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INFLUENCE OF ABSORPTIVE AND ORGANIZATIONAL LEARNING CAPACITIES ON THE RELATIONSHIP BETWEEN ENVIRONMENTAL MANAGEMENT PRACTICES AND PERFORMANCE

INFLUENCIA DA CAPACIDADE ABSORTIVA E DA APRENDIZAGEM ORGANIZACIONAL NA RELAÇÃO ENTRE PRÁTICAS DE GESTÃO AMBIENTAL E DESEMPENHO

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ABSTRACT

Purpose: This research analyzes the influence of absorptive capacities and organizational learning on the relationship between environmental management practices and performance.

Method/approach: A descriptive study with a quantitative approach (SEM) was conducted with 147 professionals responsible for environmental management in industries in Brazil.

Main findings: The results revealed that environmental management practices directly influence absorptive capacity, learning capacity and environmental performance, but not financial performance. Absorptive capacity directly influences learning capacity and financial performance. On the other hand, learning capability directly influences environmental performance. The results revealed that absorptive capacity and learning capacity have mediating effects on the relationship between environmental management practices and performance, which suggests that such capacities enhance the relationship between management practices adopted and environmental performance and financial.

Theoretical, practical/social contributions: Based on the results found, the potential contribution of organizational capabilities in the relationship between environmental management practices and performance is recognized. In general, the results indicate that when organizations have higher levels of organizational capability development (absorption and learning), they realize the importance of adopting environmental management practices that contribute to improving their performance (environmental and financial).

Originality/relevance: This research expands the evidence from the analysis of the indirect effects of environmental management practices on performance, revealing the roles of absorptive and learning capabilities in this relationship, which highlights the importance of studying organizational capabilities to better understand the effects of management practices on performance.

Keywords: Environmental Management Practices. Absorptive Capacities. Organizational Learning. Performance.

RESUMO

Objetivo: Esta pesquisa analisa a influência da capacidade absortiva e da aprendizagem organizacional na relação entre práticas de gestão ambiental e desempenho.

Método/abordagem: Pesquisa descritiva, com abordagem quantitativa (MME), foi realizada com 147 profissionais responsáveis pela gestão ambiental de indústrias no Brasil.

Principais Resultados: Os resultados revelaram que as práticas de gestão ambiental influenciam diretamente a capacidade absortiva, a capacidade de aprendizagem e o desempenho ambiental, mas não o desempenho financeiro. A capacidade absortiva influencia diretamente a capacidade de aprendizagem e o desempenho financeiro. Por outro lado, a capacidade de aprendizagem influencia diretamente o desempenho ambiental. Os resultados revelaram que a capacidade absortiva e a capacidade de aprendizagem têm efeitos mediadores na relação entre as práticas de gestão ambiental e o desempenho, o que sugere que tais capacidades melhoram a relação entre as práticas de gestão adotadas e o desempenho ambiental e financeiro.

Contribuições teóricas/práticas/sociais: Com base nos resultados encontrados, reconhece-se a contribuição potencial das capacidades organizacionais na relação entre práticas de gestão

ambiental e desempenho. Em geral, os resultados indicam que, quando as organizações apresentam níveis mais elevados de desenvolvimento das capacidades organizacionais (absortiva e de aprendizagem), elas percebem a importância de adotar práticas de gestão ambiental que contribuem para melhorar seu desempenho (ambiental e financeiro).

Originalidade/relevância: Esta pesquisa amplia as evidências da análise dos efeitos indiretos das práticas de gestão ambiental no desempenho, revelando os papeis das capacidades absortiva e de aprendizagem nessa relação, o que revela a importância do estudo das capacidades organizacionais para a melhor compreensão dos efeitos de práticas de gestão no desempenho.

Palavras-chave: Práticas de Gestão Ambiental. Capacidade Absortiva. Aprendizagem Organizacional. Desempenho.

1 INTRODUCTION

Various topics have emerged from global concerns about sustainable development, among which environmental management stands out. Accounting focused on environmental management provides tools to support management and decision-making regarding environmental aspects (Burritt et al., 2019), as the importance of environmental management is increasingly being recognized by academics, professionals, and policymakers (Potrich et al., 2019). Environmental management practices are part of the overall management system of organizations, which includes organizational structures, planning activities, responsibilities, practices, procedures, processes, and resources to develop, implement, achieve, review, and maintain environmental policy (Aslam et al., 2021).

Research suggests that environmental management practices tend to influence both financial performance and environmental performance, which "encompasses all the outcomes of the operational processes used by a company to reduce its environmental impacts" (Essid & Berland, 2018, p. 230). However, evidence found in the literature has revealed both positive (Ahinful & Tauringana, 2019; Ali et al., 2022; Aslam et al., 2021; Popova & Strikh, 2021; Zago, 2016) and negative (Yang et al., 2011; Zago, 2016) effects between environmental management practices and firms' financial performance. It also reveals a positive relationship between these practices and environmental performance (Ali et al., 2022; Aslam et al., 2021; Bananuka et al., 2021; Moosa & He, 2023; Zago, 2016), as well as non-significant relationships (Ahinful & Tauringana, 2019; Hassan et al., 2024; Zago, 2016).

Given these contradictory results, this study proposes that the influence of environmental management practices on firm performance may not occur directly, but rather indirectly through organizational capabilities - representing a theoretical gap that motivates the development of this research. Therefore, it becomes relevant to analyze the influence of absorptive capacity and organizational learning on the relationship between environmental management practices and both financial and environmental performance. This is the theoretical contradiction that the article seeks to address within the existing literature, as there is a lack of consideration of mediating variables (organizational capabilities) in the relationship between environmental management practices and performance in the studies reviewed on the subject.

A firm's absorptive capacity influences how it will "acquire, assimilate, transform, and exploit" new knowledge in its activities (Zahra & George, 2002, p. 189), being the ability of a given organization or individual to "recognize the value of new information, assimilate it, and apply it" in their work activities (Cohen & Levinthal, 1990, p. 128). However, not all firms are

able to develop such capacity (Bucheli et al., 2024), which may explain why some organizations, even when adopting environmental management practices, may fail to achieve better environmental and financial performance.

Similarly, it is necessary to consider the learning capability of organizations, defined as the "set of tangible and intangible resources or skills that a firm uses to obtain new forms of competitive advantage. These skills enable the organizational learning process" (Alegre & Chiva, 2008, p. 315). According to Picoli and Takahashi (2016, p. 2), "the completeness of the absorptive capacity process leads to full organizational learning," which makes it relevant to analyze these capabilities within the proposed relationship.

Studies have analyzed the impacts of absorptive capacity (Garcia-Perez-de-Lema et al., 2017; Kale et al., 2019; Sancho-Zamora et al., 2021) and the influence of organizational learning capability (Lin & Wu, 2014; Sok et al., 2013) on financial performance. In the systematic literature review conducted by Florencio and Oliveira Junior (2022), the authors highlight that future research addressing the relationship between absorptive capacity and organizational performance may incorporate various organizational and environmental factors identified in the literature, such as organizational learning capability (Florencio & Oliveira Junior, 2022) and environmental management practices, as proposed in this study. These arguments underscore the relevance of conducting this research.

Companies in developing countries face the challenge of reconciling their financial and environmental goals in the context of global challenges and environmental pressures. In this scenario, environmental management practices play a crucial role in the development of sustainable practices within organizations (Lajnef et al., 2025). Therefore, this study seeks to answer the following question: What is the influence of absorptive capacity and organizational learning capability on the relationship between environmental management practices and performance? To address this question, the study aims to analyze the influence of absorptive capacity and organizational learning capability on the relationship between environmental management practices and the environmental and financial performance of Brazilian industrial organizations.

Studies on environmental performance have attracted public interest, largely due to the increase in environmental disasters, such as pollution, and the effects of climate change, including unexpected heavy rainfall and droughts, declining water levels, and the drying of wetlands across much of the world (Bananuka et al., 2021). These factors justify the relevance of conducting this study. Brazil is one of the countries participating in the BRICS group (Brazil, Russia, India, China, and South Africa), and according to Caetano Pinto et al. (2018, p. 1252), "due to the expansion of the bloc's development, these countries have shown a high potential to impact the environment". Therefore, this study is relevant as it analyzes the environmental management practices adopted by industries in Brazil, an important member country of this group. This contributes to expanding the theoretical foundation for discussions on environmental management practices in developing countries and in Brazil, as well as their direct and indirect effects on performance through their interactive influence with the organizational capabilities examined.

The choice to analyze industries is due to the "fact that their operational activities tend to have a more negative impact on the environment. These companies consume natural resources as the main raw material for the development of their products" (Beuren & Zonatto, 2015, p. 119), generating waste.

Thus, understanding the effects of adopting and using environmental management practices on environmental and financial performance, as well as their effects on the

development of two important organizational capacities, constitutes theoretical contributions of this research. As practical contributions, there is an opportunity to identify the configuration of the environmental management control system used by Brazilian industrial organizations and its effects on performance (environmental and financial), which can stimulate the adoption of such management practices by others unresearched organizations.

The results of this study can be used by public administrators, regulatory bodies and stakeholders, with a view to increasing companies' commitment to environmental issues, thus contributing to society. This survey provides useful information for managers, who must pay attention to organizational capabilities, given its effects on environmental management practices and performance. Therefore, with such capabilities developed, the company can improve these practices, its image before the interested parties and obtain better performances. Next, the theoretical basis for the hypotheses proposed in the study is presented.

2 THEORETICAL BASIS AND RESEARCH HYPOTHESES

2.1 ENVIRONMENTAL MANAGEMENT PRACTICES AND ORGANIZATIONAL CAPACITIES

"Changes in regulations, changes in consumer behavior and potential gains in competitiveness are some of the reasons cited by managers as motivators for the adoption of various environmental management practices" (Zago, 2016, p. 7). The adoption of such practices may have an impact on organizational capacities. Essid and Berland (2018) revealed that organizational capabilities are operationalized through the adoption of environmental management tools. These processes are important for the company to learn from its activities and develop its organizational capabilities (Zahra & George, 2002). Studies have suggested that not all companies are able to develop and remain competitive (Lane et al., 2006; Zahra & George, 2002).

This is because not all companies are able to develop their organizational capabilities. "Developing and maintaining the absorption capacity is fundamental for the survival and success of a company in the long term, because the absorption capacity can reinforce, complement or reorient the company's knowledge base" (Lane et al., 2006, p. 833; Picoli & Takahashi; 2016). Companies that manage to develop their capacity to acquire, assimilate, transform and apply new knowledge are more likely to develop and achieve better performance, while remaining competitive in the market (Flatten et al., 2011; Zahra & George, 2002). Likewise, the organizational learning capacity acts as a facilitator for learning at all levels of the organization, being necessary so that the company can learn and become more competitive.

Thus, the first two hypotheses propose that: H1. *Environmental management practices influence the absorptive capacity,* and, H2. *Environmental management practices influence the organizational learning capacity*.

2.2 ENVIRONMENTAL MANAGEMENT PRACTICES AND PERFORMANCE

Environmental management practices can also have an effect on company performance (environmental and financial). The adoption of environmental management practices is essential to ensure positive outcomes in terms of environmental performance. Industries that promote environmental conservation efforts, integrate environmental considerations into the development of new products, maximize the reuse and recycling of

raw materials, and carry out collaborative research projects will achieve significant improvements in environmental performance (Bananuka et al., 2021).

"Environmental performance is an essential component of environmental management" and environmental management practices are designed to apply environmental protection policies and strategies and manage environmental performance (Essid & Berland, 2018, p. 230). Evidence found in the literature suggests that companies that adopt such management practices become more likely to achieve better environmental performance (Ali et al., 2022; Aslam et al., 2021; Bananuka et al., 2021; Burritt et al., 2019; Moosa & He, 2023; Zago, 2016). On the other hand, environmental management practices may not impact environmental performance, which suggests that corporations adopt these practices as a symbolic mechanism of legitimation rather than a genuine effort driven by the moral obligation to reduce their greenhouse gas emissions or carbon intensity (Hassan et al., 2024).

Regarding the effects of environmental management practices on financial performance, evidence has been found of both positive outcomes (Ahinful & Tauringana, 2019; Ali et al., 2022; Aslam et al., 2021; Popova & Strikh, 2021; Zago, 2016) and negative outcomes (Yang et al., 2011; Zago, 2016), indicating that this relationship may not occur directly. It is noted from these results that not all manifestations of environmental proactivity by companies produce similar benefits in business performance (Hassan et al., 2024). Companies that use these practices improve their production processes to face new markets, which is likely to bring greater financial benefits (Ahinful & Tauringana, 2019; Ali et al., 2022; Aslam et al., 2021; Popova & Strikh, 2021). Thus, "environmental management practices must be carefully selected, so that profitable results are achieved and company policy guidelines are followed" (Caetano Pinto et al., 2018, p. 1253).

Thus, the third and fourth research hypotheses propose that: H3. *Environmental management practices influence environmental performance,* and, H4. *Environmental management practices influence financial performance*.

2.3 ORGANIZATIONAL CAPACITIES AND PERFORMANCE

Considering the theoretical conceptions of literature related to organizational capacities, these in turn establish that absorptive and organizational learning capacities are antecedents of the development of a company and its performance (Cohen & Levinthal, 1990; Picoli & Takahashi, 2016; Zahra & George, 2002). This is because the capacities for absorbing new knowledge and organizational learning give organizations and their members the necessary know-how to implement improvement processes.

Thus, it is expected that companies that manage to promote the absorption of new knowledge and implement it in their routine activities, are more likely to learn and achieve better organizational performance, which occurs as a natural process resulting from the development of such capacities. Likewise, it is expected that these organizations are the most likely to formally adopt environmental management practices, since they qualify the management process and support decision making in companies.

Studies have analyzed the impacts of absorptive capacity (Garcia-Perez-de-Lema et al., 2017; Kale et al., 2019; Sancho-Zamora et al., 2021) and the influence of organizational learning capability (Lin & Wu, 2014; Sok et al., 2013) on financial performance. On the other hand, no research has been found that examines the effects of organizational capabilities (absorptive and learning) on environmental performance, which highlights the relevance of this study.

Thus, organizational capabilities tend to provide companies with corporate growth and improved financial performance (Essid & Berland, 2018). Absorption capacity (potential and realized) "creates and sustains performance differences between organizations" (Zahra & George, 2002, p. 197). Companies need to acquire and manage this capacity in order to obtain superior performance and create competitive advantage (Bucheli et al., 2024; Kale et al., 2019; Zago, 2016).

Absorptive capacity is recognized as a core organizational capability, as it facilitates the adoption of environmental changes and sustainable practices (Bucheli et al., 2024). Furthermore, it enables organizations to identify, acquire, assimilate, and apply external knowledge to drive innovation and implement sustainable practices. Therefore, it enhances the organization's capability to achieve competitive advantages and meet sustainability goals (Bucheli et al., 2024). Sok et al. (2013) consider that the learning capacity is one of the main resources used by companies to obtain superior performance.

Thus, the following hypotheses were formulated: H5. *Absorptive capacity influences environmental performance*, H6. *Absorptive capacity influences financial performance*, H7. *Organizational learning capacity influences environmental performance,* and, H8. *Organizational learning capability influences financial performance*.

2.4 INTERVENING EFFECTS OF ABSORPTIVE CAPACITIES AND ORGANIZATIONAL LEARNING

Evidence found in the literature on the adoption of environmental management practices and their effects on organizational performance has revealed conflicting and inconclusive results. However, it is necessary to consider the intervening effects of absorptive capacities and organizational learning, since not all companies are able to absorb new knowledge (Flatten et al., 2011; Zahra & George, 2002) and learn from their management processes (Picoli & Takahashi, 2016). Thus, they may not achieve better performance, even adopting environmental management practices.

The organizational learning capacity depends on the absorptive capacity to create and sustain competitive advantage (Bucheli et al., 2024). In this way, it is believed that the organizational capacities analyzed can enhance the relationship between environmental management practices and performance. Sok et al. (2013, p. 162) argue that "companies need to develop different sets of different capacities to compete in an environment of increasing global competition".

These environmental management practices provide increased efficiency of companies based on productivity and learning, which tends to increase revenues and reduce costs. In addition, the knowledge already acquired facilitates the adoption of such practices (Pereira-Moliner et al., 2012). In this way, "the absorption capacity (acquisition, assimilation, transformation and exploitation) and organizational learning (creation, use and institutionalization of knowledge) occur in a procedural way and in stages that can be interrelated" (Picoli & Takahashi, 2016, p. 5). In this sense, "if financial performance is positively related to environmental performance, companies will have incentives to reduce their environmental damage (Iwata & Okada, 2011, p. 1691), from potentialized capabilities.

In this context, the final hypothesis postulates that: H9. *Absorptive and organizational learning capabilities influence the relationship between environmental management practices and performance*.

The procedures adopted for conducting the research are presented below.

3 METHODOLOGICAL PROCEDURES

This is a descriptive study based on a survey (questionnaire) with a quantitative approach to the data. The population under study comprised managers responsible for the environmental area in Brazilian industries in different segments. Based on the LinkedIn® business network, it was possible to obtain a result of 1,173 people belonging to the following positions in the environmental area in Brazilian industries: environmental analyst, sustainability analyst, environmental coordinator, environmental engineer, environmental manager, sustainability manager, and environment supervisor.

Invitations were sent to all of these professionals explaining the purposes of the research, checking whether they were responsible for the environmental management part of their organization and inviting them to voluntarily participate in the work. Of this total, 574 people accepted the invitation sent to participate in the survey. However, the final answer was obtained from 147 professionals, who voluntarily participated in the research and made up the analyzed sample.

Contemporary studies (Lajnef et al., 2025; Lee et al., 2023; Sancho-Zamora et al., 2021) have also used variables such as market share, net profit, and sales revenue to measure financial performance, which justifies their operationalization in this manner in the present study.

After preparing the questionnaire and before being used for data collection, it was subjected to a pre-test with three managers from industrial organizations, potential respondents of the research (responsible for the environmental area), with a view to identifying possible biases in the instrument and its understanding. The pre-test participants did not make any observations regarding the questionings, proceeding to their application.

Data collection was carried out through the professional social network LinkedIn®. Initially through this network, the study population was identified and this population was contacted asking them to accept the invitation to participate in the research. Filters were made by the positions of interest: responsible for the environmental area of industrial organizations.

After the filters were completed, the list of people from the social network who used these positions and belonging to industries was presented, and subsequently, the “connections” were sought with these individuals. For all persons included in the filter, when making the connection, personal identification and description of the reason for the contact was used. For people who accepted the invitation, a link to the online questionnaire (google docs) was sent with the instructions for completing it. Participants were assured of the anonymity of their participation and the company in which they work.

All questionnaires received were analyzed and considered valid. The data were tabulated in an electronic spreadsheet and imported into SPSS® and AMOS® software for statistical treatment according to the procedures adopted by Ringle et al. (2014) and Zago (2016). Initially, a descriptive analysis of the indicators for each construct was carried out.

Table 1 shows the constructs used in this research. In addition to these questions, a block of questions was included in order to obtain additional information about the investigated sample and the company in which they work.

Table 1

Constructs used in the study

Variable		Definition/Operationalization	Q*	Measurement	Authors / Instrument
Environmental management practices	Environmental planning and organization practices	"They indicate the extent to which the company has defined an environmental policy, developed procedures to establish environmental objectives, selected and implemented environmental practices and evaluated the results of such practices, or assigned environmental responsibilities" (González-Benito & González-Benito, 2005, p. 3; 2006).	7	Likert scale 5 points: 1 (practice not implemented) and 5 (practice fully implemented) .	González-Benito and González-Benito (2005)
	Operational environmental practices (products and processes)	They relate to "changes in the company's production system and operations and can be classified into two groups: practices related to products and processes". "Product-related practices focus on the design and development of more environmentally friendly products". "Process-related practices aim to develop and implement manufacturing and operational methods and processes so that the impact on the natural environment is reduced" (González-Benito & González-Benito, 2005, p. 3; 2006).	16		
	Communication environmental practices	"This category includes practices that aim to communicate to the social and institutional environment of the company the actions taken in favor of the natural environment" (González-Benito & González-Benito, 2005, p. 3; 2006).	4		
Organizational capabilities	Absorptive Capacity (potential and realized)	The potential absorptive capacity consists in the acquisition and assimilation of new external knowledge. The absorptive capacity performed indicates a company's capability to transform and exploit the knowledge assimilated to the company's activities (Zahra & George, 2002).	8	Likert scale 5 points: 1 (strongly disagree) and 5 (strongly agree).	Garrido et al. (2017)
	Learning capacity	Refers to seeking to know if the company maintains an industrial learning and knowledge program, internal educational training, knowledge sharing and formation of learning groups, frequent internal learning programs and knowledge management database for access (Lin & Wu, 2014, p. 409).	5		Lin and Wu (2014)
Performance	Environmental performance	Reflects the degree to which managers perceive the improvement of the company's environmental performance in relation to its environmental responsibilities (Zhu et al., 2007; 2008). Indicators: emission of air pollutants; wastewater emission; emission reduction of solid waste; consumption of hazardous/noxious materials; frequency of environmental accidents; environmental situation of the company.	6	Likert scale 5 points: 1 (completely worsened) and 5 (completely improved). Evaluation of the evolution of the indicators in the last two years.	Zhu et al. (2007; 2008)
	Financial performance	Refers to the "degree to which an organization achieves profit-oriented results" (Yang et al., 2011, p. 252). Measurement: market share; annual profit earned; annual sales (Llach et al., 2013).	3		Llach et al. (2013)

Nota. *Q: number of questions for each construct.

Then, the confirmatory factor analysis of the constructs was developed, in order to infer about their theoretical validity. Subsequently, the discriminant validity of the constructs was analyzed, according to the criteria established by Fornell and Larcker (1981) and Bagozzi and Philips (1982). Finally, structural equation modeling was used to infer about the relationships object of study.

The presentation and discussion of the results is outlined below.

4 ANALYSES OF RESULTS

4.1 CHARACTERIZATION OF THE ANALYZED SAMPLE

Table 2 presents the data on the characterization of the companies participating in the study.

Table 2

Characterization of the companies participating in the study

Number of employees	Abs. Freq.	Rel. Freq.	Gender	Abs. Freq.	Rel. Freq.
Up to 100 employees	15	10.20%	Feminine	52	35.37%
From 101 to 499 employees	37	25.17%	Male	95	64.63%
More than 500 employees	95	64.63%	**Total**	**147**	**100%**
Total	**147**	**100%**	**Age**	**Abs. Freq.**	**Rel. Freq.**
Size (Annual Revenue)	**Abs. Freq.**	**Rel. Freq.**	Up to 25 years	8	5.44%
Small (greater than 2.4 million to 12 million)	15	10.20%	Between 26 and 35	53	36.05%
			Between 36 and 45	58	39.46%
Average (greater than 13 million to 25 million)	10	6.80%	Between 45 and 55	18	12.25%
			Above 55 years	10	6.80%
Medium-Large (greater than 26 million to 40 million)	18	12.25%	**Total**	**147**	**100%**
			Function*	**Abs. Freq.**	**Rel. Freq.**
Large (greater than 40 million)	104	70.75%	Analyst	47	31.97%
Total	**147**	**100%**	Coordinator	38	25.85%
Operating Market	**Abs. Freq.**	**Rel. Freq.**	Manager	30	20.41%
Regional	8	5.44%	Supervisor	10	6.80%
National	55	37.42%	Engineer	22	14.97%
International	84	57.14%	**Total**	**147**	**100%**
Total	**147**	**100%**	**Function Time**	**Abs. Freq.**	**Rel. Freq.**
Company Existence Time	**Abs. Freq.**	**Rel. Freq.**	Less than 5 years	50	34.01%
Less than 10 years	7	4.76%	Between 5 and 10	49	33.33%
Between 11 and 25 years	29	19.73%	Between 10 and 15	27	18.37%
Between 26 and 50 years	40	27.21%	Above 15 years	21	14.29%
Above 50 years	71	48.30%	**Total**	**147**	**100%**
Total	**147**	**100%**	**Company Time**	**Abs. Freq.**	**Rel. Freq.**
Capital	**Abs. Freq.**	**Rel. Freq.**	Less than 5 years	42	28.57%
Public Limited Company	59	34.91%	Between 5 and 10	55	37.41%
Private Limited Company	47	27.81%	Between 10 and 15	22	14.97%
Limited society	63	37.28%	Above 15 years	28	19.05%
Total	**147**	**100%**	**Total**	**147**	**100%**

Nota. *Organizational designations adopted for managers responsible for the environmental area in each company.

This survey comprised 147 respondents from different industries. Of these, 64.63% have over 500 employees and 70.75% of companies are large, equivalent to an annual turnover greater than 40 million. In relation to the market in which it operates, 57.14% of the

sample companies operate in the international market and only 5.44% stated that the organization operates only in the region. As for the time of existence, the majority has over 50 years of experience in the market, which represents 48.30% of the total sample. With regard to the capital of companies, 37.28% are companies with limited society, followed by publicly limited companies, which correspond to 34.91%. In general, it is noted that the companies that participated in the research are mostly large, strongly consolidated in their field of activity, since they have been developing their activities for more than 50 years.

The sample comprised 64.63% of male respondents, responsible for the area of environmental management in the analyzed industries. The predominant age of the respondents was between 36 and 45 years old (39.46%) and from 26 to 35 years old (36.05%). Regarding the role performed in the company, most respondents occupy the position of analyst in the environmental area (31.97%) and then the position of coordinator (25.85%). Of the study participants, 34.01% have worked for less than 5 years in the function and 33.33% work between 5 to 10 years in the functions analyzed in the study. Regarding the company time, most of the participants are between 5 and 10 years in the company, comprising 37.41% of the results.

From these results, it is noted that in the environmental area of the industries in the sample analyzed, the positions are held in their minority by women. The predominant age in these positions is people with more experience. In addition, regarding the length of service in the company and in the position, it is understood that most of the organizations surveyed possibly adopt career plan policies, with the growth of positions depending on the age of the respondents being remarkable. Following, the descriptive analysis of the data is presented.

4.2 DESCRIPTIVE ANALYSIS AND VALIDATION OF MEASUREMENT CONSTRUCTS

In the first stage of data analysis, a descriptive statistical analysis of the measurement constructs was performed (Table 3).

Table 3

Descriptive statistics

Constructs	Minimum	Maximum	Average	SD
Environmental Management Practices				
- Planning and Organization (PO)	1.00	5.00	4.04	1.24
- Operational (O)	1.00	5.00	3.62	1.35
- Communication (C)	1.00	5.00	3.61	1.46
Organizational Capabilities				
- Potential Absorptive Capacity (PAC)	1.00	5.00	3.92	1.05
- Realized Absorptive Capacity (RAC)	1.00	5.00	3.98	1.06
- Organizational Learning Capacity (OLC)	1.00	5.00	3.73	1.14
Performance				
- Environmental Performance (EP)	1.00	5.00	3.91	0.89
- Financial Performance (FP)	1.00	5.00	3.71	0.91

Nota. *SD. Standard deviation.

The results showed that in all analyzed constructs, minimum and maximum level responses were obtained on the scale used. These results demonstrate that the adoption of environmental practices (planning and organization, operational and communicational), organizational capacities (learning capacity, potential and realized absorptive capacity) and performance (environmental and financial) in the surveyed companies differ in the sample.

In general, some companies surveyed make greater use than others of environmental management practices, as well as, some organizations participating in the sample have more developed organizational capacities. Regarding organizational performance, the results revealed that companies have a satisfactory performance, as they include attention to environmental performance, with practices that minimize the impacts of their activities on society and aim to improve the company's financial performance.

Following the descriptive analysis of the data, the measurement constructs were validated. In view of the results of the confirmatory factor analysis performed, it was identified that all indicators grouped in their respective measurement constructs, validating the predictive quality of the tested models. All indicators reached the minimum standards provided by Hair Jr. et al. (2009) to validate the constructs. Thus, all indicators were maintained in the measurement models of the variables studied, making it possible to validate the constructs proposed for this research.

The discriminating validity reveals the degree to which a given construct is truly divergent from the others (Hair Jr. et al., 2009). Table 4 presents the reliability indicators analyzed for all constructs and, subsequently, the results of validity.

Table 4

Results of the reliability indicators of the measurement constructs

Constructs	CA	CC	AVE
Minimum Expected Values =>	> 0.70	> 0.50	> 0.50
Environmental Management Practices			
- Planning and Organization (PO)	0.923	0.93	0.64
- Operational (O)	0.962	0.96	0.62
- Communication (C)	0.902	0.90	0.70
Organizational Capabilities			
- Potential Absorptive Capacity (PAC)	0.925	0.93	0.76
- Realized Absorptive Capacity (RAC)	0.899	0.90	0.69
- Organizational Learning Capacity (OLC)	0.938	0.94	0.76
Performance			
- Environmental Performance (EP)	0.945	0.95	0.74
- Financial Performance (FP)	0.934	0.94	0.83

Nota. CA. Cronbach's Alpha; CC. Composite Confiability; AVE. Average Variance Extracted.

In Table 4, it can be seen that the values of standardized loads for each construct are greater than 0.50 with respect to the extracted variance (AVE), above 0.70 for the composite confiability and values above 0.70 for Cronbach's Alpha. These results demonstrate that the model can measure what is proposed in this research. Table 5 shows the results of the analysis of the discriminant validity of the constructs, according to the criteria established by Fornell and Larcker (1981) and Bagozzi and Philips (1982).

The discriminant validity according to the criteria of Fornell and Larcker (1981) compares the square roots of the AVE values of each construct with the correlations (Pearson) between the constructs (or latent variables). The square roots of the AVE must be greater than the correlations of the constructs (Fornell & Lacker, 1981). Using the criteria of Bagozzi and Philips (1982), there must be statistically significant differences between the constructs, which suggests that they will not measure the same concept. This test aims to analyze the differences between the constructs in the same model, based on the analysis of the Chi^2 of the fixed and free models, making a comparison of the statistical difference of the differences obtained in the model.

Table 5

Results of the discriminant validity tests of the measurement constructs

Discriminant Validity by the criteria of Fornell and Larcker (1981)								
SQUARED CORRELATIONS AND AVE								
		PO	**O**	**C**	**PAC**	**RAC**	**OLC**	**EP**	**FP**
PO. Planning and Organization	**PO**	**0.64**							
O. Operational	**O**	0.70	**0.62**						
C. Communication	**C**	0.50	0.64	**0.70**					
PAC. Potential Absorptive Capacity	**PAC**	0.12	0.15	0.11	**0.76**				
RAC. Realized Absorptive Capacity	**RAC**	0.19	0.25	0.18	0.50	**0.69**			
OLC. Organizational Learning Capacity	**OLC**	0.30	0.39	0.28	0.28	0.46	**0.76**		
EP. Environmental Performance	**EP**	0.22	0.28	0.20	0.06	0.10	0.33	**0.74**	
FP. Financial Performance	**FP**	0.09	0.11	0.08	0.09	0.14	0.11	0.12	**0.83**

Discriminant Validity by the criteria of Bagozzi and Philips (1982)					
PAR		**Constrained (=1)**	**Not constrained**	**Difference of**	
Construct A	**Construct B**	**Chi-Square**	**Chi-Square**	**Chi-Square**	**Sig.**
PO	O	798.620	781.767	16.853	0.0000
C	O	610.942	602.986	7.956	0.0048

The results presented in Table 5 confirm the discriminant validity of the structural model developed for this study. They reveal that all relationships are statistically significant, that is, the constructs have differences between them. For that, it becomes possible to develop the modeling of structural equations, so that one can infer about the proposed relationships.

4.3 INFLUENCE OF ORGANIZATIONAL CAPABILITIES ON THE RELATIONSHIP BETWEEN ENVIRONMENTAL MANAGEMENT PRACTICES AND PERFORMANCE

In order to answer the objective of the study, which consists of assessing the influence of the researched organizational capacities in the relationship between environmental management practices and performance, the path estimates of the model for measuring these relationships were identified. Table 6 presents the synthesis of the results of the standardized coefficients and the significance of the relationships tested in the research.

Table 6

Standardized coefficients and significance of the relationships tested in the research

Structural Pathways			**Estimates**	**Standard Error**	***t-values***	***p-values***	**Standardized Coefficients**	**R^2**
AC	←	EMP	0.691	0.159	4.341	***	0.537	0.288
OLC	←	EMP	0.631	0.164	3.843	***	0.359	0.600
OLC	←	AC	0.709	0.134	5.305	***	0.520	
EP	←	EMP	0.454	0.147	3.086	0.002	0.322	
EP	←	AC	-0.252	0.133	-1.894	0.058ns	-0.230	0.408
EP	←	OLC	0.429	0.103	4.173	***	0.535	
FP	←	AC	0.435	0.176	2.477	0.013	0.356	
FP	←	EMP	0.171	0.181	0.944	0.345ns	0.109	0.222
FP	←	OLC	-0.127	0.139	-0.914	0.360ns	-0.141	
FP	←	EP	0.287	0.122	2.351	0.019	0.257	

Nota. EMP. Environmental Management Practices; AC. Absorptive Capacity; OLC. Organizational Learning Capacity; EP. Environmental Performance; FP. Financial Performance.

Initially, the results of the influence of environmental management practices are presented, on organizational capacities according to hypotheses H1 and H2. The results reveal that the adoption of environmental management practices positively influences the development of companies' absorptive capacity and organizational learning capacity.

These results indicate that environmental management practices related to planning and organization, operational and communicational are important factors to improve potential and realized absorptive capacity, and organizational learning. Such results confirm the arguments of Essid and Berland (2018), that the organizational capacities are developed in the companies through the use of environmental management tools, as is the case of this research, the environmental management practices. Based on these results, one can accept H1: *"environmental management practices influence absorptive capacity"*, and, H2: *"environmental management practices influence organizational learning capacity"*.

Subsequently, the findings of the effects of environmental management practices on environmental and financial performance are evidenced, according to hypotheses H3 and H4. The results suggest that the adoption of environmental management practices positively influences environmental performance, a finding that corroborates Zago (2016), Ahinful and Tauringana (2019), Aslam et al. (2021), Popova and Strikh (2021) and Ali et al. (2022). However, Zago (2016) revealed that environmental management practices focused on planning and organization have a positive relationship with environmental performance. Thus, it is emphasized that the environmental management practices used in the analyzed industries aim to protect and manage environmental performance (Essid & Berland, 2018), which makes it possible to achieve environmental performance (Burritt et al., 2019).

On the other hand, such practices did not have a significant impact on financial performance. Such results reveal that the environmental planning and organization, operational and communication practices do not influence the market share of the companies, the profit earned and the annual sales (billing), but on the environmental performance, that is, the practices help and are important factors to reduce the emission of air pollutants, waste water, solid waste, consumption of hazardous/harmful materials and decrease in the frequency of environmental accidents (Zhu et al., 2007; 2008).

From these results, it can be seen that environmental management practices impact performance differently (Ahinful & Tauringana, 2019), since they had positive effects on environmental performance and did not directly impact financial performance. These results allow us to accept hypothesis H3: *"environmental management practices influence environmental performance"*, but on the other hand, the study's hypothesis H4, that *"environmental management practices influence financial performance"*, has not been confirmed.

The results of the analysis of the influence of organizational capacities (absorptive and learning) on environmental and financial performance sought to answer hypotheses H5, H6, H7 and H8. The findings indicated that absorptive capacity positively influences both learning capability and financial performance; however, it did not have a significant effect on environmental performance. Garcia-Perez-de-Lema et al. (2017), Kale et al. (2019), and Sancho-Zamora et al. (2021) corroborate these results, as they also identified positive effects of absorptive capacity on financial performance.

This result suggests that companies should improve their conduct regarding this capacity, given its important impacts in terms of improving environmental performance, since once employees have clear information about products, about the market, technologies used, resources to improve the processes, this will have positive effects in minimizing the

environmental impacts related to air, waste, environmental accidents, as well as the general situation of the company regarding the environmental performance.

This result also indicates that if employees share information for product development, they are supported by management systems on the external context of the company, they are trained to understand customers' needs, they analyze the possibility of adopting new technologies (potential absorptive capacity). In addition, they have resources to improve processes, promote actions such as meetings to improve this process, employees are trained and have routines aimed at these improvements (realized absorptive capacity), the company will present a consistent financial performance in terms of the market, its profit will increase, as well as, your annual sales.

Regarding organizational learning capacity and environmental and financial performance, the results revealed that this capacity positively influences environmental performance, but not financial performance. This result reveals that the search for employees to improve their knowledge from internal industrial knowledge and learning programs, training, knowledge sharing, among other issues related to organizational learning (Lin & Wu, 2014), positively impacts the performance of company in the face of environmental issues. The findings of studies developed by Sok et al. (2013) and Lin and Wu (2014), could not be confirmed, since they found that the organizational learning capacity positively influences financial performance.

These results suggest that environmental practices individually do not have an impact on financial performance, but developed together with the absorptive capacity may have an impact on this performance, as the absorptive capacity had a positive impact on financial performance. This evidence allows us to accept H6: *"absorptive capacity influences financial performance",* and, H7: *"organizational learning capacity influences environmental performance"*. Hypotheses H5: *"absorptive capacity influences environmental performance",* and, H8: *"organizational learning capacity influences financial performance"* were not confirmed in the study.

It is understood that the previous analyzes are significant, so that the adoption of environmental management practices influences the development of absorptive capacity and learning capacity and also environmental performance. It is possible to verify that the greatest effect found from environmental performance is through the capacity to learn. The only effect on financial performance is the interaction of absorptive capacity and environmental performance. In general, the effects found are indirect, which reinforces the need to investigate such relationships from a broader analysis perspective.

In this way, the results reinforce that the direct effects of environmental management practices on performance, occur only for environmental performance, which suggests that there are other variables that can better explain this relationship, such as the case of the joint effects of the analyzed organizational capacities. In this sense, the indirect effects of absorptive and learning capacities occurred in the relationship between environmental management practices and performance. These results reveal that from the moment that the companies have the potentialized organizational capacities, they present better environmental practices and consequently tend to present better environmental and financial performance.

Such results reinforce the need for companies to pay attention to their absorptive and learning capacities, given their positive effects on the relationship between the effects of environmental management practices on the performance of the analyzed industries. It also highlights the direct and positive effects of environmental performance on financial

performance, which suggests that companies that are concerned with environmental issues, and are able to develop their capacities, possibly have better performance in the market, profits and superior sales. This result corroborates the findings by Yang et al. (2011), who also analyzed the relationship between environmental and financial performance with Brazilian companies.

In view of the aforementioned results, the study's H9 can be accepted, which suggests that *"the absorptive and organizational learning capacities influence the relationship between environmental management practices and performance"*.

Burritt et al. (2019) highlight the importance of specific changes for companies to operate in complex sustainability scenarios and one of these changes, according to the results obtained in this research, is the investment in organizational capacities, with a view to improving employee training and the company's expertise as a whole. In addition, based on their results, Burrit et al. (2019) also highlight the richness and usefulness of promoting cleaner production practices, through the most diverse tools provided by environmental accounting. Furthermore, commitment to good environmental practices leads to the development and maintenance of effective business connections with stakeholders and the exploitation of critical resources (Ali et al., 2022).

In summary, based on the results found, the potential contribution of organizational capacities in the relationship between environmental management practices and performance is recognized. In general, the results indicate that when organizations have higher levels of development of organizational capacities (absorptive and learning), they realize the importance of adopting environmental management practices, and, consequently, will be contributing to improve their performance (environmental and financial).

4.4 DISCUSSION OF RESULTS

The results of this study converge with the assumptions established for the research, that organizational capacities have an influence on the relationship between environmental management practices and company performance. The results show that companies that adopt such management practices are able to develop their absorptive and learning capacity.

This is because, according to Picoli and Takahashi (2016, p. 2), "the completeness of the absorption capacity process leads to full organizational learning". On the other hand, when there are failures in the development of a company's absorptive capacity, they will also have difficulties in learning and developing, which is why they tend not to perform better, compared to those who develop such abilities.

When managing knowledge, company managers must be aware of the fact that it is the high levels of interaction between knowledge (absorption capacity) and learning flows (learning capacity) that jointly bring about the achievement of better business performance (Prieto & Revilla, 2006). Therefore, an organization needs the capability to utilize knowledge to implement activities that lead to better environmental performance (Lu et al., 2021).

The adoption of environmental management practices was also directly related to environmental performance. This occurs when companies, after adopting such practices, are able to improve their internal processes, promote change and establish the necessary actions to achieve better performance (Beuren & Zonatto, 2015). However, only those that manage to promote such actions will achieve better environmental performance (Burritt et al., 2019). This result indicates that the industries belonging to the sample, have a proactive profile of environmental management, focusing on environmental management practices focused on planning and organization, operational and communicational, to continue with a good

environmental performance. Furthermore, environmental management practices encompass the daily operations and strategic decisions that companies implement to minimize and control the impact of their business activities on the natural environment (Zhang & Ma, 2021).

The fact that environmental management practices did not show direct positive effects on financial performance contradicts the arguments that commitment to good environmental management practices can improve financial performance by increasing pressure on managers to engage in environmentally responsible activities, which, in turn, can help develop and maintain strong business relationships with influential stakeholders, enabling access to essential resources (Aslam et al., 2021).

The direct effects of absorptive capacity on environmental performance were not confirmed, as also noted by Bucheli et al. (2024). However, this capacity showed a positive influence on financial performance. The non-confirmation of H5 implies that, although absorptive capacity is crucial for developing organizational learning capability and enhancing financial performance, it does not directly translate into better environmental performance. This result highlights the need for organizations to direct their absorptive capacity toward specific practices that can drive environmental performance. The focus should be on creating a synergy between absorptive capacity and learning capability to achieve substantial environmental benefits (Bucheli et al., 2024). As for the learning capacity, the results were contrary to the capacity to absorb knowledge, since the positive effects on environmental performance were evident and on financial performance there was no statistical significance. These findings also indicate that companies able to align their efforts to engage with external knowledge can expect better corporate performance (Sancho-Zamora et al., 2021).

The positive result of the capacity to absorb knowledge in financial performance suggests that companies with high absorption capacity (potential and realized) are able to incorporate and apply new knowledge in their environmental management practices, systems, processes, routines and even products, generating this knowledge and positive impacts on financial results. As noted in this study, the industries in Brazil analyzed that are capable of transforming and applying the new knowledge obtained from external sources tend to present better financial results. This finding also suggests that external and internal information that is useful for the company and used in work activities (Kale et al., 2019), qualifying its management system, is beneficial for the overall performance of companies.

These results corroborate the evidence found in the literature, which suggests that companies that adopt environmental management practices, by improving their environmental performance, can achieve better financial performance (Burritt et al., 2019). This occurs when positive environmental performance is able to leverage financial performance (Lu et al., 2021). It is noteworthy that companies are learning to improve their environmental performance. However, there is considerable variation in the activities and outcomes across firms. Therefore, some companies learn more quickly than others to proactively align their operations with societal demands and expectations, as they respond swiftly and learn efficiently to initiate and implement sustainable approaches (Lu et al., 2021).

Finally, it should be emphasized that companies have caused serious environmental damage during their production and operational processes. Proactive environmental management, as well as the prevention and control of environmental pollution, are not only demands from stakeholders but also part of the companies' social responsibility (Zhang & Ma, 2021). The final considerations of the study are presented below.

5 FINAL CONSIDERATIONS

This research aimed to analyze the influence of absorptive capacities and organizational learning in the relationship between environmental management practices and performance. Nine hypotheses were formulated to achieve the study objective, six of which were validated in the study (H1, H2, H3, H6, H7 and H9). The results indicated a positive relationship between the adoption of environmental management practices and organizational capacities and environmental performance. Absorptive capacity influenced organizational learning, but not environmental performance. On the other hand, the organizational learning capacity had positive impacts on environmental performance. From these results, it can be inferred that environmental management practices and learning capability are determining factors for the occurrence of environmental performance in the industries in Brazil analyzed.

It was also evident that the adoption of environmental management practices does not directly influence financial performance, nor does learning capability. However, absorptive capacity, which is related to financial performance, showed a positive and significant relationship. It can be inferred that financial performance is improved in Brazilian industries as they increasingly incorporate absorptive capacity into the workplace, given the positive effects on capital markets, profits, and sales.

From these results, it can be seen that the relationship between environmental management practices may not occur directly in financial performance, but that the inclusion of other factors in the model can better explain this relationship, such as the consideration of capacities organizational factors as mediators of this relationship. However, the direct effect of the practices on the environmental performance was positive, but with low explanatory power, suggesting that other factors may also enhance this relationship.

In order to verify whether this finding is confirmed in this research, the effects of absorptive capacities and organizational learning on the relationship between environmental management practices and performance (environmental and financial) were analyzed. This finding was confirmed, as organizational capabilities have enhanced the relationship between environmental management practices and environmental performance. These results suggest that industries should pay attention to absorptive and learning capacities, given their positive impacts on the adoption of environmental management practices and performance. In this way, the more developed these capacities in the industries, the better will be the performance of the managers responsible for the environmental area and the environmental performance of these industries.

Therefore, this result of the analysis of the indirect effects reveals that, from the moment that managers and employees promote the developed organizational capacities, they will present greater efforts to incorporate in the companies the environmental practices focused on planning and organization (explanation of policies, objectives and environmental responsibilities, training programs and environmental measurement systems), operational (pollution reduction practices, such as the replacement of pollutants, recycling projects, acquisition of ecological products, correct disposal of waste, among other practices) and communicational (act in the organizational image, such as, for example, the disclosure of annual reports, sponsorship of environmental events, environmental marketing, and voluntary environmental information), which consequently will have a positive impact on organizational performance.

The concern with the environment and its formalization in companies, through policies, objectives, training is considered the first step for companies to effectively adopt

environmental management practices and, thus, improve performance, both environmental and financial (Zago, 2016; Aslam et al., 2021). However, this practice must take into account the improvement of the company's absorptive and learning capacity. In light of the above, this study advances the existing literature on the topic by analyzing the effects of organizational capabilities on the relationship between environmental management practices and both environmental and financial performance. Therefore, it addresses an existing gap regarding the indirect effects in the relationship between practices and performance, given that the results of the direct relationship are contradictory and limited.

This evidence provides an explanation for the conflicting results identified in the literature, on the analysis of the direct effects of environmental management practices on environmental and financial performance. They reveal that these effects may not occur directly and causally, as tested in other studies. But from the interactions existing in the organizational environment, which determine under which conditions a better performance occurs. By promoting the adoption of management practices, organizational managers now have a larger set of information, which allows them to better assess the company's performance in its different activities, identifying opportunities for improvement, in order to implement corrective interventions needed.

When this occurs, managers start to correct problems, improving management processes and the development of organizational activities, which will also reflect positively on the company's organizational capabilities. Therefore, this is a necessary condition for obtaining better performance. The organizational capacities act as intervening variables in this relationship, determining the company's environmental and financial performance. These statements are supported by the evidence found in this research. When companies are able to access new information, learn from it and use it to achieve better results, they become more likely to achieve better performance. However, the simple fact of its adoption (EMP) may not be enough to ensure the achievement of the best performance.

This research has some limitations, such as the sample analyzed, as it includes industries from the most diverse segments. Another limitation refers to the selected variables, since the use of other organizational capacity variables could increase the explanations given the relationship analyzed. Another limitation of the study is the issue of causality, since, as the study is cross-sectional, it is not possible to establish a precise cause-and-effect relationship between the variables analyzed. However, the methodological rigor adopted for the development of the study sought to minimize this limitation.

For future studies, it is suggested that this research be applied to other samples of professionals who assist in the environmental field, in other sectors such as, for example, the electrical sector. It is also recommended to consider other variables related to organizational capabilities, market performance, and to explore control variables, such as size, company age, and international market, as these variables can add important information to the structural model analyzed in the study.

The results of this research contribute to the advancement of existing knowledge on the topic, providing new evidence of organizational factors that can influence the relationship between environmental management practices and performance. Similarly, they draw attention to the need to investigate organizational variables in this relationship, since the results of capabilities are incipient in the relationship proposed in the Brazilian scenario and in light of studies carried out in the accounting field.

As practical implications, this research also contributes to the industries analyzed, as the results showed that the adoption of environmental management practices alone does not

have a direct impact on financial performance, but on environmental performance. The findings also provide managers with a useful tool that makes it possible to assess the strengths and weaknesses of the companies that operate, in view of environmental management practices, organizational capacities and performance. However, they must concentrate efforts on improving organizational capacities, given their potential impact on the adoption of environmental management practices and performance, in the face of a global scenario in which the adoption of such practices is of paramount importance for companies and the society.

The results of this research offer empirical justification for regulators and policymakers of industrial companies to accelerate their environmental management plans and improve organizational acquisition and learning mechanisms to achieve better environmental and financial outcomes.

As social contributions, it is noteworthy that from the moment that companies become aware and adopt environmental management practices, they will not only be contributing to the improvement of their environmental and financial performance, as well as the development of organizational capacities, but they will also be benefiting society by reducing pollution, and becoming competitive, generating jobs and income.

REFERÊNCIAS

Alegre, J., & Chiva, R. (2008). Assessing the impact of organizational learning capability on product innovation performance: an empirical test. *Technovation*, *28*(6), 315-326. https://doi.org/10.1016/j.technovation.2007.09.003

Ali, Q., Salman, A., & Parveen, S. (2022). Evaluating the effects of environmental management practices on environmental and financial performance of firms in Malaysia: the mediating role of ESG disclosure. *Heliyon*, *8*(12), 1-22. https://doi.org/10.1016/j.heliyon.2022.e12486

Ahinful, G. S., & Tauringana, V. (2019). Environmental management practices and financial performance of SMEs in Ghana. *Environmental Reporting and Management in Africa*, *8*(1), 127-157. https://doi.org/10.1108/S1479-359820190000008006

Aslam, S., Elmagrhi, M. H., Rehman, R. U., & Ntim, C. G. (2021). Environmental management practices and financial performance using data envelopment analysis in Japan: The mediating role of environmental performance. *Business Strategy and the Environment*, *30*(4), 1655-1673. https://doi.org/10.1002/bse.2700

Bagozzi, R. P., & Phillips, L. W. (1982). Representing and testing organizational theories: A holistic construal. *Administrative Science Quarterly*, *27*(3), 459-489. https://doi.org/10.2307/2392322

Bananuka, J., Bakalikwira, L., Nuwagaba, P., & Tumwebaze, Z. (2021). Institutional pressures, environmental management practices, firm characteristics and environmental performance. *Accounting Research Journal*, *34*(6), 637-665. https://doi.org/10.1108/ARJ-06-2020-0143

Beuren, I. M., & Zonatto, V. C. da S. (2015). Relação entre environmental management accounting e inovação: aplicação do modelo teórico de Ferreira, Moulang e Hendro (2010) em empresas do Rio Grande do Sul. *Revista de Ciências da Administração*, *17*(41), 114-129. https://dx.doi.org/10.5007/2175-8077.2015v17n41p114

Bucheli, J. M., Santa, R., Tegethoff, T., & Quintero, K. (2024). The mediating role of eco-innovation between adaptive environmental strategy, absorptive capacity, and environmental performance. *Sustainability*, *16*(15), 1-18. https://doi.org/10.3390/su16156504

Burritt, R. L., Herzig, C., Schaltegger, S., & Viere, T. (2019). Diffusion of environmental management accounting for cleaner production: evidence from some case studies. *Journal of Cleaner Production*, *224*, 479-491. https://doi.org/10.1016/j.jclepro.2019.03.227

Caetano Pinto, G. M. C., Pedroso, B., Moraes, J., Pilatti, L. A., & Picinin, C. T. (2018). Environmental management practices in industries of Brazil, Russia, India, China and South Africa (BRICS) from 2011 to 2015. *Journal of Cleaner Production*, *198*, 1251-1261. https://doi.org/10.1016/j.jclepro.2018.07.046

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive Capacity: a new perspective on learning and innovation. *Administrative Science Quarterly*, *35*(1), 128-152.

Essid, M., & Berland, N. (2018). Adoption of environmental management tools: the dynamic capabilities contributions, Sustainability Accounting. *Management Policy Journal*, *3*(3), 229-252. https://doi.org/10.1108/SAMPJ-09-2017-0099

Flatten, T., Brettel, M., Engelen, A., & Greve, G. (2011). A measure of absorptive capacity: development and validation. *European Management Journal*, *29*, 98-116. https://doi.org/10.5465/ambpp.2009.44243392

Florencio, M. N. da S., & Oliveira Junior, A. M. de (2022). The importance of absorptive capacity in technology transfer and organisational performance: a systematic review. *International Journal of Innovation Management*, *26*(2), 1-33. https://doi.org/10.1142/S136391962230001X

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equations models with unobservable variables and measurement error. *Journal of Marketing*, *18*(1), 39-50. https://doi.org/10.1177/002224378101800104

Garcia-Perez-de-Lema, D., Madrid-Guijarro, A., & Martin, D. P. (2017). Influence of university–firm governance on SMEs innovation and performance levels. *Technological Forecasting and Social Change*, *123*, 250-261. https://doi.org/10.1016/j.techfore.2016.04.003

Garrido, I. L., Parente, R. C., Gonçalo, C. R., & Vasconcellos, S. L. de. (2017). Mantendo-se inovadoras: O papel do desempenho passado, da capacidade absortiva e da

internacionalização. *Brazilian Business Review*, *14*(6), 559-574. https://doi.org/10.15728/bbr.2017.14.6.1

González-Benito, J., & González-Benito, O. (2006). A review of determiant factors of enviromental proactivity. *Business Strategy and the Environment*, *15*, 87-102. https://doi.org/10.1002/bse.450

González-Benito, J., & González-Benito, O. (2005). Environmental proactivity and business performance an empirical analysis. *Journal of Management Science*, *33*(1), 01-15. https://doi.org/10.1016/j.omega.2004.03.002

Hair Jr., J. F., William, B., Babin, B., & Anderson, R. E. (2009). *Análise Multivariada de Dados*. 6.ed. Porto Alegre: Bookman.

Hassan, O. A., Romilly, P., & Khadaroo, I. (2024). The impact of corporate environmental management practices on environmental performance. *Business Ethics, the Environment & Responsibility*, *33*(3), 449-467. https://doi.org/10.1111/beer.12618

Iwata, H., & Okada, K. (2011). How does environmental performance affect financial performance? Evidence from Japanese Manufacturing Firms. *Ecological Economics*, *70*(9), 1691-1700. https://doi.org/10.1016/j.ecolecon.2011.05.010

Kale, E., Aknar, A., & Başar, Ö. (2019). Absorptive capacity and firm performance: The mediating role of strategic agility. *International Journal of Hospitality Management*, *78*, 276-283. https://doi.org/10.1016/j.ijhm.2018.09.010

Lane, P. J., Koka, B. R., & Pathak, S. (2006). The reification of absorptive capacity: a critical review and rejuvenation of the construct. *Academy of Management Review*, *31*(4), 833-863. https://doi.org/10.5465/amr.2006.22527456

Lee, J., Chung, H., & Cho, N. E. (2023). The effects of operational efficiency and environmental risk on the adoption of environmental management practices. *Sustainability*, *15*(22), 1-22. https://doi.org/10.3390/su152215869

Lin, Y., & Wu, L.-Y. (2014). Exploring the role of dynamic capabilities in firm performance under the resource-based view framework. *Journal of Business Research*, *67*(3), 407-413. https://doi.org/10.1016/j.jbusres.2012.12.019

Lajnef, M., Zaidi, A., Lakhal, L., & Pasin, F. (2025). The effect of TQM on firms' performance: the mediating role of environmental management practices and green innovation. *Journal of Manufacturing Technology Management*, *36*(8), 1555-1575. https://doi.org/10.1108/JMTM-10-2024-0584

Llach, J., Perramon, J., Alonso-Almeida, M. M., & Bagur-Femenías, L. (2013). Joint impact of quality and environmental practices on firm performance in small service businesses: an empirical study of restaurants. *Journal of Cleaner Production*, *44*, 96-104. https://doi.org/10.1016/j.jclepro.2012.10.046

Lu, J., Mahmoudian, F., Yu, D., Nazari, J. A., & Herremans, I. M. (2021). Board interlocks, absorptive capacity, and environmental performance. *Business Strategy and the Environment*, *30*(8), 3425-3443. https://doi.org/10.1002/bse.2811

Moosa, A., & He, F. (2023). Impact of environmental management practices on corporate sustainability: evidence from the Maldives hospitality industry. *International Journal of Emerging Markets*, *18*(9), 2869-2889. https://doi.org/10.1108/IJOEM-06-2020-0700

Pereira-Moliner, J., Claver-Cortés, E., Molina-Azorín, J. F., & Tarí, J. J. (2012). Quality management, environmental management and firm performance: Direct and mediating effects in the hotel industry. *Journal of Cleaner Production*, *37*, 82-92. https://doi.org/10.1016/j.jclepro.2012.06.010

Picoli, F. R., & Takahashi, A. (2016). Capacidade de absorção, aprendizagem organizacional e mecanismos de integração social. *Revista Administração Contemporânea*, *20*(1), 1-20. https://doi.org/10.1590/1982-7849rac2016140036

Popova, E., & Strikh, N. (2021). Do circular economy and green investments create value at the regional level? Evidence from Russian regions. *Upravlenets-The Manager*, *12*(2), 1-19. https://doi.org/10.1051/e3sconf/202131106012

Potrich, L., Cortimiglia, M. N., & Medeiros, J. F. de. (2019). A systematic literature review on firm-level proactive environmental management. *Journal of Environmental Management*, *243*, 273-286. https://doi.org/10.1016/j.jenvman.2019.04.110

Prieto, I. M., & Revilla, E. (2006). Assessing the impact of learning capability on business performance: Empirical evidence from Spain. *Management Learning*, *37*(4), 499-522. https://doi.org/10.1177/13505076060702

Sancho-Zamora, R, I Peña-Garcia, S Gutiérrez-Broncano and F Hernández-Perlines (2021). Moderating effect of proactivity on firm absorptive capacity and performance: Empirical evidence from spanish firms. *Mathematics*, *9*(17), 1-18. https://doi.org/10.3390/math9172099

Sok, P., O'Cass, A., & Sok, K. M. (2013). Achieving superior SME performance: Overarching role of marketing, innovation, and learning capabilities. *Marketing Journal*, *21*(3), 161-167. https://doi.org/10.1016/j.ausmj.2013.04.001

Yang, M. G., Hong, P., & Modi, S. B. (2011). Impact of lean manufacturing and environmental management on business performance: Na empirical study of manufacturing firms. *International Journal of Production Economics*, *129*(2), 251-261. https://doi.org/10.1016/j.ijpe.2010.10.017

Zago, A. P. P. (2016). *Adoção de práticas de gestão ambiental e seus efeitos nos desempenhos ambiental e financeiro de acordo com a percepção dos gestores:* uma

survey. 130 p. Tese (Doutorado em Administração de Organizações). Universidade de São Paulo, Ribeirão Preto.

Zahra, S. A., & George, G. (2002). Absorptive capacity: a review, reconceptualization, and extension. *The Academy of Management Review*, *27*(2), 185-203. https://doi.org/10.5465/amr.2002.6587995

Zhang, Q., & Ma, Y. (2021). The impact of environmental management on firm economic performance: the mediating effect of green innovation and the moderating effect of environmental leadership. *Journal of Cleaner Production*, *292*(10), 1-22. https://doi.org/10.1016/j.jclepro.2021.126057

Zhu, Q., Sarkis, J., & Lai, K. (2007). Green supply chain management: pressures, practices and performance within the Chinese automobile industry. *Journal of Cleaner Production*, *15*(11-12), 1041-1052, 2007. https://doi.org/10.1016/j.jclepro.2006.05.021

Zhu, Q., Sarkis, J., & Lai, K. (2008). Confirmation of a measurement model for green suplly chain management practices implementation. International Journal Production Economics. *International Journal of Production Economics*, *111*(2), 261-273. https://doi.org/10.1016/j.ijpe.2006.11.029