



The relationship between leadership styles, communication styles and employee work performance in a biogas company: Agile work environment as a mediating factor

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ABSTRACT

The success of any company depends significantly on its employees' ability to deliver consistent, high-level work performance. This, in turn, is influenced by a positive and supportive working environment. The biogas industry, experiencing growing demand, faces several opportunities for expansion. However, the successful execution of these opportunities has been hindered by inadequate employee performance. This study aims to investigate the relationship between leadership styles, communication styles, and employee work performance in the biogas industry, with a focus on the agile work environment as a mediating factor. Using a self-administered questionnaire and random sampling technique, data were collected from 344 respondents. The analysis was conducted using the Statistical Package for the Social Sciences (SPSS) software, and Hayes Process Model was utilised to explore the mediating role of the agile work environment. The results reveal that effective leadership, supportive guidance, and clear communication are critical drivers of improved employee performance. Additionally, the findings highlight that leadership and communication styles significantly influence work outcomes, with the agile work environment playing a key mediating role. This emphasises how agility enhances employees' responsiveness, adaptability, and overall efficiency.

Keywords: **Communication styles, leadership styles, employee work performance, agile work environment, organisational culture**

INTRODUCTION

Malaysia's biogas industry is expanding, particularly through the use of palm oil mill effluent (POME) and organic waste to generate renewable energy. Notable initiatives include the Lepar Hilir Biogas Power Plant and projects by the Malaysian Palm Oil Board (MPOB), FELDA, and Offshore Engineering. As a cornerstone of sustainable energy, biogas contributes to climate change mitigation and transforms low-cost feedstocks into sustainable chemicals (Kabeyi & Olanrewaju, 2022; Winquist et al., 2019). However, the industry's growth depends on technological innovation and a skilled, adaptable workforce.

Central to this is effective communication, which aligns goals, reduces errors, and builds trust (Hee et al., 2019; Saputra, 2021). Miscommunication, by contrast, leads to mistrust and inefficiency (Kalogiannidis, 2020). Additionally, leaders who communicate expectations clearly foster accountability and confidence (Musheke & Phiri, 2021).

Leadership also drives motivation and teamwork. Effective leaders enhance self-confidence and support employees in navigating complex tasks (Karimi et al., 2023). Adaptive leadership styles that address diverse needs further sustain engagement and loyalty (Paais & Pattiruhu, 2020). Complementing this is an agile work environment, which boosts creativity and satisfaction through flexibility and collaboration (Cappelli & Tavis, 2018).

Success in the biogas sector lies in the synergy between technology and human capital. Organisations that promote communication, leadership, and agility will build resilient teams and drive sustainable growth (Nguyen, 2023; Peeters et al., 2022).

PROBLEM STATEMENT

Work performance is essential to organisational success, reflecting employees' ability to meet tasks and contribute to goals. However, issues like inefficiency, burnout, and low motivation remain common (Gaba, 2025; Kuswati, 2020). Leadership and communication styles play a crucial role in shaping job satisfaction, motivation, and productivity (Eliyana et al., 2019). Effective leadership marked by empowerment and structured incentives boosts job commitment and performance (Ngwa et al., 2019; Yukl & Gardner, 2020), while adaptable leadership encourages innovation and growth in flexible settings.

Communication styles are equally vital. Supportive, transparent communication fosters trust, engagement, and collaboration, enhancing efficiency and organisational loyalty (Jang et al., 2021). Leaders who promote open dialogue create more positive, productive workplaces (Cooks-Campbell, 2022).

Yet, gaps remain in understanding how leadership and communication interact in agile environments (Brush & Silverthorne, 2022). This study explores their combined influence on employee performance, aiming to improve long-term engagement, well-being, and sustainable performance in today's dynamic workspaces.

LITERATURE REVIEW

Organisational culture theory

The Organisational Culture Theory provides a comprehensive lens for understanding how individuals collaborate, communicate, and function within a workplace environment

(He, 2025). It encompasses the shared values, beliefs, and norms that shape employee behaviours and attitudes (Dewar, 2025). Schein's (1985) multi-layered model comprising artifacts, espoused values, and basic underlying assumptions explains how culture operates at both visible and unconscious levels to influence employee performance. At its core, culture shapes how individuals perceive their roles and responsibilities, affecting motivation and work outcomes.

Research indicates that organisational culture acts as a mediating force between leadership practices and employee performance. Denison et al. (2006) found that leadership's impact is amplified when leaders actively shape a positive and consistent culture. Leaders influence change not only through policies but by embodying the values and assumptions they promote (Bagga et al., 2023).

A strong, positive culture boosts motivation, productivity, and job satisfaction (Praveena & Fonceca, 2023). It encourages cohesive behaviour and commitment to organisational goals. Therefore, cultivating an effective culture is not just an human resource initiative, it is a strategic imperative. Leaders who understand and manage organisational culture effectively are better positioned to drive employee performance and ensure long-term success (Denison et al., 2006; He, 2023; Dewar, 2025).

Leadership styles

Leadership has evolved significantly, moving beyond traditional hierarchical models toward more empowering and participatory approaches (Carvajal et al., 2023). Contemporary leadership is now viewed as an interactive process shaped by leaders, followers, and the organisational environment. Modern styles such as transformational and democratic leadership emphasise motivation, innovation, and employee satisfaction, making them better suited to today's dynamic workplaces (Prayogi & Lesmana, 2021).

Transactional leadership, rooted in structured goals and contingent rewards, is effective in stable environments where clear roles and outcomes are necessary (Cherry, 2025; Makinde, 2023). However, its reliance on corrective actions and limited innovation makes it less effective in promoting adaptability and long-term growth (Harris & Cha, 2022).

Transformational leadership, in contrast, inspires followers to exceed expectations by fostering trust, creativity, and shared purpose. It has been shown to enhance engagement and performance, particularly in Malaysia (Voordt & Jensen, 2023). Still, ethical concerns arise when charisma leads to manipulation or dependency (Ndege, 2014). Autocratic leadership centralises authority, enabling fast decisions but often leading to dissatisfaction, low morale, and resistance to change due to lack of empowerment (Oh et al., 2023; Rizvi, 2023). While useful in crises, it undermines innovation in the long term.

Democratic leadership promotes collaboration and inclusion, resulting in higher job satisfaction and creativity, however, its slower decision-making can reduce agility in fast-paced environments (Raghvendra & Vijayendra, 2024). Overall, no single style is universally ideal. Effective leadership depends on aligning style with context, organisational needs, and employee dynamics to foster sustainable performance and innovation.

Communication styles

Communication is a fundamental pillar of organisational success, directly impacting performance, growth, and employee productivity (Kalogiannidis, 2020). Effective

communication fosters motivation, skill development, and innovation, yet diverse communication styles present challenges in achieving universal effectiveness (De Santis, 2023; Dhillon & Kaur, 2021). Adaptive communication strategies are essential, as no single approach suits all situations (Kreitler, 2021). Passive communication is characterised by the reluctance to express needs or opinions, leading to self-neglect, reduced participation, and hindered team dynamics (Askew, 2023; Turk, 2023). It contributes to miscommunication, weak collaboration, and lower trust (Wilmot & Hocker, 2013), especially when displayed by leaders (Sharma, 2023).

Aggressive communication, defined by dominance and intimidation, damages interpersonal trust and team morale. It often fosters fear-based environments, stifling creativity and increasing stress and absenteeism (Maryani & Gazali, 2024; Shaharuddin et al., 2022; Syed et al., 2021; Talia et al., 2021). Passive-aggressive communication involves indirect negativity, such as sarcasm or procrastination, which undermines cooperation and weakens morale (Guy-Evans, 2023). This style often stems from unresolved conflict or fear, disrupting trust and clarity (Legood et al., 2021; Segreto, 2023).

Assertive communication, the most effective style, balances confidence with respect for others. It enhances trust, collaboration, and problem-solving, while promoting healthy workplace relationships and psychological safety (Jenkins, 2022; Moss et al., 2021). Although widely endorsed, assertiveness must be contextually applied, considering cultural norms and emotional intelligence. The ability to adapt communication styles is crucial for building resilient, productive organisations (Bel et al., 2018; Gupta, 2022).

Employees work performance

Work performance is a critical driver of organisational success, closely tied to employee motivation, commitment, and engagement. In project-based environments, low motivation can disrupt workflow and productivity; yet many organisations still overlook the importance of involving employees in decision-making processes (Bevan, 2012; Kuswati, 2020; Rehman et al., 2020). High-performing employees consistently exceed expectations, demonstrating adaptability and dedication that enhance customer satisfaction and create competitive advantage (Fuentes et al., 2020; Suknunan et al., 2022).

Performance is often evaluated by quantity, quality, efficiency, and policy compliance (Tuan et al., 2021), with those possessing specialised skills delivering higher quality outcomes (Kalogiannidis, 2020). The relationship between managers and employees also plays a significant role. Supportive leadership fosters a positive work climate that boosts morale and performance (Jena, 2021). Furthermore, alignment with organisational values enhances employee resilience and engagement (Ausat et al., 2022; Suharto et al., 2019). Ultimately, cultivating a workplace that values autonomy, communication, and growth opportunities translates employee potential into sustained performance and long-term organisational success (Ramaswamy et al., 2023; Saadeh & Suifan, 2020).

Agile work environment

Agile work environments prioritise responsiveness, collaboration, and value creation, making them ideal for industries facing rapid change (Brush & Silverthorne, 2022). Central to agile success is learning agility, the capacity to absorb and apply knowledge effectively in decision-making (De Meuse et al., 2010). Agile practices shift focus from rigid metrics like attendance to adaptability, continuous improvement, and outcomes (Fishleigh, 2017).

More than a set of tools, agility is a mindset that enables organisations to respond swiftly and effectively to change (Cinnioğlu, 2020). Leadership that fosters trust, consensus, and transparent communication enhances this adaptability (Lindskog & Netz, 2021).

In sectors such as biogas, agility supports innovation and sustainability amid regulatory and operational challenges (Johansson & Heide, 2008). Agile methods also reduce costs and improve well-being through flexible work models (Peeters et al., 2022). In engineering settings, iterative planning and cross-functional collaboration accelerate progress and precision (Gabriel et al., 2021). Ultimately, agility promotes resilience, helping organisations sustain performance and growth in uncertain environments (Crnogaj et al., 2022; Waseel et al., 2024).

Relationship between communication styles and agile work environment

Agile methodologies have emerged as a cornerstone in modern work environments, focusing on responsiveness, collaboration, and value creation in dynamic settings (Brush & Silverthorne, 2022; Gabriel et al., 2021). A crucial factor in their success is communication, which can either facilitate or hinder the interactions necessary within agile teams (Ibekwe, 2023). Research highlights that transparent and adaptable communication is vital for effective collaboration and coordination in such teams (Dühring & Zerfass, 2021). Beyond frequency, the quality and flexibility of communication is key to addressing challenges in real-time. Communication styles play a significant role in conflict resolution, with cooperative approaches enhancing team cohesion and performance (Lindsjörn et al., 2016). Thus, for agile transformations to succeed, communication strategies must foster transparency, continuous feedback, and adaptability, creating a culture of learning and improvement (Naslund & Kale, 2020). These strategies are integral to maintaining agility and driving organisational success. Based on these insights, we propose the hypothesis:

H1: Communication styles have a significant relationship with an agile work environment.

Relationship between leadership styles and agile work environment

Agile work environments, marked by adaptability and process flexibility, are essential in today's fast-changing business landscape (Attar & Abdul-Kareem, 2020). Leadership styles significantly influence the success of these environments, shaping innovation, collaboration, and outcomes (Siregar et al., 2023). Transformational leadership is especially effective, inspiring commitment to agile practices and fostering innovation through team cohesion and personal growth (Mani & Mishra, 2020). Similarly, democratic leadership promotes shared decision-making and autonomy, enhancing responsiveness and team collaboration (Üstgörül & Akkaya, 2020). In contrast, autocratic leadership, with its top-down control, hinders agility by limiting creativity and adaptability. These findings emphasise the importance of leadership styles that align with agile principles to optimise team performance. Despite these insights, further research is needed to explore the mediating role of agile environments. Thus, we propose the following hypothesis:

H2 :Leadership styles have a significant relationship with an agile work environment.

Relationship between agile work environment and employee work performance

The relationship between employee performance and organisational agility has gained increasing attention, especially in industries like biogas, where research remains scarce. Existing literature highlights the influence of workplace environments on employee performance across various organisational levels (Zhenjing et al., 2022). However, its impact on biogas industry employees specifically remains underexplored. Agile methodologies, which emphasise self-managing teams, collaboration, autonomy, and adaptability, contribute significantly to improved performance outcomes (Beck et al., 2001; Grass et al., 2020). These methodologies align tasks with client needs, leading to higher-quality results and positive employee attitudes. Moreover, positive work environments are shown to enhance productivity, with employees exhibiting higher performance due to increased motivation and commitment (Wang et al., 2022; Zhenjing et al., 2022). Agile work environments amplify this effect by providing conditions that foster project success (Serrador & Pinto, 2015). Based on these insights, we propose the hypothesis:

H3: Agile work environment has a significant relationship with employee work performance.

Relationship between communication styles and employee work performance

The impact of communication styles on employee work performance is pivotal for organisational success, yet it remains underexamined in industries like biogas (Diamantidis & Chatzoglou, 2018). Effective communication enhances performance by shaping how employees interact, which directly influences productivity (Iyer, 2023). Research highlights that open, respectful communication fosters collaboration, innovation, and smoother workflows, empowering employees to share ideas (Johnson & Brown, 2019). Conversely, negative communication, such as rudeness or disrespect, can severely hinder performance, causing discomfort and impeding teamwork (Lee et al., 2020). Therefore, organisations must cultivate a culture of inclusive, transparent communication to optimise employee performance. Poor communication practices, on the other hand, can undermine collaboration and overall success (Solitto & Cramer, 2016). Based on these insights, the hypothesis is proposed as below:

H4: Communication styles have a significant impact on employee work performance.

The relationship between leadership styles and employee work performance

Effective leadership is crucial in driving organisational success and directly influencing employee performance (Baig et al., 2019; Weston-Smyth, 2024). Leadership behaviours, including how leaders engage, motivate, and support their teams, significantly impact morale, productivity, and output (Weston-Smyth, 2024). Extensive research has shown that leadership styles, particularly transformational leadership, positively affect employee performance by fostering innovation, providing support, and creating an empowering environment (Wen et al., 2019). Transformational leaders inspire and motivate their

teams through vision and individualised attention, leading to greater job satisfaction and performance (Cherry, 2024). Conversely, autocratic or laissez-faire leadership styles are associated with lower employee satisfaction and higher turnover rates (Sanam, 2023). Additionally, the Situational Leadership Theory asserts that leaders who adapt their style to employee needs can enhance performance (Cherry, 2024). These findings underscore the significant impact of leadership styles on employee work performance, which led to the hypothesis:

H5: Leadership styles have a significant relationship with employee work performance.

Mediating effect of agile work environment in between communication styles, and employee work performance

Communication styles are crucial in agile work environments, significantly impacting employee performance and team effectiveness. Once considered a basic skill, communication now drives organisational adaptability and success (Kalogiannidis, 2020). Agile teams must balance rapid communication with the risk of misunderstandings or overload (Yermolaieva, 2020), making effective communication essential for cohesion and productivity. Adapting to diverse communication preferences enhances collaboration and problem-solving. Dühning and Zerfass (2021) noted that strong communication supports innovation through faster decision-making and adaptability. Moreover, employees with high organisational commitment are more engaged and capable of managing tasks effectively, leading to better outcomes (Park et al., 2022; Suharto et al., 2019). Despite these findings, few studies have examined how agile work environments mediate these dynamics. Therefore, the following hypothesis is proposed:

H6: Agile work environment has a mediating effect between communication styles and employee work performance.

Mediating effect of agile work environment in between leadership styles, and employee work performance

The workplace environment significantly influences employee performance, particularly in agile settings that demand flexibility and responsiveness (Kazancoglu et al., 2022). Leadership styles are central to this, with adaptive approaches like servant leadership enhancing autonomy, morale, and empowerment (Fischer & Charef, 2022). In agile environments, leaders act as facilitators, building trust and accountability while empowering teams. Inclusive leadership strengthens collaboration, transparency, and resilience, enabling effective management of complex, fast-paced tasks (Joseph, 2024). Leaders who promote open communication and creativity foster continuous improvement and high performance (Supriyanto et al., 2023). These approaches also boost motivation and job satisfaction, driving sustainable organisational success. However, limited research has explored the agile work environment as a mediating factor. Therefore, this study proposes the following hypothesis:

H7 :Agile work environment have a mediating effect in between leadership styles and employee work performance.

The relationship between leadership styles, communication styles and employee work performance in a biogas company: Agile work environment as a mediating factor

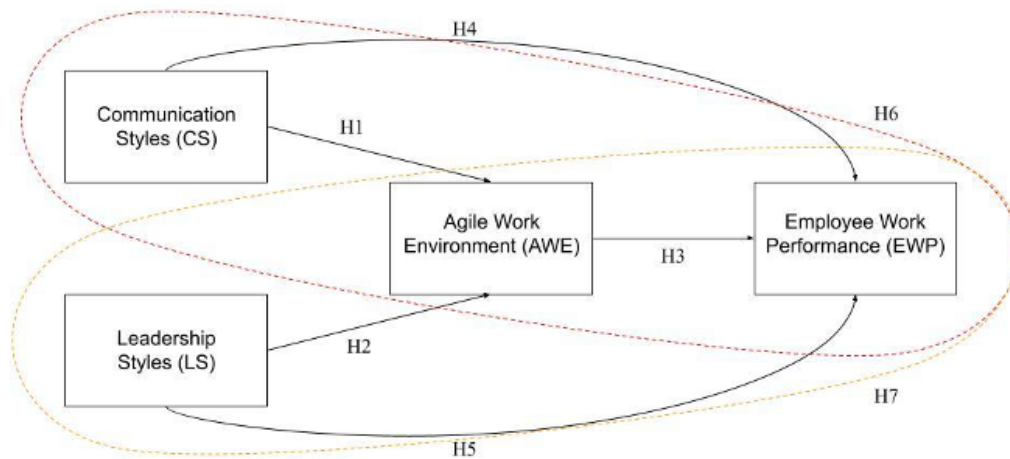


Figure 1. Conceptual framework

METHODOLOGY

This study employed a quantitative research design with data analysed via SPSS. A structured questionnaire with Likert-scale items, adapted from various scholars, was emailed in English to 344 randomly selected respondents from a company and its affiliates (total workforce ~550). The sample size follows recommendations by Krejcie and Morgan (1970) as well as Cohen and Krejcie (1975).

Table 1. Adapted questionnaire items

Variables	Items	Sources
Communication Styles	CS1, CS3, CS6	Raslie (2021)
	CS2, CS4, CS5	Bocar, A. C. (2017)
	CS7, CS8	Travers, W. G. (2024)
Leadership Styles	LS1, LS3, LS4, LS5, LS6, LS7, LS8	Northouse, P. G. (2020)
	LS2	Ismail et al. (2010)
Employee Work Performance	EWP1, EWP2, EWP3, EWP4, EWP5	Liu et al. (2020)
Agile Work Environment	AWE1, AWE2, AWE3	Crnogaj et al. (2022)
	AWE4, AWE5	Saeed et al. (2024)

This study employed Pearson’s correlation to examine the strength and direction of relationships between communication styles, leadership styles, employee work performance, and the mediating role of the agile work environment. To assess mediation effects, the PROCESS macro by Hayes (2013) was used, allowing accurate estimation of direct and indirect effects with confidence intervals. Reliability and validity tests were conducted during both pilot and actual phases. Cronbach’s alpha values ranged from 0.573 to 0.816, indicating acceptable reliability; lower values were retained to preserve construct validity (Chan et al., 2020).

The Kaiser-Meyer-Olkin (KMO) values ranged from 0.608 to 0.815, confirming sampling adequacy and construct validity. Normality tests based on skewness and kurtosis showed that all variables were approximately normally distributed, with slight left skewness suggesting a tendency toward higher ratings. Employee work performance

(EWP) and agile work environment (AWE) had moderate skewness, but their kurtosis values indicated acceptable variability without extreme outliers. Overall, the analysis supports the robustness and appropriateness of the measurement and analytical tools used.

Table 2. Skewness and kurtosis for all variables

Variables	Mean	Skewness		Kurtosis	
	Statistics	Statistics	Std. Error	Statistics	Std. Error
CS	32.4383	-0.558	0.135	-0.598	0.270
LS	32.8858	-0.606	0.135	-0.575	0.270
EWP	20.0556	-1.088	0.135	-0.847	0.270
AWE	20.2500	-1.010	0.135	-0.836	0.270

FINDINGS AND DISCUSSION

Descriptive analysis of respondents

The respondents in this study consisted of 344 individuals, comprising 59% male (203) and 41% female (141). Age distribution revealed that 49.1% were between 21 and 30 years, 32.3% were between 31 and 40 years, 12.8% were between 41 and 50 years, and 5.8% were above 50 years. Regarding job positions, 41.9% were non-executive staff, 25.3% were executives, 17.7% were managers, and 6.7% held general manager roles. This diverse sample provides a broad perspective on the relationship between leadership, communication styles, and employee work performance across various demographic groups and organisational positions.

Table 3. Descriptive analysis of respondents

Item	Category	Frequency	Percentage (%)
Gender	Male	203	59.0
	Female	141	41.0
Age	21 – 30 years	169	49.1
	31 – 40 years	111	32.3
	41 – 50 years	44	12.8
	Above 50	20	5.8
Job Position	Non-Executive	144	41.9
	Executive	87	25.3
	Manager	61	17.7
	General Manager	23	6.7

Relationship between communication styles and agile working environment

The study found a moderate correlation between communication styles and the agile work environment ($r = 0.328$, $p = 0.001$), suggesting communication plays a supportive but not dominant role. While it enhances coordination and decision-making, agility relies more on adaptability, transparency, and iterative feedback than hierarchical communication. This supports prior research emphasising that successful agile practices require comprehensive

strategies beyond communication alone (Dühring & Zerfass, 2021; Gabriel et al., 2021; Naslund & Kale, 2020).

Relationship between leadership styles and agile working environment

The study revealed a moderate correlation between leadership styles and agile work environments ($r = 0.410$, $p = 0.001$), highlighting leadership's crucial role in supporting agility. Transformational and democratic styles enhance autonomy, creativity, and collaboration, aligning with agile principles (Gutiérrez et al., 2022; Üstgörül & Akkaya, 2020). In contrast, autocratic leadership hinders agility due to its rigidity (Jony et al., 2019). These findings affirm that effective leadership is key to fostering adaptability and engagement in agile work settings.

Relationship between agile working environment and employee work performance

The study found a moderate positive correlation between the agile work environment and employee performance ($r = 0.429$, $p = 0.001$), indicating that agility enhances adaptability, collaboration, and productivity. Supported by Grass et al. (2020) and others, agile practices boost morale, job satisfaction, and goal alignment, fostering continuous improvement and commitment.

Relationship between communication styles and employee work performance

The study revealed a moderate correlation between communication styles and employee performance ($r = 0.299$, $p = 0.001$), suggesting a modest yet significant impact. Effective communication enhances job satisfaction and innovation (Johnson & Brown, 2019), while poor communication hampers morale (Moon & Morais, 2023). However, performance is also influenced by leadership, culture, and job design (Dettling, 2023; Diamantidis & Chatzoglou, 2018).

Relationship between leadership styles and employee work performance

The study found a moderate to strong correlation between leadership styles and employee performance ($r = 0.446$, $p = 0.001$), highlighting leadership's vital role in enhancing productivity and engagement. Transformational leadership fosters motivation, cohesion, and innovation (Baig et al., 2019; Cherry, 2023), while autocratic or laissez-faire styles hinder performance (Sanam, 2023). These results support the Situational Leadership Theory, emphasising adaptive leadership tailored to team needs for optimal outcomes.

Table 4. Pearson correlation analysis for each variable

Hypothesis	Variables	Pearson Correlation (r)	Sig.
H1	CS → AWE	0.328	< 0.001
H2	LS → AWE	0.410	< 0.001
H3	AWE → EWP	0.429	< 0.001
H4	CS → EWP	0.299	< 0.001
H5	LS → EWP	0.446	< 0.001

Mediating effect of agile work environment on communication styles and employee work performance

The study found that the agile work environment significantly mediates the relationship between communication styles and employee performance ($b = 0.1068$). Communication's impact on performance is amplified in agile settings, as confirmed by a bootstrapped confidence interval excluding zero. Agile practices marked by transparency, collaboration, and rapid decision-making enhance communication's effectiveness (Yermolaieva, 2020). These findings underscore how agile environments strengthen communication's role in improving productivity, creativity, and problem-solving (Dühring & Zerfass, 2021; Kalogiannidis, 2020).

Mediating effect of agile work environment on leadership styles and employee work performance

The Hayes Process Macro analysis confirmed that the agile work environment significantly mediates the relationship between leadership styles and employee performance. Hypothesis 7 showed an indirect effect ($b = 0.1068$) and Hypothesis 8 ($b = 0.1027$), with both confidence intervals excluding zero. These findings highlight the agile environment's role in enhancing leadership effectiveness by promoting adaptability, collaboration, and empowerment (Üstgörül & Akkaya, 2020), making it essential for optimising team performance and organisational success.

Table 5. Hayes process macro analysis results

Hypothesis	Variables	Indirect Effects (b)	BootLLCI	BootULCI
H7	CS → AWE → EWP	0.1068	0.1573	0.0630
H8	LS → AWE → EWP	0.1027	0.1559	0.0545

IMPLICATIONS AND CONCLUSION

Research contributions

This study advances the Organisational Culture Theory by showing how leadership and communication styles foster agile, high-performing cultures, especially in innovation-driven sectors like biogas. It identifies the agile work environment as a key mediator linking flexibility, trust, and performance. Practically, it offers strategies for enhancing workplace culture through inclusive leadership, clear communication, and employee autonomy. Methodologically, it contributes robust tools, such as segmented leadership behaviours and a comprehensive Likert scale, to deepen understanding of leadership's impact on organizational outcomes.

Research limitations and recommendations

This study provides valuable insights into agile work environments but has several limitations. Its broad approach may overlook industry-specific nuances, and the exclusion of working culture, peer communication, and technological tools restricts understanding of key agility factors. The use of a cross-sectional, quantitative method limits depth and fails to capture evolving behaviours. Additionally, its focus on the biogas sector reduces generalisability. Future research should adopt mixed-method and longitudinal approaches

with more diverse samples to offer deeper, more applicable insights into agile practices and leadership across different organisational contexts.

Conclusion

This study highlights the critical role of communication and leadership styles in shaping employee performance, with the agile work environment serving as a key mediator. Adaptive leadership and transparent, trust-based communication foster engagement and satisfaction, while agility—marked by flexibility and collaboration—amplifies these effects. Leadership that promotes inclusivity and communication that encourages collaboration create conditions for improved performance. The findings underscore the need for organisations to cultivate an agile culture that supports continuous improvement and responsiveness. This research offers valuable insights for both theory and practice, providing a framework for enhancing leadership and communication strategies to drive employee success in fast-paced, competitive environments.

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