

The impact of female leadership on innovation performance: A review study

Wang Fang

School of Management, Universiti Sains Malaysia, Malaysia

Email: wangfang123@student.usm.my

Noorliza Karia*

School of Management, Universiti Sains Malaysia, Malaysia

Email: noorliza@usm.my

** Corresponding Author*

Abstract

Purpose: This article discusses the influence mechanism between female leadership and innovation performance within enterprises, during which the effects of employee creativity and innovation climate have also been considered.

Design/methodology/approach: This paper is based on the conceptual analysis and reviews of the relevant papers published on Web of Science and Scopus databases within latest 5 years.

Findings: Female leadership positively affects innovation performance within enterprises through the mediating role of employee creativity. Innovation climate moderates the influence of female leadership on innovation performance.

Research limitations/implications: It is limited to the literature published 2018 to 2023.

Practical implications: It's essential for the boards to overcome gender stereotypes and give more concern about the management effectiveness of female leaders to further improve innovation performance and enhance competitiveness and sustainability of enterprises. It also helps to promote gender equality.

Originality/value: It originally takes female leaders as an object of study to discuss its influence on employee creativity, innovation climate and innovation performance at the same time.

Keywords: Leadership, Female, Innovation Performance, Employee Creativity, Innovation Climate

Introduction

In the context of the 4th industrial revolution, with the boom of new technologies, new products and the processes, market competition is becoming exceedingly fierce, which compels the enterprises around the world to enhance innovation to stay agile, to win market competition and to realize sustainability (Prasanna et al., 2019; Sima et al., 2020; Yadav et al., 2020). Enterprises strive to achieve excellence in innovation performance through many efforts such as gaining government support, seeking open collaboration, and inspiring internal innovation activities (Rumanti et al., 2022). However, due to limited R&D budget (Karuppiah et al., 2020; Liu et al., 2020; Yu et al., 2020), insufficient human capital (Adomako & Nguyen, 2020; Indrawati, 2020), lack of resources and advanced technologies (Chabbouh & Boujelbene, 2023; Del Giudice et al., 2021), many of them are still weak in innovation capacity, which largely prevents the fulfillment of innovation performance and hinders enterprises from winning

market competition (Ali Qalati et al., 2020; Bouchard et al., 2023; Lu et al., 2021; Müller, 2019; Yu et al., 2020).

The participation of women in organizational management has been widely convinced as a crucial factor that will impact the enterprise innovation (Ain et al., 2021; Mirza et al., 2020; Wang et al., 2022). With more and more women stepping up as senior managers to participate in the enterprise management and strategic decision-making process, they critically influence the future development of enterprises (Chen & Shao, 2022; Ibáñez et al., 2020; Khushk et al., 2023). And the positive effects of gender diversity in senior management team on the strategic decision-making process of enterprises have also been reported by the academic circles (Saeed et al., 2023). However, due to the inherent gender stereotypes and bias both from the individuals and groups in the organizations (Chang & Milkman, 2020; Fine et al., 2020; Warren et al., 2019), the role of female leaders are still undervalued, and the number and proportion of female leaders in enterprises and other social organizations in most countries are far from enough (Thornton, 2023).

Another factor hindering enterprise innovation may come from a lack of creativity among employees. Enterprises with creative employees are more inclined to generate innovative ideas, new products and new technologies, which is beneficial to improve their competitive edge in the business world (Shafi et al., 2020). Employees are the main implementer in innovation, and the extent to which the employees own the creativity is also influenced by the innovation inspiration of the company leaders and managers (Asghar et al., 2022; Cheng et al., 2019; Sidney et al., 2022). Therefore, leadership has become the most frequently discussed human resource factors that can affect employee creativity, among which transformational leadership takes priority (Chaubey & Sahoo, 2019; Ebrahimi et al., 2017; Lee & Seol, 2021). Given the differences in the characteristics of male and female leaders when it comes to carrying out management, it is important to examine the mediating effects of employee creativity in strengthening the relationships between leadership and company innovation performance from the perspective of female leaders (Jing et al., 2022).

Organizational innovation climate is also regarded as a crucial element which affects employee creativity and innovation performance within enterprises (Waheed et al., 2019). And it usually serves as a moderating variable in many researches to discuss enterprise innovation and its prerequisites (Newman et al., 2020). Research has proved that a favorable innovation climate in organizations is conducive to employee creativity (Miao et al., 2023), which leads to higher work satisfaction, stronger job identification, heightened psychological engagement and enhanced work performance among employees (Newman et al., 2020). Additionally, it exerts an influence on employees' work attitudes, values, motivation, commitment, and innovative behaviors (Lin, 2023; Newman et al., 2020; Ye et al., 2022). These collectively have a substantial impact on innovation performance and innovation capability (You et al., 2022).

Many studies now look at how leadership affects business innovation, but few investigate the ways in which female leadership affects innovation performance (Li et al., 2020; Tahir et al., 2021; TM & Joseph, 2021). Thus, this research specifically focuses on female leadership to explore its effects on innovation performance while considering the roles of employee creativity and innovation climate. This research aims to promote innovation capabilities within enterprises, thereby bolstering their competitiveness and vitality.

Theoretical Background and Literature Review

Innovation Performance and Leadership

High innovation capability is the guarantee for enterprises to achieve sustainable development (Hazem et al., 2020; Saunila, 2020). Innovation is traditionally viewed as the process of

invention or discovery (Ting et al., 2021). And the innovation performance is generally considered as the degree of fulfillment obtained through innovation activities such as products innovation, technology innovation and process innovation (Le & Do, 2023; Lu et al., 2023; Ma et al., 2020). There is a lack of agreement on the definition of innovation performance now in the academic circles, since some scholars are inclined to define it from the perspective of productive process, while others like to discuss it from the perspective of outcomes (Lu et al., 2021). This study takes the latter one, referring to the achievements or benefits obtained by enterprises in technology, invention and innovation through proposal of new ideas, technology advancement, product creation and commercialization of results.

Leadership is considered to hold a prominent position among key individual factors in business innovation (Afsar & Umrani, 2020; Chaubey et al., 2019; Cui et al., 2022; Korku & Kaya, 2023) besides internal R&D (Ferraris et al., 2021) and external collaboration (Jang et al., 2023; Lu & Yu, 2020). Among the leadership factors influencing organizational innovation, transformational leadership holds the most significant impact.(Cui et al., 2022). Leadership, especially transformational leadership, has been widely proved to be beneficial to innovation performance (Cui et al., 2022; Iqbal et al., 2021; Rr, 2020).

Transformational leaders incline to intellectually stimulate their subordinates, motivating them to engage in creative thinking(Al Harbi et al., 2019) in order to foster greater commitment and dedication to long-term objectives, missions, and visions, while displaying high expectations and confidence in the abilities of their subordinates(Bakker et al., 2023; Morkevičiūtė & Endriulaitienė, 2020). In the process of being stimulated and motivated, subordinates could continue to enhance their work enthusiasm and self-esteem, thus promoting organizational innovation (Zhu & Huang, 2023). Transformational leadership is more likely to provide a supportive environment for innovation (Shafi et al., 2020). Transformational leaders articulate a vision of innovation (Sehgal et al., 2021), create an environment of innovation (Chughtai et al., 2022), and strengthen the innovation climate (Newman et al., 2020; Nguyen et al., 2023) to further improve innovation performance. And the transformational leadership style performed by female leaders are also proved to have a positive impact on innovation performance (Khushk et al., 2023).

Hypothesis 1: Transformational leadership positively influences innovation performance in enterprises.

Females Leaders and Innovation

Studies on female leadership spread fast both in public and private sectors. The academic community usually discusses female leadership from the perspective of gender traits and characteristics of female leaders, or the leadership styles embodied by females (Jing et al., 2022; Offermann & Foley, 2020). Female leaders are good at building trust with others, focusing on collaboration, solving problems flexibly, and are more willing to empower their subordinates (Khushk et al., 2023). Women tend to possess better interpersonal skills, insights, and emotional acumen than men because of their distinct social experiences, and women's management and leadership styles tend to be more effective and compassionate compared to those of men under some circumstances (Carless, 1998; Kulkarni & Mishra, 2022). Sharif (2019) pointed out that women are more communicative, more intuitive, more cautious and meticulous, and have a more flexible and democratic leadership style than men.

Shi (2015) summarizing previous studies, suggested that women show more transformational leadership style. Through various studies on leadership and leadership style in developed countries, many scholars have come to a similar conclusion that female leadership is much closer to transformational leadership (Hsu et al., 2022). So this article considers female leadership as the transformational leadership style displayed by female leaders and borrows the

classical dimensions of transformational leadership developed by Avolio and Bass (1995), specifically, the qualities of female leadership—idealized influence, inspiring motivation, intellectual stimulation, and individualized consideration—will be examined in order to determine how they affect innovative performance.

Academic circles now pay more attention to female leadership and some relevant studies about the role of female leadership in shaping innovation outcomes start to increase (Gaur et al., 2023; Khushk et al., 2023). Wu et al. (2021) has discovered in his study that companies with a female chief technology officer (CTO) demonstrate higher levels of innovation compared to their male-led counterparts, and this phenomenon appears more obviously in organizations fostering an innovative culture. Gaur et al. (2023) empirically proved that women with feminine characteristics are more powerful transformational leaders, and female's transformational leadership influences employee performance directly and positively. Javed et al. (2023) claimed that women CEOs of state-owned enterprises and companies located in developed areas show a greater inclination toward enhancing green innovation.

Female leaders have higher emotional intelligence, are good at managing their own emotions, show their compassion and understandings to others, so they can build strong bonds with employees, and win their trusts to foster a positive and innovative working environment (Mysirlaki & Paraskeva, 2020). In an empirical research on the correlation between traits of female leadership and employees' innovation performance, Jing et al. (2022) reported that the traits of female leadership are conducive to the enhancement of innovation performance among employees. As models of integrity and fairness, women leaders often emphasize ethical decision-making and bring strong values and commitments into their leadership roles (Bernardi et al., 2006; Yang et al., 2019). The characteristics of transformational leadership behaviors displayed by females in these studies are important reasons that help them win a place in the male-dominated business management practice.

Hypothesis 2: Female transformational leadership positively influences innovation performance in enterprises.

Mediating Effects of Employee Creativity

Research on creativity began in the 1950s and was initially defined as the characteristics and cognitive styles present in individuals (Dellas & Gaier, 1970). Since the 1980s, psychology and management have shown a strong interest in the field of creativity study. According to Amabile (1983), the theory of components of creativity, an employee's creativity is impacted by both internal and external variables.

In many subsequent studies in the field of innovation, organizational contextual factors and individual factors are generally considered to be the two most important types of factors that influence employee creativity (Amabile & Pillemer, 2012; Bavik & Kuo, 2022; Fischer et al., 2019). Because of the special position of leaders in organizational context, leadership factors, including leadership style, were also consistently identified as key factors influencing employee creativity (Lee & Seol, 2021; Liu et al., 2021; Ranjbar et al., 2019). Further investigation has verified that the following types of leadership are beneficial to worker creativity: paternalistic leadership, transformational leadership, empowering leadership, and genuine leadership (Imam et al., 2020; Nguyen et al., 2023; VU et al., 2021; Wang et al., 2019). Additionally, there has been a lot of interest in researching how transformational leadership might positively impact employee creativity (Haron et al., 2020; Qian & Kee, 2023; Wang, 2020).

Jafri (2018) delved into the impact mechanism on employee creativity through the lens of emotional intelligence. His findings revealed that individuals with robust emotional strength can adeptly manage their emotions and uphold a positive mindset in challenging situations,

thus positively influencing their creativity. Therefore, it can be inferred that certain traits of female leaders such as motivation and personalized care may positively influence the motivation of employees' emotions and creativity. And studies have also proved that leadership, especially transformational leadership positively enhances innovation performance within enterprises through the mediating effect of employee creativity (Chaubey & Sahoo, 2019; Nguyen et al., 2023). Sandhu and Al Naqbi (2023) confirmed in their research that transformational leadership positively influences innovation performance of enterprises, and at the same time, employee creativity serves as a mediating factor.

Hypothesis 3: Employee creativity mediates the relationship between female transformational leadership and innovation performance.

Moderating Effects of Innovation Climate

The study of innovation climate within organizations is developed on the basis of organizational climate. According to organizational climate theory, organizational climate derives from the research on "psychological atmosphere" and "psychological climate" in the field of psychology (James et al., 2008), which was used to describe the dynamic relationship between the external environment and human behaviors. Later, it permeated other fields and developed many views of the organizational climate. Currently, organizational innovation climate refers to the extent of the support and recognition from the organizational members for organizational innovation and innovative activities within the work context (Miao et al., 2023; Zhang et al., 2022). An organization with a strong innovation climate not only grants employees autonomy and social-emotional backing, but also supplies them with tangible assets like financial support or extra work equipment. These resources play a crucial role in shaping and encouraging innovative behaviors of employees (Ren & Zhang, 2015).

Among all of the different leadership styles, transformational leadership has been most studied, particularly when regarding its role as a prerequisite for cultivating an innovative climate within a team context (Newman et al., 2020). Consistently, studies have revealed that transformational leadership, including its sub-dimensions, fosters an elevated atmosphere for team innovation (Afsar & Umrani, 2020; Newman et al., 2020; Tran et al., 2021). Transformational leadership can assist to create an innovative climate within organizations which stimulates innovation by supporting open communication, encouraging risk-taking, feedback, and stakeholder collaboration (Zuraik & Kelly, 2018).

Organizational innovation climate is also believed as an essential factor in driving employee creativity (Anderson et al., 2014). A series of empirical research studies shows that innovation climate is beneficial to the cultivation of employee creativity and impacts positively on employees' innovation behavior (Hsu & Chen, 2017; Newman et al., 2020; Ren & Zhang, 2015). In a strong innovative climate, employees can exchange information with colleagues, supervisors and the broader organizational environment freely, contributing new insights, new ideas and new solutions, which in turn enhances innovation performance (Newman et al., 2020). Hypothesis 4: Innovation climate moderates the relationship between female transformational leadership and employee creativity.

The purpose of this research is to investigate the connection between employee creativity, corporate innovation atmosphere, and female leadership. Its objective is to learn more about the ways in which female leadership affects the performance of innovation in businesses, therefore boosting their long-term sustainability and competitiveness.

Research Framework

Figure 1 presents the study framework based on the reviews mentioned previously. Employee creativity, the innovation atmosphere, and the transformative leadership of women may all be

used to predict innovation performance. The association between female leadership and innovation performance is suggested to be moderated by the innovation atmosphere and employee inventiveness.

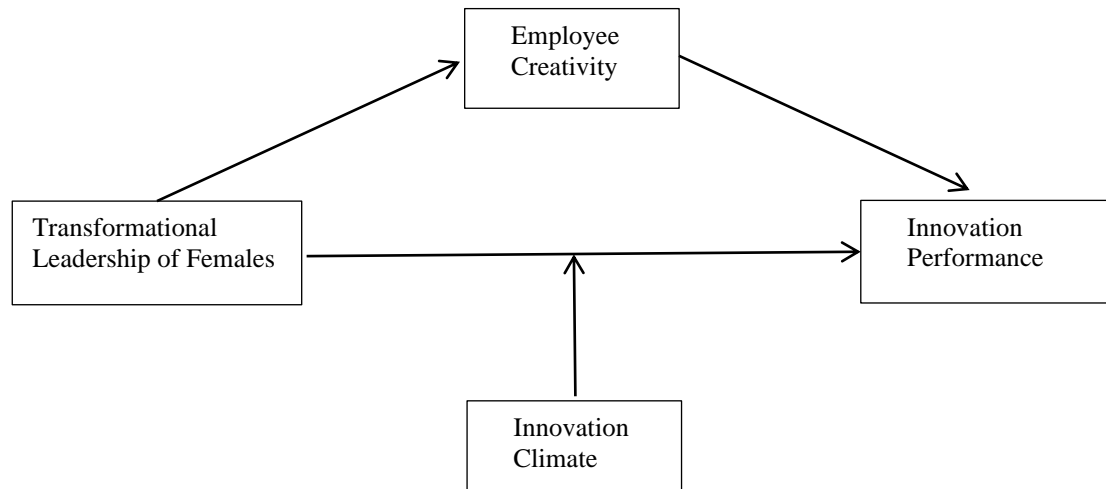


Figure1: Research Framework

Methods

This study adopted a literature review on the main related topics to provide the foundation of the research. And all the articles were collected from Web of Science and Scopus databases mainly from 2018 to 2023. The choice of Web of Science and Scopus databases was based on their renowned standing for hosting top-tier journals and scholarly documents (Alviz-Meza et al., 2023). In developing the search strategy, an expanded set of keywords in both databases was incorporated, encompassing disciplines such as psychology, management, business, social science and accounting to ensure the inclusion of only robust and high-quality research in our review. And the keywords on the list not only included single conceptional words like leadership, female leadership, leadership and gender, transformational leadership, transformational leadership and female, employee creativity, innovation climate and innovation performance, but also included the phrases that are related to the interrelationship of female leadership, transformational leadership, employee creativity, innovation climate and innovation performance, such as female leadership and innovation, transformational leadership and employee creativity, employee creativity and innovation performance, transformational leadership and innovation climate, innovation climate and innovation performance, etc. The search was refined to focus on abstracts, keywords and titles only, to enhance the effectiveness of the results. And 105 most-related articles were finally selected through the examining and filtering process, including 89 empirical ones.

The decision to limit the review to articles from the past five years (2018-2023) was made to ensure that the study reflects the most current trends, findings, and theoretical advancements in the fields of leadership, innovation, and organizational behavior. This time frame allows the inclusion of recent empirical evidence and contemporary discussions relevant to the rapidly evolving business and technological environment influenced by the 4th industrial revolution. There were several phases in the selecting process. In the beginning, the Web of Science and Scopus databases were searched using keywords. After that, the search results were filtered to

find pertinent studies using keywords, titles, and abstracts. All of the chosen articles were examined to make sure they satisfied the requirements for inclusion. Ultimately, the publications were selected according to their empirical quality, pertinence to the research inquiries, and value added in elucidating the connections among employee creativity, transformational leadership, female leadership, innovation climate, and innovation performance.

By focusing on these criteria and the last five years, the research aims to provide a comprehensive and up-to-date summary of the body of literature while ensuring the relevance and applicability of its findings to modern organizational and leadership practices.

Findings

Following the findings, women are evaluated higher on transformational leadership than men are, and they are more likely than men to apply transformational leadership approaches during the enterprise management process (Gaur et al., 2023; Hsu et al., 2022). Transformational leadership of females positively influences innovation performance within enterprises (Hsu et al., 2022; Iqbal et al., 2021; Jing et al., 2022; Khushk et al., 2023), during which both of the mediating influence of employee creativity and the moderating influence of innovation climate have been discussed (Korku & Kaya, 2023; Lin, 2023; Sandhu & Al Naqbi, 2023; Zhao et al., 2021). Transformational leadership of females exerts a positive influence directly and indirectly on innovation performance by enhancing employee creativity (Sandhu & Al Naqbi, 2023; Zhao et al., 2021). Simultaneously, the innovation atmosphere would reinforce the beneficial impact of female transformative leadership on innovation performance (Awan et al., 2021; Lin, 2023; Newman et al., 2020).

The analysis of the papers provides important new information about how innovation success in businesses and female transformational leadership relate to one another. Table 1 presents a summary of the research results from the chosen studies.

Table 1 The Summarizes of the Findings from the Selected Studies

Authors	Findings
Gaur et al., 2023	Compared to male leaders, female leaders are more likely to use transformational leadership techniques.
Hsu et al., 2022	Females are rated higher on transformational leadership than males are.
Iqbal et al., 2021	Transformational leadership of females positively influences innovation performance within enterprises.
Jing et al., 2022	Transformational leadership of females positively influences innovation performance within enterprises.
Khushk et al., 2023	Transformational leadership of females positively influences innovation performance within enterprises.
Korku & Kaya, 2023	It has been addressed how employee creativity acts as a mediator and how the innovation atmosphere acts as a moderator.
Lin, 2023	The favorable impact of female transformational leadership on innovation performance is reinforced by the innovation atmosphere.
Sandhu & Al Naqbi, 2023	Transformational leadership of females exerts a positive influence directly and indirectly on innovation performance by enhancing employee creativity.

Zhao et al., 2021	Transformational leadership of females exerts a positive influence directly and indirectly on innovation performance by enhancing employee creativity.
Awan et al., 2021	The innovation atmosphere enhances the beneficial impact of female transformational leadership on innovation performance.
Newman et al., 2020	The innovation atmosphere enhances the beneficial impact of female transformational leadership on innovation performance.

The results show that female leaders are more likely than male leaders to use transformational leadership techniques and are given better evaluations for them. Female transformational leadership has a significant influence on the success of enterprise innovation. The mediating role of employee creativity and the moderating influence of the innovation environment have been discussed. Female transformational leadership improves innovation performance both directly and indirectly by fostering employee creativity. Moreover, the innovation climate supports the positive effects of female transformational leadership on innovation output.

Discussion and Conclusion

The success and sustainability of enterprises require innovation. Considering the beneficial influence that transformational leadership has on innovation performance (Tajasom et al., 2015) and the common behaviors of female leadership and transformational leadership (Hsu et al., 2022; Lamm et al., 2021), this article discusses the beneficial role that female leadership holds in fostering employee creativity and promoting innovation performance within enterprises, and during which employee creativity serves as a mediator. At the same time, innovation climate acts as another factor to moderate the influence of female leadership on innovation performance. Female leaders take the advantages of the behaviors of transformational leadership to implement management, which fosters employee creativity and further strengthens innovation performance. And a strong innovation climate contributes to stimulate the innovative outcomes of employees, thus fulfills innovation performance. Gender diversity is beneficial to corporate development. And the corporate board could consider higher proportion of female managers in decision-making team to encourage the corporate innovation and gender diversity.

Theoretical Implications

Firstly, in order to advance the theoretical research on leadership and organizational innovation, this study analyzes the effects of a proposed theoretical model of female leadership on employee creativity and innovation performance within organizations. It is based on theories of transformational leadership and flexible management. Secondly, it also analyses and compares the different definitions of organizational innovation performance in academic circles and summarizes the concept of organizational innovation performance suitable for this research to further enrich the basic theoretical research on organizational innovation performance. Finally, this study enriches and develops the theories of creativity and innovation climate, and reports the influencing factors of innovation performance, which is of theoretical significance for promoting innovation-driven development of enterprises.

Practical and Social Implications

The conceptual study of this research can, on the one hand, enable organizations to realize that in addition to enhancing employee creativity through efforts to create a strong organizational innovation climate to accomplish high innovation performance, it is more necessary to achieve the fulfillment of innovation performance through effective measures and management tools from the leadership level. On the other hand, it is beneficial for organizations to pay more

attention to the impact of leadership and management effectiveness of female leaders on employee creativity and corporate innovation. This approach provides ideas and directions for companies to further evaluate the management effectiveness of female leaders and the practice and implementation of flexible management. Additionally, it raises an awareness of women development in the society and lays the foundation for overcoming gender stereotypes and biases, thereby promoting genuine gender equality.

Limitations and Suggestions for Future Research

The absence of empirical support is one of this study's primary weaknesses. This study examines, using only theoretical ideas and literature studies, the possible benefits of female leadership on organizational innovation performance. In the future, we hope to substantiate the relationship between these main objects through rigorous data analysis. And the other limitation is that we only take employee creativity as a mediator in this study. Actually, a wider range of variables, including staff innovative behaviors, information sharing, organizational learning, knowledge management capability, individual performance, etc., might operate as mediators in the relationships between female leadership and the innovation performance of businesses. Future research should take into account contextual elements that may affect the efficacy of female leadership on innovation performance, such as industry type, organizational culture, and geographical variances. For example, comparing the effects of female leadership styles on innovation in conventional vs technology-driven businesses might yield insightful information. Moreover, studies looking at how female leadership affects innovation performance in different cultural contexts might contribute to the advancement of a more thorough understanding of this cross-cultural relationship. Finally, using qualitative research techniques like in-depth interviews and case studies can help us understand how female executives promote innovation in their companies in a deeper and more complex way. By combining quantitative and qualitative methodologies, future research can offer a more thorough knowledge of the mechanisms via which female leadership affects organizational innovation performance.

Acknowledgement

We would like to extend our sincere gratitude to the anonymous reviewers for their profound insights to significantly enhance the quality of this paper.

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