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The Importance of Emotionally Intelligent Artificial Intelligence in Improving Remote Team Performance: A Mediation-Moderation Model

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Abstract

The present research aims to investigate the role of AI-EI in enhancing remote team outcomes through a mediation-moderation framework. Drawing on literature around emotion AI, virtual leadership, and digital maturity, five hypotheses were developed to test direct, indirect, and conditional relationships. A quantitative, cross-sectional survey (n = 150) that involved leaders was analyzed using regression and PROCESS macro techniques in SPSS. Results showed that AI-EI tools alone do not directly impact performance (H1 rejected), but marginal support was found for their influence on leadership effectiveness (H3) and moderation by digital maturity (H4). Mediation (H2) and moderate mediation (H5) were unsupported. The study concludes that AI-EI's value lies in contextually enabled, human-led leadership integration. Moreover, the study has theoretical implications on AI-human leadership integration by testing a sophisticated, socio-technical model of AI-EI tools, virtual leadership, and digital maturity. Furthermore, the research practically contributed to HR practitioners and digital transformation leaders to manage advanced AI practices for improved remote team performance.

Keywords: Artificial intelligence, Emotional Intelligence, Virtual leadership, Leadership effectiveness, Remote team performance.

1 Introduction

The rapid evolution of the workplace environment due to the COVID-19 pandemic has made remote work a standard practice across all industries (Enaifoghe & Zenzile, 2023; Wang et al., 2021). As teams become more geographically dispersed, organizations face unique challenges in fostering cohesion, productivity, and innovation among remote workers (Almazrouei et al., 2025; Chinyuku & Qutieshat, 2025). One of the significant challenges of digital collaboration is to create the requisite depth of emotions and dynamics that are typically found in person. Traditionally,

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emotional intelligence (EI) has been recognized as crucial to leader effectiveness, influencing team members' morale, communication quality, and performance (Liu et al., 2024). In this new era, however, the emergence of emotionally intelligent artificial intelligence (AI-EI) tools presents new opportunities for enhancing leaders' virtual leadership and the effectiveness of remote teams.

Emotion AI tools, which include sentiment analysis tools, AI-driven coaching agents, and emotion recognition software, are becoming increasingly commonplace in organizational toolkits (Plotkina & Sri Ramalu, 2024). They are not intended to replace human leaders, but rather to help expand their emotional capabilities when leading distributed teams (Almutairi, 2025; Al-Ani et al., 2011). Human resource management and team leading now involve the use of these tools as part of the larger trend of empathy-driven models of performance in organizations where AI is used not only as a method of automation but as a way to influence emotional decision-making (Bader & Kaiser, 2019; Babashahi et al., 2024). However, the real implications of Emotion AI on team performance remained as research gaps to be examined, particularly in virtual environments (Vistorte et al., 2024).

While existing literature has begun to explore the intersection of AI and human leadership, the central section of the literature has concentrated on issues of task automation, efficiency, and upskilling versus emotional augmentation, as well as the effectiveness of leadership at a distance (Schulthei & Lewandowski, 2020; Teixeira & Pacione, 2024). For example, Kleinrichert (2024) evaluated the value of tools and how different AI-based tools can help humans expand their thinking capacity during decision-making and managerial actions (Aziz et al., 2025) however, they noted the alarming gap in the form of a lack of research studies focused on how AI-based tools can inform relational interactions in virtual teams (Darban, 2025; Woolley et al., 2023). Additionally, much of the organizational literature on AI tends to focus on static single-layer relationships between technology and professional outcomes, contraventing the complexities of interactions mediated by leadership style and moderated by organizational culture (Darban, 2024; Liu et al., 2024).

Moreover, the existing literature has supported the positive impact of digital maturity on remote working success; however, the role of digital maturity as a moderating variable in the AI-driven leadership model has remained unexamined by previous researchers. Jensen et al. (2019) emphasized the effectiveness of digital transformation initiatives in supporting readiness and organizational culture to succeed; however, the study identifies a literature gap in examining the role of the AI-EI tool used to drive this success (Darban, 2025; Mosleh et al., 2024). Furthermore, Schulthei & Lewandowski (2020) highlighted that the empirical work exploring how virtual leadership effectiveness might mediate relationships between teams' use of AI-EI tools and teams' performance still holds a substantial literature gap in the existing literature (Tîrnăcop, 2023). The model is theoretically valid, but the relevant agents have not empirically supported the mediation pathway (Mollah et al., 2024). The literature gaps present a significant opportunity for the present research to explore the multi-layered understanding of how emotionally intelligent AI can help teams to be successful through remote work practices.

Considering these gaps, this research aims to investigate how artificial intelligence-enabled emotional intelligence (AI-EI) tools are used and their impact on team performance in remote work situations. More specifically, it will evaluate whether AI-EI tools' impact is mediated by the effectiveness of their virtual leadership practices (Saddam & Anvari, 2025), which was operationalized as employees' perceptions of support, trust, adaptability, and communication quality, and whether organizational digital work culture maturity moderated this influence (Saddam & Anvari, 2025). In this study, digital work culture maturity is defined as the extent to which values, policies, and technological readiness around remote-first work are integrated into the organization's identity (Mollah et al., 2024).

As organisations continue to re-conceptualise leadership models in response to the emergence of GenAI, they must understand how AI-EI tools will impact dynamics relevant to team performance. The research presented in this study will respond to this need by providing a timely evaluation of how emotionally intelligent AI works as more than digital assistants, performing a strategy to augment performance in virtual work contexts for better employee and teamwork performance.

2 Literature Review and Hypothesis

2.1 Adoption of AI-Driven Emotional Intelligence (AI-EI) Tools

Artificial Intelligence is an ever more critical component in creating value in decision-making for individuals and organizations (Teixeira & Pacione, 2024). Emotion AI, as a narrow subset of that shift, encompasses tools that can recognize, interpret, and respond to people's emotional states through natural language processing, facial expression analysis, and sentiment detection (Babashahi et al., 2024). These Emotion AI tools and applications are being developed for managers and HR professionals to assist them with collecting feedback, reviewing it, interpreting it, and aiding in coaching their employees, particularly in remote employee settings (Almutairi, 2025).

Emotionally intelligent AI is a form of Artificial Emotional Intelligence (AEI) that focuses particularly on the factors of AI processing through the interpretation, perception, and stimulation of human emotions. This form of AI regulates through systems that integrate natural languages and emotional cues to better interact with and understand human emotions in the workplace (Babashahi et al., 2024).

The ability of AI-EI tools to extract emotional signals from text or video calls can help leaders assess team morale, stress, and interpersonal relationship factors that are challenging to evaluate in virtual teams (Shin et al., 2021). New research from Ivanov and Webster (2017) emphasizes the increased use of AI-EI tools in remote management, and the potential for emotionally intelligent AI tools to serve as 'catalysts of empathy', thereby improving leader-follower alignment relative to team needs. However, while exciting, studies assessing the direct effects of AI-EI tool implementation on team-level outcomes are limited, underscoring the need for further research.

H1: *The adoption of AI-driven emotional intelligence (AI-EI) tools is positively related to remote team performance.*

2.2 Remote Team Performance

Team performance in remote forms of team collaboration can be evaluated by several indicators, including output, quality of collaboration, innovative potential, and task completion (Wang et al., 2021). Virtual teams often experience impaired communication, bandwidth loss, and coordination failures, which can act as barriers to performance (Choudhury et al., 2021). If the leadership approach is framed in terms of engagement, communication, and mediation, then there are multiple avenues to resolving these barriers (Ford et al., 2021).

While utilizing technology to enable and support remote collaboration has been well-documented, a more recent area of team performance research focuses on the significance of AI integration using indicators of indexical emotional intelligence (AI-EI), an emergent and relatively unexplored area (Mosleh et al., 2024; Orlikowski, 2000). AI-EI indicators offer opportunities for relational understanding, timely feedback, and within-individual support, all of which are crucial to remote team performance (Liu et al., 2024). This advancement opens even further options for performance examination incorporating AI-EI.

In addition, high-performing remote teams are also characterized by the emotional and cognitive connections among team members; they describe their shared accountability for purposeful adaptive actions in response to stressors, distractions, or interruptions in the workplace (Gibson &

Gibbs, 2006). Therefore, AI-EI systems may facilitate the management of emotional connectivity that is most difficult to achieve in distributed contexts (Ford et al., 2021), thereby underpinning their relational dynamics and awareness of others. In practice, emotion-aware interfaces are tools that provide leaders with an understanding of team sentiment and their levels of engagement with the provided task. These tools serve as direct means of performance measurement, facilitating proactive leadership, burnout avoidance, and articulating team members' needs more responsively (Vicci, 2024). Furthermore, these tools facilitate equitable voice and inclusion, were certain types of personalities or roles previously dominated engagement and interaction, influencing relational dynamics in a virtual environment.

Contrary to traditional performance variables such as task completion and timelines, contemporary understandings of remote team success increasingly emphasize holistic team health—encompassing emotional health, inclusivity, resilience, and adaptability—and AI-EI tools can provide significant support for this form of evaluation. Therefore, understanding how the tools influence the breadth of remote team performance variables (outcomes, outputs, productivity, etc.) has implications for both theory and application in digital working design.

2.3 The Mediating Role of Virtual Leadership Effectiveness

Effective virtual leadership resolves the emotional and structural boundaries that exist in remote teams. Leaders who demonstrate empathy, flexibility, and excellent communication skills have a profound impact on employee engagement and the level of trust (Hoch & Kozlowski, 2014). In virtual contexts, emotional intelligence becomes a mandate for leadership; however, most leaders struggle to identify people's emotions across screens.

AI-EI tools may reduce these pressures by increasing the leader's capacity to "read the room", even if done at a distance (Perifanis, 2023). Combined with their team management practices, AI-EI tools can improve subordinates' perceptions of leadership quality and responsiveness. There is literature to support the substantial effects of leadership; specifically, Bartsch et al. (2021) found that an emotionally attuned leadership style is associated with higher team morale and greater performance potential in digitally mediated contexts.

Currently, AI-EI tools utilizing affective computing, natural language processing, and sentiment analysis signal a new way of supporting leaders by providing emotional data to help them understand their emotional cues and respond to them effectively (Brennan, 2024). These AI-EI tools can improve a leader's ability to "read the room" and adjust their communication accordingly (Perifanis, 2023). For example, an emotionally intelligent system can prompt leaders when their team's activity is associated with stress or disengagement, allowing them to plan accordingly and intervene (Derks et al., 2021). When combined with practical team management tools, the research would expect that AI-EI tools will potentially provide better team-subordinate perceptions of leadership quality, empathy in leadership, and responsiveness, leading to improved virtual leadership outcomes.

There is also a growing base of empirical evidence regarding the role of emotionally attuned leadership style on remote team processes. Bartsch et al. (2021) found that emotionally intelligent leadership styles significantly predict team morale, trust, and task performance during work-based virtual experiences. Van Wart et al. (2019) found that digital leadership capabilities, including virtual empathy and virtual adaptability skills, are also essential for maintaining performance and cohesion in remote settings (Babashahi et al., 2024; Teixeira & Pacione, 2024). Tending to the emotional needs of the team (emotionally) and clarifying communication (leadership) are two dimensions where leadership quality more readily differentiates remote team performance in terms of satisfaction, job performance, collaboration, and conflict resolution styles (Contreras et al., 2020).

Moreover, studies indicate that leader effectiveness acts as a mediator between technology and team performance. Sharma and Kirkman (2015) noted that the implementation of transformational leadership may be a primary ingredient in leveraging digital collaboration tools to achieve performance outcomes. Involving good intentional communication of team goals, empathy, inclusivity, and servant leadership are all leveraged when leaders utilize their own AI-EI systems, affecting outcomes (Zampieri, 2019).

Thus, in summary, AI-EI tools enhance a leader's ability to lead virtually (H3), which in turn mediates the relationship between the adoption of these tools and team performance (H2).

H2: *Effectiveness of virtual leadership mediates the relationship between AI-EI tool adoption and remote team performance.*

H3: *AI-EI tool adoption is positively associated with effective virtual leadership.*

2.4 Moderating Role of Digital Work Culture Maturity

Digital work culture maturity refers to an organization's ability to develop digital-first habits, values, and infrastructure in its work practices. As Mollah et al. (2024) suggest, organizations with a mature digital work culture tend to be more agile in adopting advanced technologies, are generally more progressive and adaptive to employee needs, and have adopted or engaged with AI tools that are not only deployed but also trustfully adopted or maximally engaged with (Bankins & Formosa, 2023; Glikson & Woolley, 2020).

Digital maturity also impacts leadership behaviors, and it is stated that digital maturity would likely make leadership roles easier (by having clearer digital communication and norms) and develop trust (with more IT competence within the organization), with models or structures for remote collaboration (Vivek & Krupskyi, 2024; Tarafdar et al., 2023). Alternatively, in low digital maturity scenarios, the benefits would rarely be realized because of the barriers of adoption, training, and integration (the benefits of the AI-EI tool are unlikely to be realized). Therefore, the research propose that digital work culture affects the degree to which AI-EI tools contribute to virtual leadership effectiveness.

Organizations with greater digital work culture maturity provide a safe and supportive environment for the effective deployment and adoption of intelligent technologies, including AI- and EI-based tools. Studies show that digital maturity enhances leadership effectiveness by providing smoother digital communication channels, improving decision-making through real-time data, and fostering a culture of innovation (Hoch & Kozlowski, 2014; Westerman et al., 2014). Organizations that recognize and invest in digital training, upskilling, and infrastructure development typically share common norms and practices of virtual collaboration, which further enable leaders to manage and demonstrate empathy, as well as respond appropriately in hybrid or remote situations (Bharadwaj et al., 2013; Huang et al., 2019).

Overall, these factors amplify the overarching influence and impact of AI-enhanced leadership practices. On the other hand, if the digital maturity environment is low, technological resistance, distrust of its capacity to enhance, and the absence of maximizing their digital tools negatively influence leadership effectiveness even in the context of having access to AI-EI systems (Vial, 2019). Thus, digital work culture maturity may provide the initial foundation for using an AI tool, but also a leverage to provide greater outcomes based on their technology and leadership objectives.

H4: *Digital work culture maturity positively moderates the relationship between AI-EI tool adoption and virtual leadership effectiveness; the relationship is stronger in organizations with high digital maturity.*

2.5 Moderated mediation and integrated effects

Integrating the components discussed above, the study presents a moderated mediation model, where the indirect effect of AI-EI tools on remote team performance (through virtual leadership effectiveness) is contingent upon the maturity of digital work culture. Advanced leadership frameworks propose that technological tools are rarely used independently of leadership behavior and cultural background (Avolio et al., 2014). A higher level of digital maturity enhances the positive influences of AI-EI technology-enhanced leadership, thereby increasing its impact.

Theoretical foundations for moderated mediation models are derived from contingency and socio-technical systems theories. They suggested that the results of technology adoption depend on the organizational context and the relationships between leaders and their workforce (Bostrom & Heinen, 1977; Orlikowski, 2000). When an organization displays a high level of maturity regarding digital work culture, enhanced readiness, and digital norms, as well as blended workflows, it is more likely to utilize AI-EI tools to their fullest extent. As a result, its leaders receive high levels of emotional support, timely feedback, and personalized virtual management. When contextual factors are supportive, they enhance the mediating role of virtual leadership effectiveness, which in turn improves remote team outcomes (Kane et al., 2015). When an organization has a poorly developed digital culture, the leadership's tensions or challenges associated with relying on AI-EI tools are likely limited, thereby undermining the overall contribution of AI-EI tools to performance. In this way, digital work culture maturity acts as a contextual amplifier that defines the strength of the indirect pathway between AI-EI adoption and team outcomes.

H5: *The indirect effect of AI-EI tool usage on remote team performance through virtual leadership effectiveness is moderated by digital work culture maturity, such that the mediated relationship is stronger at higher levels of digital maturity.*

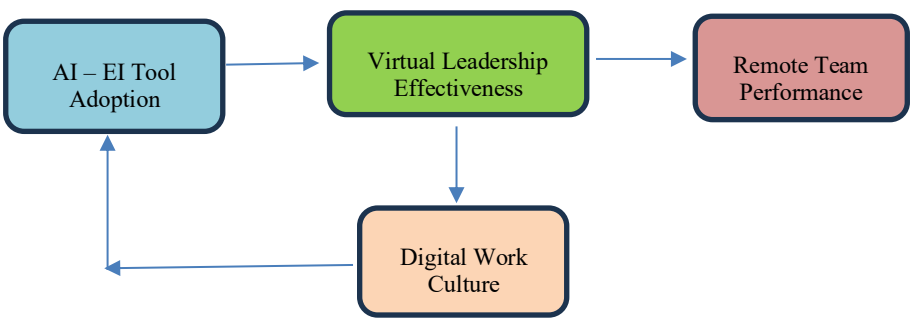

Figure 1: Conceptual framework illustrating the moderation, mediation model of AI-EI tool adoption, virtual leadership effectiveness, and remote team performance

Figure 1 illustrates the conceptual framework of this research, presenting a moderated mediation model that provides insight into how AI-EI tools influence remote team performance. The key idea in the framework is that AI-EI tools (i.e., sentiment analysis, facial expression detection, and natural language processing) influence outcomes in organizations by enabling virtual leadership that can communicate with empathy. This relationship was modeled as a mediation, in which the AI-EI tools do not have a direct impact on team performance, but rather allow leaders to communicate with more empathy, provide relevant and personalized feedback, and facilitate interpersonal relationships within virtual teams (Bankins & Formosa, 2023; Maldonado & Márquez, 2023).

Having emotionally intelligent leadership in the virtual context is even more important because

the normal visual and auditory emotional cues may be diminished or absent altogether in digital communication (Purvanova, 2014). AI-EI tools augment emotional cue awareness, enabling leaders to "read the room" even when communicating through screens (Perifanis, 2023). Therefore, AI-EI tools enhance leaders' ability to build trust, decrease social distance, and foster psychological safety —three essential ingredients for facilitating cohesive teams in remote contexts (Contreras et al., 2020; Glikson & Woolley, 2020).

The moderating factor discussed in the framework is the digital work culture maturity which presents a boundary condition that moderates the strength of the relationship (effect) between the adoption of AI-EI tools and the effectiveness of virtual leadership. Digital maturity relates to the extent to which the organization has embraced digital-first culture, behaviors and infrastructure to enable virtual work (Mollah et al., 2024; Westerman et al., 2014). Organizations with higher digital maturity are more likely to adopt, integrate and leverage AI-EI tools because of the presence of digital infrastructure, user readiness and positive normative components (Vial, 2019). In organizations with less digital maturity, even the most perfectly engineered AI tools may fail to provide the mediating influences that lead to effectiveness, because of resistance to change, insufficient technical competency and misalignment with organizational culture.

The moderated mediation model acknowledges that the effectiveness of AI-EI tools may not be uniform - that there is an underlying contextual dependence. The relationship between technology and culture is more significant in remote work settings, where reliance on digital methods for work becomes heightened and traditional face-to-face management and interaction are nonexistent (Cascio & Montealegre, 2016). The model advances understanding about digital leadership by bringing together emotional intelligence, technological augmentation of leadership, and an organizational context into a single explanatory model.

In summary, the framework suggests that utilization of AI-EI tools can be used to indirectly improve the performance of a remote team through better virtual leadership, moderated by the level of digital work culture maturity. This provides a more fluid and realistic portrayal of how digital tools and organizational context impact leadership behaviors and team outcomes in the evolving world of work.

3 Research Methods

3.1 Sample and data collection procedures

The nature of this study is quantitative and cross-sectional, investigating the impact of Artificial Intelligence-based Emotional Intelligence (AI-EI) on remote team performance, mediated by virtual leadership effectiveness, and moderated by digital work culture maturity. As the study has both exploratory and explanatory purposes, a structured survey method is selected as the best way to collect standardized data for conducting statistical mediation-moderation analysis, which will be analyzed using SPSS software. The population for this study includes employees within remote or hybrid teams with organizations that utilize technology and employ AI-EI tools, such as sentiment analysis, emotion-detection dashboards, or NLP-based coaching programs, in their work processes. The participants are selected based on their previous experience in the field of Artificial Intelligence. Furthermore, they are selected to examine the effectiveness of virtual leadership style in maintaining their performance, as the study aims to understand employees' perspectives, such as how their leaders utilize advanced AI techniques and manage the remote team performance of employees.

This study employed a non-probability, purposive sampling process to ensure participation from individuals familiar with the use of AI tools within their teams. The expectation was to collect a minimum of 250 responses, which was considered acceptable for SEM-based mediation and interaction analysis in SPSS (Hayes, 2018). Data were collected using a structured questionnaire that contained demographic items and Likert-scale constructs related to the variables measured in

this study's conceptual framework. Each of the latent constructs was operationalized using validated items from previous literature, with adjustments to the original wording to make them relevant to the study context. The responses for the constructions will use a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The instrument, comprising a total of 12 items, consisted of 4 demographic items and 8 items based on the constructions described below.

3.2 Measures

IBM SPSS Statistics (version 26) was used to analyze all data. Data cleaning, normality, and outlier analyses were the first steps in the analysis. Internal consistency was verified using Cronbach's alpha ($\alpha \geq .70$) for multi-item constructions, including AI-EI tool adoption, the effectiveness of virtual leadership, team performance, and digital maturity. After assessing basic relationships using descriptive statistics and Pearson correlations to check for multicollinearity, various linear and hierarchical regression analyses were performed to test the hypotheses. Simple regression was used to test the direct effects (H1, H3), and mediation (H2) was tested. Moderation (H4) was analyzed using hierarchical regression using mean-centered predictors and an interaction term (AI-EI × Digital Maturity), and for moderated mediation (H5) separate mediation models were run for high and low digital maturity subgroups based on a median split comparison of indirect effects. All analyses were performed using a threshold of $p < .05$.

This study has complied with ethical standards in human research to uphold the rights and protection of participants and data. Participation was voluntary, and Amendment 14 required informed consent to be collected digitally before participants completed the survey. All respondents were assured that their responses would be kept confidential and anonymous, and no identifiable information would be collected. Data was kept in a secure location and used exclusively for academic purposes. Ethical approval was obtained from the institution's ethics research board prior to data collection. The study adhered to the ethical principles outlined in the Declaration of Helsinki and met all requirements for research involving human subjects.

4 Results

Table 1: Correlation and descriptive statistics

	1	**2**	**3**	**4**	**5**	**6**	**7**
1. Age	—						
2. Gender	0.079	—					
3. Industry	-0.026	-0.047	—				
4. IV_AI_EI	-0.075	-0.029	0.03	—			
5. MV_VLE	-0.074	-0.128	-0.068	0.146	—		
6. DV_RTP	-0.053	-0.12	0.066	0.009	0.041	—	
7. MODV_DWCM	0.021	-0.121	.199*	-0.07	-0.064	-0.062	—
Mean	2.51	1.48	2.78	4.15	3.08	2.98	3.02
Std. Deviation	0.939	0.501	1.186	1.33	0.995	1.043	0.768

Notes: n = 150; p < .05 (2-tailed)

Table 1 presents the descriptive statistics, along with Pearson correlations among all significant variables. The results suggest there are no serious multicollinearity or issue relations. Most correlations were weak and not significant; however, there are some interesting results. First, digital work culture maturity (MODV_DWCM) was positively correlated with industry type ($r = .199$, $p < .05$), indicating that there were industry differences in terms of digital readiness. AI-EI adoption (IV_AI_EI) was also found to have a weak positive correlation with virtual leadership effectiveness (MV_VLE; $r = .146$), supporting our prior comments about a relationship to

Hypothesis 3. AI-EI was found to have only a weak correlation with team performance (r = .009), which may imply there are limited direct effect relationships, as predicted by the mediation model as outlined by Bartsch et al. (2021), and Liu et al. (2024).

Table 2: Regression Analysis for Predicting Remote Team Performance from AI-EI

Statistic	Value
Model Summary	
R	0.009
R^2	0
Adjusted R^2	–.007
Std. Error of the Estimate	1.047
ANOVA	
F	0.011
Sig. (p-value)	0.917
Coefficients	
Constant (Intercept, B_0)	2.949***
IV_AIEI (Slope, B_1)	0.007
Beta (Standardized)	0.009
t-value	0.104
p-value	0.917

*N (Sample Size) 150; ***p < .001*

Table 2 examined Hypothesis 1, which indicated that AI-EI tool adoption would significantly predict remote team performance. The output from the regression model suggests that AI-EI tool adoption was not a significant predictor of remote team performance (B = .007, p = .917), and R^2 approached 0. Performance outcomes are far more complicated, and AI-EI adoption on its own does not have a direct effect. For future research, the next step will be to add mediators or moderators to the model, as suggested by Vicci (2024) and Perifanis (2023).

Table 3: Mediation results (PROCESS macro-Model 4)

Predictors	MV_VLE (Mediator)	DV_RTP (Outcome)	
IV_AI_EI (Independent Variable)	.109 (†)	0.002	
MV_VLE (Mediator)	—	0.042	
R^2	0.021	0.002	
† p = .0749 (marginally significant)			
Indirect Effect via MV_VLE			
Effect	**Bootstrap SE**	**LLCI**	**ULCI**
0.0046	0.0112	–.0165	0.0305

Direct Effect (IV_AI_EI → DV_RTP); Effect = .0021, SE = .0653, p = .9744

Table 3 discusses Hypothesis 2, which examines the mediating role of VLE in AI-EI adoption on team performance as the outcome. In examining the full mediation role of VLE on the path to performance, AI-EI does predict VLE positively (B = .109, p = .0749). However, it has a weak and non-significant mediation path to team performance. The indirect/pathway effect confidence interval contains zero (–0.0165, 0.0305), indicating evidence for partial mediation or non-significant mediation, consistent with the previous literature in a conceptual sense (Glikson & Woolley, 2020; Contreras et al., 2020). AI-EI has a negligible direct effect on performance (B = .0021, p = .974). This evidence supports situating AI-EI in the context of other relational variables, including leadership, for purposes of prediction and future research.

Table 4: Regression Analysis for Predicting Virtual Leadership Effectiveness from AI-EI

Statistic	Value
Model Summary	
R	0.146
R^2	0.021
Adjusted R^2	0.015
ANOVA	
F	3.217
Sig. (p-value)	.075†
Coefficients	
Constant (Intercept, B_0)	2.625***
IV_AIEI (Slope, B_1)	.109†
Beta (Standardized Coefficient)	0.146
t-value	1.794
p-value	.075†

*N (Sample Size) 150; † p < .10 (marginally significant), **p < .001*

The regression model for Hypothesis 3 predicting the use of AI-EI tools on virtual leadership effectiveness is shown in Table 4. The effect is only marginally significant (B = 0.109, p = 0.075), but it is consistent with theoretical expectations, leading to better remote leadership through enhanced awareness and responsiveness, facilitated by emotionally intelligent systems (Bartsch et al., 2021; Hoch & Kozlowski, 2014). The R^2 of .021 indicates that the effect is small but conceptually important, furthering the argument for research of leadership as a mediating process.

Table 5: Moderation Results (PROCESS macro-Model 1)

Predictors	DV_RTP (Dependent Variable)
Constant	5.080***
IV_AIEI (Independent Variable)	–.457
MODV_DM (Moderator)	–.682†
IV_AIEI × MODV_DM (Interaction term)	.149†
R^2	0.02
ΔR^2 (Interaction)	0.016
n = 150; † p < .10 (marginal); p < .05, p < .01**, p < .001****	
Conditional Effects of IV_AIEI at Values of MODV_DM	
MODV_DM	**Effect of IV_AIEI on DV_RTP**
2.33 (–1 SD)	–.269
3.00 (Mean)	–.210
3.67 (+1 SD)	–.161

Table 5 explores Hypothesis 4, which suggests that digital work culture maturity moderates the relationship between AI-EI and virtual leadership effectiveness. The moderation interaction term (AI-EI × Digital Maturity) was marginally significant (B = 0.149, p < 0.10) and accounted for a negligible amount of additional variance in the model ($\Delta R^2 = 0.016$). Conditional effects analyses reveal that AI-EI has a more substantial influence on leadership effectiveness as digital maturity increases, aligning with socio-technical systems theory (Bostrom & Heinen, 1977) and empirical research on the enabling role of digital maturity (Mollah et al., 2024; Westerman et al., 2014). Moreover, Figure 2 illustrates how the interaction between IV_AIEI and DV_RTP occurs under the influence of MODV_DM. The plot reveals differential patterns depending on the level of the moderator, indicating the importance of the moderator, as it has a highly significant moderating effect.

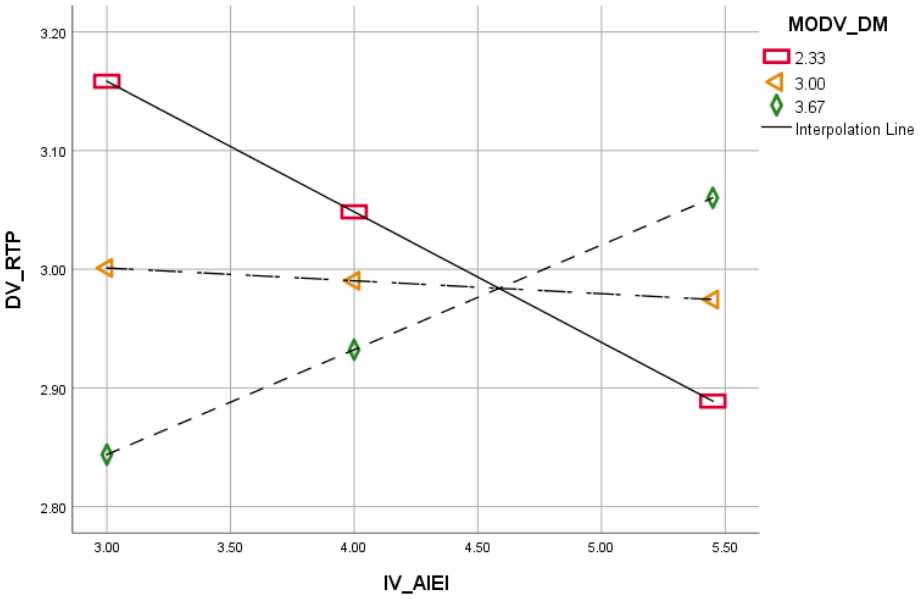

Figure 2: Interaction plot representing the moderating effect of MODV_DM on the relationship between IV_AIEI and MV_RTP

Table 6: Moderated Mediation Results (PROCESS macro-Model 7

Predictors	**MV_VLE (Mediator)**	**DV_RTP (Outcome)**
Constant	1.844	2.838***
IV_AIEI (Independent Variable)	0.354	0.002
MODV_DM (Moderator)	0.252	—
IV_AIEI × MODV_DM (Interaction term)	–.080	—
MV_VLE (Mediator)	—	0.042
R^2	0.029	0.002
ΔR^2 (Interaction)	0.005	—

n = 150; No significant predictors; all p > .05; p < .05, p < .01**, p < .001****

Conditional Indirect Effects of IV_AIEI on DV_RTP via MV_VLE				
MODV_DM	**Effect**	**Boot SE**	**LLCI**	**ULCI**
2.33 (–1 SD)	0.007	0.0172	–.0283	0.0445
3.00 (Mean)	0.0048	0.0122	–.0181	0.0331
3.67 (+1 SD)	0.0025	0.0117	–.0162	0.0339
Index of Moderated Mediation				
Moderator	**Index**	**Boot SE**	**LLCI**	**ULCI**
MODV_DM	–.0034	0.0123	–.0305	0.0232

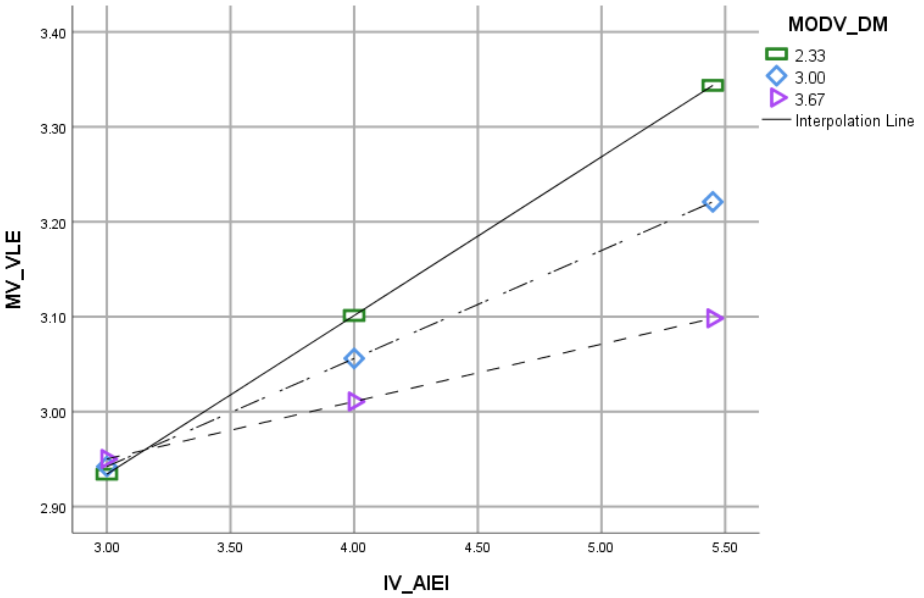

Figure 3: Interaction plot representing the moderating effect of MOD_DM on the relationship between IV_AIEI and MV_VLE

To test Hypothesis 5, the moderated mediation model, PROCESS Model 7 was employed (see Table 6). The results showed that there were no significant conditional indirect effects at each level of the moderator, and that the index of moderated mediation had a confidence interval that contained zero (-0.0305 to 0.0232), indicating no statistical evidence. There was some theoretical rationale for the use of digital work culture maturity as a moderator within the process presented by Kane et al. (2015) and Orlikowski (2000); however, the data in this study do not suggest that digital work culture maturity significantly strengthens the indirect relationship between AI-EI and performance through leadership. According to Figure 3, the relationship between IV_AIEI and MV_VLE will vary at different levels of the moderator (MODV_DM). At high levels of MODV_DM, the slopes suggest a stronger positive relationship between IV_AIEI and MV_VLE. The results suggest that digital maturity in this sample works in a more direct moderating process, as shown by H4, and does not compound or act conditionally.

Table 7: Total variance explained from Harman's Single Factor test using Principal Component Analysis

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.314	14.602	14.602	1.314	14.602	14.602
2	1.278	14.201	28.803	1.278	14.201	28.803
3	1.185	13.168	41.971	1.185	13.168	41.971
4	1.086	12.062	54.033	1.086	12.062	54.033

5	1.023	11.370	65.403	1.023	11.370	65.403
6	.947	10.526	75.929			
7	.797	8.852	84.781			
8	.727	8.073	92.854			
9	.643	7.146	100.000			

Extraction Method: Principal Component Analysis.

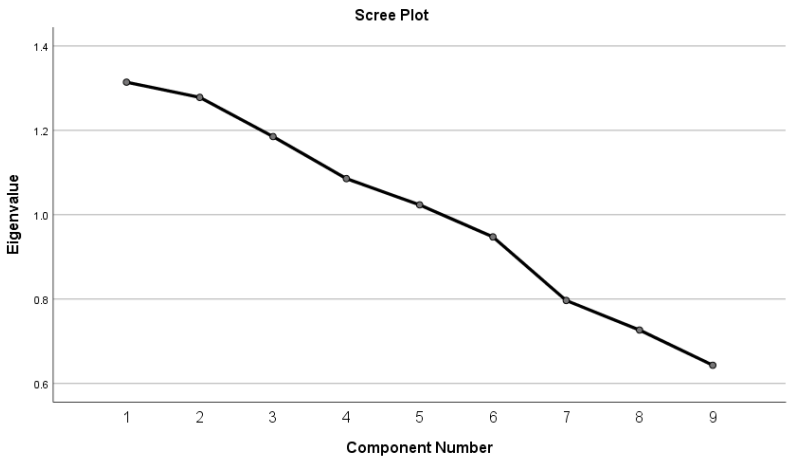

Figure 5: Scree plot showing eigenvalues of extracted components from Harman's Single-Factor Test

Table 7 represents the exploratory factor analysis, which extracted five components with eigenvalues greater than 1, explaining a total of 65.40% of the variance. The first factor accounted for only about 14.6% of the variance, which is relatively low compared to 50%, indicating that common method bias is not a significant concern. Additionally, the scree plot (Figure 5) also shows a clear break after the fifth component, verifying the absence of a single dominant factor.

5 Discussion

This research investigated the impact of using emotionally intelligent artificial intelligence (AI-EI) tools on remote team performance, examining the mediating role of virtual leadership effectiveness and the moderating role of digital work culture maturity. Utilizing elements from socio-technical systems theory (Bostrom & Heinen, 1977) and contingency theory (Orlikowski, 2000), the results contribute to the field of knowledge by suggesting a moderated mediation model of AI-led leadership in virtual work environments.

The regression analysis revealed no direct relationship between the adoption of AI-EI tools and remote team performance ($p = .917$), indicating that using AI-EI tools alone is insufficient to replace performance outcomes. (Vivek & Krupskyi, 2024) This finding is consistent with the early literature, which suggests that tools cannot replace emotional intelligence and leadership quality (Bankins & Formosa, 2023; Glikson & Woolley, 2020).

Hypothesis 2, which proposed that virtual leadership effectiveness mediates the relationship between AI-EI and team performance, was not statistically supported through bootstrapping confidence intervals. However, a significant effect was found in the AI-EI to leadership path ($p = .075$), providing some limited support for Hypothesis 3. This indicates that AI-EI tools may help

leaders become more emotionally responsive, but translating a leader's emotional responsiveness to team performance may require other drivers (e.g. trust, group cohesion, or psychological safety) to make that translation happen. (Wong & Law, 2002)

Hypothesis 4, proposing a moderation effect from digital work culture maturity, had support ($p < .10$) provided in the regression model for the interaction term. Conditional effects indicated that AI-EI tools had a more positive influence on leadership effectiveness in digitally mature conditions. (Ertiö et al., 2024) This finding reinforces the notion that cultural and infrastructural readiness heightens the leadership augmentation capacity of AI (Mollah et al., 2024; Westerman et al., 2014).

Hypothesis 5, which predicted moderated mediation, was ultimately not supported as the index of moderated mediation was zero. This means that while digital maturity appears to moderate the effectiveness of AI-EI on leadership independently, it does not significantly condition the entire mediation path to performance. (Mikalef et al., 2023)

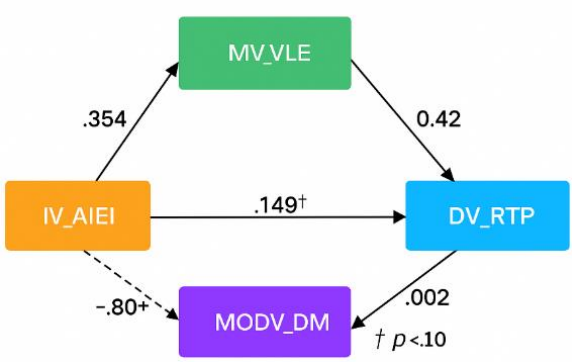

Figure 2: Path analysis model illustrating direct, indirect, and moderated relationships between IV_AIEI, MV_VLE, MODV_DM, and DV_RTP.

Figure 2 illustrates a moderated mediation model, where IV_AIEI predicts DV_RTP through MV_VLE. MODV_DM moderates the pathway from IV_AIEI to DV_RTP, as indicated by the interaction (IV_AIEI × MODV_DM). The numbers (e.g., .354, .149, .002) represent regression coefficients, and † denotes marginal significance ($p < .10$). The arrows on the diagram indicate the direction and strength of the relationships among variables.

5.1 Theoretical Implications

This article adds to the recent literature on AI-human leadership integration by testing a sophisticated, socio-technical model of AI-EI tools, virtual leadership, and digital maturity. It builds upon socio-technical systems theory (Bostrom & Heinen, 1977) and contingency theory (Avolio et al., 2014), illustrating that emotionally intelligent AI systems alone are insufficient to generate performance gains; their deployment relies, in part, on leader responsiveness and organizational readiness. This validates and expands the scope of present research towards existing literature through highlighting the need of context-driven AI integration frameworks in organizational behavior (Bankins & Formosa, 2023; Orlikowski, 2000). It also signals the growing need to reassess our leadership constructs in the AI-driven digital workplace.

More importantly, the research questioned the prevalence of technological determinism in narratives on AI adoption. The findings suggest that while the technical abilities of AI-EI tools may reasonably identify and interpret emotional states, these tools likely will not produce intended performance improvements without human interpretation and contextual leadership. (Joshi, 2025) The research findings for mediation and moderation suggest a theorized value in combined models

that integrate emotional, cultural, and cognitive aspects of remote work.' Future theoretical models and perspectives on AI and human dynamics must consider the interplay of tool functionality, leader behavior, and organizational circumstances before any claim that AI impacts human dynamics can be substantiated.

5.2 Practical Implications

The findings suggested several implications for practitioners. First, that AI–EI solutions are not meant to be implemented as a standalone product for remote employee performance. Leaders need to be trained to develop and sift through emotional insights generated by AI–EI tools, essentially an emotion coaching skillset on a digital device (Perifanis, 2023). Second, organizations need to embrace digital maturity that includes employee upskilling, clarity in policy and procedures, buy-in from organization cultural norms, etc. (Deep, 2023). For a company that sells technology to be effective in utilizing AI-based sentiment dashboards, managers must be capable of identifying and responding to emotional fatigue alerts with empathetic responses. This highlights that tech-enabled empathy is a leadership competency, not just an incorporation of software.

Furthermore, the implications of these findings also serve as a caution to HR practitioners and digital transformation leaders. Evidence of no direct correlation between performance and the use of AI-EI tools suggests that performance-based KPIs cannot be solely linked to the application of digital tools. Performance needs to be assessed in conjunction with relational metrics such as engagement, trust, and clarity of communication. Organizations implementing digital tools such as Microsoft Viva Insights and Zoom AI Companion must ensure that they do not rely solely on output metrics to drive decisions or actions but instead rely on the learning predicted from the insights, embedding them in how leaders act and make decisions within their routines and practices.

Ultimately, this study presents a practical opportunity to develop a leadership training program incorporating an AI-assisted component. Rather than just developing technical skills, it is essential that leadership development programs also develop AI literacy, emotional signal deciphering, and digital communication intricacy. A practical example is to recommend that organizations consider adding an emotional AI detection module to manager onboarding programs, helping leaders working with global teams become more adaptive and empathetic leaders. Organizations with a higher level of digital maturity, such as Salesforce, IBM, and Accenture, may offer opportunities to vet emotionally intelligent AI systems paired with training programs as a pilot model for digital maturity and close the loop on a replicable model for other companies.

Remote work has become an increasingly popular way of working since the COVID-19 pandemic, and managing a virtual team is one of the most challenging tasks. Emotional intelligence (EI) has generally been a significant predictor of effective leadership in face-to-face contexts (Hoch & Kozlowski, 2014). However, in today's distributed teams, artificial intelligence (AI)-based tools are now used as augmentations to an emotionally intelligent leader's decision-making, providing EI functions such as sentiment analysis, emotion tracking, and empathetic interventions (Almutairi, 2025; Vicci, 2024). While the use of such AI-EI tools is becoming more common, it remains unclear how AI-EI tools are directly or indirectly associated with team performance in virtual environments. This research study addressed the stated gap by creating and testing a mediator-moderator model as a framework for understanding these relationships. As a result of this research study, the research problem is partially answered by showing that the use of an AI-EI tool alone does not lead directly to team outcomes or performance; the volume of the tool depends on the leadership (contingent contextual) and cultural (also contextual) conditions surrounding the team.

5.3 Limitations and Future Research

This research has a few limitations. First, a cross-sectional design limits inference about causality;

longitudinal designs could map the development of leadership effectiveness over time, as leaders adopt AI tools in their practice. Second, as all variables were self-reported, common method bias is a potential concern. Third, the study's sample may be less relevant for industries that are not already highly familiar with digital tools/offerings, such as IT or marketing. In the case of a retail company that is not digitally ready to implement a tool, for instance, this company may struggle to implement an AI-EI tool, even if the tool is effective for those with AI-EI capabilities. Future research could examine team-level or multi-source data, and possibly investigate specific AI tools (e.g., Zoom-based, facial recognition) to identify which features are most effective compared to other tools. Future work could also study the lived experiences of leaders who use AI to manage the emotional dynamics of remote interactions qualitatively.

5.4 Conclusion

This study examined emotionally intelligent artificial intelligence (AI-EI) and its impact on remote team performance, with a focus on virtual leadership effectiveness and digital work culture maturity. Although there was no direct evidence that AI-EI tools improved performance, the potential of AI-EI tools to improve leader responsiveness was found to be promising, and more importantly, in a digitally mature environment. These results emphasize that technology, by itself, does not transform; rather, it is about how we use technology as individuals that allows transformation to occur. Given that work is becoming increasingly remote and AI-driven, organizations need to consider using tools, but more importantly, develop leadership and culture to utilize those tools effectively. The future of virtual work will not only depend on smart machines, but on emotionally intelligent humans who know how to engage with smart machines.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request. All relevant data generated or analyzed during this study have been included in the article.

Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this paper.

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7 Appendix

Survey Questionnaire

Demographic Information

1. Participant ID: _____
2. Age: _____
3. Gender: ☐ Male ☐ Female
4. Industry: _____

Section A: AI-Enabled Emotional Intelligence (AI-EI) Tools

Q1. In my team, AI tools (e.g., sentiment analysis, emotion recognition software) are used to understand emotional states during virtual interactions.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Q2. The AI systems we use help improve emotional awareness and communication among remote team members.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Section B: Virtual Leadership Effectiveness

Q3. My virtual team leader adapts their leadership style based on the emotional needs of the team.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Q4. My team leader communicates supportively and is responsive to emotional signals in our digital environment.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Section C: Remote Team Performance

Q5. Our remote team works effectively to complete tasks and meet deadlines.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Q6. We maintain high team morale and resolve conflicts constructively while working virtually.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Section D: Digital Work Culture Maturity

Q7. My organization has clear digital norms and practices that support remote collaboration.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Q8. We have a mature digital culture that embraces the use of advanced tools like AI for emotional and team management.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Q9. My organization provides adequate training and support for using digital tools, including AI-based systems, in remote team environments.

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree