



The Interactive Role of Green Knowledge Acquisition In The Relationship Between Green Learning And Environmental Resilience: An Applied Study of The Opinions of A Sample of Employees At Al-Kafeel Meat Production Company

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Abstract: The current research aims to identify the interactive role of acquiring green knowledge in the relationship between green learning with its dimensions (cognitive, skill-based, organisational, technological) and sustainable resilience with its dimensions (economic sustainability, social sustainability, environmental sustainability). It is an applied study based on the opinions of a sample of 132 employees from Al-Kafeel Meat Production Company. The research problem was represented by the main question: "What is the interactive role of acquiring green knowledge in the relationship between green learning and environmental resilience?" The questionnaire was used as the main tool for data collection, and statistical programs (AMOS.V.29, SPSS.V.29) were employed. The research results indicated that a higher level of green learning among employees contributes to enhancing the organization's ability to adapt to environmental changes and improving its environmental resilience.

Keywords: Green Knowledge Acquisition, Green Learning, And Sustainable Resilience

Introduction

In light of the growing environmental challenges facing contemporary organizations, such as climate change, resource scarcity, and increasing legislative and social pressures, there is a pressing need to adopt more sustainable management practices capable of fostering a balance between economic objectives and the preservation of the environment and society (Wang et al., 2020). In this context, the role of the legislative authority in environmental protection has become increasingly important through the enactment of environmental laws, regulations, and policies that oblige organizations to comply with sustainability standards and reduce harmful environmental impacts. Legislative institutions contribute to strengthening environmental governance by establishing legal frameworks that encourage organizations to adopt environmentally responsible practices and promote accountability and environmental compliance. Green learning and environmental resilience have

emerged as modern management concepts that contribute to enhancing organizations' ability to adapt to and respond effectively to environmental changes (Kui & Wang, 2022). Green learning is considered an important approach for instilling environmental awareness and developing skills and behaviors that support sustainability within organizations, while environmental resilience represents an organization's ability to adapt to environmental changes and disruptions without compromising the continuity of its operations or resources (Kui et al., 2023). Therefore, the importance of green knowledge as a pivotal element supporting this relationship becomes clear, as it contributes to enhancing employees' understanding of environmental issues and developing their ability to apply them in organizational practices (Schwei & Huang, 2024).

Based on that, this study addresses the interactive role of acquiring green knowledge in the relationship between green learning and sustainable resilience, through an applied study of the opinions of a sample of employees at Al-Kafeel Meat Production Company. The aim is to analyse the extent to which acquiring environmental knowledge contributes to enhancing this relationship and developing the organization's ability to achieve environmental sustainability. The study also seeks to provide a deeper understanding of how these variables interact within the work environment and their reflection on the organization's sustainable performance.

Methodology

Research Problem

The research problem lies in the significant increase in environmental, legislative, and social pressures facing production organizations, including meat processing companies. This necessitates the adoption of modern management methods capable of promoting environmental sustainability and improving organizational performance (Huang, 2024). In this context, green learning and environmental resilience emerge as key variables that contribute to enhancing an organization's ability to adapt to environmental changes and mitigate their negative impacts (Lin et al., 2025). Despite the importance of these two variables, the relationship between them may not always be direct, but rather influenced by other factors that can strengthen or weaken this relationship (Abusto et al., 2024). Among these factors, acquiring green knowledge stands out as an interactive variable that can play a significant role in strengthening the relationship between green learning and environmental resilience by raising employee awareness and equipping them with the environmental knowledge necessary to implement sustainable practices (Ritunga & Amaroh, 2022). Through the analytical study method, the research problem revolves around the following question: (What is the cooperative role of purchasing green knowledge in the relationship between green scholarships and resilience from the perspective of employees at Al-Kafeel

Meat Production Company?) From this question arise some sub-questions, which are:

1. What is the close of green scholarship execution at Al-Kafeel Meat Creation Company?
2. What is the neck and neck of justifiable suppleness amongst the company's workforces?
3. To what magnitude does purchasing green familiarity contribute to improving green scholarship?
4. Does purchasing green acquaintance play an cooperative role in weakening the affiliation between green wisdom and defensible resilience?

The Importance of the Research

The reputation of this examination lies in its give a lecture a existing topic related to conservation sustainability indoors construction establishments. It studies the affiliation between green education and workable suppleness, and the role of emerald knowledge procurement as an collaborative inconstant that toughens this rapport. This aligns by means of recent trends towards workable environmental managing. Additionally, the research subsidizes to heartening secretarial and ecofriendly nonfiction by expounding the rapport between green scholarship and workable resilience, and provided that a more truthful thoughtful of the collaborative role of emerald data acquisition. It helps conduit the enquiry gap relating to the extent of connection and mutual encouragement of these variables, principally within the location of food invention establishments. On another note, the research offers findings that can benefit the management of Al-Kafeel Meat Production Company in enhancing its sustainable practices. This can be achieved through developing green learning programs and improving mechanisms for acquiring environmental knowledge among employees, thus supporting administrative decisions related to sustainability and reducing the environmental impact of production processes.

Research Objectives

The research objectives are to study and analyze the interactive role of green knowledge acquisition in the relationship between green learning and sustainable resilience. This will be achieved through an examination of the opinions of a sample of employees at Al-Kafeel Meat Production Company. The objectives can be defined as follows:

1. To identify the level of green learning implementation at Al-Kafeel Meat Production Company from the perspective of its employees.
2. To measure the level of environmental resilience among the company's employees and their ability to adapt to environmental changes.
3. To determine the level of green knowledge acquisition within the company and its contribution to enhancing environmental awareness among employees.

4. To analyze the relationship between green learning and sustainable resilience in the work environment under study.
5. To test the interactive role of green knowledge acquisition in strengthening the relationship between green learning and sustainable resilience.

The hypothetical plan

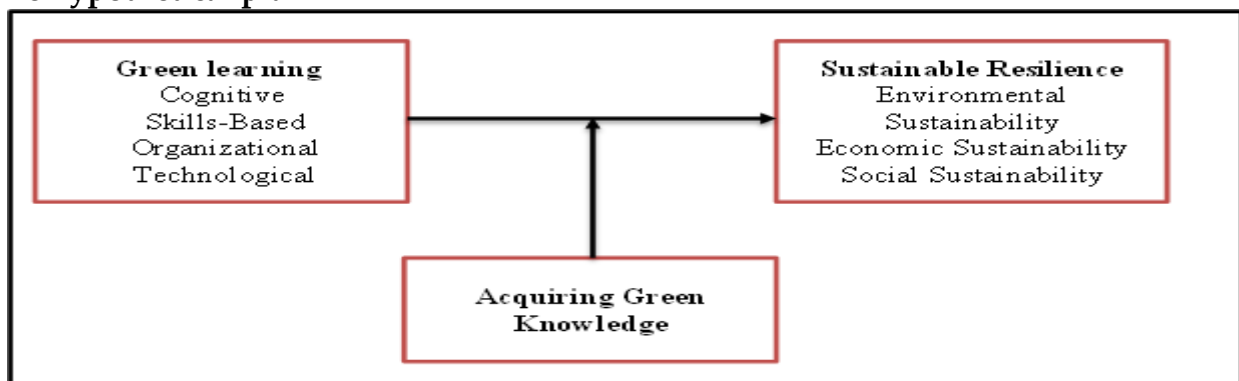


Figure 1. Hypothetical diagram

Research Hypotheses

1. There is a correlation between green learning and sustainable resilience.
2. There is a correlation between acquiring green knowledge and sustainable resilience.
3. Green learning has an impact on sustainable resilience.
4. Acquiring green knowledge has an impact on sustainable resilience.

Research Population and Sample

The research population is represented by Noor Al-Kafeel Company for Animal and Food Products, affiliated with the Holy Abbasid Shrine. It is one of the leading companies in the field of animal and food production in Iraq, as it provides diverse products of high quality and reasonable prices, and contributes to supporting the local market and employing national labor. The company has also expanded by establishing sales centers in several Iraqi governorates, relying on specialized committees to supervise all stages of production and ensure that the products conform to standard specifications. As for the research sample, it included the employees of the company, where (150) questionnaires were distributed, of which (139) questionnaires were returned. After excluding (7) invalid forms, the valid questionnaires for analysis became (132), with a response rate of (88%).

Theoretical Framework

1. The Concept of Green Learning

The concept of green learning in organizations refers to the process by which an organization acquires knowledge, skills, and values related to environmental protection and sustainability, and integrates them into its daily

behaviors, processes, and decisions ([Wang et al., 2020](#)). This learning is not limited to formal training, but also includes continuous learning from experiences, both within the organization and from its external environment (Mushtaq & Akhtar, 2025). Green learning aims to enhance employees' awareness of environmental issues and develop their ability to adopt environmentally friendly practices, such as rationalizing resource use, reducing waste, and relying on clean technologies (Kuo & Madni, 2023). It also contributes to supporting environmental innovation by encouraging creative thinking to find sustainable solutions to environmental challenges (Shafait & Huang, 2024). This concept is manifested in several practices, including: integrating environmental values into training and development programs, exchanging knowledge about best environmental practices, building an organizational culture that supports sustainability, and learning from partnerships with other entities such as research institutions and environmental organizations (Cui et al., 2023). The concept of green learning in organizations can be expanded by viewing it as an integrated strategic approach aimed at bringing about a profound transformation in the way an organization thinks and behaves towards the environment and sustainability, so that continuous learning about environmental issues becomes an integral part of its organizational culture and not just a marginal activity (Cui & Wang, 2022).

Green learning refers to the continuous process through which organizations and individuals acquire environmental knowledge, values, and skills that support sustainability and environmentally responsible behavior. It aims to increase awareness of environmental challenges, such as climate change, pollution, and resource depletion, while encouraging employees and institutions to adopt sustainable practices in their operational and strategic activities ([Wang et al., 2020](#)). Green learning also contributes to strengthening environmental responsibility and integrating sustainability principles into organizational culture and decision-making processes (Amaroh, 2022).

Another critical issue relates to the risks of abuse of power in environmental law enforcement (Amaroh, 2022). Overlapping authority and weak accountability mechanisms may create opportunities for selective enforcement, corruption, or misuse of legal powers by certain officials or institutions ([Hayat et al., 2023](#)). Such practices can undermine public trust, reduce organizational compliance, and negatively affect the legitimacy of environmental governance ([Purwanto, 2024](#)). Therefore, transparency, accountability, and clear legal procedures are essential to ensure that environmental enforcement is conducted fairly and effectively.

Green scholarship is not inadequate to removing conservation familiarity, but also embraces construction executive capacities that empower personnel to recognize composite conservation challenges, such as microclimate transformation and resource inadequacy, and to deal with them in inventive and workable ways ([Purwanto, 2024](#)). This is completed concluded mounting critical sophisticated skills, problem-solving, in addition to combined work, which

provisions administrative that takes into account eco-friendly dimensions in accumulation to economic and social proportions ([Baquero, 2024](#)).

2. The Importance of Green Learning

The standing of green scholarship in establishments lies in its role as a premeditated tool that underwrites to completing sustainability and ornamental the establishment's capacity to adapt to collective environmental encounters ([Wei et al., 2024](#)). It is not restricted to raising ecofriendly responsiveness, but encompasses to impacting managerial concert and long-term competitiveness ([Huang, 2024](#)). Avocado learning supports establishments improve their conservation concert by empowering workforces to adopt applies that condense resource and dynamism drinking and decrease waste and secretions ([Ismail & Aldous, 2025](#)). This completely impressions the lessening of operating costs and the accomplishment of sophisticated source effectiveness ([Lin et al., 2025](#)). This type of scholarship develops the facility to adapt to changes, whether jurisdictive or conservation, as the association becomes supplementary organized to re-join to new ecofriendly rations and external compressions, such as conservation protocols or market opportunities ([Hayat et al., 2023](#)). Green scholarship also underwrites to stimulating origination, as it reassures workforces to develop biologically friendly resolutions, harvests, and processes, which opens up new-fangled openings for growth and gives the organization a competitive advantage in markets where sustainability is charming increasingly imperative ([Wu et al., 2025](#)).

Dimensions of Green Learning

The green learning variable is measured through three dimensions ([Ritonga & Amaroh, 2022](#)):

1. The Cognitive Dimension (Awareness)

This dimension focuses on building a solid environmental knowledge base among employees, going beyond superficial knowledge to a deep understanding of the relationships between organizational activities and environmental impacts ([Kaneko et al., 2024](#)). This includes familiarity with issues such as climate change, natural resource management, biodiversity, and environmental laws and regulations. It also includes the ability to analyze environmental risks and make informed decisions ([Juo & Wang, 2025](#)). This dimension helps guide organizational behavior towards more sustainable practices because it links knowledge with practical application and enhances awareness of environmental responsibility within the organization ([Apostu et al., 2024](#)).

2. The Skills Dimension (Behavioral)

This dimension focuses on developing the practical skills that enable employees to translate environmental knowledge into actual behaviors within the work environment. This contains skills such as competent oomph and source

use, waste supervision, the presentation of clean invention machineries, and observance to specific ecofriendly canons ([Ritonga & Amaroh, 2022](#)). It also comprehends the capacity to adapt to conservation fluctuations and implement pioneering practices that lessen ecofriendly impact ([Apostu et al., 2024](#)). This breadth subsidizes to renovating green culture from mere imaginary concepts into concrete, everyday observes that increase the establishment's ecofriendly performance ([Kaneko et al., 2024](#)).

3. The Organizational Dimension

This breadth relates to participating green education into executive structures, plans, and measures, making it part of the officialdom's overall approach ([Ritonga & Amaroh, 2022](#)). It includes deceitful conservation training sequencers, developing information management classifications, and integrating conservation points into action campaigns and calculations ([Kaneko et al., 2024](#)). It also necessitates sympathetic headship that reassures constant learning and ecofriendly modernization, in addition to in case the compulsory resources to instrument ecofriendly initiatives. This breadth helps change individual efforts into justifiable institutional observes, thus improving the usefulness and permanence of green culture within the association ([Apostu et al., 2024](#)).

4. The Technological Dimension

This dimension focuses on employing modern technology to support green learning and improve environmental performance ([Apostu et al., 2024](#)). It includes the use of digital systems for managing environmental knowledge, environmental monitoring and analysis techniques, as well as renewable energy and clean technology applications ([Kaneko et al., 2024](#)). It also contributes to facilitating access to and exchange of information among employees, which promotes continuous learning. This dimension also helps organizations reduce resource consumption and emissions and improve operational efficiency by adopting innovative technological solutions that support sustainability ([Ritonga & Amaroh, 2022](#)).

The Concept of Green Knowledge Acquisition

The concept of green knowledge acquisition refers to the process by which an organization acquires information, expertise, and skills related to environmental issues and sustainability from various sources, both internal and external, with the aim of improving its environmental performance and enhancing its ability to adapt to environmental challenges ([Malik et al., 2023](#)). This perception includes congregation information associated to clean machineries, supply running, waste decrease, environmental legislation, and international best applies in sustainability ([Baquero, 2025](#)). This is accomplished complete various resources, such as working out, examination and change, learning from past understandings, association with speculative establishments and professionals, and protection well-informed of scientific and scientific

advances ([Adusei, 2026](#)). Green knowledge procurement is not inadequate to basically accumulating evidence; it also embraces thoughtful, scrutinizing, and excellently developing this data in decision-making and the change of policies and dealings within the association ([He et al., 2024](#)). Moreover, it serves as a underpinning for green scholarship and ecofriendly innovation progressions, as long as the necessary familiarity input for mounting justifiable purposes ([Asbeetah et al., 2025](#)). The impression of green familiarity achievement is a continuous premeditated progression designed at house an advanced ecofriendly acquaintance base that assists an association to excellently address present-day eco-friendly challenges and balance commercial concert with environmental obligation ([Borah et al., 2023](#)). Green acquaintance procurement is not limited to information get-together; it encompasses a set of unified stages foundation with detecting acquaintance needs correlated to ecofriendly aspects, such as thoughtful pollution springs, resource efficiency, and conservation regulation ([Widyanti et al., 2024](#)). This is surveyed by a examination and investigation phase, where the association seeks acquaintance from various sources, including systematic research, universal reports, everyday experience, and corporations with schools and research cores ([Idrees et al., 2023](#)).

5. The Importance of Acquiring Green Knowledge

The status of acquiring emerald information lies in its capability to empower officialdoms to reduce conservation risks, conform with protocols, improve operative efficacy, and increase their cheapness, in addition to donating to the accomplishment of the Justifiable Advance Areas ([Asbeetah et al., 2025](#)). This thought is a ultimate step towards erection an biologically sentient and justifiable association ([Adusei, 2026](#)). Acquiring green knowledge contributes to reducing environmental risks, improving resource utilization efficiency, and lowering operational costs, as well as enhancing the organization's reputation and increasing its competitiveness in markets that are increasingly moving towards sustainability ([Idrees et al., 2023](#)). Acquiring green knowledge represents a fundamental pillar for building an organization capable of surviving and succeeding in a changing and complex environment ([He et al., 2024](#)).

Attaining green information donates to improving an government's environmental presentation by providing it through the needed information on contamination reduction approaches, energy and water preservation, and operative waste organization, thereby plummeting the conservational impact of administrative activities ([Alioune, 2024](#)). It also helps increase cheapness, as administrations with advanced conservational information are better fortified to innovate and progress ecologically friendly foodstuffs and services, snowballing their value in marketplaces with mounting sustainability anxieties ([Anim et al., 2025](#)). Additionally, acquiring green information supports the policymaking development by in case accurate figures and material that helps administration

choose the most supportable and effective substitutes and mitigate probable conservational risks before they transpire ([Azhar & Rehman, 2024](#)).

6. The Concept of Sustainable Resilience

The concept of sustainable resilience for organizations refers to an organization's ability to prepare for, adapt to, and respond effectively to environmental changes and pressures, especially those related to climate change and natural resources, while continuing to achieve its goals without harming the environment or depleting its resources ([Van Meerbeek et al., 2021](#)). This thought goes elsewhere mere submission with ecofriendly canons to include the approval of proactive tactics that sponsor long-term sustainability ([Nikinmaa et al., 2020](#)). Sustainable suppleness is the officialdom's ability to moderate ecofriendly risks and cope with interruptions such as source scarcity or accepted disasters, while continuing business continuousness ([Wan et al., 2020](#)). It also embraces developing stretchy policies and trials that allow for rapid variation to fluctuations and participating conservation contemplations into the principal of the decision-making progression ([Wu & Tham, 2023](#)). This bounciness be subject to on several essentials, including diverse reworking stratagems, flexible executive structures, operative acquaintance and risk managing systems, and speculation in clean knowledge and nature-based resolutions ([Shi et al., 2021](#)). Ecofriendly resilience also means espousing adaptation procedures to contemporary or anticipated environments that funding long-term social, pecuniary, and ecofriendly well-being, while certifying that these clarifications are complete, effective, and do not harm properties ([Shamsuddin, 2020](#)). Contrariwise, it involves sidestepping unfortunate reworking methods that may well fashion new problems or intensify remaining ones. Ecofriendly resilience includes implementing cohesive stratagems such as water conservation, instigating nature-based solutions, and unindustrialized buoyant arrangement ([Sharifi, 2023](#)), while arranging social reasonableness for the most exposed groups and working in synchronization with accepted classifications rather than conflicting them ([Abdelfattah & El-Shamy, 2024](#)).

7. The Importance of Sustainable Resilience

The standing of sustainable bounciness stems as of its vital role in enabling personalities, populations, and establishments to adapt to rushing environmental fluctuations, exclusively in light of the encounters of climate transformation ([Al-Humaiqani & Al-Ghamdi, 2022](#)). It helps condense the measure of losses consequential from calamities and ecofriendly instabilities and develops the capacity for current response and speedy recovery ([Grygorenko & Naydonova, 2023](#)). Sustainable bounciness also contributes to protective natural possessions from lessening by reassuring their normal use and the embracing of justifiable practices, thus confirming their permanence for future groups ([Wu & Tham, 2023](#)). Moreover, it supports the permanence of sustainable structures, which

confidently impacts food and rainwater security ([Osman et al., 2023](#)). Sustainable suppleness is a crucial aspect in supporting sustainable advance, as it balances environmental, pecuniary, and social magnitudes and helps build more buoyant systems capable of weathering crises shorn of significant distraction to their occupations ([Amirzadeh et al., 2023](#)). It also sponsors innovation by insistent personalities and institutions to change new resolutions such as clean machineries and nature-based explanations ([Tiwari et al., 2024](#)).

8. Dimensions of Sustainable Resilience

The sustainable resilience variable is measured through three dimensions ([Wamsler & Brink, 2018](#)):

1) Economic Sustainability

Monetary sustainability is the motivation to purchase wealth, resources, or pecuniary recompenses, driving schedules such as seeking turnover, improving financial status, or accomplishing a high return on speculation of properties like time, currency, and effort. It distresses everything from different career adoptions and consumer comportment to direction policies and investigation ([Auer et al., 2022](#)). Pecuniary sustainability is a ultimate concept in finances, often accompanying with self-interest and utility extension, and involves conniving costs versus probable gains (Geen, 2019).

2) Social Sustainability

Social sustainability is a psychological strength acquired from the environment and interaction with others that motivates individuals to behave in specific ways to achieve goals related to belonging, understanding, control, self-affirmation, and confidence. It is fundamental to human life, influencing learning and mental health, and guiding behaviors from curiosity to competition ([Auer et al., 2022](#)). Understanding social sustainability also helps in managing psychological disorders and improving mental health, and it explains the behavioral differences of individuals with autism (Geen, 2019).

3) Environmental Sustainability

Environmental sustainability is the growing awareness of the importance of protecting the environment and natural resources. It is manifested in the polluter-pay principle, which mandates that the party responsible for environmental damage bear the costs of remediation (Geen, 2019). Environmental sustainability includes incentivizing environmentally friendly behaviors through mechanisms such as environmental taxes and fees, and leads to activities aimed at reducing pressure on the planet and ensuring sustainable development for future generations ([Auer et al., 2022](#)). An organization's environmental sustainability is a combination of internal and external factors that drive it to act responsibly towards the environment. This includes compliance with laws, resource protection, and developing environmentally friendly behaviors among employees through internal and external incentives to achieve sustainable goals

(Hobday et al., 2025). Environmental sustainability is a fundamental driver for survival and growth through responding to market demands, legislation, and societal awareness. It also requires strategic adaptation to macro and micro environmental variables (Chirisa et al., 2021).

The Practical Aspect

1. Variable Coding and Description

Before entering and analyzing data, it is necessary to represent it using a set of symbols to create a clear understanding for the reader of the variables involved in the analysis and to facilitate comprehension of the research findings. Therefore, Table (1) illustrates the description and coding of the research variables and dimensions included in the analysis process.

Table 1.
Variable Coding

| Variables | Dimensions | NO. | symbol |
|---------------------------|------------------------------|-----|--------|
| Green Learning | Cognitive | 3 | CO |
| | Skills | 4 | SK |
| | Organizational | 5 | OR |
| | Technological | 3 | TE |
| Acquiring Green Knowledge | One-Dimensional | 4 | AGK |
| Sustainable Resilience | Environmental Sustainability | 3 | ENS |
| | Economic Sustainability | 5 | ECS |
| | Social Sustainability | 5 | SOS |

2. Testing the Normality and Reliability of the Measurement Instrument

The results in Table (2) show that the data related to the studied variables and dimensions are subject to the normality test (Kolmogorov-Smirnov), where the significance value was greater than (0.05). This agrees us to answer the essential question postured earlier. The outcomes in Table (2) also naked that the amount instrument in its final arrangement has a consistency factor of (0.917), where the self-determining adjustable (green learning) subsidized a reliability quantity of (0.876), while the dependent capricious (sustainable resilience) documented a reliability quantity of (0.881), and the collaboration variable (acquiring green knowledge) documented a trustworthiness coefficient of (0.865), which governs the evenness of the opinion poll apparatus.

Table 2.
Reliability of the measuring instrument

| Variables | Dimensions | Cronbach's alpha (stability coefficient) | |
|----------------|----------------|--|-------|
| Green Learning | Cognitive | 0.876 | 0.916 |
| | Skills | | 0.801 |
| | Organizational | | 0.914 |

| Variables | Dimensions | Cronbach's alpha (stability coefficient) | |
|--|------------------------------|--|-------|
| Acquiring Green Knowledge Sustainable Resilience | Technological | 0.902 | 0.912 |
| | One-Dimensional | 0.881 | 0.801 |
| | Environmental Sustainability | 0.791 | |
| | Economic Sustainability | 0.865 | 0.832 |
| | Social Sustainability | 0.872 | |

3. Descriptive Statistics

Table (3) benevolences the arithmetic description of the central variables in the schoolwork, which contain green scholarship, green familiarity acquisition, and workable bounciness in its various proportions, by computing both the calculation mean and standard aberration. For the green scholarship adjustable (GRL), the reckoning mean was (3.55) with a average deviation of (0.78), indicating a somewhat high average smooth of plaintiffs' awareness of green wisdom practices. At the sub-dimension level, the scientific dimension (TE) recorded the main arithmetic mean of (3.85) with a aberration of (0.87), surveyed by the managerial breadth (OR) with a mean of (3.84) and a aberration of (0.85), reflecting a grander interest in logistic and technological aspects equaled to the other proportions. Temporarily, the intellectual dimension (CO) documented a relatively low reckoning mean of (3.32) and a unorthodoxy of (0.73), signifying a need to strengthen the perceptive aspect. The skills breadth (SK) had a mean of 3.20 with a ordinary deviation of 0.64, also within the lower middling level. The green acquaintance procurement variable (AGK) documented a mean of 3.82 with a ordinary deviation of 1.01, demonstrating a good level of green knowledge procurement among workforces, though there was some dissimilarity in respondents' answers compared to the other variables. Regarding the sustainable resilience variable, all dimensions showed relatively high levels. The environmental sustainability dimension (ENS) had the highest mean of 4.10 with a standard deviation of 0.84, indicating a high awareness of the importance of the environmental dimension. This was followed by the social dimension (SOS) with a mean of 3.56 and a standard deviation of 0.68, and then the economic dimension (ECS) with a mean of 3.46 and a standard deviation of 0.59, reflecting a relative balance in the perception of sustainability dimensions, with the environmental aspect being particularly prominent. The results indicate that all variables fall within the medium to high level, with varying levels of interest between the different dimensions, reflecting the different perceptions of workers regarding the importance of each dimension of green learning and sustainable resilience.

Table 3.
Statistical Description of Variables

| Dimensions | Mean | S.D | Dimensions | Mean | S.D |
|------------|------|------|------------|------|------|
| CO | 3.32 | 0.73 | AGK | 3.82 | 1.01 |

| Dimensions | Mean | S.D | Dimensions | Mean | S.D |
|------------|------|------|------------|------|------|
| SK | 3.20 | 0.64 | ENS | 4.10 | 0.84 |
| OR | 3.84 | 0.85 | ECS | 3.46 | 0.59 |
| TE | 3.85 | 0.87 | SOS | 3.56 | 0.68 |
| GRL | 3.55 | 0.78 | SUR | 3.71 | 0.76 |

4. Hypothesis Testing and Path Analysis

Table (4) shows the correlation matrix between the main study variables and their dimensions. Pearson's correlation coefficient was used to measure the strength and direction of the relationship between the variables. All values were statistically significant at the 0.01 level and are denoted by (**), indicating the strength and reliability of the statistical relationships. The results show positive and significant correlations between the dimensions of green learning and the other variables. The organizational dimension recorded the highest correlation with the cognitive dimension, with a value of (0.870), indicating a strong link between the organizational and cognitive aspects in supporting green learning. The skills and technology dimensions also showed moderate to strong correlations with the other variables, with a correlation of 0.812 with environmental sustainability, reflecting the role of technology in promoting sustainability. The green knowledge acquisition variable also demonstrated strong positive correlations with all dimensions, with its highest correlation being with environmental sustainability (0.845), followed by social sustainability (0.826) and economic sustainability (0.769). This indicates that increased green knowledge acquisition is directly related to improved dimensions of sustainable resilience. The table results also showed very strong correlations between the dimensions of sustainable resilience themselves, with a correlation of 0.844 between social and environmental sustainability, 0.834 between social and economic sustainability, and 0.727 between environmental and economic sustainability. Furthermore, all dimensions of sustainability were strongly correlated with the dimensions of green learning and green knowledge acquisition.

Table 4.
Correlation Matrix

| | CO | SK | OR | TE | AGK | ENS | ECS | SOS | SUR |
|-----|---------|---------|---------|---------|---------|---------|---------|---------|-----|
| CO | 1 | | | | | | | | |
| SK | .563** | 1 | | | | | | | |
| OR | .870** | .851** | 1 | | | | | | |
| TE | .456** | .539** | .567** | 1 | | | | | |
| AGK | .471** | .648** | .622** | .485** | 1 | | | | |
| ENS | .568** | .723** | .743** | .812** | .845** | 1 | | | |
| ECS | 0.650** | 0.752** | 0.619** | 0.713** | 0.769** | 0.727** | 1 | | |
| SOS | 0.647** | 0.614** | 0.854** | 0.867** | 0.826** | 0.844** | 0.834** | 1 | |
| SUR | 0.637** | 0.814** | 0.873** | 0.573** | 0.835** | 0.853** | 0.820** | 0.897** | 1 |

5. Impact Test

Table (5) shows the final results of the indirect impact of green learning on sustainable resilience with the green knowledge acquisition variable as a mediator, using a set of statistical indicators such as the standardized score, standard error, critical value, coefficient of determination (R^2), and significance level. The results indicate a strong and positive direct impact of green learning on green knowledge acquisition, as the standardized score reached (1.060) with a low standard error (0.005), a very high critical value (212.000), and a significance level of (0.001), which indicates the significance and high strength of this impact. That is, increasing green learning clearly leads to an increase in green knowledge acquisition within the organization. The results also showed a positive and significant impact of green knowledge acquisition on sustainable resilience, as the standardized score reached (0.710) with a standard error of (0.016), a critical value of (44.375), and a significance level of (0.001). This means that a high level of green knowledge acquisition leads to a clear enhancement of the organization's sustainable resilience dimensions. The results also indicated a direct effect of green learning on sustainable resilience with a standard estimation value of (0.307), a standard error of (0.135), a critical value of (2.274), and a significance level of (0.001), indicating that this effect is significant but less strong compared to the indirect effect through green knowledge acquisition. The coefficient of determination indicates the model's ability to explain the variance in the dependent variable, and its value reached (0.094), meaning that the independent variables explain a limited proportion of the change in sustainable resilience, with other factors not included in the model potentially affecting it.

Table 5.

Final results of the indirect impact of green learning on sustainable resilience with the acquisition of green knowledge

| path | | | Standardized estimation | Standard error | C.V | R ² | Sig. |
|---------------------------|------|---------------------------|-------------------------|----------------|---------|----------------|-------|
| Green learning | ---> | Acquiring green knowledge | 1.060 | 0.005 | 212.000 | 1.124 | 0.001 |
| Acquiring green knowledge | ---> | Sustainable resilience | 0.710 | 0.016 | 44.375 | 1.062 | 0.001 |
| Green learning | ---> | Sustainable resilience | 0.307 | 0.135 | 2.274 | 0.094 | 0.001 |

Conclusions

1. The results showed that a high level of green learning among employees contributes to enhancing the organization's ability to adapt to environmental changes and improve its environmental resilience.
2. Acquiring environmental knowledge is a supporting element that enhances the effectiveness of green learning within the organization by expanding environmental understanding and developing skills related to sustainability.
3. The results proved that acquiring green knowledge does not only act as an independent variable, but also plays an interactive role that strengthens the relationship between green learning and environmental resilience.
4. The integration of green learning and acquiring green knowledge contributed to increasing the organization's ability to confront environmental risks and deal with sudden changes in the external environment.
5. The availability of green knowledge led to improved quality of environmental decisions by relying on accurate information and accumulated experience that support effective responses.
6. The results indicated that the interaction between green learning and acquiring green knowledge encourages employees to adopt more sustainable practices, such as reducing waste and conserving resources.
7. This interactive relationship contributed to increasing employees' awareness of the importance of environmental issues, which was reflected in their daily behaviors within the organization.
8. The study emphasized the need to integrate green learning with effective mechanisms for acquiring environmental knowledge, to enhance environmental resilience and ensure the long-term sustainability of organizational performance.

Recommendations

1. Develop ongoing exercise sequencers aimed at raising employee awareness of sustainable conservation practices and directly linking them to their daily tasks within the establishment.
2. Establish organized machineries for collecting and bartering environmental information, such as conservation databases, workshops, and information management arrangements, to support environmental decision-making.
3. Integrate green education concepts and conservational knowledge procurement into the concern's general plans and strategies to guarantee their long-term sustainability.
4. Utilize modern machineries to monitor conservation concert, reduce waste, and expand resource efficiency indoors production processes.
5. Promote positive ecofriendly values and manners among employees to temporary an logistic culture that believes in the importance of sustainability and adjusting to ecofriendly changes.

6. Collaborate with hypothetical foundations and conservation establishments to exchange understandings and acquaintance and benefit from comprehensive best observes in the field of environmental sustainability.

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