Nurturing Sustainability: Exploring the Link between Organizational Green Culture and Environmental Performance in the Public Sector Universities of Sindh

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ABSTRACT: Universities help the economy, budget, and green innovation. Academic competitions have increased this trend. Thus, a thorough study of green innovation's origins in the organization's region would improve theoretical frameworks and actual implementations. Several studies have examined green performance, organizational green culture (OGC), and green innovation. Their relationship was unknown. This study explored their correlation. Negotiation was essential to the research. This study used green innovation as a mediator. This study investigates how organizational green culture (OGC) affects green performance, with a focus on green innovation. Data from public universities were used in this investigation. Surveys were disseminated by public universities. A total of 198 faculty members participated in the study by completing 200 questionnaires, resulting in a response rate of 99%. Correlation and regression showed a positive relationship between OGC (organizational green commitment) and green performance. All variables also showed favorable connections. The regression study shows a favorable association between green innovation, organizational green culture (OGC), and green performance. This study, like others, has limitations. Regional scope limits this investigation. This study did not explore the generalizability of its findings to other institutions in the same association or to public university statistics from Sindh and other Pakistani provinces. 200 workers limited the study.

The study found a quantitatively significant correlation between organizational green culture and green performance. Organizational green culture increases green performance. This empirical study on corporate culture and creativity examines untapped green environmental challenges. This analysis explains the relationships by understanding the green innovation method's mediating role. To fill a research gap, this study focuses on Sindh's education sector, which significantly contributes to Pakistan's economy.

Keywords: Organizational green commitment, green innovation, green performance, public universities

Introduction

Prior research has focused extensively on identifying the factors contributing to developing environmentally sustainable practices (Leal-Millan et al., 2016). The analysis of Huang et al. (2016) on the implications of green innovation on drivers lacks clarity. Moreover, an initiative's notion of a mean-based high spot, assets, and internal capabilities play a crucial role in its growth and operation. The study by Zameer et al. (2018) highlighted the significant impact of internal executive elements on external influences. The concept and recurrence of green innovation are receiving significant attention owing to its focus on delivering a presentation on environmentally friendly subjects. As defined by Przychodzen and Przychodzen (2015), green manufacturing encompasses the incorporation of environmentally friendly concepts throughout the whole life cycle of an organization.

Tseng et al. (2013) have reported that implementing green culture organizations has been associated with waste reduction and improved overall production efficiency. Nevertheless, the degree to which it can be advantageous in fostering a sustainable reputation and augmenting overall effectiveness remains uncertain. This analysis focuses on the previous studies conducted by Hart (1995), which proposed that the concept of reasonable benefit is based on the interplay between a corporation and its customary surroundings. Moreover, much attention has been devoted to investigating green organizational management and its related factors. Nevertheless, it is crucial to recognize that some limitations exist linked to the cessation of one's educational endeavors. In a similar vein, academic research on sustainable manufacturing has mostly centered on the identification of key factors pertaining to green organizational culture. The use of environmentally friendly industrial practices is a fundamental necessity for ensuring organizations' long-term viability and sustainable development. The educational sector, which includes public universities, is widely acknowledged for its substantial impact on the nation's economy. The tool in question holds significant potential for addressing inadequacies, boosting economic growth, nurturing a proficient pool of human resources, developing a sound and logical societal milieu, and fostering self-reliance within nations. An inverse correlation exists between poverty and education, wherein an enhancement in one attribute results in a deterioration of the other. This study defines the term "green strategy" as the strategic method utilized by innovators to regain and establish a sustainable competitive advantage to contribute to environmental preservation. This approach may incorporate components such as promoting knowledge of sustainability, practicing corporate social responsibility, or demonstrating environmental concern. Implementing a green strategy is widely acknowledged as a crucial technique to effectively advancing sustainable development within the built environment. According to Kingsley (2008), a prior investigation suggests that adopting and utilizing green buildings present an economically feasible choice for developers and policymakers aiming to address the negative ecological consequences linked to urban expansion. Previous studies have employed experimental methodologies to investigate innovation and ecological considerations. The investigation into green modernization and its subsequent exposition has produced many findings. The divergent findings of the research have sparked scholarly curiosity in comprehending the correlation between firms' environmental innovation and their environmental performance (Martins and Terblanche, 2003; McLean, 2005).

Therefore, the present study aims to examine the discrepancies in order to determine the extent to which green modernization contributes to the achievement of ecologically sustainable results within organizational contexts. In recent years, there has been a growing recognition of the significance of organizational green cultures (OGC) as highlighted by studies conducted by Baker and Sinkula (2005), De Ruyter et al. (2009), and Grinstein and Nisan (2009). However, it is surprising to note the limited attention provided in the literature to the effectiveness of OGC strategies. The relationship between organizational cultures and corporate presentations is a matter of great importance for organizations worldwide. However, limited material is available to address this issue, either in terms of historical research or the existing literature gap (De Marchi, 2012). The inclusion of study in this context is crucial for the attainment of comprehensive insights derived from experimental analysis. This study contributes to our knowledge by examining how industrial organizations transform their tangible resources, such as organizational green capabilities (OGC), into environmentally friendly practices and a competitive edge. It also explores the role of green innovation in mediating these relationships. According to Ho et al. (2017), organizations may place confidence in the efficacy of market orientation, yet they may encounter a deficiency in the proficiency required to execute the anticipated outcomes associated with market orientation effectively. The lack of competitive differentiation, satisfaction with current affairs, and uncertainty among purchasers may hinder the achievement of significance from a marketing orientation (Jogaratnam, 2017). The study was conducted by Jiangetal. (2018) examines the relationship between buyer environmental consciousness and consumer behavior, specifically focusing on the

influence of green innovation sustainability and pricing comprehension on green purchasing decisions. Further investigation is required to examine the various stages through which entrepreneurial orientation influences the sustainable competitive advantage of organizations, as highlighted by LeeandChu (2017). This research gap may be addressed by using a mediation variable to elucidate the complex relationship. The primary aim of this study is to examine the influence of organizational culture and inter-organizational learning on the transformation of green entrepreneurial orientation and market orientation into sustainable competitive advantages. The physical calculation aimed to elucidate the relationship between green company positioning, market positioning, and sustainable competitive advantage. However, the current issue lies in the fact that current research focuses solely on how green production contributes to the improvement of efficiency and effectiveness. The contemporary competitive environment fosters the adoption of innovative public management practices or performance-based strategies by community higher education institutions. These practices may be based on factors such as routine and output. According to Hughes and Hughes (2013), an organization's implementation of green high-tech innovation has negative implications for factors such as innovativeness, productivity, competitive advantage, and presentation. The growing public concern regarding the prevailing circumstances rapidly shapes the comparable landscape and compels organizations to embrace environmentally friendly modernization strategies. Numerous industrial enterprises have established a prevailing notion of green innovation, notwithstanding the limited extent of study conducted on the factors driving its implementation and its resultant impact. This study aims to

empirically create and evaluate a conceptual model that examines the impact of organizational green culture (OGC) on the firm's green performance and overall performance. This model specifically demonstrates the role of green innovation as a mediator in the relationships between variables.

Literature Review

Organizational Green Culture (OGC) and Green Performance

According to Banerjee et al. (2003), the implementation of a proper organizational green culture (OGC) based on eco-green ethics can effectively meet and integrate processes related to different environmentally friendly products within organizations. According to Schlegelmilch et al. (1996), using OGC can be advantageous for organizations as it facilitates the implementation of ecologically proactive strategies, leading to improved green performance. According to Russo and Fouts (1997), firms that do not prioritize environmental sustainability may have limited financial resources to invest in their environmental initiatives. Additionally, top-level management may concentrate these resources on the firm's more immediate and pressing needs, often neglecting the ecological aspect.

Green performance and green innovation

In general, individuals tend to avoid situations about which they possess limited knowledge or understanding. The study was conducted by Amyx et al. (1994). Individuals possess extensive evidence pertaining to numerous ecological issues. Consequently, individuals tend to allocate additional funds towards the purchase of environmentally friendly products (Chan et al., 2014). Ecological knowledge, ethics, methods, and predisposition towards specific behaviors, influenced by intentional and positional factors, are considered to be the most significant characteristics of individual ecological

responsiveness (Zsoka, 2008; Ajzen, 1985; Luthans, 2006; Zsoka et al., 2013). In addition to internal factors that affect information, assertiveness, and norms, external factors influence environmentally friendly behavior. Based on the relevant training conducted by Fliegenschnee and Schelakovsky in 1998, it was established and explored that the environmental performance of firms is influenced by the extent to which their employees consider environmental concerns and possess specific green skills related to core operations for regulatory compliance (El-Kassar and Singh, 2018; Guerci et al., 2016; Singh and El-Kassar, 2019; Wang et al., 2012).

The concept of environmental sustainability, commonly referred to as "Go Green" has gained limited traction inside human resources (HR) departments of organizations. Recent studies have indicated a steady and growing disinterest in adopting environmentally friendly practices within HR structures of organizations (Boiral et al., 2015; Jabbour, 2015; Kim et al., 2019). While incorporating ecological considerations into business strategies is not a recent phenomenon, it has only recently gained prominence in mainstream business discourse and attracted the attention of scholars in the field (Leonidou & Leonidou, 2011).

Corporate environmental management

According to Chen (2008b), there is widespread awareness among the public regarding environmental issues in contemporary society. This is mostly due to the significant amount of environmental contamination, particularly concerning industrial mechanization, observed on a global scale. The principles of environmental governance, at the national and international levels, encompass regulations promoting sustainability, stakeholder engagement, environmental advocacy, and the influence of

competitive pressures on corporate operations (Rugman and Verbeke, 1998). According to Berry and Rondinelli (1998), firms are compelled to engage in environmentally sustainable practices in order to comply with worldwide environmental legislation and meet the growing expectations of environmentally conscious customers. According to Chen (2008b), organizations are willing to assume responsibility for minimizing environmental harm through deliberate and intentional cognitive processes. The modernization efforts of industrial businesses were impeded. The Green Revolution has responded to this concern by prioritizing environmentally friendly strategies that enable industrial companies to achieve their business objectives while preserving the natural environment (Robinson and Stubberud, 2013). The study acknowledged a specific aspect of a sustainability program, which involved the inclusion of supply chain partners in the government's initiatives. This aspect pertains to the management of supply chain activities, which encompasses all aspects of the supply chain processes and can significantly impact supply chain performance (Flynn et al., 2010). Establishing supply chain partnerships within the organization's sustainability initiatives also involves transparency in engaging with other institutions in fundamental advancements and resource allocation. Sincerity can be engendered by the implementation of committed activities by those in positions of authority. However, the evidence transfers process entails using operative statements (Rowlinson and Cheung, 2011).

Corporate social responsibility (CSR) and strategic CSR

According to McWilliams and Siegel (2001), corporate social responsibility (CSR) is the practice in which a company engages in social initiatives and assumes certain duties driven by its own interests and mandated by legal requirements.

Numerous theories about corporate social responsibility exist, which can be delineated as follows. From an organizational theory perspective, there are uncertainties surrounding why firms adopt corporate social responsibility (CSR) practices and the extent to which managers utilize CSR for personal gains or private agendas. For instance, some argue that CSR is a misallocation of corporate resources that could be better utilized for value-added services (Friedman, 1970). Hart (1995) argues that the resource-based view (RBV) approach highlights the potential of green corporate social responsibility (CSR) to serve as a source of sustained competitive advantage. When industrialized firms encounter environmental challenges, they are confronted with a decision-making dilemma. This dilemma involves weighing two conflicting objectives: selecting the most favorable approach to environmental compliance, even if it may result in reduced revenues, versus pursuing the most profitable course of action while still adhering to credible environmental standards (Russo and Fouts, 1997). The year 1995 is significant in this context. Chen (2008a) argues that implementing green management practices is unnecessary and unproductive for companies or mistakenly believes that it poses risks to already established corporations. However, numerous researchers have explained that pollution is often a result of inefficient or wasteful resource utilization. Companies that adopt green management or engage in green innovation can reap various benefits, including improved public perception, access to green products, and competitive advantages that lead to greater overall benefits.

Organizational identity

According to Albert and Whetten (1985), organizational brands encompass a collection of perspectives concerning a firm's central purpose, ongoing nature, and distinctive attributes.

According to Albert et al. (2000), organizations strive to present themselves to internal and external stakeholders in order to showcase their connections with other organizations, groups, and individuals. According to Fiol (1991), organizational personality or brand name enables an organization's members to comprehend the organization's actions in relation to their understanding of what the organization represents. Additionally, organizational personality provides the context in which members interpret and attribute significance to everyday behaviors. According to Gioia and Thomas (1996), corporations have the capacity to influence the ideas and attitudes of their organizational members, especially leaders, and can alter their understanding or endorsement of innovative ideas that aim to transform the corporate identity in response to environmental changes. Previous studies have extensively elucidated the concept of corporate personality or brand identity within business. Therefore, governments have increasingly focused on 'Sustainability' as a business domain, implementing green marketing methods to promote adopting environmentally friendly products to existing and potential customers. Green goods refer to products that aim to protect the natural environment by utilizing sustainable competitive advantage involves the strategic pursuit of innovation and surpassing contemporary practices to create value. The concept of a learning organization is concerned with fostering a culture of continuous learning, thereby transforming learning processes and boosting the capacity for learning to improve organizational performance (Rup cic, 2017). The green innovation policy is derived from an organizational green commitment (OGC) that management plan, along with its policies and processes, contributes to the achievement of

sustainable resources and reducing harmful intermediaries, toxic waste, and excess (Ottman, 1992). Previous studies have revealed that those who exhibit a higher level of concern for the environment are more inclined to make purchases of environmentally friendly products (Sarumathi, 2014). In the examination of global conservation topics, it is mostly caused by human activities (Dong, Deng, Li, & Huang, 2017).

The positive effect of green organizational culture

According to Fiol (1991), appropriate courses of action exist for different situations within corporate culture, which can be elucidated by a collection of commonly shared psychological assertions that indicate comprehension and behavior within organizations. According to Hatch and Schultz (2002), corporate traditions are a foundation for developing common sense and internal identity clarification. According to Hatch (1993), the symbols of corporate culture are considered the most significant resources in shaping an organization's identity. These symbols transform raw data into the automatic representation of the distinctive characteristics of corporate cultures. Kuncoro and Suriani (2018) argue that driving market competitiveness can be achieved by leveraging.

encompasses the organization's performance and averages for environmental sustainability. The study conducted by Ozsomer et al. (1997) demonstrates that OGC has a significant impact on the perspectives of executives with regards to green modernization.

Conceptual framework

According to Ormazabaland Sarriegi (2014), the implementation of a company's natural resource

sustainable construction practices at the social and global levels. Klassen and McLaughlin (1996)

define social management as the process by which a company's efforts are aimed at mitigating the adverse effects of its products and manufacturing processes on the natural environment inside the society. Currently, the proliferation of organizational implementation has enabled scholars to develop a keen interest in studying the operational aspects of corporate social management and its implementation. This requires companies to broaden their scope of sales and incorporate the strengthening of social stakeholders and the typical relationship between their strategic marketing goals referred to as the tripartite bottom line of financial, social, and environmental performance (Stoeckl & Luedicke, 2015). The implementation of proactive ecological measures involves the coordination of green defense plans, which allows for the permissible obedience of regulations. This is a crucial stage in the process, as highlighted by Sharma and Vredenburg (1998). They are also referred to as accountable conservation practices that promote ecological sustainability and environmentally friendly behaviors. The term "green information" refers to the practice of achieving a sustainable balance between ecological conditions and economic and social developments (Jamison, 2001, 2003). It has been indicated that the presence of specific information can significantly disrupt an individual's ability to make expressive pronouncements.
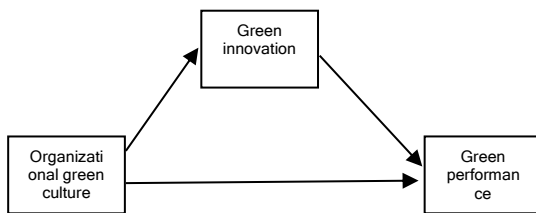
A proposed model has been developed from the literature review. The following hypotheses have been developed:

H1: Organizational green culture has a direct positive effect on green performance.

H2: Organizational green culture has a direct positive effect on green innovation.

H3: Green innovation has a direct positive effect on green performance.

H4: Green innovation mediates the relationship between organizational green culture and green performance.

Research Methodology

The present study primarily focuses on the relationship between organizational green culture and green performance. This study examines the concepts of organizational green culture, green performance, and green innovation. Currently, there exist four distinct components that contribute to the concept of Organizational Culture (OGC). These factors include engagement culture, consistency culture, adaptability culture, and mission culture. The survey instrument was employed for the purpose of data gathering. The questionnaire is divided into four parts. The initial section of the questionnaire enclosed the demographic information, followed by inquiries pertaining to organizational green culture in the subsequent segment. The third section focused on questions related to green innovation, while the fourth section addressed inquiries regarding green performance. The researchers employed a five-point Likert Scale to analyze the factors.

Population and Sample

As previously said, competitive advantages have been cultivated across many enterprises. Public universities in the province of Sindh play a significant role in this institution. The environmental concerns inside the faculty are prevalent in public colleges, as these institutions have prioritized the

enhancement of educational standards worldwide. Faculty members in public universities are burdened with a significant workload d, making them an optimal choice for pursuing higher education. For this study, all faculty members, including lecturers, assistant professors, and professors, were selected, apart from the Vice Chancellor and other higher-level administrators. The inclusion of a sample size comprising 200 faculty members has been accounted for in this study. The questionnaire was employed as a means of data collection. The dataset obtained from the personnel consisted of 198 observations, representing a total of 99% of the entire population. The data from a standardized questionnaire was collected.

Organizational green culture

The concept of organizational green culture encompasses four characteristics, namely "green culture involvement," "green culture consistency," "green culture adaptability," and "green culture mission." These dimensions were identified and formulated by Yang et al. (2017) and Denison (1995). The scale comprises a total of twelve components. The researchers employed a five-point Likert scale to quantify the variables, with responses ranging from 1 to 5 (indicating strong agreement). One example of an included item is the statement, "Our organization values the opinions of its employees, which can result in significant changes within the organization." The reliability coefficient for the construct of organizational green culture is 0.828.

Green innovation

The Green Innovation Scale (GIS) was employed in the study, which was originally devised by Chen et al. in 2015. The scale comprises seven components. The inclusion of one item is exemplified by the statement, "Within our organization, we demonstrate innovation in the development of environmentally friendly products."

The dependability coefficient for green innovation is 0.815.

Green performance

The Green Performance Scale (GPS) was initially formulated by Chen et al. in 2014 and subsequently implemented by Kuo and Chen in 2016. The scale comprises three components. The inclusion of one item is exemplified as follows: "Our organization demonstrates a commitment to environmental policies aimed at mitigating the adverse effects of emissions resulting from various processes." The dependability coefficient for green performance is 0.685.

Data Collection

The researchers distributed structured questionnaires in order to collect data. The data collection was conducted using individual interviews and an online survey. The questionnaires have been gathered in their entirety. The dataset comprises information gathered from public universities located in the province of Sindh.

Data Analysis

The data analysis was performed using the Statistical Package for Social Sciences (SPSS) tool. The study primarily centered on the examination of correlation and regression. Nevertheless, the reliability assessment devised by Cronbach (1951) has been widely employed to evaluate the dependability of survey items. As asserted by McMillan and Schumacher (2001), this method is considered the most effective means of gauging item reliability. In this study, the mean, maximum, and minimum values of the responses to the questionnaire were utilized. The Correlation test was employed to discover the association between separate variables. This observation also indicates the correlation between variables, whether it is positive or negative. Was the analysis of variance (ANOVA) test employed to evaluate the goodness of fit of the constructed model?

Regression analysis has been employed to examine the role of Green Innovation in mediating the relationship between organizational green culture and green performance. The calculation was performed as outlined by Barron and Kenny (1986), and all three assumptions necessary for estimating the mediator variable were incorporated. In this scenario, an alpha value coefficient of less than 0.50 would not possess sufficient credibility. When the alpha coefficient value falls between the range of 0.70 to 0.90, the factor can be considered highly accurate. Similarly, if the value of the alpha coefficient falls within the range of $.90 < alpha < 1$, the element can be considered highly reliable. According to Nunnally (1978), it is recommended that the minimum alpha coefficient for item reliability should be 0.60.

Results-Frequency

Table 2: Gender % age

	Frequency	%	Valid%	Cumulative %
Male	135	68.2	68.2	68.2
Valid Female	63	31.8	31.8	100.0
Total	198	100.0	100.0	

The frequencies of gender are observed in Table 1 presented above. Out of a total of 198 questionnaires, 135 respondents identified as male, accounting for 68.2 percent of the sample. Conversely, 63 respondents identified as female, representing 31.8 percent of the sample. Additionally, the information is visually depicted in the following graphical representation.

Table 2: Designation

	Frequency	%	Valid %	Cumulative %
Professor	4	2.0	2.0	2.0
A.P	54	27.3	27.3	29.3
Valid Lecturer	140	70.7	70.7	100.0
Total	198	100.0	100.0	

According to the data presented in Table 2, the frequencies of the different designations are displayed. Out of the 198 questionnaires collected,

a total of 4 respondents identified themselves as Professors, accounting for 2.0% of the sample. Additionally, 54 respondents identified themselves as Assistant Professors, representing 27.3% of the sample. The majority of respondents, 140 in total, identified themselves as Lecturers, constituting 70.7% of the sample.

Table 3: Experience

	Year	Frequency	%	Valid %	Cumulative %
	< 10	190	96.0	96.0	96.0
Valid	10-19	4	2.0	2.0	98.0
	20-29	1	.5	.5	98.5
	30-39	3	1.5	1.5	100.0
	Total	198	100.0	100.0	

The frequency of the Experience are depicted in Table 3 above. Among the total of 198 questionnaires distributed, a majority of 190 respondents, accounting for 96% of the sample, reported having less than 10 years of experience. A smaller proportion of 4 respondents, representing 2.0% of the sample, reported having 10-19 years of experience. Additionally, 1 respondent, constituting 0.5% of the sample, reported having 20-29 years of experience. Lastly, 3 respondents, making up 1.5% of the sample, reported having 30-39 years of experience.

Reliability of Organizational Green Culture

The reliability statistics indicate that there were 12 items used to measure the construct of organizational green culture. The Cronbach alpha coefficient of 0.828 suggests that the questions pertaining to organizational green culture are highly reliable and effectively capture the variable being assessed. Adkins (1995) conducted a study in which the alpha coefficient exhibited a range of values between 0.71 and 0.95.

Table 4: Summary Item Statistics of Organizational culture

Mean	Minimum	Maxi.	Range	Maximum / Minimum	Variance	N of items

3.859	3.667	4.035	.369	1.101	.009	12

The calculated mean value in Table 4 is 3.859, indicating that the employees' responses tend to lean towards agreement. However, they remain aligned with the majority viewpoint as indicated by the responses on the questionnaire. The observed minimum level (3.667) and maximum level (4.035) suggest that the responses predominantly fell into the Agree category of the questionnaire.

Reliability of green innovation

The reliability data indicates that there was a total of seven items used to measure the construct of Green innovation. The Cronbach's alpha coefficient, which measures internal consistency, was found to be 0.815. This high number suggests that the questions pertaining to green innovation are very reliable and effectively capture the underlying variable of organizational green culture. Adkins (1995) conducted research in which the alpha coefficient ranged from 0.71 to 0.95.

Table 5: Summary Item Statistics of Green innovation

Mean	Minimum	Maxi.	Range	Maximum / Minimum	Variance	N of Items
3.846	3.707	4.030	.323	1.087	.014	7

According to the data shown in Table 5, the mean value is 3,846. This indicates that the faculty members' replies on the questionnaire are categorized as "Indifferent." However, they still align with the agreed category on the questionnaire scale. The observed minimum level (3.707) and maximum level (4.030) indicate that the responses tended to lean towards agreement on the questionnaire.

Reliability of green performance

The reliability statistics indicate that there were three items utilized to assess the factor of Green's performance. The Cronbach alpha coefficient, with a value of 0.828, suggests that the questions pertaining to green performance exhibit a good level of reliability. In practical terms, this implies that these questions effectively measure the variable of organizational green culture. The study conducted by Adkins (1995) observed alpha values ranging from 0.71 to 0.95.

Table 6: Summary Item Statistics of Green performance

Mean	Minimum	Maxi.	Range	Maximum / Minimum	Variance	N of Items
3.825	3.697	3.965	.268	1.072	.018	3

The mean value observed in Table 6 is 3,825, indicating that the replies fall within the middle range as indicated by the "Indifferent" category in the questionnaire. However, they continue to align with the agreed category on the questionnaire scale. The lowest value seen in the dataset is 3.697, while the largest value is 3.965. The amount of agreement is indicated by the responses provided in the questionnaire.

The correlation table presented above illustrates the relationship between two variables. The correlation coefficient between organizational green culture and green innovation is 0.725, indicating a statistically significant positive association between the two variables. When there is a rise in one variable, there is a corresponding increase in the other variable. The correlation coefficient between organizational green culture and green performance is 0.537, indicating a positive and statistically significant association between these two variables. The observed

correlation coefficient between green innovation and green performance is 0.524. This finding suggests that there is a positive and statistically significant association between green innovation and green performance. This implies that as one variable experiences a rise, the other variable will also exhibit an increase.

Mediation

According to the study conducted by Barron and Kenny (1986), the presence of four specific circumstances is necessary for mediation to occur. The first criterion pertains to the existence of a meaningful association between the independent variable and the dependent variable. The second finding demonstrates a noteworthy association between the independent variable and the mediator variable. The third finding highlights the importance of the relationship between the mediator and the dependent variable, particularly when considering the presence of the independent variable. The association between the independent and dependent variables becomes non-significant in the presence of the mediator. Prior to introducing the mediator variable, it is essential to ensure that the link between the variables, regardless of their relevance, meets the criteria for significance in the context of the study. Therefore, the correlation between the green culture within an organization and its corresponding green performance was identified. The observed link between the variables was found to be statistically significant at a significant level of 0.001. The study revealed a substantial correlation (p < 0.001) between the organizational green culture and green innovation. The statistical analysis revealed a significant link (sig. 0.014) between green performance and green innovation. All four requirements were successfully fulfilled for the mediation analysis conducted to examine the relationship between organizational green culture and green performance. To assess the overall significance of the mediation model, the p-value is employed. If the p-value of a mediation model is less than 0.05, it will be deemed statistically significant, indicating partial mediation. Conversely, if the p-value exceeds 0.05, it will be considered statistically insignificant, suggesting full mediation.

Table 8 H1 presents the results indicating that the standardized value of 0.330 is statistically significant (p=0.001). Moreover, the coefficient is positive, implying a potential association between greater levels of green performance and the presence of an organizational green culture. Which outcome can we anticipate? Furthermore, it is important to note that a one-unit rise in the predictor variable is associated with a corresponding increase of 0.330 units in the criterion variable. At this stage, the hypothesis in question is deemed acceptable.

The table labeled H2 illustrates the relationship between the organizational green culture and its impact on green innovation, accounting for 72.5 percent of the observed variance. The data demonstrates that a one-unit rise in the independent variable corresponds to a 0.725-unit increase in the mediating variable. The model holds significance within this context. This finding indicates that there exists a potential to predict 72.5% of the variability in green innovation based on the presence of organizational green culture. The standardized value of 0.725 is found to be statistically significant at a significance level of p=0.001. The positive coefficient implies a positive relationship between broad organizational green culture and green innovation, as anticipated. Based on the available evidence, hypothesis two is deemed to be accepted in this scenario.

Table 8 presents the H3 hypothesis, which indicates that green innovation accounts for 0.285% of the variance in green performance. It is

well acknowledged that a one-unit rise in the mediating variable is associated with a corresponding increase of 0.285 units in the anticipated variable. The model holds considerable significance within this context. This finding indicates that there exists a potential to predict approximately 28.5% of the variability in green performance based on the level of green innovation. The standardized value of 0.285 is shown to be statistically significant at a significant level of p = 0.014. The positive coefficient indicates a positive relationship between wide green innovation and green performance, which aligns with our expectations.

The indirect relationship between OGC, green innovation, and green performance is demonstrated in Table 8. A substantial correlation was detected between organizational green culture (OGC) and green innovation, which in turn influenced green performance. The standardized value of this association was found to be 0.206, with a significant level of P=0.011. This indicates a partial mediation effect and supports the acceptance of the hypothesis.

There are various types of common method bias that can be disregarded or acknowledged as a potential source of bias in the data, such as Harman's single factor, market variable, and common latent factor. The presence of common method bias can be assessed using two distinct ways. The study used methodological control measures to ensure the confidentiality and anonymity of the participants during the data collecting phase for employee information. This was achieved by employing Harmon's single factor in factor analysis, a statistical technique commonly used to address concerns over typical method biases. According to Posakoff, Mackenzie Lee, and Podsakoff (2003), this process involves determining the number of factors for variance in the variables. In this process, all the markers are loaded into an exploratory factor analysis (EFA) to examine the unrotated factor solution (Aulakh & Gencturk, 2000). The resulting solution is then assessed, and in this case, it yielded a score of 29.857 points, which is less than 50 percent (29.857 percent < 50 percent). This indicates that there is no common method bias present in the survey questionnaire, and the effect of common bias in the analysis is not significant. This method is referred to as the single-factor test Harmon.

Hypotheses Testing

Using correlation and regression analysis, the hypotheses which were formed for the research were calculated. Organizational green culture was the independent variable in the analysis and green performance was a dependent variable and a mediator variable was used for green innovation.

The results of the hypothesis are presented in Table No. 17.

Hypothesis 1

(H1). Organizational green culture has a direct positive effect on green performance.

Hypotheses 1 investigated the correlation between the presence of organizational green culture and the level of green performance. The hypothesis was accepted based on the data collected from faculty members of public universities in Sindh. The results of the correlation study suggest a positive association between the factors of Organizational green culture and green performance, with a correlation value of 0.288 at a significance level of p<0.01. Additionally, the regression analysis revealed a regression coefficient of Beta=0.288, also significant at p<0.01.

Hypotheses 2

(H2). Organizational green culture has a direct positive effect on green innovation.

The second hypothesis was deemed valid, as there was a statistically significant positive association (r = 0.728, p < 0.01) between organizational green

culture and green innovation. The regression coefficient exhibited a value of 0.728, indicating a statistically significant relationship (p<0.01). At this juncture, the magnitude of the value is noteworthy. This analysis serves to confirm the theory. The values were selected from the CFA examination.

Hypotheses 3

(H3). Green innovation has a direct positive effect on green performance.

The third hypothesis was examined in relation to the association between green innovation and green performance. Based on the data gathered from the participants and validated by the academic staff. The analysis revealed a positive correlation coefficient of 0.275, indicating a statistically significant relationship. The p-value was found to be less than 0.01, further supporting the significance of the association. The regression coefficient, with a value of 0.275, demonstrates statistical significance at the 0.01 level.

Hypotheses 4

(H4). Green innovation mediates the relationship between green culture and environmental performance.

The acceptance of the fourth hypothesis suggests that there is a mediating relationship between organizational green culture (OGC) and green performance, which is facilitated by green innovation. The data was obtained from the participants and validated by the faculty members of public universities in the province of Sindh. During the process of data analysis, it was seen that the correlation coefficient exhibited a positive value of 0.571. Additionally, the p-value associated with this correlation was determined to be 0.01, indicating statistical significance. The regression coefficient had a statistically significant value of 0.326, reaching a level of significance of 0.01.

Discussion

The purpose of this study was to examine the impact of role conflict, role ambiguity, and work stress as mediators on job satisfaction. The investigation additionally examined the inquiries that were presented throughout the initial phase of the examination.

Various inquiries have been raised.

What is the impact of organizational green culture on green performance?

What is the impact of green innovation on green performance?

Does the presence of green innovation act as a mediator in the relationship between an organization's green culture and its green performance?

Findings

Contribution of Organizational Green Culture to Green Performance: -

This study aimed to establish a correlation between the green culture inside organizations and their corresponding green performance. The study reached the conclusion that there exists a positive correlation between the organizational green culture and green performance. The regression analysis further confirmed this link, as indicated by the positive value of Beta. This suggests a direct association between the organizational green culture and green performance. This research provides support for the study conducted by García-Machado and Martinez-Avila (2019).

Contribution of green innovation to green performance: -

The association between green innovation and green performance is shown to be positive, as supported by the study's regression analysis, thereby confirming the hypothesis. The findings of the studies conducted by García-Machado and Martinez-Avila (2019) as well as Wang (2019) indicate a favorable relationship between green innovation and green performance and organizational green commitment (OGC).

Mediating effect of Job Stress on Role Ambiguity,

Role Conflict, and Job Satisfaction: -

Juan J. García-Machado and Minerva Martinez-Avila (2019) and Chao-Hung Wang (2019) have correlated green performance significantly with organizational green culture and green innovation. In line with the regression study, the influence between organizational green culture and green performance is mediated by green innovation.

Research Implication

The establishment of a research program was established for public universities in the province of Sindh. In contemporary times, a multitude of further transformations have occurred. The competition has been conducted, resulting in certain outcomes, while also giving rise to additional challenges. An increasing number of environmental challenges have been delegated to various organizations. The findings of this paper, when seen from a pragmatic standpoint, offer thought-provoking recommendations that emphasize the need to prioritize green performance. The outcome of innovation yields profitability for organizations and fosters competition. The implementation of green innovation has a significant impact on overall green performance. If organizations possess a high level of innovation, it is likely that their work will exhibit increased effectiveness, leading to improved performance. On the contrary, the implementation of an organizational green culture also has an impact on green performance. The OGC and green innovation are expected to have a significant impact on green performance.

The significance of green innovation for achieving green performance has been widely acknowledged and anticipated by executives. During a contemporaneous period, the evolving business landscape necessitates the implementation of supplementary criteria that encompass environmentally sustainable innovation. One of the primary implications of our research is that the performance of green initiatives has a more significant impact on the organizational green commitment. Organizations should also possess the utmost edge in terms of green innovation compared to OGC.

Limitations, Suggestions for Future Research

This research, like many others, also presents certain limitations. One primary restriction of this study is the constraint imposed by the regional scope. The data was collected exclusively from public universities. The generalizability of the findings from this analysis may be limited to institutions within the specific association under study. Additionally, the applicability of these findings to data acquired from public universities in the Sindh region, as well as other provinces of Pakistan, was not considered and therefore omitted. The scope of the study was confined to those in senior administrative positions within public colleges, so included individuals who bear the actual workload. However, it is important to note that the study was constrained by a sample size of only 200 participants.

There exist several significant recommendations for organizations to embrace a green culture and formulate green innovation strategies since these serve as advantageous factors for organizational competitiveness. It is recommended to consider pursuing studies in other provinces, as this study was conducted using data from public universities in the province of Sindh.

Conclusion

The primary objective of this study is to ascertain the influence of factors on one another. Each variable must have a beneficial impact, which can significantly influence the study. The results of our study indicate a positive relationship between organizational green culture and green performance. The research is carried out on universities located in the province of Sindh. The primary sampling units consist of the public universities located in the province of Sindh. The

link between the independent and dependent variables exhibits positive influences.

There exists a strong correlation between the adoption of green cultures inside organizations and the subsequent emergence of green innovation. The relationship between the variable of green innovation and green performance is positively correlated, indicating that an increase in one variable is accompanied by a corresponding increase in the other variable in the same direction. The acceptance of the hypothesis enhances the value of the investigation.

The primary findings of the study indicate that organizations should embrace a green culture since it has a direct impact on overall organizational performance and contributes to achieving success. Innovation can be facilitated by receiving favorable feedback and achieving positive outcomes. The analysis of the study reveals that the presence of a mediator variable can have a favorable impact on the study. The research conducted on corporate social responsibility (CSR) and management indicates that it has the potential to generate beneficial outcomes. Specifically, the organizational green culture, which serves as the key independent variable, can be influenced by several aspects.

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