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Are Green Entrepreneurial Technology and Sustainable Practices Related to Employees' Performance? A Basis for BPO Techno-Stewardship Action Plan

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Abstract

In recognizing the vital role of BPO industry to the Philippine economy and in ascribing to SDG 13 Climate Action target goal 13.2 in integrating climate measures into policies, strategies, and planning and target goal 13.3, that focuses on the building of knowledge to meet climate change, this research is carried out to answer this specific question: What is the relationship between green entrepreneurial technology & sustainable practices to employee performances in attaining sustainable techno-stewardship? This research embraced a quantitative correlational design in determining the relationship between green entrepreneurial technology & sustainable practices to employee performance. The Structural Validity of the Employee Performance Scale for Filipino Workers EPS-FW by Nieva et al. (2025) was utilized to measure Filipino employee performance. In measuring the ecological conscientiousness of BPO firms in employing green entrepreneurial technology (GET) & sustainable practices (SP), the Program Sustainability Assessment Tool (PSAT) of Washington University, St. Louis, MO (2013) was utilized. Results showed a significant relationship of GET and SP to employee performance, particularly the environmental support dimension to the latent constructs of task, adaptive, and contextual performances. This means that having a supportive internal and external climate strengthens the sustainability capacity of BPO firms. The strategic planning dimension also indicates a significant relationship to task performance, demonstrating strong BPO program directions, goals, and strategies. In designing a sustainable action plan, the study

concludes the existence of all PSAT dimensions to support BPO firms' sustainability competence towards a holistic techno-stewardship plan.

Keywords: BPO, Employee Performance, Green Entrepreneurial Technology, SDG 13, and Sustainability.

Introduction

It is inherent among entrepreneurs to constantly change the way they operate by relying on various factors such as environmental consciousness and technology integration. Coupled with significant changes in the mode of communication, work method, and technology use, entrepreneurs are confronted with a dynamic environment resulting in a shift in their operations, especially those firms that operate in a techno-intensive environment. The firm's increasing dependency on technology for competitive advantage has led to a strong possession of talent and strategies. From the earliest view of corporations as legal entities in the 19th century to a narrower perspective that includes the society where they operate, firms have extended their outlook to include environmental issues. Such a shift in the entrepreneurial mindset can be attributed to the worsening climate conditions that affect firms' operations and a global call for the love of the planet.

Scholars have accentuated the competitiveness that business models, specifically the use of sustainable technologies, can bring to firms' operations. The same focus was emphasized by Khan and Bohnsack (2020), stating that technological input translates into commercial success, most especially for sustainable technologies. This only proves the benefit that a business will reap in advancing the use of green entrepreneurial technology (GET). Green entrepreneurship, according to Potluri and Phani (2020), is a form of entrepreneurship that combines profit orientation with technological innovations to alleviate human impact on the environment. As organizations move towards developing their goals and objectives, they identify core and support activities, such as sizable portions of their business operations, that can be outsourced. Outsourcing is the transfer of internal activities to external suppliers (Haizer et al, 2024, p. 78). Because firms may cater to several techno-intensive operations, outsourcing firms, especially those that digitally support processes for individual and corporate clients, are known today as business process outsourcing (BPO) companies. The creation of the Philippines Economic Zone (PEZA) back in 1995 primarily functioned to attract foreign investment in the country, paving the way to what we know now as the Business Process Outsourcing. With the emergence of the BPO industry in the country in the late 2010s, the Philippines was named the world's BPO capital (Pearce, 2023) attributed to the Filipino fluency in English, less stringent government policies, and low cost of labor. BPO environmental responsibility is crucial because their operations often require a significant amount of technology use; hence, energy consumption, paper usage, and waste management are of critical concern in relation to environmental stewardship. As environmental concerns become increasingly paramount, sustainable practices are focused on specific areas such as energy, transportation, energy conservation, and waste management (Silva et al., 2023). The published article of LinkedIn (2024, May 29) in a supporting view emphasized the incorporation of eco-friendly technologies such as energy-efficient buildings, cloud computing, virtual meetings, and digital documentation among BPOs in the Philippines. In achieving

the SDG 13 goal targets, the assumed substantial amount of technology dependency among BPO companies can be an important starting point in reviewing and developing firms' policies, especially with the depth of their operations in the Philippines. Since sustainability and financial performance nexus are evident, Rahi and Associate (2023) stressed the presence of a macroenvironmental support for institutional isomorphism because corporate sustainability becomes intense, hence, it pays to be green, but it lags in time because the benefit of sustainability takes time to be realized in terms of financial performance since sustainability requires an initial investment to alter production, service, and operations mechanism (p. 812). With the given premise, the researchers presuppose that for-profit firms' direction should not only be limited to economic and environmental positioning, but also a balance that will include workers' performances. While scholars have recognized the increase in firms' activities in terms of promoting environmentally sustainable business practices, a theoretical gap in recognizing the relationship of ecological practices to employee performance among the business process outsourcing firms in the Philippines subsists.

Statement of Research Problem

In recognizing the vital role of BPO industry to the growth of the Philippine economy and in ascribing to SDG 13 Climate Action target goal 13.2 (*integrating climate measures into policies, strategies, and planning)* and target goal 13.3, (*focuses on the building of knowledge to meet climate change),* this research is carried out to answer this specific question: *What is the relationship between green entrepreneurial technology and sustainable practices to employee performances in attaining sustainable techno-stewardship?* Moreover, the research problem is carried out with the following specific objectives: (1) *To identify the green entrepreneurial technology of business process outsourcing firms;* (2) *To assess the sustainable practices of business process outsourcing firms;* (3) *To describe and analyze the relationship of green entrepreneurial technology & sustainable practices to employee performances; and (4) To design a sustainable techno-stewardship action plan for BPO firms.*

Literature Review

Business Process Outsourcing

Industry 4.0 is characterized by the digital transformation involved in the management of services, which connects the massive amount of data that impacts global business competitiveness (Haizer et al., 2024). This includes the products and services of the outsourcing industry. To sustain a business position in the market, BPO firms must employ continuous innovation in the workplace by integrating technology-driven methods that are relevant to their operations. Along with the many challenges brought about by technology in the world of work,

Haizer et al. (2024) emphasized the need for managers to develop and produce safe, high-quality green products (p. 56) while understanding employee performance. The passing of the Philippine Republic Act 7916, or the Special Economic Zone Act of 1995, empowered PEZA with a broader mandate to develop ecozones all over the country to generate incremental investment, jobs, and exports, and to spur industrialization and countryside development (PEZA, 2020). This gave birth to over 800 Business Process Outsourcing firms in the country. Being the biggest contributor (11% contribution to national gross domestic product), BPO consists of eight sub-sectors, namely: *call centers, medical transcription, software development, games development, engineering design, animation, knowledge process outsourcing, and back offices* (Gallimore, 2023), with more than 1.2 million Filipino workers nationwide (USource, 2022).

Green Entrepreneurial Technology (GET) and Sustainability Practices

While the adoption of a business model has proven to acquire an advantage, technological development combined with customers' interest in a product or service has resulted in much higher competitiveness (Saura and Associates, 2022). The integrative approach involving two influential concepts, according to Trapp and Kanbach (2021), that is, sustainable business model and technological entrepreneurship, is a strategic starting point for managers and decision makers to analyze and assess firms' position in the market. The intersection of green technology innovations, the environment, and the entrepreneurial aspects ofbusinesss will play a crucial role in developing and commercializing green technologies. These green innovations reduce resource consumption, minimize pollution, and support ecological balance, which are found in clean energy generation and energy-efficient solutions, which, according to Cate (2025), is not merely a technical enabler but a strategic catalyst for entrepreneurship. Therefore, the idea of green entrepreneurial technology (GET), as the researchers presuppose, pursues ecological goals to generate economic return, resulting in various reforms that are expected to transform technological input, work method, and guiding policies, especially in their operations into financial results by considering the use of greener technologies. Supporting this notion is the study of Kim and Petalcorin (2022), where they emphasized that a delicate balance of an industry business model that can generate economic returns while practicing conscientious production using clean technology must not excessively harm the environment.

Employee Performance

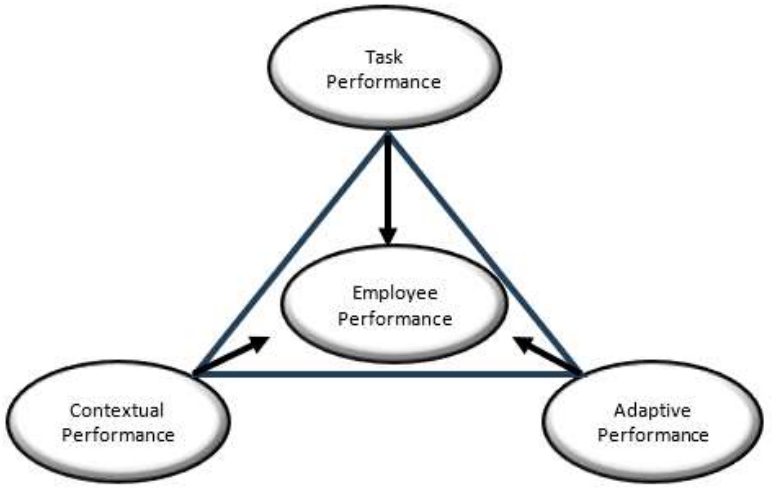
Scholars in the field of management recognized the importance of people in the organization and the study of management, according to DeNisi and Griffin (2025). Scientific management is concerned with motion and time studies, where

changes in the movement or in the placement of some piece of equipment led to increased productivity. Hence, work performance, as the authors suggest, is not solely a function of motivation but a joint function of ability, motivation, and context (p.337). Pradhan and Jena (2017) point out that it is essential for employees to acquire relevant knowledge and behaviors to handle multiple technical processes or assignments (*task performance*) and apply such technical knowledge to accomplish the task with minimal supervision. The ability of an employee to efficiently deal with volatile circumstances such as technological revolution, changes in one's core job assignment, restructuring of organization (*adaptive performance)* is used to address and create solutions to implement change in some facet of the organization, either to engage employees or enhance productivity (p. 4). To build positive relationships, some employees go above and beyond the call of duty through their discretionary and voluntary behaviors (*contextual performance)* even if they are not a part of the employee's specific role requirements and are not formally rewarded. Robbins and Judge (2022) refer to this behavior as organizational citizenship behavior or OCB, where discretionary behavior contributes to the achievement of the firm's overall performance. Oftentimes, ability and motivation are considered critical aspects of employee performance, but the context, which refers to the systems, equipment, materials, and technology adoption, can also affect the overall performance of a worker. Therefore, a company will require the benefits from workers' abilities as well as the technological advancement that will motivate its workers to exert the highest level of effort. In a bid to understand and explore the phenomenon of employee performance and ecological consciousness, the researchers are interested in discovering the underlying relationship between the two constructs in proposing a sustainable techno-stewardship action plan to business processing outsourcing companies.

Conceptual Framework

Figure 1

The Triarchy Model of Employee Performance



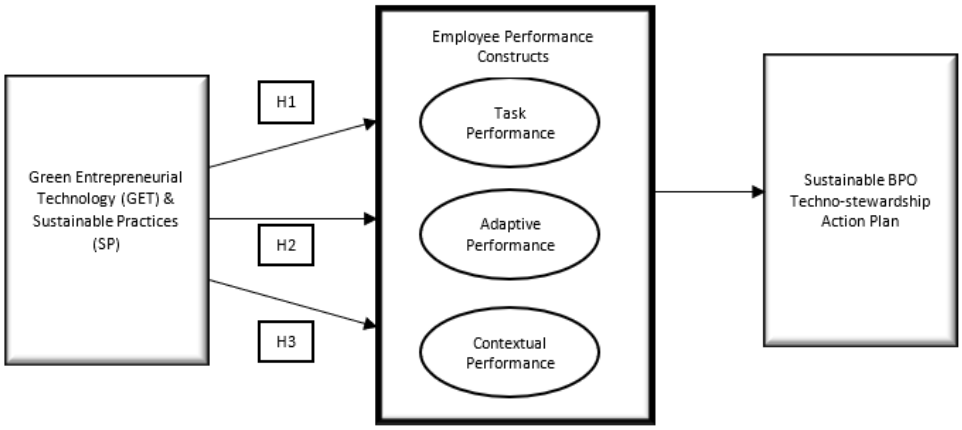
*Source**: Employee Performance at Workplace: Conceptual Model and Empirical Validation** by Rabindra Kumar Pradhan and Lalatendu Kesari Jena (2017), Business Perspectives and Research 5(1) 69-85. SAGE Publications. https://doi.org/10.1177/2278533716671630*

In the Triarchy Model of Employee Performance (Figure 1), Pradhan and Jena (2017), in citing Conway (1999), describe *task performance* as comprising explicit job behaviors that include fundamental job responsibilities assigned as a part of the job description. *Adaptive performance* refers to behaviors and attitudes that enable an individual to cope with volatile circumstances, such as changes brought about by technological transformations. In creating a better workplace, *contextual performance,* also known as organizational citizenship behavior or OCB, will lead to the creation of a productive work environment. These voluntary behaviors, although not overtly expressed in one's job description, are performed by helping a coworker with various job roles. Given that *task, adaptive*, and *contextual performances* are distinct constructs that identify relevant measures in employee performance that include the use of innovative technologies, the researchers are interested in knowing the relationship between the ecological conscientiousness of BPO firms as perceived by their employees, that is, the use of green technology & sustainable practices, and their employee performances.

Operational Framework

Figure 2

Sustainable BPO Techno-stewardship Action Plan Model



The Sustainable BPO Techno-stewardship Model (Figure 2) diagrams the relationship of green entrepreneurial technology (GET) & sustainable practices (SP) of BPO firms to the latent constructs in employee performance, namely *task performance, adaptive performance, and contextual performance*. Considering these individuals as technology end users, it is interesting to know the direct relationship of techno-ecological integration of BPO firms to the work performances of employees (*SDG 13, target 13.3*). The outcome of the study provides relevant information that may help BPO firms in assessing their techno-stewardship capacity and initiate policy reforms (*SDG 13, target 13.2*) as an active response to the call for a more sustainable planet.

Hypotheses/Propositions:

With the given framework, the researchers hypothesized that:

H_{01}*: There is no significant relationship between Green Entrepreneurial Technology & Sustainable Practices to Task Performances among BPO employees*

H_{02}*: There is no significant relationship between Green Entrepreneurial Technology & Sustainable Practices to Adaptive Performances among BPO employees*

H_{03}*: There is no significant relationship between Green Entrepreneurial Technology & Sustainable Practices to Contextual Performances among BPO employees*

Methodology

Research Design

This research embraced a quantitative correlational design in determining the relationship between green entrepreneurial technology & sustainable practices to employee performance. *The Structural Validity of the Employee Performance Scale for Filipino Workers* EPS-FW by Nieva et al. (2025) was utilized since the robust psychometric analysis of the instrument has established a strong validity and reliability for measuring Filipino employee performance. The measurement tool designed by Pradhan and Jena (2017) for Indian manufacturing served as a concise tool in the structural validity of EPS-FW. To measure the ecological conscientiousness of BPO firms in employing green entrepreneurial technology, the participants were asked to identify their present sources of energy being implemented in the company and the existing green technology programs or initiatives. In addition, in measuring the effect of GET and SP on employee performance, a free, public-use instrument, *The Program Sustainability Assessment Tool* (PSAT) from Washington University, St. Louis, MO (2013) was used.

Research Approaches

The study employed a cross-sectional survey to secure the data needed for the analysis. Secondary/archival data were utilized to support the findings in the analysis section of the paper.

Research Participants / Respondents

The 415 participants in the study are employees situated in Metro Manila who qualify in the following criteria: (1) with at least one (1) year of work experience in a BPO company, (2) have been employed in the company for at least 6 months before administration of the instrument, (3) and willing to participate in the study.

Sampling Design

The total number of BPO workers in Metro Manila as of August 2023 *(PESO Employment Information System, DOLE-BLE*) is 6,444. Using the Raosoft sample size calculator, the desired sample size is 377 respondents at a 95% confidence level and 5% margin of error. The researchers employed a purposive sampling technique following the criteria mentioned above.

Data Analysis

The statistical analyses were conducted with the JASP software (version 0.19.2.0; JASP Team, University of Amsterdam, the Netherlands). P values less than 0.05 were considered statistically significant. Descriptive statistics such as the median, interquartile range, and upper and lower quartiles were used in the statistical analysis. Shapiro-Wilk's test was used to assess the normality of data. To determine the relationship among the independent variables, Pearson Correlation was utilized. Lastly, to determine the effect of the independent variables and dependent variables, Multiple Linear regression was used.

Measurement and Instrumentation

The study utilized two measurement tools. The structural validity of the employee performance scale for Filipino workers, EPS-FW by Nieva et al. (2025), analyzed the three latent constructs in evaluating employee performances using the corresponding indicators, namely *task performance (5 items). Adaptive performance (6 items) and contextual performance (9 items)*. The second metric is the 40-item Program Sustainability Tool designed by Washington University, St. Louis, MO (2013), the eight (8) dimensions assess the sustainability practices of BPO firms along with the green entrepreneurial technology employed in the company.

Research Ethics Approaches

Ethical approval was secured from the university's Research Ethics Board before the conduct of the study, and the consent of the participants was obtained prior to answering the online questionnaire. The researchers maintain the confidentiality of information provided to them. Their contact details were given to the participants for any questions or clarifications they may have.

Results and Discussion

Aiming to determine the relationship of green entrepreneurial technology & sustainable practices to employee performances to attain a sustainable techno-stewardship action plan, the responses of 415 employees situated in Metro Manila that qualify in the given criteria were statistically analyzed and evaluated.

Table 1.

Distribution of the respondents based on profile variables

Variable	Categories	Frequency	Percent
Sex	Woman	215	51.81
	Prefer not to say	27	6.51
	Man	173	41.69
Years of total work experience	1 to 4 years	225	54.22
	5 to 9 years	103	24.82
	10 or more years	87	20.96

Based on Table 1, 215 (51.81%) of the employees of BPO situated in Manila were women, 173 (41.69%) were men, and 27 (6.51%) preferred not to say their sex. A total of 225 (54.22%) of the employees have 1 to 4 years of total BPO work experience, 103 (24.82%) have 5 to 9 years of total work experience, and 87 (20.96%) have 10 or more years. With the majority of the respondents having work experience in a BPO firm for 1 to 4 years, this proves the level of awareness of the company's existing technologies and sustainability initiatives. These programs are offered through onboarding for new employees and socialization for existing employees to increase awareness about the firm's programs.

Objective 1: To identify the green entrepreneurial technology of business process outsourcing firms.

The researchers identified the sub-sector categories of the participating firms in the study. Being the biggest contributor to national GDP, Gallimore (2023) distinguished the eight (8) dynamic and vibrant outsourcing sub-sectors, namely *call centers, medical transcription, software development, games development, engineering design, animation, knowledge process outsourcing, and back offices*. The majority of the respondents (301 or 56%) operate as Call Centers. Andrew Dennis (17 December 2024) emphasized the high regard for call centers regardless of industry and size, or product offering, since they provided companies with customer-facing communication services like answering support calls and responding to tickets via digital channels like email, live chat, help desk, and social media. In addition, the primary source of energy as enumerated by the participants indicate the heavy use of Natural Gas or Fossil Fuel (306 or 59%). The results have proven the considerable carbon emission and negative environmental impacts produced by BPO firms to meet their rising demand, especially when the required energy to run their computers, servers, and facilities comes from non-renewable sources. In order for the employee to adapt to the prevailing culture, the

organization regularly introduces a process called socialization. According to Robbins and Judge (2022), socialization practice includes orientation programs that enable the employee to acquire social knowledge that may impact their commitment to the organization's objectives and decision to stay with the organization (p. 551). These kinds of programs promote proper knowledge to employees to better understand and be acquainted with the green infrastructure and initiatives of the organization. SBToolkit (2024) emphasized having a sustainability champion who will help to inform, endorse, and involve employees in the green programs of the company.

Objective 2: To assess the sustainable practices of BPO firms.

The respondents were asked about the present sustainability program or initiative being implemented in their company. 339 or 24% of the respondents answered that they use of Virtual Meeting, which includes the use of Zoom and MS-Teams. 301 or 22% are using Digital Documentation for sending email and correspondence. Lastly, 250 or 18% of the surveyed BPO firms adopt Cloud-based computing technology to store and maintain data collection. This gives emphasis to the prevailing digitalization mechanisms of the surveyed respondents, hence, illuminates BPOs' strong dependence on various digital platforms that contribute to carbon emissions. In relation to the programs being implemented in the BPO firm, the descriptive summary of the eight sustainability program dimensions and of the three latent constructs of employee performance were rated agreeable by the Metro Manila BPO employees since the Median equals six. This only shows a deeper understanding and awareness of the respondents to the GET and SP programs of their company.

Objective 3: To describe and analyze the relationship of green entrepreneurial technology & sustainable practices to employee performances.

Relationship of Green Entrepreneurial Technology (GET) & Sustainable Practices (SP) to Employee Performance

Employee performance encompasses a broader scope, being a key factor in achieving organizational goals since it measures the extent to which an employee can fulfill their duties and responsibilities properly and effectively (Nieva et al., 2025). Since technology is revolutionizing the way firms operate, especially in the BPO industry, it is interesting to know if *GET & SP* of for-profit organizations have a significant connection to *task, adaptive, and contextual performances of employees*. When performing any correlation analysis with more than one independent variable, there are several assumptions that need to be checked. These assumptions are the normality of the responses using the Shapiro-Wilk test, and for the correlation analysis, Pearson was used since the responses are normally distributed. Tables 2 to 4 present the correlations between the

different independent variables, computed using Pearson. Pearson was used since the data is at an ordinal level and normally distributed. As a rule, independent variables must not be highly correlated, that is, with correlations greater than 0.90 (Hair, Black, Babin & Anderson, 2010). It can be observed from Tables 2 to 4 that the given variables are positively correlated and that there are no pairs of independent variables having correlations greater than 0.817; hence, multicollinearity is absent.

Table 2.

Pearson's Partial Correlations of Green Entrepreneurial Technology & Sustainable Practices to Employee Task Performance in Attaining Sustainable Techno-Stewardship

Variable	Environmental Support	Funding Stability	Partnerships	Organizational Capacity	Program Evaluation	Program Adaptation	Communications	Strategic Planning
Environmental Support	1							
Funding Stability	0.74*	1						
Partnerships	0.672*	0.756*	1					
Organizational Capacity	0.724*	0.799*	0.815*	1				
Program Evaluation	0.65*	0.731*	0.727*	0.771*	1			
Program Adaptation	0.598*	0.691*	0.636*	0.689*	0.805*	1		
Communications	0.545*	0.577*	0.692*	0.629*	0.748*	0.737*	1	
Strategic Planning	0.541*	0.628*	0.67*	0.639*	0.737*	0.733*	0.8*	1

Note. All tests are one-tailed for positive correlation.
Conditioned on variable: Task Performance.
*Note. * Significant at p < .05*

Table 2 presents the correlations between the different independent variables by the Metro Manila BPO employees, computed using Pearson's Correlation. Pearson r was used since the data is normally distributed. It can be observed from this table (2) that there is no pair of independent variables having correlations greater than 0.799; hence, multicollinearity is absent. Additionally, the relationships between green entrepreneurship and employee performances in attaining sustainable techno-stewardship, conditioned on employee task performance, were statistically significant at 0.05.

Table 3.

Pearson's Partial Correlations of Green Entrepreneurial Technology & Sustainable Practices to Employee Adaptive Performance in Attaining Sustainable Techno-Stewardship

Variable	Environmental Support	Funding Stability	Partnerships	Organizational Capacity	Program Evaluation	Program Adaptation	Communications	Strategic Planning
Environmental Support	1							
Funding Stability	0.741*	1						
Partnerships	0.677*	0.759*	1					
Organizational Capacity	0.723*	0.796*	0.817*	1				
Program Evaluation	0.657*	0.732*	0.732*	0.733*	1			
Program Adaptation	0.607*	0.693*	0.643*	0.689*	0.811*	1		
Communications	0.556*	0.583*	0.699*	0.632*	0.756*	0.745*	1	
Strategic Planning	0.566*	0.642*	0.682*	0.649*	0.754*	0.751*	0.81*	1

Note. All tests one-tailed for positive correlation.
Conditioned on variable: Adaptive Performance.
*Note. * Significant at $p < .05$*

Table 3 presents the correlations between the different independent variables by the Metro Manila BPO employees, computed using Pearson's Correlation. Pearson r was used since the data is normally distributed. It can be observed from this table (3) that there is no pair of independent variables having correlations greater than 0.817; hence, multicollinearity is absent. Finally, the relationships between green entrepreneurship and employee performances in attaining sustainable techno-stewardship, conditioned on employee adaptive performance, were statistically significant at 0.05.

Table 4.

Pearson's Partial Correlations of Green Entrepreneurial Technology & Sustainable Practices to Employee Contextual Performance in Attaining Sustainable Techno-Stewardship

Variable	Environmental Support	Funding Stability	Partnerships	Organizational Capacity	Program Evaluation	Program Adaptation	Communications	Strategic Planning
Environmental Support	1							
Funding Stability	0.728*	1						
Partnerships	0.664*	0.75*	1					
Organizational Capacity	0.705*	0.786*	0.81*	1				
Program Evaluation	0.633*	0.717*	0.721*	0.752*	1			
Program Adaptation	0.583*	0.677*	0.628*	0.667*	0.797*	1		
Communications	0.534*	0.564*	0.688*	0.611*	0.742*	0.732*	1	
Strategic Planning	0.544*	0.625*	0.671*	0.629*	0.739*	0.737*	0.801*	1

Note. All tests were one-tailed for positive correlation.
Conditioned on variable: Contextual Performance.
Note. * Significant at $p < .05$

Table 4 presents the correlations between the different independent variables by the Metro Manila BPO employees, computed using Pearson's Correlation. Pearson r was used since the data is normally distributed. It can be observed from this table (4) that there is no pair of independent variables having correlations greater than 0.81; hence, multicollinearity is absent. Lastly, the relationships between green entrepreneurship and employee performances in attaining sustainable techno-stewardship, conditioned on employee contextual performance, were statistically significant at 0.05. When performing any regression analysis with more than one independent variable, there are several assumptions that need to be checked. These assumptions are the linearity of the phenomenon measured, the absence of multicollinearity, constant variance of the error terms, independence of the error terms, and normality of the error term distribution. The linearity of the phenomenon is verified by the scatterplots between the independent and dependent variables, which all show a linear pattern. Multicollinearity is assessed either using the correlation between independent variables or by checking the values of the variable inflationary factors (VIFS), which should not be greater than 10. Finally, residual plots are used to examine constant variance and normality of the error terms.

Table 5.

Regression results to explain Green Entrepreneurial Technology & Sustainable Practices to Employee Task Performance in Attaining Sustainable Techno-stewardship

Model	Unstandardized Coefficients		Standardized Coefficients	t	95% CI		Collinearity Statistics	
	B	SE	Beta		Lower	Upper	Tolerance	VIF
Constant	6.143	0.045		135.95*	6.054	6.231	6.231	
Environmental Support	0.257	0.063	0.288	4.056*	0.133	0.382	0.25	4.004
Funding Stability	-0.031	0.077	-0.035	-0.4	-0.182	0.12	0.167	5.973
Partnerships	-0.082	0.072	-0.097	-1.14	-0.224	0.059	0.173	5.768
Organizational Capacity	0.01	0.083	0.011	0.117	-0.154	0.174	0.142	7.065
Program Evaluation	0.119	0.085	0.136	1.4	-0.048	0.286	0.134	7.486
Program Adaptation	0.129	0.079	0.144	1.639	-0.026	0.284	0.164	6.1
Communications	-0.042	0.074	-0.048	-0.561	-0.187	0.104	0.17	5.887
Strategic Planning	0.321	0.079	0.346	4.079*	0.166	0.476	0.175	5.73

Dependent Variable: Task Performance
** Significant at $p < 0.05$*
$R^2 = 0.489$, $F(8,406) = 48.547$, $p < .001$

Regression results in Table 5 indicate that the eight predictors do account for a statistically significant proportion of the variance on employee task performance, $F(8,406) = 48.547, p < .001$. Also, $R^2 = 0.489$ denotes that 48.9% of the variation in employee task performance can be explained by the differences in different green entrepreneurial technology & sustainable practices in attaining sustainable techno-stewardship. We also note from the table that all VIFs or variable inflationary factors are below the threshold of 10, which indicates that there is no multicollinearity among the independent variables. Results from Table 5 indicate that the relationship between environmental support and employee task performance is statistically significant, $t = 4.066, p < .001$. The influence is likewise positive, $B = 0.257$. Higher levels of agreement with environmental support result in higher levels of agreement with the different statements on employee task performance. Table 5 also indicates that *employees perform well when they feel that there is internal and external environmental support*. This means that workers can do and accomplish the job, especially when there is a strong champion who can generate necessary resources in implementing techno-environment programs that are *supported by clear goals, roles, and responsibilities and is framed within a long-term financial plan and strategic plan*. Also, the relationship between strategic planning and employee task performance is statistically significant, $t = 4.079, p < .001$. The influence is likewise positive,

$B = 0.321$. Higher levels of agreement with strategic planning result in higher levels of agreement to the different statements on employee task performance. Contrary to, the remaining independent variables are statistically not significant. This only shows the importance of integrating environmental programs into the overall assessment of operations since ecological initiatives have a direct relationship to employee performance, particularly to one's technical knowledge. The result of the analysis also supports the article by Poitras (2024), where employees are increasingly attracted to companies that prioritize sustainability and social responsibility because it reflects a positive work environment and a sense of purpose beyond profit. The same view is held by customers, suppliers, investors, and other stakeholders. Because the plans needed for a sustainability program, such as those relating to climate change, are highly technical, Dela Cruz and Angeles (2022), highlighted that substantive and appropriate planning, represented by technical data and inputs from experts in the field, is an essential component to managers especially among local government unit (LGU) which can be done through strategic planning. Considering the positive influence and higher levels of agreement with the different statements of green entrepreneurial technology & sustainable practices on employee performance, the study proposition on: ***There is no significant relationship between Green Entrepreneurial Technology & Sustainable Practices to Task Performances among BPO employees, IS REJECTED***.

Table 6.

Regression results to explain Green Entrepreneurial Technology & Sustainable Practices to Employee Adaptive Performance in Attaining Sustainable Techno-stewardship

	UnStandardized Coefficients		Standardized Coefficients		95% CI		Collinearity Statistics	
Model	B	SE	Beta	t	Lower	Upper	Tolerance	VIF
Constant	6.135	0.045		135.682*	6.047	6.224		
Environmental Support	0.225	0.065	0.251	3.432*	0.096	0.354	0.25	4.004
Funding Stability	0.025	0.079	0.028	0.31	-0.132	0.181	0.167	5.973
Partnerships	-0.124	0.074	-0.146	-1.662	-0.27	0.023	0.173	5.768
Organizational Capacity	0.121	0.086	0.137	1.408	-0.048	0.29	0.142	7.065
Program Evaluation	0.105	0.088	0.12	1.197	-0.067	0.277	0.134	7.486
Program Adaptation	0.133	0.081	0.148	1.633	-0.027	0.293	0.164	6.1
Communications	0.04	0.076	0.046	0.523	-0.11	0.19	0.17	5.887
Strategic Planning	0.133	0.081	0.143	1.635	-0.027	0.292	0.175	5.73

Dependent Variable: Adaptive Performance
**Significant at p<0.05*
R2=0.456, F(8,406=42.559,p<.001

Regression results in Table 6 indicate that the eight predictors do account for a statistically significant proportion of the variance on employee adaptive performance, $F(8,406) = 42.559, p < .001$. Also, $R^2 = 0.456$ denotes that 45.6% of the variation in employee adaptive performance can be explained by the differences in different green entrepreneurial technology & sustainable practices in attaining sustainable techno-stewardship. We also note from the table that all VIFs or variable inflationary factors are below the threshold of 10, which indicates that there is no multicollinearity among the independent variables. Results from this table (6) indicate that the relationship between environmental support and employee adaptive performance is statistically significant, $t = 3.432, p < .001$. The influence is likewise positive, $B = 0.225$. Higher levels of agreement with environmental support result in higher levels of agreement to the different statements on employee adaptive performance. On the contrary, the remaining independent variables are statistically not significant. Technological transformation in a worker's core job assignment is just one of the many changes that challenge the adaptive work performances of employees. An effective adaptive performance, according to Pradhan and Jena (2017) (in citing Baard, Rench, & Kozlowski, 2014) necessitates employees' ability to efficiently deal with volatile work circumstances. This is imminent, especially in a techno-intensive work environment like BPO, where employees are expected to meet the demands of their job using varied technologies, mostly are sourced from non-renewable energy. Enterprises must establish a positive connection with the environment by upgrading production methods and management models to minimize carbon (Wang et al, 2024). Furthermore, Tennakoon et al. (2024) concluded that heightened awareness of ecological sustainability underscores the critical importance of multidisciplinary collaboration, data driven decision making processes, and adaptive management strategies. In addition, the advancement of technology such as remote sensing and satellite technology have significantly enhanced the efficacy and precision of environmental sustainability practices, especially if such technologies enable more accurate data collection and improve analysis, thus empowering organizations to make informed decisions and target interventions (p. 9). Table 6, indicating a positive relationship, denotes that employees can adjust their interpersonal behavior in each circumstance to be able to work with a wide range of co-workers. This is true especially if there is a leadership that strongly supports green initiatives and is institutionally and publicly implemented. Such leadership importance in embracing and embedding sustainability strategies, as mentioned by Co (2022), is essential in achieving adaptive capacities. Considering the positive influence and higher levels of agreement with the different statements of green entrepreneurial technology & sustainable practices on employee performance, the study proposition on: ***There is no significant relationship between Green Entrepreneurial Technology & Sustainable Practices to Adaptive Performances among BPO employees, IS REJECTED***.

Table 7.

Regression results to explain Green Entrepreneurial Technology & Sustainable Practices to Employee Contextual Performance in Attaining Sustainable Techno-stewardship

	Unstandardized Coefficients		Standardized Coefficients		95% CI		Collinearity Statistics	
Model	B	SE	Beta	t	Lower	Upper	Tolerance	VIF
Constant	6.135	0.045		135.682*	6.047	6.224		
Environmental Support	0.225	0.065	0.251	3.432*	0.096	0.354	0.25	4.004
Funding Stability	0.025	0.079	0.028	0.31	-0.132	0.181	0.167	5.973
Partnerships	-0.124	0.074	-0.146	-1.662	-0.27	0.023	0.173	5.768
Organizational Capacity	0.121	0.086	0.137	1.408	-0.048	0.29	0.142	7.065
Program Evaluation	0.105	0.088	0.12	1.197	-0.067	0.277	0.134	7.486
Program Adaptation	0.133	0.081	0.148	1.633	-0.027	0.293	0.164	6.1
Communications	0.04	0.076	0.046	0.523	-0.11	0.19	0.17	5.887
Strategic Planning	0.133	0.081	0.143	1.635	-0.027	0.292	0.175	5.73

Dependent Variable: Contextual Performance
** Significant at $p < 0.05$*
$R^2 = 0.503$, $F(8,406) = 51.341$, $p < .001$

Regression results in Table 7 indicate that the eight predictors do account for a statistically significant proportion of the variance on employee contextual performance, $F(8,406) = 51.341, p < .001$. Also, $R^2 = 0.503$ denotes that 50.3% of the variation in employee contextual performance can be explained by the differences in different green entrepreneurial technology & sustainable practices in attaining techno-stewardship. We also note from the table that all VIFs or variable inflationary factors are below the threshold of 10, which indicates that there is no multicollinearity among the independent variables. Results from this table (7) indicate that the relationship between environmental support and employee contextual performance is statistically significant, $t = 3.432, p < .001$. The influence is likewise positive, $B = 0.225$. Higher levels of agreement with environmental support result in higher levels of agreement with the different statements on employee contextual performance. Finally, the remaining independent variables are statistically not significant. Along with task and adaptive employee performance, some non-job components are equally important in creating a better workplace. Santander and Prudente (2020) emphasized a form of cooperation and helpfulness to a co-worker in achieving organizational goals known as organizational citizenship. Table 7 shows the supportive behavior demonstrated by an individual in each workplace, particularly when there is a strong leadership initiating firms firm-environmental related programs. Such organizational citizenship behavior promotes cohesiveness that promotes higher

cooperation among employees. Considering the positive influence and higher levels of agreement with the different statements of green entrepreneurial technology & sustainable practices on employee performance, the study proposition on: ***There is no significant relationship between Green Entrepreneurial Technology & Sustainable Practices to Contextual Performances among BPO employees, IS REJECTED***.

Conclusion and Recommendations

For-profit firms like Business Process Outsourcing have been viewed as beneficial to society because of the contribution they bring to the Philippine economy, and the same has caused great harm as pollution is amplified from the way they operate. The snapshot of the BPO's current sustainability capacity has led the researchers to understand the significant factors that their operation contributes to the global footprint. Interesting to point out is the relationship brought about by the techno-environment initiatives of BPO firms to employee performance.

The descriptive summary results from the eight (8) dimensions of sustainability practices anchored on green entrepreneurial technology and three (3) constructs of employee performances have both indicated the respondents' deeper knowledge and understanding of the ecological initiatives of BPO firms. The use of onboarding and socialization for new and existing employees is a program that is found to be effective in engaging the workforce with the firm's sustainability practices; hence, it is recommended to be continued by BPO companies.

The encompassing significant relationship of environmental support as perceived by BPO employees emphasized a greater need for a sustainability champion who will strongly support environmental-related programs that are backed up with a long-term financial plan and public support. Since sustainability initiatives are related to the financial position of a company, the strong champion must have the ability to generate resources to ensure the success of the program because this is viewed as critical in achieving sustainable techno-environment programs. Through these critical factors, BPOs and stakeholders can build program capacity for sustainability projects and can better focus on how they will position their efforts for long-term positive results through a firm's strategic planning backed up with a concrete program with clear goals, directions, and strategies. Since BPO firms are viewed as a large driver of change because they are uniquely positioned to do something about the negative effects of climate and environmental degradation, the researchers recommend the application of sustainability dimensions to reassess the impact of their present sustainability practices and programs for policy development. The application of all 8 eight constructs *(Environmental support, Funding stability, Partnerships, Organizational capacity, Program evaluation, Program adaptation,*

Communication, and Strategic planning) in the program sustainability assessment tool will maintain balance since they have a significant impact on employee performances. Such a holistic perspective will help in the development of a techno-sustainable action plan. Furthermore, the researchers propose an action plan that highlights the role of stakeholder-specific programs with target outcome and timeline anchoring on PSAT and of the study results and analysis with the new program suggested by the authors:

Table 8.

BPO Techno-stewardship Action Plan

Stakeholder (involvement)	Proposed Programs	Expected Outcome	Timeline
Top Level Manager, Middle Level Manager, Employee, Government, NGOs	**Environmental Support, Funding, Partnership** • Appointing a Sustainability Champion or Green Officer • Securing long-term funding commitments for green initiatives • Partnering with government agencies, NGOs, technology providers for climate and eco-programs • Providing leadership training on sustainability integration into business strategy	Enhanced reputation, financial position, and competitiveness	Short-term (0-1 year)
Top Level Manager, Employee Representatives	**Strategic Planning, Organizational Capacity and Policy Development** • Integrating sustainability indicators into performance management systems • Conducting an annual audit using the program Sustainability Assessment Tool • Assessing the present sustainability programs and initiatives and enhance the firm's policy on waste management, digital documentation, and resource efficiency	Enhanced reputation, financial position, and competitiveness	Medium term (1-3 years)

Table 8.

Continued.

Stakeholder (involvement)	Proposed Programs	Expected Outcome	Timeline
Middle Level Manager, Employees	**Monitoring and Evaluation** • Adapting the use of EPS-FW tool to measure employee performance • Tracking the reduction of carbon footprint, energy use, and waste generation • Implementing a regular report (bi-annual or annually) on sustainability viz-a-viz employee performance • Adjusting of strategies based on evaluation results (feedback loop)	Enhanced reputation, financial position, and competitiveness	Medium term (1-3 years)
Middle to Low Level Manager, Employee	**Employee Engagement and Performance** • Strengthening the onboarding and socialization programs with sustainability modules for new and existing workers • Introducing eco-behavior training to reinforce tasks, adaptive, and contextual performances • Creating an employee 'Green Teams' to foster organizational citizenship behavior • Launching of an incentive system (awards, performance bonus, recognition) for eco-conscious practices either per unit or department	• Increased employee task performance particularly efficiency and technical mastery • Strengthened contextual performance particularly collaboration and organization citizenship	Short-term (0-1 year)

Table 8.

Continued.

Stakeholder (involvement)	Proposed Programs	Expected Outcome	Timeline
Middle to Top Level Manager, Employees	**Communication and Advocacy** • Establishing internal sustainability newsletter and dashboards that is accessible to all stakeholders • Sharing of success stories and best practices within employees • Organizing other green campaign and eco-awareness events with employees • Positioning the concern BPO firm as sustainability leaders not only in the Philippines but in the global outsourcing industry	Enhanced reputation, financial position, and competitiveness in Philippines and Global BPO	Long term (3-5 years)
Top Level Manager, Employees	**Green Technology Integration (NEW)** • Implementing renewable energy sources like solar panels or hybrid energy systems • Assessing the facilities that requires upgrade to energy-efficient lighting and equipment • Enhancing the existing cloud-based systems to reduce paper and hardware use • Promoting other programs that minimize travel-related emissions like work from home setup	• Enhanced reputation, financial position, and competitiveness • Improved adaptive performance particularly resilience to technological and environmental changes	Medium term (1-3 years)

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