeling (PLS-SEM) method was applied to analyze the influence between independent and dependent variables.

Research Results

1. The analysis of the respondents' general data showed that the majority of respondents were female, accounting for 156 individuals (52.00%). Most were over 50 years old, comprising 101 individuals (33.67%). A significant portion were married or living together, totaling 149 individuals (49.67%). The majority held a bachelor's degree, with 141 individuals (47.00%). The largest group had an average monthly income between 4,001 and 6,000 CNY, representing 120 individuals (40.00%). Additionally, 160 respondents (53.33%) had more than 10 years of work experience.

2. The analysis of mean and standard deviation of work environment, transformational leadership, and employee performance

Table 1 shows the mean and standard deviation

Factors	\bar{X}	SD	Level of opinion
Work Environment	3.96	0.80	High
- Space requirement and layout	3.97	0.86	High
- Ambient Conditions	3.96	0.84	High
- Work Equipment	3.96	0.87	High
Transformational Leadership	3.99	0.78	High
- Idealized Influence	4.00	0.84	High
- Inspirational Motivation	3.96	0.86	High
- Intellectual Stimulation	4.00	0.83	High
- Individualized Consideration	3.98	0.86	High
Employee Performance	3.97	0.75	High
- Quality	4.00	0.77	High
- Quantity	3.98	0.83	High
- Time	3.95	0.84	High

3. The hypothesis testing

Table 2 shows the test results for structural integrity and component weight.

Factors	Loading	AVE	Dijkstra-Henseler's rho (ρ_A)	Jöreskog's rho (ρ_C)	Cronbach's alpha (α)
Work Environment		.789	.867	.918	.866
- Space requirement and layout	.882				
- Ambient Conditions	.891				
- Work Equipment	.892				
Transformational Leadership		.761	.896	.927	.895
- Idealized Influence	.853				
- Inspirational Motivation	.879				
- Intellectual Stimulation	.870				
- Individualized Consideration	.887				
Employee Performance		.768	.849	.909	.849
- Quality	.873				
- Quantity	.878				
- Time	.878				

According to Table 2 indicates that all observed variables in the model have factor loading values greater than 0.5, ranging from 0.853 to 0.892, indicating their reliability in measurement. Dijkstra-Henseler's rho (ρ_A) values range from 0.849 to 0.896, Jöreskog's rho (ρ_C) ranges from 0.909 to 0.927, and Cronbach's alpha (α) falls within the range of 0.849 to 0.895. Importantly, all these values exceed the 0.7 threshold for reliability. Furthermore, the latent variables demonstrate discriminant validity, with AVE values above 0.5, ranging from 0.761 to 0.789, in accordance with the established criteria (Henseler et al., 2016).

Table 3 shows a comparison of discriminant validity according to the Fornell-Larcker criterion.

Factors	Work Environment	Transformational Leadership	Employee Performance
Work Environment	.888		
Transformational Leadership	.746	.873	
Employee Performance	.777	.787	.876

* Note: The values on the diagonal are \sqrt{AVE} .

According to Table 3 indicates that the model exhibits discriminant validity, as evidenced by the square root of the Average Variance Extracted (AVE) being higher than the correlations (*r*) among each latent variable. This finding aligns with the criteria established by Henseler et al. (2016), which state that the correlation between each latent variable should not exceed the square root of its AVE. In this model, the correlations between latent variables range from 0.746 to 0.787.

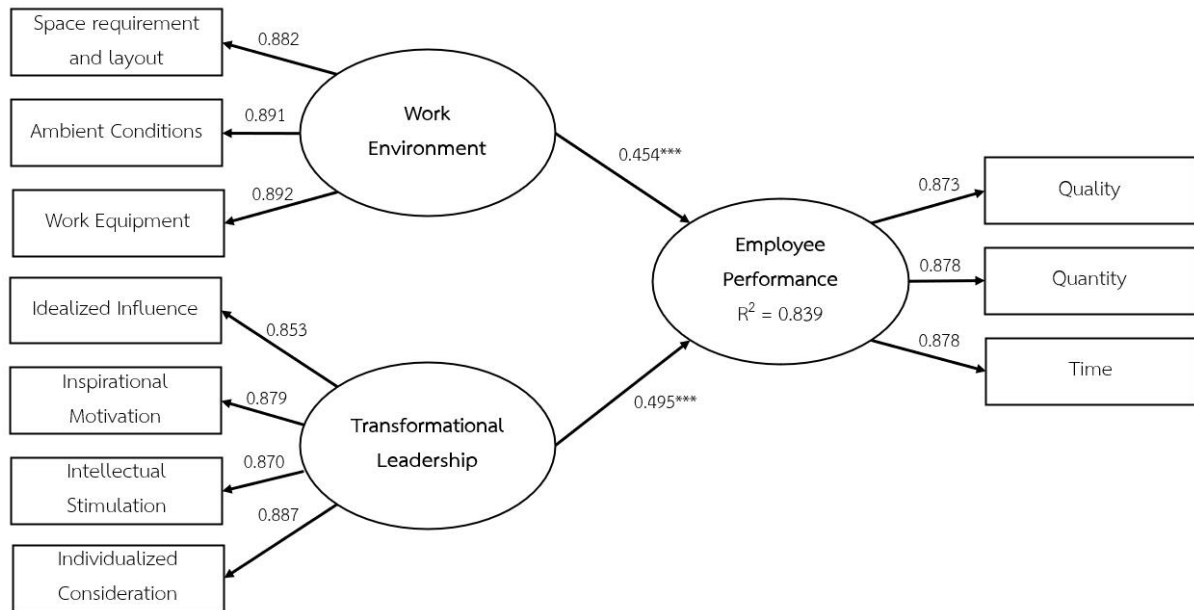


Figure 2 shows the results of hypothesis testing.

Table 4 show the effects of the work environment and transformational leadership on employee performance.

Factors	Employee Performance			
	Beta	t-test	p-value	Cohen's F ²
- Work Environment	.454	10.212	.000***	0.326
- Transformational Leadership	.495	11.323	.000***	0.388

*** Statistical significance at .001 level

According to Table 4 indicates that both the work environment and transformational leadership have a statistically significant influence on employee performance at Zhanchen New Materials Group Co., Ltd., with a significance level of .000 and a predictive power of 83.9% ($R^2 = 0.839$). Among these factors, Transformational Leadership ($\beta = .495$) was found to have

a greater influence on employee performance than the work environment ($\beta = .454$). The Cohen's F^2 values indicate that both the work environment (0.326) and transformational leadership (0.388) exhibit moderate to large effect sizes on employee performance, with transformational leadership demonstrating a slightly stronger influence.

Discussions

1. Work environment had the greatest impact on employee performance at Zhanchen New Materials Group Co., Ltd. A favorable work environment promotes employee performance. When employees are supported by a conducive work environment, which includes access to appropriate equipment, a comfortable environment and convenience, they can maximize their potential, reduce stress and increase overall job satisfaction. These factors form the basis of employee motivation and enable them to work smoothly. This aligns with Blahová and Pauliková's (2021) assertion that the work environment can help or hinder employee engagement. The work equipment component had the highest factor loading, as quality and modern equipment play a crucial role in improving employee performance. When the company provides modern and effective equipment, work processes become smoother and fewer technical problems occur, which reduces errors and boosts employee confidence. In addition, modern equipment enables employees to work efficiently and meet the company's expectations. This finding is in line with Sander et al. (2019), who emphasized that modern work equipment is essential for improving work performance and reducing operational problems. The environmental conditions component, including air quality, lighting and noise, ranked next in importance. A pleasant and healthy working environment, such as clean air, adequate lighting and minimal noise, helps to reduce stress and increase job satisfaction. This is in line with Ng (2016), who found that a suitable physical environment increases employee performance and reduces health risks. Space requirements and workplace design had the lowest factor score. Although the organization of space and the design of the workplace are essential to ensure comfort, they are secondary to equipment and other environmental conditions. Appropriate space management helps to ensure that employees can work efficiently without feeling cramped or distracted. This is consistent with Patel et al. (2022) who found that adequate private workspace directly improves productivity. This finding is supported by the research of Yusuf et al. (2022), which showed that the work environment directly affects employee performance, especially in terms of amenities and environmental

factors that affect employee comfort and satisfaction. Riyanto et al. (2017) also emphasized the role of work environment in improving motivation and performance and highlighted its importance in promoting effective work outcomes.

2. Transformational leadership ranks second in terms of its impact on employee performance at Zhanchen New Materials Group Co., Ltd. Transformational leadership is a critical factor in motivating and supporting employees to improve their performance. By providing inspiration, personal support and encouraging creativity, transformational leaders give employees a sense of purpose and motivation, which has a direct impact on their performance. The Individualized Consideration component had the highest factor loading, as responding to employees' personal needs makes them feel understood and supported by their managers. This personal support increases job satisfaction and organizational commitment, which increases employee motivation and commitment to achieving organizational goals. Reza (2019) also emphasized that individual consideration strengthens employee commitment and leads to better performance. Inspirational motivation comes second, as leaders who inspire their employees foster a strong sense of purpose and motivation, encouraging them to set and achieve ambitious goals. Gomes (2014) suggested that inspiration increases commitment and drives employees to work harder, which in turn improves teamwork and collaboration. Intellectual stimulation follows, as encouraging critical thinking and creativity in problem solving enhances employees' skills. When leaders support analytical thinking and experimentation with new ideas, employees feel valued and engaged, which is consistent with Bass's (1985) concept that transformational leadership stimulates creativity and systematic problem solving. Finally, idealized influence had the lowest factor loading. Although role modeling is important to leadership, it may not have as strong an impact on employee performance as the other factors. It is possible that employees view exemplary leadership as an expected attribute rather than an important motivator for continuous improvement. This is consistent with Steinmann et al. (2018), who found that while leading by example commands respect, it is not the most important factor in driving employee performance. Research by Buil et al. (2018) supports these findings, highlighting that transformational leadership has a positive impact on employee engagement and performance, particularly through individual support and inspiration. Atmojo (2012) also found that transformational leadership improves job satisfaction and organizational commitment, both of which are critical to increasing employee performance.

Implications of the study

1. Policy and Practical Recommendations for Work Environment

1.1 Work equipment: Companies should prioritize the provision and upgrading of high-quality, modern work equipment. Regular inspections and maintenance of equipment will reduce operational problems and improve employee performance. In addition, surveying employees about their equipment needs will help the organization respond to those needs effectively and in a timely manner.

1.2 Environmental conditions: Companies should create a favorable physical work environment, focusing on air quality, lighting and noise reduction. Investing in better ventilation, adequate lighting and soundproofing will improve the health, comfort and productivity of employees and ultimately contribute to their long-term well-being.

1.3 Space requirements and layout: Companies should ensure that the workplace is appropriate and well organized for both individual and team work. Designing work areas that provide privacy and encourage teamwork improves overall efficiency. Proper space management, including good air circulation and a comfortable layout, reduces discomfort and increases employee satisfaction.

2. Policy and Practical Recommendations for Transformational Leadership

2.1 Individualized consideration: Managers should understand and take into account the individual needs and circumstances of employees. Open channels of communication where employees can voice their concerns and ask for advice strengthen trust and commitment between managers and employees. Managers should regularly monitor and assess the development and well-being of their employees.

2.2 Inspirational motivation: Managers should use their skills to inspire employees and help them set meaningful goals. By guiding and encouraging their employees to pursue challenging but achievable goals, they can foster commitment. Developing growth plans for employees and offering rewards for achieving goals will further increase employee engagement and motivation.

2.3 Intellectual stimulation: Managers should encourage their employees to think critically and creatively when solving problems. Fostering a culture of innovation and encouraging employees to present new ideas will develop their potential and drive innovation within the company. Managers should also involve employees in decision-making processes and the development of company policy.

2.4 Idealized influence: Leaders should set an example and demonstrate their ability to lead the organization to success. If they uphold the principles and values of the company and demonstrate responsibility in decision-making, they will gain the respect of employees and instill confidence and dedication to their work.

Future Research

1. Industry-specific research: Future studies should examine the influence of the work environment and transformational leadership in different industries to compare their impact on employee performance in different work environments, such as the service sector, manufacturing or the technology sector, which may have unique influencing factors.

2. Deeper exploration of the components of transformational leadership: further exploration of the internal components of transformational leadership, such as individualized consideration and inspirational motivation, will provide deeper insights into how leaders can improve employee engagement and performance. This research will contribute to the development of more effective leadership strategies.

3. Long-term impact analysis: Further studies should examine the long-term effects of the work environment and transformational leadership on employee performance. A quantitative long-term analysis will provide a broader perspective on employee development and the impact of changing working conditions on performance and provide valuable insights for the development of organizational strategies.

4. Research in multicultural contexts: Future research should consider the influence of the work environment and transformational leadership in multicultural contexts to understand how these factors affect employee performance in different cultural settings. This will help organizations to better adapt their management strategies to different cultural and environmental conditions.

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