

ORIGINAL ARTICLE

From Antecedents to Consequences: A Meta-Synthesis Approach to Green Absorptive Capacity

*Hasan Rangriz¹ , Maryam Mola Ghalghachi² , Bagher Asgarnezhad Nouri³ 

1. Associate Professor, Department of MBA, Kharazmi University, Tehran, Iran

2. Ph.D. Candidate in Business Management, Department of Business Management, Faculty of Management, Kharazmi University, Tehran, Iran

3. Associate Professor, of Business Management, Department of Business Management, Faculty of Economics and Management, Urmia University, Urmia, Iran

Correspondence:

Hasan Rangriz

Email: rangriz@khu.ac.ir

Received: 30.Dec.2025

Received in revised form: 4.Mar.2026

Accepted: 14.Mar.2026

How to cite:

Rangriz, H., Mola Ghalghachi, M., & Asgarnezhad Nouri, B., (2026). From Antecedents to Consequences: A Meta-Synthesis Approach to Green Absorptive Capacity. *Journal of Environmental Education and Sustainable Development*, 14(4), 27-49.

(DOI: [10.30473/EE.2026.77007.2916](https://doi.org/10.30473/EE.2026.77007.2916))

ABSTRACT

Environmental sustainability has, in recent years, increasingly been recognized as a strategic approach to protecting the environment and improving business management, with the aim of enhancing corporate performance. Accordingly, the present study is one of the few qualitative studies that, by employing a meta-synthesis approach, examines the antecedents and consequences of green absorptive capacity. The objective of the research is applied, and in terms of data collection, it falls within the category of descriptive studies; from the perspective of the research approach, it is qualitative. In this study, the meta-synthesis was conducted based on the seven-step model proposed by Sandelowski and Barroso (2007). For data collection, prior scientific documents were utilized, and ultimately, 27 relevant articles were selected as the primary sources for analysis. The data were analyzed using the thematic analysis method. The results of the study indicate that the factors influencing green absorptive capacity can be identified and classified into four main antecedent domains, while its outcomes fall into three main consequence domains. The antecedent domains refer to structural and operational empowerment for absorbing and utilizing green knowledge, interactive, institutional, and green market-oriented strategies, knowledge-based leadership and management for green synergy and innovation, and the exploitation and development of sustainable competitive capabilities in the green domain. On the other hand, the consequence domains include culture-strategy governance based on green interactions, a learning ecosystem for enhancing corporate sustainability, as well as the ambidextrous management of sustainable innovations. Thus, the results indicate that green absorptive capacity can help companies maintain and strengthen their competitive advantage in the market while paying serious attention to environmental issues and supporting the green economy.

KEYWORDS

Dynamic Capabilities Theory, Knowledge-Based View, Sustainable Performance, Big Data Analytics Capabilities, Green Absorptive Capacity.



Introduction

The Industrial Revolution, although it reduced poverty for millions, simultaneously led to environmental degradation and the depletion of natural resources. Rapid industrialization, particularly in the manufacturing sector, resulted in significant environmental destruction and the emergence of socio-economic challenges. Environmental sustainability in manufacturing companies has recently emerged as an important approach to environmental protection and business management, aiming to simultaneously improve both environmental and commercial performance. Companies that actively engage in environmental initiatives such as pollution prevention, energy efficiency improvement, and sustainable product design gain a competitive advantage by reducing their environmental footprint and enhancing their market reputation. In the realm of sustainability, green absorptive capacity emerges as an important construct that helps establish the link between green practices and firm performance. Green absorptive capacity is a form of knowledge absorptive capacity that involves the acquisition, assimilation, transformation, and application of external green knowledge. Therefore, the central research problem of the present study is to identify and explicate the antecedents and outcomes of green absorptive capacity through a comprehensive approach grounded in meta-synthesis analysis.

Absorptive capacity is divided into two categories: potential absorptive capacity and realized absorptive capacity, which operate sequentially in the process of knowledge absorption. Potential absorptive capacity refers to the capabilities of acquiring and assimilating knowledge, whereas realized absorptive capacity includes the capabilities of transforming and exploiting knowledge. Since green absorptive capacity corresponds to the concept of absorptive capacity, it has garnered the attention of researchers in the “natural-resource-based view”, “dynamic capabilities theory”, and the “knowledge-based view”. The natural-resource-based view argues that firms possessing appropriate internal strategic resources—such as unique characteristics,

capabilities, and assets—are able to gain a competitive advantage by effectively responding to environmental complexities through continuous learning and innovation. Furthermore, within the dynamic capabilities literature, green absorptive capacity is conceptualized as an organizational capability with an environmental orientation, allowing firms to acquire essential knowledge and a deep understanding of emerging green opportunities and anticipated environmental risks. Moreover, from a knowledge-based perspective, green absorptive capacity enables companies to apply developed knowledge to redesign organizational processes, introduce environmentally sustainable products, expand their market presence, and consequently improve environmental performance.

Methodology

In terms of its objective, the present research is developmental-applied, and in terms of the nature of the information and data, it is qualitative. Furthermore, in terms of the method of data collection, the present study is of a documentary-meta-synthesis nature. The meta-synthesis research method is based on a systematic review of the literature and library studies in order to achieve a deep understanding and comprehension of the phenomenon under study. In this regard, to complete the research process, the meta-synthesis approach and the seven-step method of Sandelowski and Barroso (2007) were used to achieve the objectives of this research. For data collection, previous scientific documents and records were used, and finally, 27 related articles were selected as the main source for analysis. The data were analyzed using the thematic analysis method.

Results

The results of the study indicate that the factors influencing green absorptive capacity can be identified and classified into four main antecedent domains, while its outcomes fall into three main consequence domains. The antecedent domains refer to structural and operational empowerment for absorbing and utilizing green knowledge, interactive, institutional, and green market-oriented

strategies, knowledge-based leadership and management for green synergy and innovation, and the exploitation and development of sustainable competitive capabilities in the green domain. On the other hand, the consequence domains include culture-strategy governance based on green interactions, a learning ecosystem for

enhancing corporate sustainability, as well as the ambidextrous management of sustainable innovations. Thus, the results indicate that green absorptive capacity can help companies maintain and strengthen their competitive advantage in the market while paying serious attention to environmental issues and supporting the green economy.

«مقاله پژوهشی»

از پیشایند تا پیامد: رهیافتی فراترکیب به ظرفیت جذب سبز

*حسن رنگریز^۱ , مریم مولا قلقلچی^۲ , باقر عسگرنژاد نوری^۳ 

چکیده

پایداری زیست‌محیطی در سال‌های اخیر به عنوان رویکردی راهبردی برای حفاظت از محیط‌زیست و بهبود مدیریت کسب‌وکار، با هدف ارتقای عملکرد شرکت‌ها مورد توجه فزاینده قرار گرفته است. در همین راستا، پژوهش حاضر از معدود مطالعات کیفی است که با بهره‌گیری از روش فراترکیب، به بررسی پیشایندها و پیامدهای ظرفیت جذب سبز می‌پردازد. هدف پژوهش کاربردی است و از نظر روش گردآوری داده‌ها در زمره مطالعات توصیفی و از منظر رویکرد پژوهش، کیفی محسوب می‌شود. در این مطالعه، فراترکیب بر اساس مدل هفت‌مرحله‌ای سندلوسکی و بارسو (۲۰۰۷) انجام شده است. برای گردآوری داده‌ها، اسناد و مدارک علمی پیشین مورد استفاده قرار گرفت و در نهایت، ۲۷ مقاله مرتبط به عنوان منابع اصلی تحلیل انتخاب شدند. داده‌ها با استفاده از روش تحلیل مضمون مورد بررسی قرار گرفتند. نتایج پژوهش نشان می‌دهد که عوامل مؤثر بر ظرفیت جذب سبز در چهار حوزه اصلی پیشایند و پیامدهای آن در سه حوزه اصلی پیامد قابل‌شناسایی و طبقه‌بندی هستند. حوزه‌های پیشایند به توانمندسازی ساختاری و عملیاتی برای جذب و به‌کارگیری دانش سبز، راهبردهای تعاملی، نهادی و بازارگرایی سبز، رهبری و مدیریت دانش‌محور برای هم‌افزایی و نوآوری سبز، بهره‌برداری و توسعه قابلیت‌های رقابتی پایدار در حوزه سبز اشاره دارند. از سوی دیگر، حوزه‌های پیامد شامل راهبری فرهنگی – راهبردی مبتنی بر تعاملات سبز، اکوسیستم یادگیرنده برای ارتقای پایداری شرکتی و همچنین مدیریت دوست‌توان نوآوری‌های پایدار هستند. بدین ترتیب، نتایج بیانگر آن است که ظرفیت جذب سبز می‌تواند به شرکت‌ها کمک کند تا ضمن توجه جدی به مسائل زیست‌محیطی و حمایت از اقتصاد سبز، توان رقابتی خود را در بازار حفظ و تقویت کنند.

واژه‌های کلیدی

تئوری قابلیت‌های پویا، تئوری مبتنی بر دانش، عملکرد پایدار، قابلیت‌های تجزیه و تحلیل کلان داده، ظرفیت جذب سبز.

۱. دانشیار، گروه آموزشی مدیریت کسب و کار، دانشکده مدیریت، دانشگاه خوارزمی، تهران، ایران
۲. دانشجوی دکتری، گروه مدیریت بازرگانی، دانشکده مدیریت، دانشگاه خوارزمی، تهران، ایران
۳. دانشیار مدیریت بازرگانی، گروه مدیریت بازرگانی، دانشکده اقتصاد و مدیریت، دانشگاه ارومیه، ارومیه، ایران

نویسنده مسئول:

حسن رنگریز

رایانامه: rangriz@khu.ac.ir

تاریخ دریافت: ۱۴۰۴/۱۰/۰۹

تاریخ بازنگری: ۱۴۰۴/۱۲/۱۳

تاریخ پذیرش: ۱۴۰۴/۱۲/۲۳

استناد به این مقاله:

رنگریز، حسن. مولا قلقلچی، و عسگرنژاد نوری، باقر. (۱۴۰۵). از پیشایند تا پیامد: رهیافتی فراترکیب به ظرفیت جذب سبز، فصلنامه علمی آموزش محیط‌زیست و توسعه پایدار، ۳۷ (۴)، ۳۷-۴۹.

(DOI: [10.30473/EE.2026.77007.2916](https://doi.org/10.30473/EE.2026.77007.2916))



Introduction

Although the Industrial Revolution alleviated poverty for millions, it concurrently resulted in the degradation of the environment and natural resources. Rapid industrialization, particularly in the manufacturing sector, has led to significant environmental degradation and the emergence of socio-economic challenges (Shehzad et al, 2024). Industrial activities have increased over the past few decades due to rapid economic development, leaving considerable negative impacts on the environment. Under such conditions, in some developing countries such as Iran, increased consumer awareness, regulatory requirements imposed by institutions such as the Department of Environment, the Forests, Rangelands and Watershed Management Organization, and other relevant bodies, as well as growing stakeholder pressures, have made the adoption of environmental strategies a necessity for maintaining corporate reputation and gaining a competitive advantage (Wang et al, 2023). In this regard, companies and organizations that adhere to environmental practices and initiatives often attract greater positive attention from stakeholders (Shehzad et al, 2024).

In today's dynamic business environment, environmental sustainability has emerged as one of the core pillars of corporate strategies (Bourini et al, 2025). The Natural Resource-Based View (NRBV) theory also substantiates this approach, asserting that firms must identify and exploit green business opportunities in order to both sustain their competitive advantage and enhance their level of environmental sustainability (Makhloufi et al, 2023; Makhloufi et al, 2024).

Environmental sustainability in manufacturing firms has recently been recognized as an important approach to environmental protection and business management, aimed at simultaneously improving environmental and business performance (Ibrahim et al, 2025). This approach also influences consumer behavior, making it essential for firms to incorporate it into their operations, as consumers tend to prefer brands that are environmentally conscious and responsible (Ismail et al, 2023).

Nevertheless, striking a balance between

environmental protection and green production remains a fundamental challenge. Specifically, manufacturing processes impose numerous adverse impacts on the environment, including the emission of air pollutants, the generation of various forms of pollution, and the use of packaging materials that are inconsistent with sustainability principles. Although environmental sustainability has been placed on corporate agendas as one of the primary objectives, the relationship between environmental safety and corporate strategy is often perceived as a trade-off between green practices and productivity performance. In this context, environmental activists and policymakers exert considerable pressure on firms to design and implement environmentally oriented business strategies—strategies that are not only efficient but also ensure corporate responsibility toward the environment across all business operations (Begum et al, 2023).

Today, the growing emphasis on environmental sustainability has become a powerful force that is reshaping firms' strategic priorities. Companies are now expected not only to comply with environmental regulations but also to integrate these strategies into the very core of their business operations. Consequently, firms that actively engage in environmental initiatives such as pollution prevention, improvements in energy efficiency, and sustainable product design gain competitive advantages by reducing their environmental footprint and enhancing their market reputation (Ni & Abdullah, 2025). However, the successful implementation of these initiatives is challenging, as, compared with conventional business activities, they often require the adoption of advanced technologies, complex specialized knowledge, and innovative processes, all of which entail a greater reliance on external resources and knowledge.

Corporate factors and environmental regulations exert pressure on firms to be accountable for the environmental and social consequences of their operations. The management of processes and production required to address environmental challenges encompasses a wide range of knowledge domains, which significantly influence a firm's internal performance. Therefore, a firm's

capacity to generate innovative ideas is not solely dependent on its resources; rather, it is equally rooted in its capabilities (Shehzad et al, 2024). Cohen & Levinthal (1990) argue that absorptive capacity shapes firms' ability to acquire knowledge from the external environment, integrate it with their existing knowledge base, and exploit it effectively (Pacheco et al, 2018; Asamoah et al, 2024; Bourini et al, 2025). This capacity is typically divided into two components: potential absorptive capacity and realized absorptive capacity. Potential absorptive capacity comprises knowledge acquisition and assimilation, whereas realized absorptive capacity encompasses knowledge transformation and exploitation (Ibrahim et al, 2025; Kim et al, 2025). Absorptive capacity links knowledge generated outside the firm to knowledge produced internally, illustrating how firms acquire external knowledge and transform it into organizational capabilities (Asamoah et al, 2024). Specifically, green absorptive capacity is a form of knowledge absorptive capacity that involves the acquisition, assimilation, transformation, and application of external green knowledge (Chen et al, 2014; Asamoah et al, 2024; Shehzad et al, 2024). As firms involve their supply chain partners in their production processes, green absorptive capacity enables them to be highly responsive through the information received and to implement green supply chain management practices, which ultimately leads to improved performance (Asamoah et al, 2024).

A review of the research literature indicates that, to date, numerous studies have been conducted on green absorptive capacity (Gluch et al, 2009; Chen et al, 2014; Pacheco et al, 2018; Lin et al, 2020; Qu et al, 2022; Wang et al, 2023; Zhang et al, 2023; Ismail et al, 2023; Makhoulfi, 2024a, 2024b; Baquero, 2024; Cheng et al, 2025; Bourini et al, 2025; Yadav, 2025; Ibrahim et al, 2025; Canbul Yaroğlu, 2025). However, a substantial proportion of these studies have primarily adopted a quantitative approach to examine certain antecedents and outcomes of this capacity. It appears that the use of the meta-synthesis method to provide a comprehensive exploration

of this concept in prior research has received relatively limited attention. To more precisely articulate this research gap, it is essential to distinguish between existing quantitative reviews and qualitative approaches grounded in meta-synthesis. For instance, the study by Yadav (2025) employed a meta-analysis method with a quantitative approach to statistically synthesize the results of prior studies; whereas the present research adopts meta-synthesis as a qualitative approach, the purpose of which is to interpret, integrate, and conceptually reconstruct the findings of previous studies. Moreover, by focusing on the comprehensive identification of antecedents—such as information systems capabilities, external and internal green orientations, green market orientation, green inclusive leadership, perceptions of a green work environment, and other related factors—as well as outcomes including corporate agility, green creativity, green innovative behavior, continuous learning from stakeholders and the integration of new knowledge, ambidexterity and innovation diversity, and other associated consequences, the present study seeks to provide an integrated and systematic portrayal of the multifaceted dimensions of green absorptive capacity.

Nevertheless, a precise understanding of the antecedents and outcomes of green absorptive capacity can play a vital role in explaining and guiding firms' strategies. The main gap in explicating green absorptive capacity lies in the fact that, although most firms have now acknowledged the necessity of moving toward green approaches, it is essential—prior to determining the appropriate pathway and strategic direction of this transition—to comprehensively identify the dimensions and components that shape the antecedents and outcomes of this capacity. The significance of this issue stems from the fact that green absorptive capacity encompasses diverse dimensions of the firm, including strategic approaches, human resources, environmental conditions, consumer behavior, and other key factors. Given this breadth, the absence of a study that can, through a meta-synthesis approach, systematically compile, analyze, and synthesize all the antecedents and outcomes of green absorptive capacity is clearly evident.

Therefore, the central research problem of the present study is to identify and explicate the antecedents and outcomes of green absorptive capacity through a comprehensive approach grounded in meta-synthesis analyses.

Theoretical Background

Cohen and Levinthal (1990) foundational work is broadly regarded as the point of origin for the absorptive capacity concept, introducing a new perspective on organizational learning and innovation (Begum et al., 2023). They conceptualize absorptive capacity as the organizational capability to identify external knowledge, internalize it, and put it to effective use (Cohen & Levinthal, 1990; Pacheco et al., 2018; Ismail et al., 2023). Building on this foundation, Zahra & George (2002) reconceptualized the construct by proposing an advanced framework grounded in dynamic capabilities theory (Ibrahim et al., 2025). At a more general level, absorptive capacity is understood as consisting of two interconnected dimensions—potential and realized absorptive capacity—that operate sequentially and collectively support the absorption of knowledge. Potential absorptive capacity represents an organization's ability to recognize and absorb new knowledge, whereas realized absorptive capacity refers to its competence in reshaping that knowledge and applying it in practice. In particular, potential absorptive capacity provides the groundwork for making sense of and embedding knowledge within the organization, allowing firms to regularly refresh their knowledge reservoirs and strengthen their responsiveness to environmental change. Tacit knowledge becomes actionable through realized absorptive capacity, which enables organizations to reconfigure and apply knowledge in ways that generate innovation and measurable performance results (Kim et al., 2025). Building on the absorptive capacity framework introduced by Zahra & George (2002), Gluch et al. (2009) advanced the model by developing a more comprehensive perspective known as green absorptive capacity. Absorptive capacity has received sustained scholarly attention across the natural resource-based view, Dynamic Capabilities Theory (DCT), and the

Knowledge-Based View (KBV), owing to its critical role in knowledge acquisition and organizational adaptation to environmental change.

The Natural Resource-Based View. This perspective argues that firms endowed with suitable internal strategic resources—such as specific attributes, capabilities, and assets—are able to secure a competitive advantage by effectively responding to environmental complexity through ongoing learning and innovation (Wernerfelt, 1984; Barney, 1991). Nevertheless, increasing attention to environmental challenges in the business context has prompted the extension of the Resource-Based View (RBV) into the natural resource-based view. Nonetheless, increasing attention to environmental considerations in business practices has driven the evolution of the resource-based view toward the natural resource-based view (Ismail et al., 2023). (Note: These two consecutive sentences are nearly identical paraphrases of each other; you may want to retain only one). In this context, Chen et al. (2014) argued that green absorptive capacity plays a crucial role in enabling firms to combine and restructure green resources and capabilities (Ismail et al., 2023). This viewpoint explains how firms can interact with the natural environment in a manner that simultaneously enhances economic performance, advances social well-being, and maintains environmental responsibility. Ibrahim et al. (2024) demonstrated that green absorptive capacity operates as a strategic organizational asset that enhances employees' engagement in green innovation by providing access to relevant knowledge, analytical resources, and systematic problem-solving approaches. By fostering knowledge exchange and experimental learning, employees become more capable of developing innovative solutions related to waste minimization, eco-efficiency, and sustainable product development.

Dynamic Capabilities Theory. As articulated by Montreuil et al. (2021), this framework presents a rigorous basis for elucidating how manufacturers adjust, internalize, and reorganize their internal and external capabilities in response to swiftly evolving business environments (Makhloufi, 2024b; Chen et al., 2025). Scholars of dynamic

capabilities, including Zahra & George (2002), contend that absorptive capacity gives rise to knowledge-based capabilities that allow firms to effectively manage uncertainty and adapt to environmental change. In the dynamic capabilities literature, green absorptive capacity is conceptualized as an environmentally oriented organizational capability that allows firms to obtain critical knowledge and understanding concerning emerging green opportunities and expected ecological risks (Makhloufi, 2024b; Chen et al., 2025). Pacheco et al.'s (2018) findings indicate that green absorptive capacity reflects an organization's ability to detect, internalize, restructure, and utilize environmentally oriented knowledge, thereby enabling firms to respond effectively to rapidly changing environmental conditions (Ibrahim et al., 2025).

Knowledge-Based View. First introduced by Grant (1996), this viewpoint underscores the strategic role of knowledge and knowledge-centric resources in achieving and sustaining competitive advantage (Ismail et al., 2023). A number of scholars have approached absorptive capacity through the lens of the knowledge-based view (Baquero et al., 2024; Makhloufi, 2024). As a strategic resource, absorptive capacity plays a critical role in broadening an organization's knowledge base, stimulating innovation, and enabling both the generation and application of knowledge (Makhloufi, 2024). Green absorptive capacity enables firms to leverage developed knowledge in order to redesign organizational processes, introduce environmentally sustainable products, broaden market presence, and improve environmental performance (Makhloufi et al., 2023). Green absorptive capacity enables organizations to translate accumulated knowledge into renewed operational processes, environmentally sustainable product development, broader market penetration, and improved environmental outcomes (Makhloufi et al., 2023). A firm's absorptive capacity encompasses the processes through which external information is obtained and interpreted, after which it is structured and applied internally, enabling both the identification of novel insights and the effective

use of existing knowledge (Baquero, 2024).

Research Methodology

The present study is developmental–applied in terms of its objective and qualitative in terms of the nature of the data. Moreover, with respect to the data collection method, the study adopts a documentary meta-synthesis approach. The meta-synthesis method, which was first introduced by Zimmer (2006), was employed in this study based on the seven-step model proposed by Sandelowski & Barroso (2007). According to Zimmer (2006), meta-synthesis is a method based on a systematic review of library-based studies and research, conducted with the aim of achieving deep knowledge and understanding of the phenomenon under study (Haghighi Nasab et al, 2025; Colabi & Goodarzi, 2025).

Meta-synthesis can be regarded as a systematic examination of prior studies (Tuncer & Korchagina, 2024); however, unlike approaches that are limited merely to an integrative review of qualitative literature and the analysis of primary and secondary data, this method focuses on the analysis and synthesis of the findings of selected studies. Achieving this requires the researcher to conduct a deep and rigorous review and to synthesize the findings of relevant qualitative studies in such a way that a holistic and comprehensive perspective on the research topic is attained (Colabi & Goodarzi, 2025). Therefore, given that the objective of the present study is to address the research question through the review and analysis of previous studies, the meta-synthesis method is considered an appropriate choice for conducting this research.

In order to complete the research process, the meta-synthesis approach and the seven-step method proposed by Sandelowski & Barroso (2007) were employed to achieve the research objectives. According to Sandelowski & Barroso (2007), this method constitutes a coherent framework for conducting meta-synthesis, enabling the systematic examination of information and findings extracted from relevant studies. By creating a systematic perspective through the integration of findings from quantitative and qualitative studies, this approach helps identify novel concepts, themes,

and metaphors; consequently, it contributes to the expansion of existing knowledge and provides a comprehensive view of the issue under investigation. Figure 1 illustrates the seven stages of this method.

Meta-synthesis is considered one of the types of meta-study methods. Within this framework, meta-study comprises four main components: meta-theory (analysis of theories

from previous research), meta-methodology (analysis of past research methodologies), meta-synthesis (qualitative analysis of findings from prior studies), and meta-analysis (quantitative analysis of findings from earlier research). In this regard, the method proposed by Sandelowski & Barroso is recognized as one of the important approaches in the field of meta-synthesis (Ghomi Aveili et al, 2021).

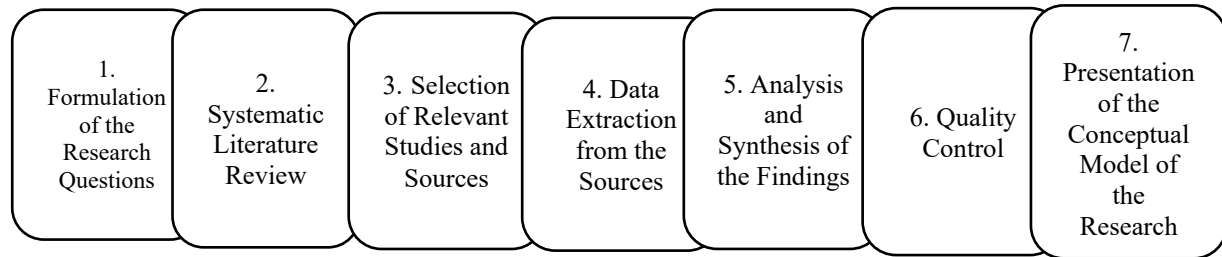


Figure 1. The Seven-Step Model of Sandelowski & Barroso (2007)

Research Findings

Step 1: Formulating the Research Questions

In the meta-synthesis method, the texts of previous studies and research are examined and analyzed through documentary analysis. To conduct this, defining the research question is

the first step. According to Sandelowski & Barroso's (2007) method, the main research inquiry in this approach is examined and defined based on the indicators of What, Who (research population), When (time limitation and framework), and How (how the research is conducted), and is fully presented in Table 1.

Table 1. Research Questions

Question	Description
What	Identification of the antecedents and consequences of green absorptive capacity
Who (Research Population)	Academic articles addressing green absorptive capacity
When (Timeframe and Temporal Scope)	Covering all works published between 2009 and 2025
How	Thematic review, identification and coding of key points, and conceptual analysis

Step 2: Systematic Review of the Literature

In accordance with the search strategy outlined in Table 2, articles published in reputable scientific databases and journals were reviewed. The main keyword used for searching in these databases was «Green Absorptive

Capacity». The search was conducted with the aim of identifying relevant and credible studies within the research domain, to ensure that the obtained results would provide a scientific and reliable basis for the analyses.

Table 2. Research Strategy for the Systematic Search of Articles

Inclusion Criterion	Description
Criterion 1	Selected articles and studies must be either published or accepted for publication in their final form.
Criterion 2	Qualitative use of all sections of quantitative and qualitative articles.
Criterion 3	Studies must report sufficient data and information relevant to the research objectives.
Criterion 4	Articles published between 2009 and 2025.

Inclusion Criterion	Description
Criterion 1	Studies that did not provide adequate information related to the objectives of this research.
Criterion 2	Studies that were not conducted with identical titles and objectives.
Criterion 3	Studies lacking an appropriate methodological framework.
Criterion 4	Studies of insufficient scientific quality that were published in low-quality journals.

Step 3: Searching and Selecting Suitable Sources (Articles)

Based on the defined keyword and selected scientific databases, a total of 139 articles were identified. Subsequently, in accordance with the established research process, a refinement procedure was executed to exclude irrelevant articles. This involved a meticulous review of the retrieved articles based on their thematic

relevance, research methodology, execution, and presented results. Figure 2 presents an overview of the screening procedure, indicating how many studies were retained or excluded at each stage. In the initial step, articles were reviewed based on their titles and subjects. Those found to be irrelevant to the research topic—namely, Green Absorptive Capacity—were excluded from the list.

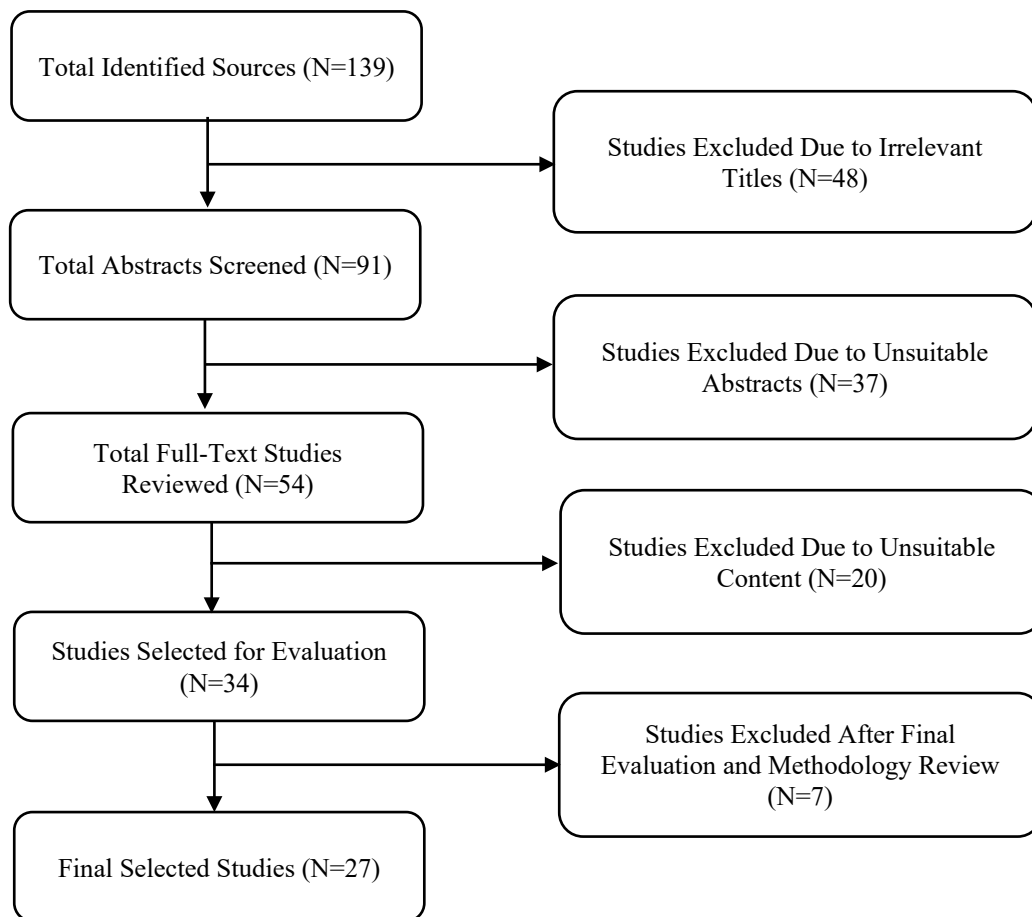


Figure 2. Process of Searching and Selecting Final Articles

In the subsequent stage, through an analysis of the article abstracts, studies that did not consider the main topic of this research as their central question, but rather addressed it merely as a secondary topic, were excluded from the

review process. Subsequently, the full content of the articles was reviewed. Those cases that did not align substantively and thematically with the main research question were then excluded. Content incongruence specifically

referred to articles that did not address Green Absorptive Capacity (GAC), its influencing factors, or the outcomes affected by it. In the final stage of screening, the remaining articles were evaluated for their methodological rigor

and overall quality. Ultimately, the final selection comprised 27 articles. Table 3 outlines how the selected studies are distributed across the databases examined.

Table 3. Breakdown of Selected Articles

Database Name	Emerald	Wiley	Springer	MDPI	Taylor & Francis	Science Direct	SAGE	Total
Number of Articles	11	5	4	3	2	1	1	27

Step 4: Extracting Information from Sources

At this stage, the selected and finalized articles were continuously reviewed to derive the research findings. Information for each article—including components, author, and year of publication—was extracted, and the results were recorded in Table 4.

Step 5: Analysis and Integration of Qualitative Findings

In this study, data were examined using a thematic approach aimed at uncovering and interpreting recurring patterns within the dataset, thereby generating deeper analytical

insights (Braun & Clarke, 2006; Naeem et al., 2023). Theme development entails organizing codes into coherent categories to reveal patterns and interconnections that inform the research questions (Pourkarimi & Azizi, 2025). Through second-stage coding, relationships between concepts generated during the first-stage coding process were identified, leading to the discovery of secondary themes. Finally, by integrating and refining these secondary themes, the final themes were extracted. Table 4 displays the coding scheme applied to the research findings.

Table 4. Research Findings Classification

Antecedents of Green Absorptive Capacity			
Reference	Sub-Component	Main Component	Final Theme
Sarmad et al. (2023); Qu et al. (2022)	Green Training and Development, Green Performance Management, Green Core Competencies	Green Human Resource Management	Structural and Operational Empowerment for the Acquisition and Application of Green Knowledge
Khasmafkan-Nezam (2025); Makhoulfi (2024a); Cheng et al. (2025)	Information System Capabilities (Outside-in, Spanning, Inside-out), Big Data Analytics Capabilities, Artificial Intelligence Literacy	Infrastructure and Skills of Green Technologists	
Yadav (2025); Asamoah et al. (2024)	Acquisition and Application of Artificial Intelligence, Collaborative Innovation, Customer Collaboration	Green Innovative Technologies and Interactions	
Ebrahim et al (2025); Yadav (2025); Asamoah et al. (2024)	Environmentally Driven Supply Chain Practices, Green Sourcing	Green Supply Chain Management	Interactive, Institutional, and Green Market-Oriented Strategies
Ibrahim et al (2025); Lin et al. (2020); Yadav (2025)	Relational Capability, Green Relationship Quality	Green Interactions	
Dantas et al (2025); Mady et al. (2022); Yadav (2025); Canbul Yaroğlu (2025)	Environmental Challenges, Competitive Pressure, Environmental Regulations, Environmental Governance, Green External Orientation	Institutional and Environmental Drivers of Green Practices	

Mady et al. (2022); Lin et al. (2020); Canbul Yaroğlu (2025)	Eco-Friendly Product Demand, Green Market Orientation, Green External Orientation	Green Market and Customer Orientation	
Canbul Yaroğlu (2025); Ozgul (2022)	Green Internal Orientation, Internal and External Environment Orientation	Green Internal Strategies	
Murad & Li (2025); Ozgul (2022); Yadav (2025)	Green Inclusive Leadership, Green Transformational Leadership, Digital Leadership	Green Leadership Styles	
Yadav (2025)	Knowledge Spillover, Knowledge Management Capacities, Knowledge Creation and Application	Green Knowledge Management and Development	Knowledge-Based Leadership and Management for Synergy and Green Innovation
Makhloufi (2024a); Yadav (2025)	Knowledge Sharing, Green Information Acquisition, Shared Green Vision	Knowledge Sharing and Alignment	
Begum et al. (2023); Akhtar et al. (2024); Yadav (2025); Dantas et al. (2025)	Green Intellectual Capital (Human, Structural, Relational), Cognitive Social Capital, Green Knowledge Capital, Competitive Advantages of Green Absorptive Capacity	Green Capitals and Advantages	Exploitation and Development of Sustainable Competitive Capabilities in the Green Domain
Dantas et al. (2025); Yadav (2025)	New Dynamics of Absorptive Capacity, Green Ambidexterity, Green Corporate Ambidexterity	Green Dynamic Capabilities	
Consequences of Green Absorptive Capacity			
Reference	Sub-Component	Main Component	Final Theme
Sarmad et al. (2023); Bourini et al. (2025); Makhloufi et al. (2024); Makhloufi et al. (2023)	Corporate Environmental Citizenship Well-being, Green Workplace Perception, Managerial Environmental Concerns	Environmental Culture and Responsibility	
Makhloufi (2024a, 2024b); Makhloufi et al. (2024); Begum et al. (2023); Yadav (2025); Mazon et al. (2023); Dantas et al. (2025); Lin et al. (2020)	Green Absorptive Capacity: A Knowledge-Based Mediation–Moderation Model for Innovation	Green Strategy and Competitive Capabilities	Cultural–Strategic Leadership Based on Green Interactions
Yadav (2025); Khasmafkan-Nezam (2025)	Green Innovation and Collaboration at the Corporate Level, Green Reputation, Corporate Agility (Market Investment Agility and Operational Adjustment Agility)	Green Collaboration and Reputation	
Canbul Yaroğlu (2025); Ibrahim et al. (2025); Mohammad et al. (2025); Li et al. (2025); Kim et al. (2025); Asamoah et al. (2024); Makhloufi et al. (2024); Akhtar et al. (2024); Makhloufi et al. (2023); Ismail et al. (2023); Dantas et al. (2025); Yadav (2025)	Sustainable Performance/Corporate Performance (Environmental Performance, Operational Performance, Economic Performance, and Commercial Performance), Environmental Sustainability, Green Operations	Corporate Performance and Sustainability	Learning Ecosystem for Enhancing Corporate Sustainability

Bourini et al. (2025); Murad & Li (2025); Dantas et al. (2025); Chen et al. (2014)	Green Innovative Behavior, Green Creativity, Continuous Learning from Stakeholders and Integration of New Knowledge, Green Exploratory Learning, Green Exploitative Learning		
Qu et al. (2022); Mady et al. (2022); Dantas et al. (2025); Yadav (2025); Mason et al. (2023)	Green Innovation (Green Product and Green Process), Environmental Innovation (Eco-Innovation), Eco-Product and Ecological Process Innovation, Green Technology Innovation, Green Service Innovation	Green Learning and Creativity	Ambidextrous Management of Sustainable Innovations
Kim et al. (2025); Akhtar et al. (2024); Pacheco et al. (2018); Chen et al. (2014)	Ambidextrous Open Innovation (Inbound and Outbound Open Innovation), Green Innovation Performance, Sustainable Radical Innovation Outcomes, Sustainable Incremental Innovation Outcomes	Innovation Ambidexterity and Diversity	

Step 6: Quality Control of the Analysis

To ensure the validity of the research, the strategy of researcher sensitivity (also known as reflexivity) was employed. This strategy, which is one of the auditing approaches in qualitative research, is utilized to progressively ensure validity and reliability, and consequently the scientific rigor of the study throughout the research process (Parvar & Khorshid, 2024). This implies that all stages of the research, including the review of existing literature, the design of research questions and objectives, the selection of the research method, the process of data collection, data analysis, the comparison of categories derived from documentary studies and relevant literature, the identification of model components, and finally, the design of the model, were carried out with meticulous care and continuous oversight. Subsequently, the findings were submitted to three academic experts and validated by them.

Furthermore, to assess the reliability of the research, the intercoder agreement method was utilized (Irani et al., 2024). In this regard, in addition to the researcher who performed the initial coding, another researcher independently coded the findings. The congruence of the results from these two codings indicates agreement and, consequently, the reliability of the research. To calculate the extent of this agreement, Cohen's kappa coefficient was employed using SPSS software. The calculated value of this coefficient was 0.78, which surpasses the acceptable threshold of 0.60 reported by Finfgeld-Connett (2018). Therefore, it can be concluded that the code

extraction process demonstrated a desirable level of reliability.

Step 7: Presentation of the Conceptual Model of the Research

After identifying the drivers and outcomes of green absorptive capacity, the researchers proceeded to design a conceptual model, which is depicted in Figure 3.

Key determinants of green absorptive capacity include structural and operational empowerment for acquiring and utilizing green knowledge, interactive, institutional, and market-oriented green strategies, leadership and knowledge-based management for green synergy and innovation, as well as the exploitation and development of sustainable competitive capabilities in the green domain. On the other hand, the consequences of green absorptive capacity encompass cultural-strategic leadership based on green interactions, a learning ecosystem for enhancing corporate sustainability, and the ambidextrous management of sustainable innovations.

The antecedent of structural and operational empowerment for acquiring and utilizing green knowledge, as one of the fundamental antecedents of green absorptive capacity, encompasses an integrated set of organizational mechanisms that enable the acquisition, internalization, transformation, and exploitation of environmental knowledge. This empowerment is shaped through four main categories of codes. First, green human resource management, which includes green training and development, green performance

management, and core green competencies, cultivates the necessary skills and attitudes among employees for participation in green knowledge activities. Second, green technological infrastructure and skills, which, by leveraging information system capabilities (outside-in, spanning, inside-out), big data analytics capabilities, and artificial intelligence literacy, provide the platform for processing, interpreting, and circulating green knowledge. Third, green innovative technologies and interactions, which, through the absorption and application of artificial intelligence, collaborative innovation, and customer collaboration, strengthen the process of combining and recreating green knowledge. Fourth, green supply chain management,

which, by utilizing green supply chain practices and green procurement, enables access to external environmental knowledge and its transfer to internal processes. Thus, this set of codes provides a structural and operational context through which the organization is enabled to develop its green absorptive capacity and transform green knowledge into a competitive advantage and sustainable innovations. These antecedents align with the results reported by scholars such as Sarmad et al. (2023), Qu et al. (2022), Khasmafkan-Nezam (2025), Makhoulfi (2024a), Cheng et al. (2025), Yadav (2025), Asamoah et al. (2024), and Ibrahim et al. (2025).

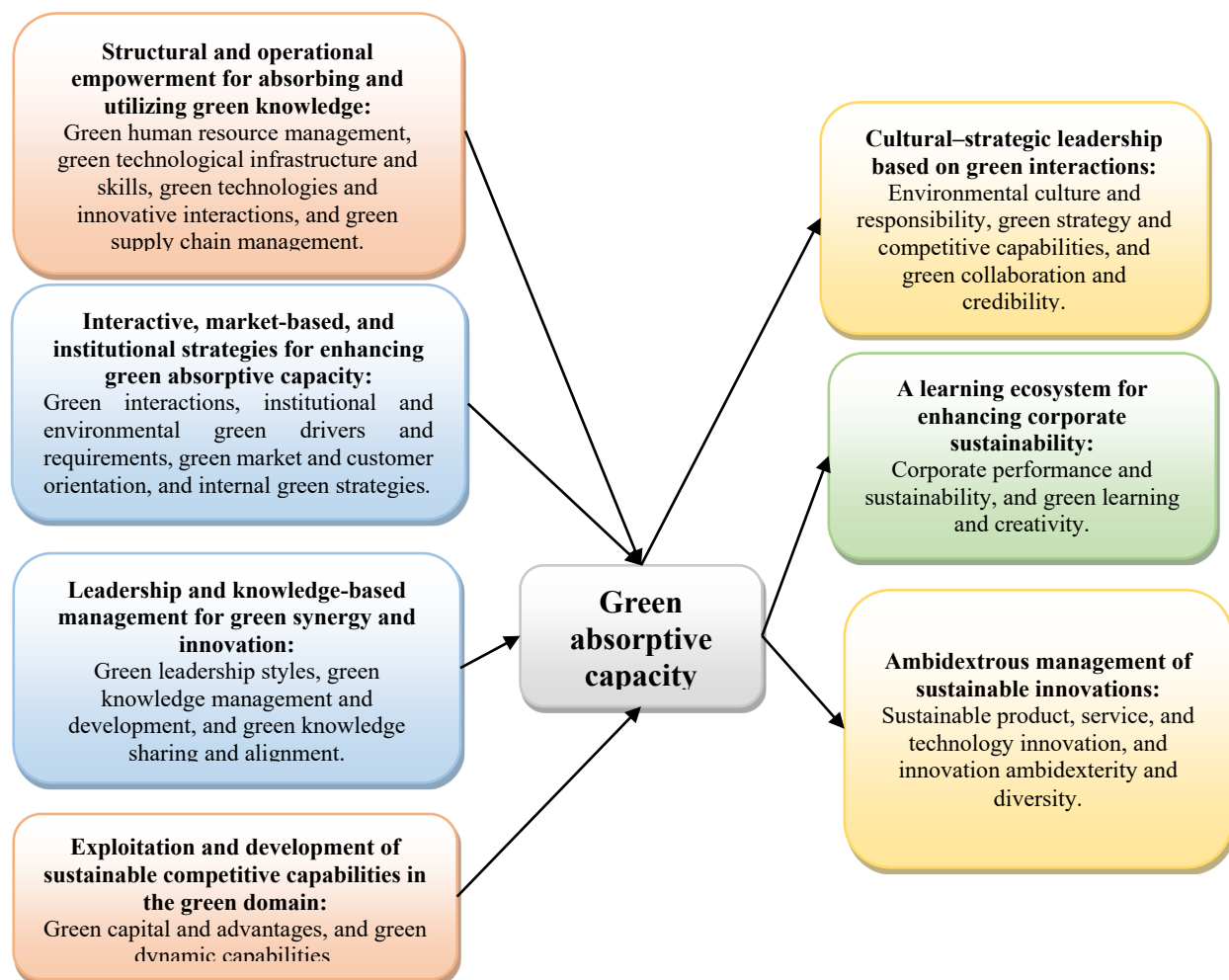


Figure 3. The model of Determinants and Implications of Green Absorptive Capacity (Source: Developed by the authors)

Green interactive, institutional, and market-based strategies constitute a key antecedent of green absorptive capacity, encompassing internal and external mechanisms that guide an organization's approach to acquiring and interpreting environmental knowledge. This antecedent is composed of four code groups. First, green interactions, which include relational capability and green relationship quality, lay the groundwork for the effective exchange of green knowledge with stakeholders and the creation of a foundation of trust in environmental collaborations. Second, green institutional and environmental drivers and requirements, which act in the form of environmental challenges, competitive pressure, environmental regulations, environmental governance, and external green orientation, guide the organization toward searching for, acquiring, and utilizing green knowledge. Third, green market and customer orientation, which includes eco-friendly product demand, green market orientation, and external green orientation, increases the organization's sensitivity to customers' environmental needs and values, thereby strengthening the organization's cognitive and interpretive capacity for understanding green knowledge. Fourth, internal green strategies, which, relying on inward green orientation and both internal and external environmental orientations, enhance the organization's internal coherence and external adaptability when confronting environmental issues. This set of mechanisms creates an integrated system through which the organization is exposed to green knowledge drivers, strengthens its relationships for knowledge exchange, and develops the understanding and interpretation of green market needs, thereby enhancing green absorptive capacity across the stages of acquisition, assimilation, transformation, and exploitation of environmental knowledge. These antecedents are consistent with the findings of researchers such as Ebrahim et al. (2025), Lin et al. (2020), Yadav (2025), Dantas et al. (2025), Mady et al. (2022), Canbul Yaroğlu (2025), and Ozgul (2022).

The antecedent of knowledge-based leadership and management for synergy and green innovation, as one of the key factors shaping green absorptive capacity, encompasses a set of mechanisms for the

leadership, management, and application of environmental knowledge that empower the organization to acquire, assimilate, transform, and exploit green knowledge. This antecedent consists of three main groups of codes. First, green leadership styles, which include inclusive green leadership, transformational green leadership, and digital leadership, enhance a culture of learning and attention to green knowledge within the organization through inspiration, participation, and the utilization of technology. Second, green knowledge management and development, by leveraging knowledge spillovers, knowledge management capabilities, and knowledge creation and application, provides the necessary groundwork for the generation and flow of environmental knowledge within the organization. Third, green knowledge sharing and alignment, which includes knowledge sharing, green information acquisition, and a shared green vision, leads to the perceptual and cognitive alignment of employees when confronting environmental issues and fosters a common understanding of green objectives. This set of codes, by strengthening conscious leadership and the organization's knowledge mechanisms, improves the pathways for the transfer, interpretation, and exploitation of green knowledge, ultimately enhancing green absorptive capacity across all its stages. These antecedents are consistent with the findings of researchers such as Murad and Li (2025), Ozgul (2022), Yadav (2025), and Makhoulfi (2024a).

The antecedent of leveraging and developing sustainable competitive capabilities in the green domain, as an influential factor in the formation and enhancement of green absorptive capacity, is founded upon a set of capitals, advantages, and dynamic capabilities that enable the organization to effectively acquire, integrate, transform, and exploit environmental knowledge. This antecedent is composed of two main code groups. First, green capitals and advantages, which include sustainability-focused intellectual resources comprising human, organizational, and relational components, cognitive social capital, green knowledge capital, and the competitive advantages of green absorptive capacity. These elements establish the essential knowledge, relational, and structural foundations for generating and disseminating environmental

knowledge, thereby enabling organizations to advance green learning and innovation. Second, green dynamic capabilities, which are based on the new dynamics of absorptive capacity, green ambidexterity, and corporate green ambidexterity, enhance the organization's strategic flexibility for rapid and intelligent responses to environmental changes. By integrating green knowledge capital with dynamic capabilities, this configuration establishes a context in which organizations can reconstruct their sustainable competitive capabilities and reinforce green absorptive capacity at both potential and realized levels, ultimately converting green knowledge utilization into a sustainable competitive advantage. These antecedents are consistent with the findings of researchers such as Begum et al. (2023), Akhtar et al. (2024), Yadav (2025), and Dantas et al. (2025).

The consequence of cultural-strategic leadership based on green interactions, as one of the key outcomes of green absorptive capacity, indicates how an organization's ability to acquire, internalize, transform, and exploit green knowledge can lead to the formation of advanced patterns of green culture, strategy, and collaborations. This consequence comprises three main code groups. First, environmental culture and responsibility, which includes corporate environmental citizenship, the perception of a green workplace, and environmental considerations at the managerial level. This indicates that green absorptive capacity can enhance the organization's sensitivity, awareness, and ethical commitment to the environment at both individual and organizational levels. Second, green strategy and competitive capabilities, which are formed by relying on green entrepreneurial orientation, green business strategy, environmental strategy, green dynamic capabilities, the acquisition and mobilization of resources for greater knowledge absorptive capacity, and green competitive advantage. This expresses how green absorptive capacity leads to the strengthening of strategic orientations, innovation, and sustainable advantage. Third, green collaboration and reputation, which includes corporate-level green innovation and

collaboration, green reputation, and corporate agility (market investment agility and operational adjustment agility). This indicates that organizations with higher green absorptive capacity will have a greater ability for inter-organizational collaborations, rapid response to environmental changes, and establishing green credibility and legitimacy in the market. Collectively, these codes indicate that green absorptive capacity not only expands the organization's knowledge capability but also creates broad cultural, strategic, and network-related consequences, ultimately empowering the organization on the path to green competitiveness and sustainability. These consequences are consistent with the findings of researchers such as Sarmad et al. (2023), Bourini et al. (2025), Makhloufi et al. (2023), Makhloufi (2024a, 2024b), Begum et al. (2023), Yadav (2025), Mazon et al. (2023), Dantas et al. (2025), Lin et al. (2020), and Khasmافkan-Nezam (2025). (Duplicate citation of Yadav (2025) removed).

The consequence of a learning ecosystem for enhancing corporate sustainability, as one of the prominent outcomes of green absorptive capacity, demonstrates how an organization's ability to acquire, assimilate, transform, and exploit green knowledge leads to the formation of a learning, dynamic, and innovative mechanism for improving performance and sustainability. This consequence is composed of two main code groups. First, corporate performance and sustainability, which includes sustainable performance and firm performance (environmental, operational, economic, and commercial performance), environmental sustainability, and green operations. This indicates that green absorptive capacity, by providing a deeper understanding of environmental opportunities and threats, guides the organization toward enhanced efficiency, reduced negative environmental impacts, and the achievement of better economic and operational outcomes. Second, green learning and creativity, which consists of green innovative behavior, green creativity, continuous learning from stakeholders and the integration of new knowledge, green exploratory learning, and green exploitative learning. This demonstrates how green

absorptive capacity creates a learning environment based on interaction with stakeholders, in which the organization is able to acquire new knowledge, integrate it with prior knowledge, and translate it into green innovations. The findings of this consequence align with the results of recent studies, including Canbul Yaroğlu (2025), Ebrahim et al. (2025), Mohammad et al. (2025), Li et al. (2025), Kim et al. (2025), Asamoah et al. (2024), Makhoulfi et al. (2024), Akhtar et al. (2024), Makhoulfi et al. (2023), Ismail et al. (2023), Dantas et al. (2025), Yadav (2025), Bourini et al. (2025), Murad & Li (2025), and Chen et al. (2014). In summary, this set of codes indicates that green absorptive capacity, by enhancing organizational learning, green innovation, and sustainable performance, constructs a learning ecosystem that drives the organization toward corporate sustainability at a deeper level.

The consequence of the ambidextrous management of sustainable innovations, as a significant outcome of green absorptive capacity (GAC), signifies that an organization, by possessing the ability to acquire, assimilate, transform, and exploit green knowledge, becomes capable of simultaneously developing sustainable innovations at both exploratory and exploitative levels, thereby expanding its innovation diversity. This consequence is composed of two primary code groups. First is the environmental innovation of products, services, and technology, which encompasses green innovation (green product and process), environmental innovation (or eco-innovation), eco-product innovation and ecological processes, green technology innovation, and green service innovation. This indicates that green absorptive capacity, by deepening understanding of environmental technologies and practices, steers organizations toward developing more environmentally aligned products, services, and processes. Second is innovation ambidexterity and diversity, which includes ambidextrous open innovation (inbound and outbound), green innovation performance, radical green innovation performance, and incremental green innovation performance. This demonstrates that green absorptive capacity strengthens the organization's ability to combine new knowledge with existing knowledge, develop

transformative innovations, and pursue continuous and incremental improvements. This set of codes indicates that green absorptive capacity not only contributes to the creation of sustainable innovations but also enables the organization to strike a balance between radical and incremental innovations, thereby strengthening its sustainable competitive advantage through the ambidexterity, diversity, and dynamism of green innovations. These outcomes are consistent with the findings of researchers including Qu et al. (2022), Mady et al. (2022), Dantas et al. (2025), Yadav (2025), Mazon et al. (2023), Kim et al. (2025), Akhtar et al. (2024), Pacheco et al. (2018), and Chen et al. (2014).

Conclusion

The present study was conducted with the aim of investigating the drivers and resulting outcomes of green absorptive capacity using a meta-synthesis approach. The antecedents of green absorptive capacity include structural and operational empowerment for the acquisition and practical deployment of environmentally related knowledge, interactive, institutional, and market-oriented green strategies, knowledge-driven leadership and management for synergy and green innovation, as well as the exploitation and development of sustainable competitive capabilities in the green domain. On the other hand, the consequences of green absorptive capacity encompass cultural-strategic leadership based on green interactions (environmental culture and responsibility, green strategy and competitive capabilities, and green collaboration and credibility), a learning ecosystem for enhancing corporate sustainability (corporate performance and sustainability, and green learning and creativity), and the ambidextrous management of sustainable innovations (sustainable product, service, and technology innovation, and innovation ambidexterity and diversity).

The antecedent of structural and operational empowerment for the acquisition and application of green knowledge comprises green human resource management, green technological infrastructure and skills, green innovative technologies and interactions, as well as environmentally oriented supply chain practices. Green human resource management

includes green training and development, green performance management, and green core competencies. Green technological infrastructure and skills encompass information system capabilities (outside-in, spanning, inside-out), big data analytics capabilities, and artificial intelligence literacy. The adoption and application of artificial intelligence, collaborative innovation, and customer cooperation are considered parts of green innovative technologies and interactions. Finally, green supply chain management includes green supply chain management practices and green procurement.

Accordingly, managers are advised to strategically invest in green human capital, enhance technological capabilities, leverage innovative tools and collaborations, and develop sustainable supply chain practices to establish the structural and operational conditions necessary for the effective acquisition, integration, and utilization of green knowledge. This approach strengthens the firm's ability to understand and utilize environmental knowledge and, through enhanced information flows, advanced digital capabilities, closer stakeholder collaboration, and a sustainable supply chain, supports proactive responses to environmental change, the development of green innovations, and improvements in sustainability, operational performance, and green competitive advantage in volatile markets.

The antecedents of interactive, institutional, and market-oriented green strategies include green interactions, institutional and environmental drivers and requirements, green market and customer orientation, and internal green strategies. Relational capability and green relational quality are considered part of green interactions. Institutional and environmental drivers and requirements encompass environmental challenges, competitive pressure, environmental regulations, environmental governance, and green external orientation. From the perspective of green market and customer orientation, one can refer to the demand for environmentally friendly products, green market orientation (green marketability), and green external orientation. Also, internal green strategies include green

internal orientation and internal and external environmental orientation.

Therefore, it is suggested to company and organizational managers that by strengthening green interactions through developing relational capabilities and improving the quality of relationships with environmental stakeholders, actively attending to institutional and environmental drivers and requirements including environmental challenges, competitive pressures, environmental regulations and governance, and also by strengthening green market and customer orientation, they provide the necessary foundation for shaping efficient external strategies. Furthermore, the development of internal green strategies based on green internal orientation and the optimization of internal and external environmental orientations enable the organization to systematically absorb and integrate environmental knowledge and use it to respond more efficiently to market changes, customer expectations, and institutional requirements. Adopting such an approach strengthens the green absorptive capacity within the organization, makes environmental collaborations more effective, and ultimately leads the organization to achieve a green competitive advantage, operational sustainability, and environmental innovations.

The antecedents of knowledge-driven leadership and management for synergy and green innovation include green leadership styles, green knowledge management and development, and green knowledge sharing and alignment. Inclusive green leadership, green transformative leadership, and digital leadership are considered part of green leadership styles. Green knowledge management and development includes knowledge spillovers, knowledge management capabilities, and knowledge creation and application. Regarding green knowledge sharing and alignment, one can name knowledge sharing, green information acquisition, and a shared green vision.

Therefore, it is suggested to managers of companies and organizations that by developing and strengthening green leadership styles, such as inclusive green leadership, green transformative leadership, and digital

leadership, they create an inspiring behavioral model that motivates organizational members to engage proactively in environmental and innovative activities. It is further suggested that green knowledge management and development systems be systematically embedded through the continual reinforcement of knowledge spillovers, the enhancement of knowledge management capabilities, and the establishment of integrated mechanisms for generating and utilizing environmental knowledge. In addition, platforms for green knowledge sharing and alignment should be strengthened by promoting knowledge sharing, enhancing green information acquisition flows, and shaping a shared green vision among internal and external units and stakeholders. Adopting this set of measures enables the organization to enhance its ability to absorb, integrate, and utilize green knowledge, strengthen synergy among individuals and units, and ultimately pave the way for sustainable green innovation, green competitive advantage, and organizational sustainability.

The antecedents for exploiting and developing sustainable competitive capabilities in the green domain include green assets and advantages, and green dynamic capabilities. Among green assets and advantages, we can mention green intellectual capital (human, structural, relational), cognitive social capital, and green knowledge capital, in addition to the competitive advantages of environmental absorptive capacity. Green dynamic capabilities include the new dynamics of absorptive capacity, green ambidexterity, and green corporate ambidexterity.

Therefore, it is suggested to managers of companies and organizations that by targeted investment in the development and strengthening of green capitals—including green intellectual capital in its human, structural, and relational dimensions, cognitive social capital, and green knowledge capital—they provide the necessary groundwork for the creation and accumulation of environmental knowledge and its transformation into sustainable competitive advantages. It is further recommended that organizations enhance green

dynamic capabilities—such as emerging forms of absorptive capacity, green ambidexterity, and green corporate ambidexterity—to improve rapid environmental adaptation, resource reconfiguration, and the concurrent exploitation of radical and incremental innovations. Combining these capitals and capabilities enables the organization to continuously develop its green absorptive capacity, respond more effectively to competitive and environmental pressures, and ultimately strengthen sustainable competitive advantage, strategic agility, and sustainable green innovation at the enterprise level.

Limitations and Future Research Directions

One of the primary limitations of this research is the scarcity of and difficulty in accessing domestic and international scholarly resources. Due to the novelty of the concept of Green Absorptive Capacity in the theoretical literature and the emerging nature of the research field, published studies in this area are limited, and a significant portion of the existing works have only recently reached the publication stage. This situation has affected the scope of the literature search and the depth of theoretical analysis, reducing the possibility of a comprehensive comparison of the findings. Accordingly, it is recommended that future researchers precisely test and examine the present research model using quantitative methods, such as structural equation modeling, to evaluate the relationships between the indicators or variables within the proposed model among knowledge-based companies. Furthermore, it is suggested that the modeling of “Inclusive Green Leadership” and “Green Innovation Climate” in knowledge-based companies active in the green sector be investigated using a grounded theory approach. In addition to these points, identifying the key success factors for implementing Green Absorptive Capacity strategies in knowledge-based companies through a foresight approach can also pave the way for developing knowledge and practical applications in this domain.

REFERENCES

Akhtar, S., Li, C., Sohu, J. M., Rasool, Y., Hassan, M. I. U., & Bilal, M. (2024).

“Unlocking green innovation and environmental performance: the mediated

- moderation of green absorptive capacity and green innovation climate". *Environmental Science and Pollution Research*, 31(3), 4547- 4562. <https://doi.org/10.1007/s11356-023-31403-w>.
- Asamoah, D., Acquah, I. N., Nuerter, D., Agyei-Owusu, B., & Kumi, C. A. (2024). "Unpacking the role of green absorptive capacity in the relationship between green supply chain management practices and firm performance". *Benchmarking: An international journal*, 31(8), 2793-2818. <https://doi.org/10.1108/BIJ-09-2022-0564>.
- Baquero, A. (2024). "Examining the role of ambidextrous green innovation and green competitive advantage in stimulating sustainable performance: The moderating role of green absorptive capacity". *Sage Open*, 14(4), 21582440241294160. <https://doi.org/10.1177/21582440241294160>.
- Barney, J. (1991). "Firm resources and sustained competitive advantage". *Journal of management*, 17(1), 99-120. <https://doi.org/10.1177/014920639101700108>.
- Begum, S., Ashfaq, M., Asiaei, K., & Shahzad, K. (2023). "Green intellectual capital and green business strategy: the role of green absorptive capacity". *Business Strategy and the Environment*, 32(7), 4907-4923. <https://doi.org/10.1002/bse.3399>.
- Bourini, I., Khassawneh, O., Behery, M., Anadol, Y., & Mohammad, T. (2025). "Green Leadership Support as a Catalyst for Innovative Behavior: A Study of Green Absorptive Capacity and Work Climate in UAE Hotels". *Business Ethics, the Environment & Responsibility*. <https://doi.org/10.1111/beer.70003>.
- Braun, V., & Clarke, V. (2006). "Using thematic analysis in psychology". *Qualitative research in psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>.
- Canbul Yaroğlu, A. (2025). "Firm performance through green orientation, environmental culture, and green absorptive capacity". *Management Decision*. <https://doi.org/10.1108/MD-05-2024-1016>.
- Chen, Y. S., Chang, C. H., & Lin, Y. H. (2014). "The determinants of green radical and incremental innovation performance: Green shared vision, green absorptive capacity, and green organizational ambidexterity". *Sustainability*, 6(11), 7787-7806. <https://doi.org/10.3390/su6117787>.
- Chen, Y., Tang, G., Jin, J., Li, J., & Paillé, P. (2015). "Linking market orientation and environmental performance: The influence of environmental strategy, employees' environmental involvement, and environmental product quality". *Journal of Business Ethics*, 127(2), 479-500. <https://doi.org/10.1007/s10551-014-2059-1>.
- Cheng, J., Xu, N. R., Khan, N. U., & Singh, H. S. M. (2025). "The impacts of artificial intelligence literacy, green absorptive capacity, and green information system on green innovation". *Corporate Social Responsibility and Environmental Management*, 32(2), 2375-2389. <https://doi.org/10.1002/csr.3017>.
- Cohen, W. M., & Levinthal, D. A. (1990). "Absorptive capacity: A new perspective on learning and innovation". *Administrative Science Quarterly*, 35(1), 128-152. <https://doi.org/10.2307/2393553>.
- Colabi, A. M., & Goodarzi, A. (2025). "Identifying Factors Influencing Online Shopping Decisions: The Role of Virtual Ideal Self-Image and Cognitive Approaches through Meta-Synthesis". *Journal of Business Management*, 17(2), 266-300. <https://doi.org/10.22059/jibm.2024.364016.4640>.
- Dantas, D., Ferreira, J. J., & Jayantilal, S. (2025). "Green absorptive capacity and environmental management: the main challenges, gaps, and research agenda". *Management of Environmental Quality: An International Journal*. 36(6), 172-1391. <https://doi.org/10.1108/MEQ-10-2024-0466>.
- Finfgeld-Connett, D. (2018). "A guide to

- qualitative meta-synthesis". *New York, NY, USA: Routledge*.
<https://pei.ut.ac.ir/documents/439269/554185/062>.
- Ghomi Aveili, Z., Taghipourian, M. J., Maranjori, M. and Rahmati, M. (2021). "Systematic review of meta-synthesis technique based brand equity: Analysis of constituents and its consequences from a combined perspective (financial-customer)". *New Marketing Research Journal*, 11(2), 91-112.
<https://doi.org/10.22108/nmrj.2021.125110.2245>.
- Gluch, P., Gustafsson, M., & Thuvander, L. (2009). "An absorptive capacity model for green innovation and performance in the construction industry". *Construction Management and Economics*, 27(5), 451-464.
<https://doi.org/10.1080/01446190902896645>.
- Grant, R. M. (1996). "Toward a knowledge-based theory of the firm". *Strategic management journal*, 17(S2), 109-122.
<https://doi.org/10.1002/smj.4250171110>.
- Haghighi Nasab, M., Yazdani, H. R., & Goli, F. (2025). "Presenting the Perceived Fairness Model of Dynamic Pricing: Meta-Synthesis Approach". *Journal of Business Management*, 17(1), 129-148.
<https://doi.org/10.22059/jibm.2024.369202.4718>.
- Ibrahim, M., Mahmood, R., & Som, H. M. (2025). "Green absorptive capacity and environmental performance: a perspective of SMEs' relational capability and green supply chain management practices". *Environment, Development and Sustainability*, 27(6), 13947-13971.
<https://doi.org/10.1007/s10668-023-04420-5>.
- Irani, H. R., Ebrahimi, E., & Somi, B. (2024). "Clarification and Prioritization of Omnichannel Marketing Antecedents: A Meta-Synthesis Approach". *Journal of Business Management*, 16(4), 909-948.
<https://doi.org/10.22059/jibm.2023.356336.4550>.
- Ismail, I. J., Amani, D., & Changelima, I. A. (2023). "Strategic green marketing orientation and environmental sustainability in sub-Saharan Africa: Does green absorptive capacity moderate? Evidence from Tanzania". *Heliyon*, 9(7). e18373.
<https://doi.org/10.1016/j.heliyon.2023.e18373>.
- Khasmafkan-Nezam, M. H. (2025). "Harnessing information system capabilities to enhance organizational agility: the interplay of green absorptive capacity, collaborative knowledge creation, and strategic flexibility". *Journal of Enterprise Information Management*, 1-35.
<https://doi.org/10.1108/JEIM-02-2025-0080>.
- Kim, J., Ali, M., & Roh, T. (2025). "When Do Green Absorptive Capacity and Ambidextrous Open Innovation Foster Sustainable Performance?". *Business Strategy and the Environment*, 34(17), 9223-9241.
<https://doi.org/10.1002/bse.70075>.
- Li, C., Akhtar, S., Sohu, J. M., Shaikh, S. N., Junejo, I., & Iatzaz-Ul-Hassan, M. (2025). "Navigating the SMEs Green Path: Exploring the Role of Green Absorptive Capacity, Green Innovation, and Environmental Regulation in Enhancing Environmental Performance". *SAGE Open*, 15(2), 21582440251342496.
<https://doi.org/10.1177/21582440251342496>.
- Lin, Y. H., Kulangara, N., Foster, K., & Shang, J. (2020). "Improving green market orientation, green supply chain relationship quality, and green absorptive capacity to enhance green competitive advantage in the green supply chain". *Sustainability*, 12(18), 7251.
<https://doi.org/10.3390/su12187251>.
- Mady, K., Abdul Halim, M. A. S., Omar, K., Abdelkareem, R. S., & Battour, M. (2022). "Institutional pressure and eco-innovation: The mediating role of green absorptive capacity and strategic environmental orientation among manufacturing SMEs in Egypt". *Cogent Business & Management*, 9(1), 2064259.
<https://doi.org/10.1080/23311975.2022.2064259>.
- Makhloufi, L. (2024a). "Do knowledge sharing and big data analytics capabilities matter for green absorptive capacity and green entrepreneurship orientation?

- Implications for green innovation". *Industrial Management & Data Systems*, 124(3), 978-1004. <https://doi.org/10.1108/IMDS-07-2023-0508>.
- Makhloufi, L. (2024b). "Predicting the impact of big data analytics capability and green absorptive capacity on green entrepreneurship orientation and eco-innovation". *Journal of Enterprising Communities: People and Places in the Global Economy*, 18(4), 746-770. <https://doi.org/10.1108/JEC-05-2023-0069>.
- Makhloufi, L., Djermani, F., & Meirun, T. (2024). "Mediation-moderation model of green absorptive capacity and green entrepreneurship orientation for corporate environmental performance". *Management of Environmental Quality: An International Journal*, 35(1), 139-157. <https://doi.org/10.1108/MEQ-05-2023-0164>.
- Makhloufi, L., Zhou, J., & Siddik, A. B. (2023). "Why green absorptive capacity and managerial environmental concerns matter for corporate environmental entrepreneurship?". *Environmental Science and Pollution Research*, 30(46), 102295-102312. <https://doi.org/10.1007/s11356-023-29583-6>.
- Mazon, G., Soares, T. C., Birch, R. S., Schneider, J., & Andrade Guerra, J. B. S. O. D. A. (2023). "Green absorptive capacity, green dynamic capabilities, and green service innovation: a study in Brazilian universities". *International Journal of Sustainability in Higher Education*, 24(4), 859-876. <https://doi.org/10.1108/IJSHE-10-2021-0454>.
- Montreuil, V. L., Lauzier, M., & Gagnon, S. (2021). "A closer look at determinants of organizational capability to innovate (OCI) A dynamic capabilities perspective". *European Journal of Innovation Management*, 24(3), 820-847. <https://doi.org/10.1108/EJIM-05-2019-0127>.
- Murad, M., & Li, C. (2025). "Impact of green inclusive leadership on employee green creativity: mediating roles of green passion and green absorptive capacity". *Leadership & Organization Development Journal*, 46(1), 118-138. <https://doi.org/10.1108/LODJ-01-2024-0022>.
- Naeem, M., Ozuem, W., Howell, K., & Ranfagni, S. (2023). "A step-by-step process of thematic analysis to develop a conceptual model in qualitative research". *International journal of qualitative methods*, 22, 16094069231205789. <https://doi.org/10.1177/16094069231205789>.
- Ozgul, B. (2022). "Does green transformational leadership develop green absorptive capacity? The role of internal and external environmental orientation". *Systems*, 10(6), 224. <https://doi.org/10.3390/systems10060224>.
- Pacheco, L. M., Alves, M. F. R., & Liboni, L. B. (2018). "Green absorptive capacity: A mediation-moderation model of knowledge for innovation". *Business Strategy and the Environment*, 27(8), 1502-1513. <https://doi.org/10.1002/bse.2208>.
- Parvar, F., & Khorshid, S. (2024). "Designing the model of drivers for the development of agricultural tourism with a sustainable development approach (Case study: Villages of Durood County, Lorestan province)". *Village and Space Sustainable Development*, 5(3), 78-103. <https://doi.org/10.22077/vssd.2024.6708.1203>.
- Pourkarimi, J., & Azizi, M. (2025). "Organizational Strategies in Turbulent Environments: A Meta-Synthesis Study". *Journal of Business Management*, 17(2), 454-480. <https://doi.org/10.22059/jibm.2024.375005.4774>.
- Sandelowski, M., & Barroso, J. (2007). "Using qualitative met summary to synthesize qualitative and quantitative descriptive findings". *Research in Nursing & Health*, 30(1), 99-111. <https://doi.org/10.1002/nur.20176>.
- Sarmad, M., Pirzada, M. A., & Iqbal, R.

- (2023). "Fostering extra-role green behavior through green HRM practices: mediating role of green absorptive capacity". *International Journal of Manpower*, 44(8), 1535-1552. <https://doi.org/10.1108/IJM-10-2021-0592>.
- Shehzad, M. U., Jianhua, Z., Naveed, K., Zia, U., & Sherani, M. (2024). "Sustainable transformation: an interaction of green entrepreneurship, green innovation, and green absorptive capacity to redefine green competitive advantage". *Business Strategy and the Environment*, 33(7), 7041-7059. <https://doi.org/10.1002/bse.3859>.
- Tuncer, B., & Korchagina, E. (2024). "A systematic literature review and conceptual framework on green entrepreneurial orientation". *Administrative Sciences*, 14(6), 109. <https://doi.org/10.3390/admsci14060109>.
- Wang, C., Zhang, X. E., & Teng, X. (2023). "How to convert green entrepreneurial orientation into green innovation: the role of the knowledge creation process and green absorptive capacity". *Business Strategy and the Environment*, 32(4), 1260-1273. <https://doi.org/10.1002/bse.3187>.
- Wernerfelt, B. (1984). "A resource-based view of the firm". *Strategic management journal*, 5(2), 171-180. <https://doi.org/10.1002/smj.4250050207>.
- Yadav, G. (2025). "Environmental stewardship: A meta-analytic review of green absorptive capacity and dynamic capabilities". *Strategy & Leadership*. <https://doi.org/10.1108/SL-06-2025-0148>.
- Zahra, S. A., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension". *Academy of Management Review*, 27(2), 185-203. <https://doi.org/10.5465/amr.2002.6587995>.
- Zhang, X., Le, Y., Meng, Q., & Teng, X. (2023). "Green entrepreneurial orientation and financial performance in Chinese firms: The role of stakeholder engagement and green absorptive capacity". *Corporate Social Responsibility and Environmental Management*, 30(3), 1082-1095. <https://doi.org/10.1002/csr.2405>.
- Zimmer, L. (2006). "Qualitative meta-synthesis: a question of dialoguing with texts". *Journal of advanced nursing*, 53(3), 311-318. <https://doi.org/10.1111/j.13652648.2006.03721.x>

COPYRIGHTS



© 2026 by the authors. Licensee PNU, Tehran, Iran. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution 4.0 International (CC BY4.0) (<http://creativecommons.org/licenses/by/4.0>)