Entrepreneurial Leadership Development in the Digital Age

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Abstract: During the second half of the 21st century, academia has presented different studies to conceptualize entrepreneurial leadership without academic consensus. Although leadership and entrepreneurship are distinct, the literature has come to understand their similarities (Harrison *et al.*, 2020). Despite the large number of publications, the characteristics of a leader should be based on an entrepreneurial profile, mainly to gain competitive differentiation for companies through the productivity of their human capital (Addy *et al.*, 2024). Over the last century, the business world has undergone several transformations intrinsically linked to innovations and developments in Information and Communication Technologies. Over the last few decades, the installed business park has changed in computerization and automation, making it necessary to equip human resources with ICT-related tools and knowledge. This and several generations cooperating in companies have brought new challenges to leadership (Figueiredo and Joaquim, 2023). However, in contemporary times, the business sector has to acknowledge the challenges inherent in meeting ESG indicators to respond to the SDGs, forcing leaders to equip themselves with entrepreneurial skills to involve, motivate, and create strategies for promoting innovation and retaining talent (Addy *et al.*, 2024). According to Omeihe *et al.* (2023), "the role of entrepreneurial leadership in enhancing positive business outcomes" (2023, p. 1), but the authors also acknowledge that leaders should embrace several attributes and skills to implement this new leadership perspective. The entrepreneur concept has gained new topics to discuss and internalize, including ICT and the sustainable domains paradigms regarding the ESG indicators and the SDG goals. This article aims to understand the challenges and competencies needed to conceptualize entrepreneurial leadership by critically reviewing the existing literature and linking it to the inherent needs of ESG and SDG goals; it seems to be the only way to understand and internalize the processes and procedures involved in entrepreneurial leadership in the digital age.

Keywords: ESG; Sustainable Development Goals, Entrepreneurial Leadership, Digital Era

1. Introduction

Contemporary society is facing the phenomenon of climate change due to the lack of environmental sustainability in companies. The perspective of financial benefits superseded the need to apply ecological practices.

Davies (2004) presented ESG as a fundamental indicator for companies' sustainable development, but this methodology has yet to resonate within the business community. However, in 2015, the United Nations (UN) conceptualized and promoted the need to achieve the 17 Sustainable Development Goals (SDGs), with the main goals of creating and preserving the world through human rights, labor rights, resource preservation, or fighting climate change. However, the results remain below expectations (United Nations, 2022, 2023).

However, in 2020, the most significant investment company in the world, BlackRock, rescued the ESG presented almost two decades earlier through a letter from its CEO to his peers.

This brought the urgency of sustainability to the business dialogue and alerted investors that this would be the most important indicator to consider when making investments(Fink, 2020). Sustainability should become more important than profit *per se*. According to Larry Fink, investors must look at companies through a binomial of profit and sustainability (Fink, 2020). According to him, "climate risk will impact both our physical world and the global system that finances economic growth"(2020). So, for that reason

> BlackRock announced several initiatives to place sustainability at the center of our investment approach, including making sustainability integral to portfolio construction and risk management; exiting investments that present a high sustainability-related risk, such as thermal coal producers; launching new investment products that screen fossil fuels; and strengthening our commitment to sustainability and transparency in our investment stewardship activities(Fink, 2020).

Despite the buzz generated by these statements, the topic faded and eventually disappeared. After some time, companies resumed their business as usual.

The European Union (EU) has been at the forefront of the shift towards sustainability, taking concrete measures to change the business paradigm. One such measure is the implementation of fines or environmental fees. More recently, the EU introduced the Corporate Sustainability Reporting Directive (CSRS 2022/2464), which mandates certain companies (as identified in the document) to present, from 2025 onwards, a report containing key indicators of their environmental, social, and governance impacts. This exemplifies the EU's commitment to sustainability and its impact on corporate reporting.

As businesses adapt to these new sustainability requirements, another significant shift is occurring alongside the rapid evolution of Information and Communication Technologies (ICT) and Artificial Intelligence (AI) since the final two decades of the 20th century.

Integrating ICT and AI is progressively becoming integral to individuals' daily and professional obligations.

In parallel, academia presented, albeit in an embryonic form, a leadership typology based on the characteristics of entrepreneurship. Given all the environmental, legislative, and technological changes experienced, this typology is necessary and urgent.

Given these arguments, this article intends to list four themes (human relations, AI, ESG, and SDG) in the promising and growing trend of entrepreneurial leadership.

2. Entrepreneurial Leadership: Characterization

Technological changes and innovations have been undeniable, especially in the 21st century.

The integration of ICT, with a particular focus on AI, in all business areas has been happening at a dizzying speed, forcing the business sector to permanent cyclical and structural adaptations.

It also leverages the constant need for the applicability of entrepreneurial skills to respond to the needs of increasingly demanding markets.

According to Bessant and Tidd (2019), entrepreneurship is based on innovation. The authors, however, also state that the need to innovate must be based on sustainability; that is, sustainability must be internalized as an opportunity to innovate procedures and processes and not as a reductive threat.

The entrepreneur must be aware of opportunities, create differentiation and be able to integrate ICT, to generate an added and competitive value proposal.

ICT has become a community product (Figueiredo and Joaquim, 2023). However, the emergence of AI has gained permeability in several business sectors.

According to McCarthy (2007), AI is characterized as the creation of intelligent machines through the science of engineering.

If, on the one hand, the internalization of AI in the business installed base has proven to be a competitive advantage, on the other hand, entrepreneurial and leadership characteristics and skills are forced to adjust to the competitive reality.

The entrepreneur's profile is based on the search for opportunities with competitive advantage based on personal skills, so the entrepreneur must have developed tools of resilience, critical thinking, and emotional intelligence(Subramaniam and Shankar, 2020; Addy et al., 2024).

However, entrepreneurship gained new topics of discussion and internalization as it became necessary and imperative for interconnection with ICT and AI and environmental requirements based on ESG indicators and the Sustainable Development Goals (SDGs).

Faced with this panoply of competitive and environmental demands, the leader's role becomes fundamental for motivating teams and linking them to organizational cultures.

The literature on leadership conceptualization is vast; however, at the beginning of the century, a new field of study brought to academia a different approach based on positive leadership arising from positive psychology(Cameron, 2012; Gauthier, 2015; Olckers, van Zyl and van der Vaart, 2017; Unnu, 2019; Klug, Felfe and Krick, 2022).

Positive leadership is based on skills and characteristics that promote employee communication, focus on objectives, and, consequently, company productivity (Goswami, Singh, and Goswami, 2019).

Figueiredo and Fonseca (2022) conceptualize that leaders who demonstrate optimism, calm, empathy, confidence, resilience, and sustained communication of decisions promote positive leadership.

Gauthier (2015)alludes that workers are more productive when they feel happy in their workplace.

Despite the importance of positive leadership, technological challenges based on computerization and automation have brought the need for constant adaptation from human resources to ICT tools to the business sphere, almost empirically promoting the flexibility and resilience inherent to entrepreneurs' profiles.

Although the scope of this article is based on leadership, it is essential to understand that worker teams are diverse. They may comprise different generations of individuals, reflected in their distinct perceptions of the employer and their skills and digital gaps (Figueiredo and Joaquim, 2023).

As previously mentioned, the heterogeneity of human resources is reflected in the integration of ICT and AI in day-to-day functions since *Generation Z*; this task may prove to be almost innate. In contrast, for *baby boomers*, there is a need for constant learning to fill the inherent gaps of being an analog generation(Figueiredo and Joaquim, 2023).

However, on the opposite spectrum, the literature identifies *baby boomers* as privileged holders of critical thinking (Elliott and Turnbull, 2005), in contrast to *Generation Z's* human resources (Bauerlein, 2009).

Now, generational diversity and the pressing emergence of ICT and AI advocated unifying concepts pre-established by the positive leadership and entrepreneurship literature.

These concepts of joining forces rely on the soft skills regarding positive leadership and the hard skills of entrepreneurship.

According to Harrison et al. (2020), although the two fields of study are distinct, it is possible to list similarities; in fact, the authors state that entrepreneurship should be evaluated as a variant of leadership through a positive integration where they verify a replication of attributes and skills between the concepts.

Understandably, entrepreneurial leadership has gained increasing attention in contemporary academic literature; however, after a critical review of existing research, this terminology needs to be more conceptualized.

In the words of Omeihe et al. (2023), “the role of entrepreneurial leadership in enhancing positive business outcomes” (2023, p. 1). However, the authors also acknowledge that leaders should embrace several attributes and skills to implement this new leadership perspective. Harrison et al. (2020) convey this argument, adding that entrepreneurial leadership is a dynamic and contextual approach associated with entrepreneurship *per se*.

Addy et al. (2024)alluded that entrepreneurial leaders' main characteristics should be proactivity, emotional intelligence, strategic vision, adaptability, recognition of opportunities, and propensity for risk. According to the authors, the incorporation of these skills and strategies will foster an environment that promotes innovation, resilience, and sustainable growth in companies in a technological scenario that is constantly evolving and rich in uncertainties and complexities. The same authors conclude that it is possible to create strategies involving human resources, motivating them to promote innovation and retain talent.

So, regarding the literature review, it's possible to create an entrepreneurial leadership development model where the entrepreneurial culture, which includes the business context and stakeholders, the organization, the human resources teams, and the employees, is aligned with the entrepreneurial leadership hard and soft skills to obtain results of excellence that incorporate organizational sustainable performance (Figure 1).

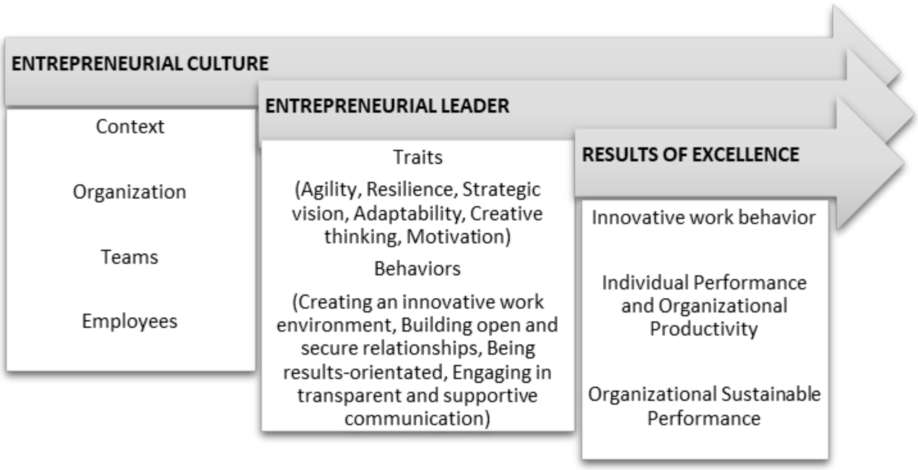

Figure1: Entrepreneurial leadership development model

According to the Future of Jobs Report(World Economic Forum, 2023), the five skills with the most significant preponderance in demand for human resources by 2027 are analytical and critical thinking, integration and understanding of AI, and processing large amounts of computer data, leadership and social influence and resilience, and flexibility and agility.

These skills are based on cognitive, technological, and teamwork skills. As Figure 1 shows, they are intrinsically linked to entrepreneurial leadership skills.

Analytical and critical thinking skills have become a tremendous must-have in leadership, especially when integrating AI, because this technology cannot understand human feelings, such as empathy (Dobrev, 2012).

Despite all the advantages of problem-solving or procedure simplification, regarding AI, the entrepreneurial leader should be able to balance human behaviors and traits with advanced technology.

However, it is essential to note that the skills inherent to entrepreneurial leadership may also be present in freelancers or digital nomads (Ahmed and Lucianetti, 2024), not exclusive, commonly identified as traditional business positions.

Dhakal, Wiesner, and Maraseni (2024) concluded that there is a fruitful relationship between positive leadership and entrepreneurship, which is reflected in the growth of companies based on the interconnection between business culture and the characteristics of entrepreneurial leadership.

However, it is essential to note that the business sector faces additional challenges regarding sustainable matters that are not limited to those previously exposed, such as the ESG indicators and the SDGs proclaimed by the United Nations (UN) in 2004 and 2015 (Davies, 2004; United Nations, 2024).

3. Environmental, Social, and Governance Indicators and the Sustainable Development Goals

ESG was conceptualized in 2004 for the first time in a United Nations report (Davies, 2004) regarding sustainability as an essential factor for financial companies' analytics.

At the beginning of the 2020s, environmental, Social, and Governance (ESG) indicators emerged within the framework of the SDGs (United Nations, 2024) as a proactive movement that consists of a comprehensive framework that includes these three critical elements, which are divided through the analysis of environmental and social impacts and governance structures that impact corporate well-being.

This way, stakeholders can understand how companies manage their risks and opportunities transparently.

In the words of Davis (2004), the need to conceptualize this framework is because "until now, the industry has not developed a common understanding on ways to improve the integration of environmental, social and governance (ESG) aspects in asset management, securities brokerage services, and the associated buy-side and sell-side research functions. This is due partly to the complexity and diversity of issues involved" (2004, p. 19).

However, as mentioned before, these emerged into the business field only in the 2020s, when Larry Fink, Chairman and Chief Executive Officer (CEO) of BlackRock, sent a letter to his peers, international business companies concluded that sustainability should be in parallel with financial profit on the leading analysis standards for making investments (Fink, 2020).

The CEO realized that climate change was not a conjunctural problem but a long-term topic that must be fully incorporated into companies' daily objectives, goals, and procedures.

> Over the next few years, one of the most essential questions we will face is the scale and scope of government action on climate change, which will generally define the speed with which we move to a low-carbon economy. This challenge can only be solved with a coordinated, international response from governments aligned with the goals of the Paris Agreement(Fink, 2020).

Khaled et al. (2021), quoted by Dalcero et al. (2023), also understood that the interrelationship between the SDGs and the ESG aimed to promote sustainable economic development and the adaptation of the business installed base to climate change, as well as combat social inequalities through the integration of governance (Table 1).

Table 1: The intersection between SDG and ESG

ESG	Sustainable Development Goals
Environment	**SDG 6 – Drinking water and sanitation**
	SDG 7 – Clean and Affordable Energy
	SDG 9 – Industry, Innovation and Infrastructure
	SDG 11 – Sustainable Cities and Communities
	SDG 12 – Responsible Consumption and Production
	SDG 13 – Action against Global Change and Climate
	SDG 14- Life in Water
	SDG 15 – Life on Earth
Social	SDG 1 – Eradication of Poverty
	SDG 2 – Zero Hunger and Sustainable Agriculture
	SDG 3 – Health and Well-Being
	SDG 4 – Quality Education
	SDG 5 – Gender Equality
	SDG 10- Reduction of Inequalities
Governance	SDG 8 – Decent Employment and Economic Growth
	SDG 16 – Peace, Justice, and Strong Institutions
	SDG 17 – Partnerships for the goals

Font: Adapted from Davies (2004) and United Nations (2024)

According to Dalcero et al. (2023), the environmental (*E*) indicators must be aligned with the gold standards of SDG through companies' internal procedures that aim to reduce environmental degradation. Nevertheless, the employee's labor work conditions (*S*) must be based on well-being, confidence, respect, and equality. At last, but not least, the governance (*G*) indicators correspond to companies' policy ability to become more informative and transparent with the stakeholders.

This urgent necessity of aligning the ESG with the SDG relies on several tipping points that scientists have identified, like "Earth warms, sea ice melts, that reduces the reflectance of solar radiation back into space and accelerating the warming"(Sachs *et al.*, 2023, p. 7). Consequently, it increases drastic climate changes.

The Earth's resources are limited, and for that matter, they should be consumed with efficiency!

The role of companies' procedures is central to mitigating this global problem.

However, despite being intrinsically linked to the political guidelines of the UN Member States, legislation needed to be more active regarding the implementation of both the ESG and the SDGs (United Nations, 2024). Although each SDG was defined and implemented through goals and indicators that were measurably monitored, their applicability and achievement were below expectations(United Nations, 2022).

In 2022, the European Union (EU) enacted the Corporate Sustainability Reporting Directive (CSRS 2022/2464)(European Commission, 2022), included in the European Sustainability Reporting Standards (ESRS), thus legislating the sharing of information about sustainability in a standardized and transparent way.

The European Sustainability Reporting Standards (ESRS) represent a novel regulatory framework within the European Union. Effective January 5th, 2023, the CSRD (Corporate Sustainability Reporting Directive) mandates the implementation of ESRS. This directive necessitates that listed companies and financial institutions (including banks and insurance companies) prepare sustainability reports. While the legal obligation to report commences in 2024, with reports first due in 2025, the CSRD signifies a significant shift towards increased transparency in corporate sustainability practices.

Notably, the interpretation of ESG results transcends the mere concept of sustainability. The directive's underlying assumption is the unambiguous identification of metrics about environmental pollution, social capital (human resources), and corporate governance practices.

Consequently, a pressing need exists to understand each ESG dimension concisely. As Davies (2004) posits, standardized evaluation criteria enhance the transparency of corporate practices, facilitating a more rigorous systemic analysis of organizational efficiency and effectiveness. While short-term business cycles may influence profitability, implementing an ESG-oriented business culture fosters long-term structural benefits for companies.

However, as mentioned, it was only in 2020 that Davies's visions (2004) began to gain relevance and importance. Therefore, environmental indicators are understood as all those that impact the environment, that is, the emission of gases harmful to the greenhouse effect, water and energy consumption, or waste management, among others.

Social indicators relate to companies' responsibilities towards stakeholders, including employees, customers, other partners, and society. Regarding governance, indicators may present business ethics, transparency, or social responsibility to combat corruption.

These are only a tiny sampling of ESG indicators; however, understanding their functionality and purpose will benefit companies and the environment in the medium and long term.

4. Incorporating ESG and SDGs into Entrepreneurial Leadership

From a simplistic approach, it may seem that incorporating ESG and SDGs is impossible in entrepreneurial leadership, as it is commonly wrongly believed that entrepreneurial leadership is limited to a company's microenvironment.

While achieving the SDGs by 2030 necessitates a collective effort from all individuals, it does not preclude but necessitates strengthened interconnectedness among companies. This collaboration is fundamental to accelerate progress towards the multifaceted objectives enshrined within the SDGs.

To Doghan, Abdelwahed, and Ali Soomro (2023), the responsibility factor is prominent in organizations where it plays a central role. According to the authors, companies have social and environmental responsibilities that directly impact their workers.

Entrepreneurial leadership comprises skills linked to innovation and development based on characteristics of positive leadership and the understanding that human interactions make teams more robust (Kets de Vries and Korotov, 2012; Redín, Meyer, and Rego, 2023; Dhakal, Wiesner, and Maraseni, 2024).

The clear challenges of entrepreneurial leadership are based on complex premises: human relations, AI, ESG, and the SDGs. However, it is understood that they can be overcome through creative skills and a critical spirit to integrate all these topics and, subsequently, challenges inherited.

The incorporation of ESGs and SDGs must be carried out from a macro-to-micro perspective, that is, through conceptualizing a pluralistic framework comprising the four dimensions (Figure 2).

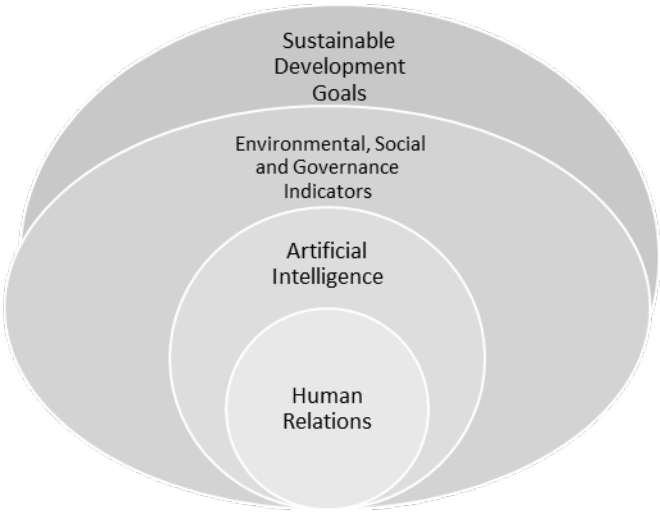

Figure 2: Dimensions of Entrepreneurial Leadership

According to Yela Aránega, Gonzalo Montesinos, and del Val Núñez (2023), the primary soft skills of the entrepreneurial leader are motivation, teamwork, and risk-taking, which enhance the quality of an entrepreneurial ecosystem in business management.

The internalization of the SDGs and ESG in business culture must be carried out from a macro perspective; it will probably be necessary to change the company's mission, vision, and values, redirecting the business strategy towards the theme of sustainability in the three axes of ESG indicators (Al Doghan, Abdelwahed and Ali Soomro, 2023).

To recover the characteristics of entrepreneurial leadership, communication must be clear and transparent, integrating the team into the proposed organizational paradigm (Thummakul, Sinjindawong, and Makmee, 2012). To Goswami, Singh, and Goswami (2019), a positive relationship between high-performance human resource management practices, employee engagement, and effective leadership tended to have better results, as it can be incorporated with the social indicators of ESG.

Another dimension to consider is mitigating technological inequalities between employees, as this should be one of the agenda items through the promotion of specialized training and collaborative work, for example (Figueiredo and Joaquim, 2023).

The literature identifies the integration of AI into work tasks as a phenomenon based on ambiguous feelings on the part of workers; on the one hand, according to Ratcheva, Leopold, and Saadia Zahidi (2020), AI translates into an increase in opportunities, but on the other Tuomi (2018) alludes to the fact that there is still much skepticism on the part of society and the economy regarding the emergence of the AI phenomenon. This understands the need for the leader to undertake skills based on resilience and adaptability in the face of binomial human relations and AI to overcome inequalities and promote inclusion through governance policies incorporated with the social and environmental indicators.

Tursunbayeva and Chalutz-Ben Gal (2024) propose a framework based on technology (AI), organizations (culture of trust), and people (motivation and skills) as a way of empowering digital leaders. Being a digital leader in contemporary times has become redundant since more is needed to have digital skills.

However, according to the Future of Jobs Report (World Economic Forum, 2023), soft skills tend to maintain, if not gain, more significant importance in the digital era at all levels, particularly in leadership.

Emerging from the intersection of leadership and entrepreneurship, entrepreneurial leadership has solidified as a paradigm despite ongoing efforts to refine the definitions of its constituent concepts. This convergence has garnered significant scholarly interest in recent years, as entrepreneurial leadership is increasingly recognized as a potential pathway to achieving sustainable competitive advantage. However, for those goals to be achieved, companies must incorporate the challenges inherent in ESG indicators and SDG accomplishment into their procedures.

5. Conclusions

The field of leadership boasts a vast literature encompassing a diverse array of evolving conceptual frameworks and subtopics.

Leadership theories have transitioned from traditional models to encompass positive leadership, digital leadership, and other contemporary approaches.

In today's dynamic environment, leaders must adapt to meet the demands of businesses operating within an interconnected ecosystem encompassing markets, society, and the environment.

The increasing salience of sustainability and the pervasiveness of AI have introduced novel challenges for business management, particularly in human resource management. Consequently, leadership adaptability has become a mandate in response to stakeholder expectations.

Integrating entrepreneurial characteristics into leadership practices offers an asset for team management, enabling leaders to effectively navigate the constant challenges posed by technological and environmental advancements. Comprehending and internalizing ESG indicators will align businesses with achieving SDGs in environmental stewardship, promoting decent work, combating inequalities, and upholding human rights principles.

The recently enacted CSRS may be familiar to academia. However, it will likely challenge established businesses and tiny and medium-sized enterprises (SMEs).

The initial implementation phase will likely target specific sectors and company types, with an anticipated gradual expansion encompassing the entire business landscape.

This necessitates a paradigm shift within the business community, prompting structural changes aligned with the CSRS.

To facilitate a smooth and sustainable transition, leaders must embrace a more entrepreneurial approach, necessitating procedural modifications and the acquisition of entrepreneurial skills to navigate the ever-increasing pace of technological advancements; in other words, entrepreneurial leaders bring a fresh perspective to the field of leadership, fostering closer connections among employees, cultivating a positive organizational culture, embracing new technologies, and promoting environmental sustainability.

According to Addy et al. (2024), Ahmed and Lucianetti (2024), and Dhakal, Wiesner, and Maraseni (2024), the implementation of entrepreneurial leadership has demonstrated successful results in the investigation field. Nevertheless, the authors also realize several challenges to its operationalization, such as the digital gap, workers' training needs, and sampling dimensions, to name a few.

In these case studies, the authors did not explicitly analyze the link between ESG and entrepreneurial leadership. However, their conclusions suggest that there are aligners between these two topics.

6. Study Limitations and Future Recommendations

This exploration of entrepreneurial leadership and its intersection with ESG (Environmental, Social, and Governance) factors and the SDGs (Sustainable Development Goals) does not represent a definitive endpoint. A critical gap persists within the existing academic literature regarding the empirical validation of entrepreneurial leadership's effectiveness when coupled with ESG and SDG integration into company strategy. While extant research includes articles on these topics, a comprehensive analysis of the practical outcomes of applying an entrepreneurial leadership model that leverages the interconnectedness of ESG and SDGs in corporate strategic management still needs to be discovered.

The current body of literature primarily focuses on localized case studies, lacking large-scale, data-driven analyses investigating the interplay between these four interconnected dimensions (entrepreneurial leadership, human relations, AI, and ESG/SDGs). This lacuna underscores the pressing need for further research exploring entrepreneurial leadership models grounded in the consideration of human relations, AI integration, and the combined impact of ESG and SDG principles on company strategic decision-making.

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