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Empower to Innovate: The Role of Empowering Leadership in Driving Green Innovation Initiatives in Beverage Companies of the Kurdistan Region of Iraq

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ABSTRACT

This study aims to evaluate the impact of empowering leadership on green innovation and how such a leadership style can lead and drive the organization's capability to innovate in green initiatives. This study focused on the beverage companies operating in the Kurdistan region of Iraq, as most of the studies in a similar scope are conducted in high-tech companies, but this study focused on such a low-tech industry. To fill this gap, the researchers used a quantitative approach to collect data from staff working at these three selected major companies and analyze the data using SPSS and SMARTPLS - SEM. The sample consisted of 293 respondents randomly selected, and the researchers analyzed the reliability and validity of the scale used, and the path analysis and Structural model to test the hypothesis developed in this study. The effect size of EI on GI is large, as f2 is 0.547 and P=0.000. The findings show that empowering leadership can significantly and positively affect green innovation initiatives. The results recommend that when leaders trust, coach, and involve employees in decisions in order to empower the employees, in return, they actively innovate in green practices to develop green products and green processes.

KEYWORDS: Empowering Leadership, Green Innovation, Beverage Industry, Sustainability, Kurdistan Region.

1. [1]INTRODUCTION

In the Kurdistan Region of Iraq, where environmental awareness is increasing but institutional support for sustainability is still lacking, leadership is particularly important in determining how organizations respond to environmental challenges (Aguilera-Caracuel & Ortiz-de-Mandojana, 2013). organizations have increasingly recognized the importance of leadership styles that can improve and support green innovation (GI), especially in the context of environmental sustainability of companies. Among the leadership styles, one of the leading styles to do so is empowering leadership (EL), which emphasizes trust, autonomy, and employee participation. This leadership style is seen as a common style that can improve both employees and organizational performance (Ahearne et al., 2005; Arnold et al., 2000). By delegating authority and encouraging initiative-taking, EL helps to create a more adaptable and creative workforce by shifting from strict hierarchies to more dynamic, team-oriented workplaces. Building on that the connection between them is especially important when a company is pursuing to follow sustainability into their strategy to achieve competitive advantage. Not only that, but also EL can help to improve the organizational culture and it supports the employees to initiate experimenting ideas, taking risks, and continuous improvement which are necessary for GI initiatives (Cheong et al., 2019; Yue et al., 2022). It is important to emphasize on the definition of GI that refers to creating and implementing innovative technologies that improve products and processes that limit or reduce the environmental damage and help to contribute to sustainability objectives (Xu et al., 2024). Moreover, there is a need, and it is critical to align leadership style with the GI, in order to meet the UN's Sustainable Development goals, which is important to

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contribute to the global sustainability standards (Wang et al., 2023; Zhao et al., 2021). On top of that, the research area of the role of empowering leadership style in leveraging and promoting green practices initiatives is yet to be explored, and this is considered a gap in the literature, especially in low-tech industries such as the beverage industry, which needs basic technology in its manufacturing process. Not only that, the gap is in the fact that there is much prior research on high-tech industries and in developed countries, while this study focuses on the low-tech industry and the context of Kurdistan region of Iraq which is considered as a regional area in a developing country (Arici & Uysal, 2022).

This study's objective is to fill this gap by evaluating the effect of empowering leadership on green innovation initiatives in the context of the beverage industry and to contribute to the literature. Moreover, to answer the research question, how does EL influence GI in beverage companies in the Kurdistan Region of Iraq?

2. LITERATURE REVIEW

2.1 Empowering Leadership

The literature of leadership shows that one of the important leadership styles is EL, which emphasizes on sharing power with the subordinates, providing autonomy to take risks and initiatives, and honing the employees' competency and encouraging responsibility taking (Vu, 2020). EL marks a shift from traditional leadership to a leadership style that encourages employees to be self-driven, trusted, and involved in decision-making. It is important to mention that EL has evolved to emphasize on several core practices or functions, such as promoting participation in decision-making, enhancing the meaningfulness of work, expressing confidence in subordinates, and providing autonomy from bureaucratic limitations (Vecchio et al., 2010). A related idea is that such behaviors to a great extent contribute to the employee's psychological empowering, and it can increase their creativity, innovation, job satisfaction, and commitment (Amundsen & Martinsen, 2014). The definition of EL by Arnold et al. (2000) stated that there are five key dimensions, namely, coaching, informing, leading by example, participative decision-making, and showing concern. These behaviors build trust and engagement and help discover the creative potential of employees by positioning them as valued contributors rather than passive followers (Ahearne et al., 2005).

The literature of leadership shows that research on EL has been increased across different industries because of its important role in creating an environment at the companies that supports employees' innovation which is necessary for a dynamic environment (Cheong et al., 2016).

2.2 Characteristics of Empowering Leadership

Leadership styles are typically recognised by a small set of habits that set them apart. In the case of empowering leadership (EL), those habits centre on enlarging employees' discretion, building capability, and cultivating a climate in which people feel able to initiate, experiment, and contribute in ways that matter. A leadership style that focuses on tight direction and close control, it distributes authority and opens up to trust employees, that in return increases a stronger sense of ownership and motivation among employees (Chow, 2018). One of the characteristics of EL is that there is confidence in employees' competence and capabilities. Empowering Leaders usually avoid micromanagement they make their trust open, communicate their belief in their team and provide opportunities for their employees. This leadership behavior encourages employees to have self-confidence and share ideas rather than choosing silence and keeping their ideas for themselves (Lee & Ding, 2020). Another feature of EL is participative decision-making which means the leader believe in delegation in way that get rid of tasks, but it is to invite their subordinates to solve problems and provide alternative and make informed decisions which creates an environment that employees understand their direct contribution to the success of the company (Fong & Snape, 2015). EL is marked by supportive coaching and developmental feedback in which leaders behave like mentors or religious guides who listen and provide guidance to individuals' needs, encouraging progress on both technical and interpersonal issues. This orientation to growth nourishes psychological empowerment and reinforces professional self-confidence over time (Tang & Dong, 2022). Also, empowered leaders always seek transparent communication and make the organisation's aims, constraints, and performance expectations clear and understood to everyone, and by doing so, they reduce any ambiguity or miscommunication about priorities and standards, such clarity enables employees to exercise judgment without constantly seeking permission (O'Donoghue & van der Werff, 2022). Finally, such leaders protect work autonomy, in which employees are given the freedom to choose methods, sequence tasks, and adjust processes according to the knowledge they have. Such autonomy at work, increases the employee's creativity, normalise constructive risk-taking, and support learning from failure, conditions that are especially conducive to innovation, including sustainability-oriented initiatives (Kim & Beehr, 2020).

Taken together, these characteristics create a social context of psychological safety and purpose in which initiative is expected, informed, and supported. In such

contexts, employees are more likely to experiment responsibly, surface problems early, and channel their expertise toward solutions that advance both performance and longer-term organizational resilience.

2.3 Dimensions of Empowering Leadership

EL is commonly known to be measured through five fundamental behavioral dimensions, as explained in Arnold et al.'s (2000) widely adopted EL Questionnaire (ELQ). These dimensions together focus on providing employees with autonomy, competence, and innovation.
The first dimension is *leading by example*, which means to be the model and expose the best example of the behaviors and standards expected from team members (Eisenkopf & Kölpin, 2024). Leaders who possess this dimension, show the integrity, dedication, and accountability. Therefore, they're inspiring employees to adopt similar values and work ethics.
The second dimension is *participative decision-making*, which means to actively and genuinely involve employees in decision processes and motivate them to contribute ideas and collaborate in enhancing organizational performance (Huq, 2017).
The third dimension is *coaching*, it refers to quality of guidance provided to subordinates and in a personalized way and seeking for developmental feedback in a two-way communication that aims to enhance employee skills, confidence, and problem-solving abilities and skills (Longo et al., 2023).
The fourth dimension is *Informing*, which reflects the leader's role in ensuring open and transparent communication regarding organizational goals, expectations, and contextual developments (Baltzan et al., 2013).
The fifth dimension is *work autonomy* that refers to the degree of discretion and independence given to employees in performing their tasks and teamwork assignments (Lumpkin et al., 2009). Leaders who possess this behavior support self-management and encourage individuals to determine the most effective methods for achieving their responsibilities (Srivastava & Vyas, 2015). This autonomy helps to increase intrinsic motivation, a sense of taking responsibility, and encourages innovative behavior, particularly in dynamic environments (Nie et al., 2023).

2.4 Green Innovation

One of the important strategies to become a green organization is to enhance the organization's capability to create green solutions, which is known as GI, which refers to designing and developing technologies to create products and greening the manufacturing process to reduce the negative impact on the environment (Xie et al., 2019). Based on the definition above, the GI involves more than just adopting new technologies, but it also requires organizational and managerial changes and transformation that will help to achieve the long term sustainability goals of organizations (Wang & Ahmad, 2024). GI is usually related to sustainability initiatives such as reducing waste, preventing pollution, energy efficiency, and the use of materials that can be recycled in both the product and the process of manufacturing and operations (Xie et al., 2019). The term GI is often used interchangeably with eco-innovation and environmental innovation, even though there is a clear distinction between the terms. While eco-innovation emphasizes systemic resource optimization and environmental management, GI often reflects intentional organizational efforts to reduce negative environmental impacts while generating value (Oduro et al., 2022). The way to understand GI is that, it is the effort made to make both product and process of manufacturing more environmentally friendly (Chen et al., 2006. Many companies now include GI as part of their social responsibility goals and use it to strengthen their image and performance (Guinot et al., 2022; Sun et al., 2022). A related idea is that, from a strategic point of view, the Resource-Based View (RBV) suggests that GI can be a powerful internal resource when it has qualities such as being valuable, rare, difficult to imitate, and not easily replaced. These features allow it to create lasting advantages for a company. Recent studies also highlight that investing in green research and development, using eco-friendly designs, and building a culture that values sustainability help organizations perform better both environmentally and competitively (Khanra et al., 2022).

2.5 Drivers of Green Innovation

There are various drivers that affect and shape GI consisted of internal or external drivers, and understanding these drivers is important for organizations to include sustainability in their innovation strategies and achieve a competitive advantage. According to Saunila et al. (2018), stated that leadership and the organizational culture of an organization are seen as important internal drivers. Moreover, according to Agyabeng-Mensah et al. (2023), leaders who have environmental goals awareness and a background of prioritizing such goals are more prone to create a culture of sustainability and intend to support and inspire green innovation in the organization, especially empowering leadership that provides employees with the autonomy, and support to experiment ideas and take risks to innovate in the area of sustainability (Agyabeng-Mensah et al., 2023). It is also important to mention that regulatory pressure from the government, unions, syndicates, and the community is a major external driver, they have introduced a large list of environmental laws, standards, and certifications for the sake of reducing carbon emissions, managing waste, and improving clean and

green energy (Jayaraman et al., 2023; Chen et al., 2022; Shao et al., 2022; Ahmad et al., 2019). Compliance with such regulations often requires innovative changes in the firm's products and processes (Salihi et al., 2024). Moreover, the market and customer demand are also matters as drivers of GI. As people learn more about environmental problems, many prefer products that do less harm and they expect companies to act responsibly. As a response, organizations reconsider what they sell and how they produce it their products to adopt more clean and environmentally friendly approaches to show their commitment to social responsibility (Kittilaksanawong, 2016). In addition to market and customer demand, technology also pushes green innovation forward, because companies are seeking for new options, renewable energy systems, materials that use less energy, and digital tools that track resources, open practical paths for greener products and processes. As these tools spread across industries, they make green innovation easier and more attractive to adopt (Zheng et al., 2023). According to Zhao et al. (2021) strong environmental performance indicators are signals or evidence of the company's commitment to environmental and ethical responisbilities that can in return attract customers and improve the public image of the company and help it to establish strong connection with the community. Lastly, resource limitations and cost pressures act as indirect yet powerful motivators to GI and organizations that face high input costs or scarce resources often adopt green process innovations to improve efficiency and reduce waste, leading to more sustainable business models (Cuerva et al., 2014).

2.6 Dimensions of Green Innovation

The literature shows that GI can be understood through two main dimensions that helps to measure how organizations integrate sustainability in the process of designing products and manufacturing process of the products (Li et al., 2022). The two dimensions of GI can help to measure the envrionmental challenges, green initiatives, the technological advancements and behaviorial fields of green (Oduro et al., 2022). It also involves the redesigning and recreation of entire product life cycles and production systems to reduce negative environmental impacts, increase resource efficiency, and promote sustainable value creation (Wang et al., 2021). As mentioned earlier, in the literature, GI has often been divided into two main dimensions, namely the green product innovation and green process innovation (Chen et al., 2006). These dimensions measure different areas and sub-dimensions of green innovation, green product innovation focuses on what is offered to the market and the other one focuses on how it is produced or delivered. According to Dangelico (2016), Green product innovation refers to the design and development of new or modified products that are environmentally sustainable across their lifecycle, and this includes to select raw materials that are envrionmentally friendly, minimizing harmful emissions during the manufacturing process, to enhance the energy efficiency, and design for recyclability or biodegradability (Khan, Dhir, et al., 2021). Such innovations rise consumer demand for green products and helps to create green brands, it is not only used to respond to environmental concerns.

The important role of green product innovation is more evident in industries that have big impact such as the manufacturing industry, oil and gas industry, and transportation (Melander, 2017). To facilitate green innovation initatitives, often it requires collaboration across departments, such as research and development, marketing, and supply chain management, human resources management in order to make sure that environmental considerations taken care of from the input to the output and after sales of the company (Ilg, 2019). By such innovations, organizations can differentiate themselves from others and use such innovations as their competitive advantage in the markets where they compete to gain reputation as sustainable company and gain the customer loyality (Dangelico & Pujari, 2010). According to Cheng et al. (2023), in an empirical study they have confirmed that companes engaged in green product innovation can experience improved customer loyalty, enhanced brand image, and access to new market segments (Cheng et al., 2023). As a measurement tool, this dimension is often used to assess the degree to which the companies use features that have eco-friendly functions, and use materials that can be reused or recycled, and types of materials that comply or are in line with environmental product standards such as the standards mentioned in ISO standards (Woo et al., 2014).

Green process innovation refers to the transformation of internal organizational operations to reduce environmental harm and improve efficiency (Chen et al., 2006). It includes to adopt clean technologies, practices that reduce waste, systems that are energy efficient, and redesigns of processes that reduce environmental impact of production and other services that are part of the whole production system (Nuryakin, 2022). Unlike green product innovation that is visible by stakeholders, green process innovation is usually happens behind the scence and the view of the stakeholders, but still it is considered an important innovation that become important business model (Patel et al., 2014). Such innovations can be source of reducing cost, waste, and compliance with envrionment standards and expectations (Kivimaa & Kautto, 2010). Organizations adopting green process innovation may invest in renewable energy sources, upgrade to energy-efficient machines, or implement recycling systems (Xie et al., 2022). These innovations

often require initial capital investment but generate long-term benefits by lowering environmental risk, improving stakeholder relations, and enhancing overall performance (Khan et al., 2021). According to Chen et al. (2006), Green process innovation is ideally measured by the extent to which the companies uses mechanism and control methods or initatives to reduce the excessive use of materials by the employees or workers that can be better and more efficiently used (Chen et al., 2006). Likewise, this dimension of green innovation can also measure the carbon emissions, the excessive use of water which is common in the beverage industry, and excessive consmption of energy (Liu et al., 2023).

2.7 The Relationship Between Empowering Leadership and Green Innovation

EL has been marked as an important driver of GI in organizations in the literature, by promoting autonomy, supporting employee decision-making, and encouraging creative engagement. EL establishes the foundations necessary for innovation to thrive, particularly in the context of GI initiatives (Kim et al., 2018; Praszkier, 2017). According to the literature, such a leadership style as EL, helps to discover talented employees and their creativity, and allows managers to invest in their ideas and creativity (Tang & Dong, 2022). Lately, research has been focused on the relationship between EI and other outcome variables such as GI, for instance, the scholarly work of Badar et al. (2023), showed that leadership styles that empower employees while prioritizing environmental goals enhance green work engagement and therefore, it strengthen the employees' commitment to sustainability practices. Moreover, according to the empirical study from Supriyanto et al. (2023) has asserted that EL has a direct impact on important factors that facilitate innovation, such as creativity, autonomy, and risk-taking, such factors are important for a successful implementation of GI. The EL style helps to create a work environment that facilitates innovation, allows the employee to experiment with new ideas, patterns, or processes is supported, according to Khattak et al. (2024), the role of EL in the hospitality sector, discovered that there is a positive relationship between empowering leaders behavior and the employee's tendency and passion toward green practices and green innovation. Their findings suggest that empowering leaders can activate both the emotional and behavioral dimensions necessary for sustainable innovation. Additional evidence for this perspective comes from Arici and Uysal's (2022) systematic review of the literature on EL and GI, which shows a growing scholarly interest in how different leadership styles influence environmental innovation outcomes. While much of the existing literature focuses on broader constructs like transformational or ethical leadership, the review emphasizes the need to examine the unique contributions of EL (Srivastava & Pinto, 2022). According to the investigative scholarly work of Begum et al. (2022), about the relationship between EL and GI, they have identified this link as an important area of research for now and in the future. Similarly, Liu et al. (2025) found that CEO openness to ideas and creativity, a leadership quality similar to EL, promotes sustained GI that enhances receptivity to new ideas and an environment of adaptation and creativity. Despite the consistent evidence to link EL to green creativity, engagement, and innovation-friendly climates, most existing studies have focused on related or intermediary constructs rather than directly testing the relationship between EL and GI. This gap in the literature highlights the need for empirical investigation into this direct link, thereby to support the hypothesis proposed in the current study.

H1: Empowering leadership positively affects green innovation.

3. METHODS

This research aims to explain the relationship between a specific and important leadership style which is EL and GI, and for this purpose, the researchers adopted a quantitative research design to investigate this relationship in the context of three major beverage companies located in the Kurdistan region of Iraq. The researchers have followed a positivist paradigm, which is based on the belief that reality can be observed and measured objectively, allowing researchers to identify causal relationships among well-defined variables (Park et al., 2020). In addition, the researchers used a deductive approach which was used to test a theory that was discussed in the literature review, of the relationship between EL and GI in order to test a hypothesis (Bell et al., 2022; Saunders et al., 2023). This framework is consistent with the need for generalizable and statistically valid findings. Moreover, in order to back the findings with data and empirical results, the researchers used a survey questionnaire as a method for its efficiency and alignment with quantitative methodology. According to Saunders et al. (2023), a questionnaire allows for the systematic and consistent collection of data from a relatively large population while ensuring consistency in the format and structure of responses. The researchers used a self-administered online questionnaire, distributed via Google Forms, to participants across the three major beverage companies, which made the process more efficient and reduced printing costs. Additionally, online tools reduced missing data and improved the overall quality of the responses because the respondent had to answer all the questions in order to submit the response.

3.1 Measures

To evaluate EL, the study used a widely and commonly used questionnaire Empowering Leadership Questionnaire (ELQ), which is a reflective scale developed by Arnold et al. (2000) that consists of 25 items across five dimensions: Coaching, Informing, Autonomy, Leading by Example, and Participative Decision Making. The questionnaire is widely used and has received high internal consistency and validity in different contexts and organizational environments (Ahearne et al., 2005; Ferraro & Lott, 2023; Kim et al., 2017). An example from the scale is "My leader shows me how I can improve my performance". GI was measured using the two-dimensional reflective scale developed by Chen et al. (2006), consisting of Green Product Innovation and Green Process Innovation, with each dimension measured by 5 items. The scale is commonly used and considered a foundational construct by scholars in the field of GI (Awan et al., 2021; Begum et al., 2022; Wong et al., 2020). The scale starts with the item "The company chooses the materials of the product that cause the least pollution". The scales were slightly modified for wording and to better suit the beverage companies' context. In addition, both measures of GI and EL were measured using a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

3.2 Sample Size and Data Collection

The target population consisted of employees from three beverage companies operating in the Kurdistan Region of Iraq. The total population was estimated to be 1,100 employees. Using Cochran's formula and referencing Saunders et al. (2023), a minimum sample size of 285 was calculated. The study used simple random sampling, and the respondents were selected based on their accessibility and relevance to the study. Senior executives were excluded to avoid bias in their responses to the EL construct. Data collection was conducted using a Google Form shared via internal communication channels. Participation was voluntary and anonymous. Translation into Kurdish and Arabic was done using Brislin's back-translation method to maintain clarity and equivalence across languages. A total of 293 valid responses were received.

4. DATA ANALYSIS PROCEDURE

The data were analyzed using SPSS for descriptive statistics and SmartPLS 4 and Partial Least Squares – Structural Equation Modeling (PLS-SEM) to test the hypothesized relationship. Tests for reliability and validity were conducted to ensure the internal consistency and use of accurate measures. Moreover, the researchers used composite reliability, Cronbach's alpha for convergent validity, Fornell and Larcker criterion, and HTMT for discriminant validity. For testing the hypothesis, bootstraps have been used to evaluate the path direction, and the F^2 is used to measure the effect size of the exogenous variable on the endogenous variable.

4.1 Descriptive statistics

The sample collected from the beverage companies in the Kurdistan region consisted of (N = 341), which was mostly male (83.3%) and mostly aged between 20 and 30 (79.4%). The majority held a bachelor's degree (60.4%), followed by smaller groups with master's, high school, or other qualifications. A very small portion held a PhD (5.0%) or postdoctoral degree (0.6%).

Table 1
Descriptive analysis of the sample

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male (1)	251	85.7
	Female (2)	42	14.3
Age	Under 20 (1)	6	2
	20–30 (2)	103	35.2
	31–40 (3)	130	44.4
	41–50 (4)	38	13
	Over 50 (5)	16	5.5
Education	High School (1)	43	14.7
	Bachelor's Degree (2)	164	56
	Diploma or Vocational degree (3)	43	14.7
	Higher Diploma (4)	19	6.5
	Master's Degree (5)	20	6.8
	Ph.D (6)	2	.7
	Other (7)	2	.7
Total N=293		100%	

4.2 Validity and Reliability

The validity and reliability analysis were conducted utilizing SmartPLS software 3.0 to evaluate the measurement model based on Partial Least Squares (PLS-SEM) (Ringle et al., 2024). The researchers evaluated the individual factor items' loadings, and according to Hair et al. (2019), the item loadings must be more than the threshold of 0.6. According to Table 2, the results show that both constructs, EL and GI, have high reliability and acceptable validity. For EL, the Cronbach's Alpha (0.966) and Composite Reliability (0.969) indicate excellent internal consistency. Although a few items have slightly lower loadings (for example, EL15 and EL14), they were important items of the scale and are within the acceptable range, and the researchers decided to retain the items. the

overall Average Variance Extracted (AVE) is 0.562, which is above the recommended threshold of 0.50 (Guenther et al., 2023), confirming acceptable convergent validity. Item EL12 was removed from the analysis because its factor loading was below 0.60, which is generally considered the minimum acceptable level. Similarly, GI shows strong reliability, with Cronbach's Alpha of 0.922 and Composite Reliability of 0.925. The AVE is 0.587, indicating good convergent validity. Overall, both constructs meet the reliability and validity criteria and are suitable for use in the structural model.

Table 2
Reliability and validity of the items

Constuct	Item No.	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Empowering Leadership	EL-1	0.715	0.966	0.969	0.562
	EL-2	0.651			
	EL-3	0.741			
	EL-4	0.788			
	EL-5	0.781			
	EL-6	0.749			
	EL-7	0.822			
	EL-8	0.804			
	EL-9	0.783			
	EL-10	0.692			
	EL-11	0.662			
	EL-13	0.671			
	EL-14	0.645			
	EL-15	0.604			
	EL-16	0.820			
	EL-17	0.823			
	EL-18	0.823			
	EL-19	0.783			
	EL-20	0.810			
	EL-21	0.741			
	EL-22	0.753			
	EL-23	0.787			
	EL-24	0.777			
	EL-25	0.777			
Green Innovation	GI-1	0.723	0.922	0.925	0.587
	GI-2	0.762			
	GI-3	0.661			
	GI-4	0.817			
	GI-5	0.789			
	GI-6	0.843			
	GI-7	0.766			
	GI-8	0.801			
	GI-9	0.729			
	GI-10	0.757			

To check whether the constructs are clearly different from each other, the researchers used both the Heterotrait–Monotrait (HTMT) and Fornell–Larcker standard. Fornell and Larcker (1981) Suggest that discriminant validity is confirmed since the √ value of AVE is greater than the correlation with other variables. As shown in Table 3, the square root of the AVE for EL (0.750) is higher than its correlation with Green Process Innovation (0.595). Likewise, the √ AVE for Green Process Innovation (0.766) is also greater than its correlation with EL (0.595). Additionally, the HTMT value between EL and GI was found to be 0.614, which is below the recommended maximum value of 0.85 (Henseler et al., 2015). These results show that the two constructs are different enough from each other, meaning that each one measures a separate concept. Therefore, discriminant validity is established.

Table 3
Fornell and Larcker, and the HTMT analysis for Discriminant Validity

	Empowering leadership	**Green Innovation**
Empowering leadership	0.750	
Green Innovation	0.595	0.766
Green Innovation <-> Empowering Leadership	**HTMT**	
	0.614	

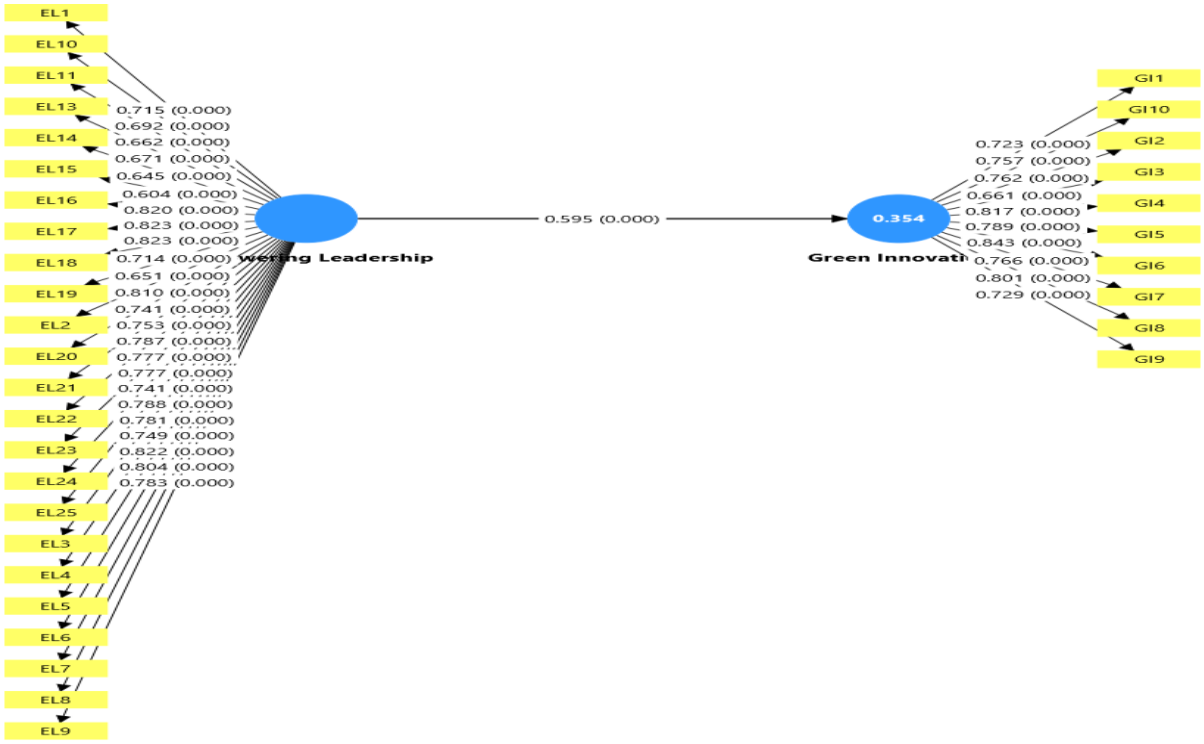
4.3 Hypothesis testing

The researchers analyzed the direct effect of the exogenous variable on the endogenous variable and tested the hypothesis. The R-square is 0.354, which means EL explains 35% of the variance in the endogenous variable. The structural model was analyzed using bootstrap analysis with a 5000 bootstrap sample to evaluate the direct path coefficient. The results in Table 4 show that EL is significantly and positively associated with GI ($\beta = 0.596$ and $p < 0.001$). Moreover, Figure 1 shows the factor loading, the R^2, and the structural model of the study.

Table 4
Results of the structural model

Hypothesis	Original sample (O)	Std. Dev.	T stats.	P value
H1=Empowering Leadership -> Green Innovation	0.595	0.046	12.935	0.000

FIGURE 1
Structural Model with factor loading and P values



The effect size of the EL on GI is evaluated based on the F2 value, which is 0.547, see Table 6. According to Cohen (1988)'s guidelines, an f^2 effect size of 0.547 indicates a large effect of EL on GI. This means that EL makes a substantial contribution to explaining the variance in GI. The effect is statistically significant ($T = 3.881$, $p < 0.001$), suggesting a meaningful relationship in the model.

Table 5

Effect Size

f^2 Value	Effect Size Interpretation	T-Statistic
0.547	Large	3.881

5. CONCLUSION

This study aimed to examine the influence of EL (EL) on GI within beverage companies located in the Kurdistan Region of Iraq. The findings strongly support the hypothesis that EL positively affects GI, as demonstrated by the significant and positive path coefficient ($\beta = 0.595$, $p < 0.001$) and a substantial explanatory power ($R^2 = 0.354$). These results are consistent with previous studies (e.g., Supriyanto et al., 2023; Khattak et al., 2024), suggesting that when leaders encourage autonomy, support participation, and model positive behaviors, employees are more likely to engage in environmentally friendly innovation. The analysis also revealed that the effect size ($f^2 = 0.547$) is considered large, indicating that EL is not only statistically significant but also practically important in driving GI. This confirms that EL is an important and influential internal driver of GI, even in low-tech industries such as the beverage sector. This is especially important in developing regions like the Kurdistan Region of Iraq, where environmental awareness is rising but institutional support remains limited. Moreover, this study has shown that EL plays a significant role in promoting GI in the beverage industry within a developing region. The findings demonstrate that EL not only improves innovation outcomes but also contributes to an organization's ability to meet sustainability goals. This is particularly relevant in contexts where environmental regulations are emerging and external support systems are still evolving. By highlighting the strong and positive relationship between EL and GI, this research encourages both scholars and practitioners to further explore how leadership styles can influence environmental performance. It also suggests that EL can be a valuable strategic tool for companies aiming to align their innovation efforts with sustainable development goals (SDGs). Therefore, based on the results, the researchers recommend that the beverage companies to open training programs to train their leaders to empower their employees and enhance and create an environment for employees to be creative and risk taking initatives in order to innovate.

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دەسەڵاتپێدان بۆ داهێنان؛ ڕۆڵی سەرکردایەتیی دەسەڵاتپێدەر لە ئاراستەکردنی دەستپێشخەرییەکانی داهێنانی سەوز لە کۆمپانیاکانی خواردنەوە لە هەرێمی کوردستانی عێراق

پوختە

ئامانجی ئەم توێژینەوەیە هەڵسەنگاندنی کاریگەری بەهێزکردنی سەرکردایەتی لەسەر داهێنانی سەوزە و لێکۆڵینەوەیە کە چۆن ئەم شێوازەی سەرکردایەتی دەتوانێت توانای ڕێکخراوێک بۆ داهێنان لە دەستپێشخەرییە سەوزەکاندا بەهێز بکات و بەرەو پێش ببات. توێژینەوەکە تیشکی خستە سەر کۆمپانیاکانی خواردنەوە کە لە هەرێمی کوردستانی عێراق کار دەکەن، لە کاتێکدا زۆربەی توێژینەوەکانی هاوشێوە لە کۆمپانیاکانی تەکنەلۆژیای بەرزدا ئەنجامدراوە. بەڵام ئەم توێژینەوەیە تەماشای پیشەسازی تەکنەلۆژیای نزم دەکات. بۆ چارەسەرکردنی ئەم کەلێنە، توێژەران شێوازێکی چەندێتییان بەکارهێنا بۆ کۆکردنەوەی داتا لە کارمەندانی سێ کۆمپانیای گەورەی دیاریکراو و داتاکانیان بە بەکارهێنانی SPSS و SMARTPLS - SEM شیکردەوە. نمونەکە 293 وەڵامدەری هەرەمەکی لەخۆ گرتبوو و توێژەران متمانە و دروستی پێوەرەکانی بەکارهێنانیان هەڵسەنگاند و هەروەها شیکردنەوەی ڕێڕەو و مۆدێلکردنی پێکهاتەیان ئەنجامدا بۆ تاقیکردنەوەی گریمانەکان کە لە توێژینەوەکەدا پەرەیان پێدراوە. قەبارەی کاریگەری EI لەسەر GI گەورەیە، لەگەڵ f2 0.547 و P = 0.000. دەرەنجامەکان دەریدەخەن کە بەهێزکردنی سەرکردایەتی دەتوانێت کاریگەری بەرچاو و ئەرێنی لەسەر دەستپێشخەرییەکانی داهێنانی سەوز هەبێت. ئەنجامەکان پێشنیاری ئەوە دەکەن کاتێک سەرکردەکان متمانە بە کارمەندەکان دەکەن، ڕاهێنان دەکەن و بەشداری دەکەن لە بڕیاردان بۆ بەهێزکردنیان، کارمەندەکان چالاکانە بەشداری داهێنانی سەوز دەکەن بۆ پەرەپێدانی بەرهەم و پرۆسەی سەوز.

وشە سەرەکییەکان: سەرکردایەتیی دەسەڵاتپێدەر، داهێنانی سەوز، پیشەسازیی خواردنەوەکان، بەردەوامیپێدان، هەرێمی کوردستان.

التمكين نحو الابتكار: دور القيادة التمكينية في توجيه مبادرات الابتكار الأخضر في شركات المشروبات في إقليم كردستان العراق.

الملخص

تهدف هذه الدراسة إلى تقييم تأثير القيادة التمكينية على الابتكار الأخضر وكيف يمكن لهذا الأسلوب القيادي أن يقود ويعزز قدرة المؤسسة على الابتكار في المبادرات البيئية. ركزت الدراسة على شركات المشروبات العاملة في إقليم كردستان في العراق، حيث أُجريت معظم الدراسات المشابهة في شركات التكنولوجيا العالية، بينما ركزت هذه الدراسة على صناعة منخفضة التقنية. لسد هذه الفجوة، استخدم الباحثون منهجًا كميًا لجمع البيانات من الموظفين العاملين في هذه الشركات الثلاث الكبرى المختارة، وتم تحليل البيانات باستخدام برنامجي SPSS و SMARTPLS - SEM. تكونت العينة من 293 مشاركًا تم اختيارهم عشوائيًا، وقام الباحثون بتحليل موثوقية وصلاحية أدوات القياس المستخدمة، بالإضافة إلى تحليل المسار والنموذج الهيكلي لاختبار الفرضيات المطورة في هذه الدراسة. حجم تأثير الذكاء العاطفي على الابتكار الأخضر كبير حيث F2 = 0.547 وP=0.000. تظهر النتائج أن القيادة التمكينية يمكن أن تؤثر بشكل كبير وإيجابي على مبادرات الابتكار الأخضر. توصي النتائج بأنه عندما يثق القادة بالموظفين، ويوجهونهم، ويشركونهم في اتخاذ القرارات لتمكينهم، فإن الموظفين بدورهم يبتكرون بنشاط في الممارسات الخضراء لتطوير المنتجات والعمليات الخضراء.

الكلمات المفتاحية: القيادة التمكينية، الابتكار الأخضر، صناعة المشروبات، الاستدامة، إقليم كردستان.