

# Educational needs in green education: a survey-based exploration among Romanian students

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## Abstract

This paper aim aligns with recommendations from recent research, exploring greenwashing education among Romanian socio-economic students. The study aims to contribute insights into the specific educational needs within the social fields concerning greenwashing and discern the potential implications for consumer behavior in this context. The current study builds upon preceding research conducted by the author, where professionals in ecological fields underscored the prevalence of deceptive practices, leading to the misleading of urban consumers. The limited comprehension of green claims and regulatory nuances among urban inhabitants emerged as a salient contributing factor. Employing a survey-based methodology, the research captures practical insights from students in socio-economic fields. The 16-question questionnaire explores participants' perceptions and knowledge on green claims. Preliminary findings indicate varying levels of awareness and experiences with greenwashing among Romanian students. The survey data provides insights into factors influencing the recognition of deceptive environmental claims, their impact on consumer choices, and perceived corporate responsibility. The study's implications extend to academics, researchers, and practitioners interested in sustainable communication and consumer behavior. For smart city development, addressing students' greenwashing awareness gaps is crucial. Integrating sustainability into urban education can empower citizens for informed choices. At the community level, combating greenwashing requires targeted programs fostering environmental literacy. Hence, in academia, identified gaps highlight the need for integrated greenwashing modules, preparing future professionals for sustainability challenges. This research offers a nuanced perspective on greenwashing by centering on Romanian students' perceptions. Its value lies in informing interventions, policies, and education efforts to combat greenwashing, fostering an informed and sustainable consumer base. The insights contribute uniquely to the Romanian context, enriching the global discourse on sustainable practices and consumer awareness.

**Keywords:** sustainable communication, greenwashing awareness, green claims.

## 1. Introduction

As global concerns about environmental sustainability intensify, the need for comprehensive education on greenwashing becomes increasingly apparent. This paper delves into this imperative by aligning with recent research recommendations and focusing on the greenwashing education landscape among Romanian socio-economic students. With a broader objective of contributing insights into specific educational needs within social fields and discerning potential implications for consumer behavior, this study addresses a critical aspect of sustainable development.

Building on previous research conducted by the author, which highlighted deceptive practices influencing urban consumers, this study takes a focused approach. The prevalence of greenwashing underscored the limited comprehension of green claims and regulatory nuances among urban inhabitants, establishing a foundation for this investigation. Employing a survey-based methodology, the research captures practical insights from students in socio-economic fields, utilizing a 16-question questionnaire to explore their perceptions and knowledge regarding green claims. Preliminary findings from the survey indicate varying levels of awareness and experiences with greenwashing among Romanian students. This research sheds light on factors influencing the recognition of deceptive

environmental claims, their impact on consumer choices, and perceived corporate responsibility. The implications of the study extend to academia, researchers, and practitioners interested in sustainable communication and consumer behavior. For smart city development, addressing students' greenwashing awareness gaps is crucial, advocating for the integration of sustainability into urban education to empower citizens for informed choices.

At the community level, combating greenwashing necessitates targeted programs fostering environmental literacy. The value of this research lies in its nuanced perspective on greenwashing, centering on Romanian students' perceptions and enriching the global discourse on sustainable practices and consumer awareness. By informing interventions, policies, and education efforts, this study contributes to fostering an informed and sustainable consumer base in Romania and beyond.

## **2. Literature review**

Greenwashing has become a critical issue in the context of sustainability and environmental claims, especially as consumer awareness and interest in nature and climate change have surged globally in the past years. With a heightened focus on environmental preservation and climate change mitigation, the term “sustainability” has evolved to encompass not only environmental concerns but also the broader influences on communities, cultures, and interpersonal connections. As individuals demand for sustainable and ethical products rises, the consumer goods market faces increased pressure to provide environmentally friendly outputs that align with consumer expectations. Academic research has explored the challenges in defining and verifying sustainability claims, emphasizing the need for businesses to adapt to meet these evolving consumer expectations.

Amidst the growing demand for sustainable and ethical products, the market for consumer goods is witnessing increased pressure to provide environmentally friendly outputs that minimize damage to the environment. The rise in online searches related to nature loss and biodiversity, along with the amplification of environmental concerns on social media, underscores the urgency for businesses to adapt and meet consumer expectations for sustainable practices. In this context, green or environmentally friendly products were defined as those causing less harm to the environment in terms of pollution and resource depletion or those that can be recycled or maintained [1]. In the absence of a globally acknowledged definition or methodology for determining sustainability, the term has been increasingly used by politicians and marketers as a catchphrase, potentially diluting its original meaning. As globalization continues to shape supply chains, the outsourcing of manufacturing to foreign suppliers by retailers has become commonplace. However, this trend has given rise to the unethical practice of supply chain greenwashing, wherein retailers selectively disclose information about their upstream suppliers, exaggerating the environmental benefits of ostensibly green products to consumers. In the quest for improved environmental standing and competitive advantage, many companies employ green marketing strategies to appeal to environmentally conscious consumers. However, this endeavor is not without risks, as green marketing claims may be perceived as 'greenwashing,' potentially leading to ethical harm and impacting a company's profitability. Building on existing greenwashing studies, two studies involving interviews with consumer product and

consulting firms were conducted [2], as well as an experiment with consumers interacting with a company website. Results revealed that perceived greenwashing not only influences environmental and product perceptions but also correlates with consumers' happiness during website interactions. The degree of website interactivity was also found to be linked to perceived greenwashing, environmental and product perceptions, and the extent of interaction with the website. This research sheds light on the multifaceted impact of green marketing, providing insights for both research and managerial practices. Additionally, the moderating role of greenwashing perceptions was explored in the relationship between environmental concern and the green purchasing behavior of post-millennials [3]. The findings suggested that greenwashing perceptions diminish the effects of environmental concern on green behavior, highlighting the crucial role of awareness in shaping the environmentally conscious consumption patterns of post-millennials.

The unethical practice of greenwashing poses a significant threat to the growth of sustainable products and markets, undermining essential efforts to address climate change, pollution, and social justice. Greenwashing involves false marketing communication that falsely labels products as sustainable, eroding the value of genuinely green products and impairing consumers' ability to discern between sustainable and non-sustainable options. This deceptive practice also erodes trust in products claiming to be environmentally friendly, impeding the necessary transformation toward sustainability. A different study sheds light on potential remedies, demonstrating that providing consumers with reliable, transparent, traceable, and tamperproof product information can counteract perceived greenwashing, particularly in the context of ecological foods [4]. Surprisingly, the research reveals that blockchain information proves more effective than certification systems in safeguarding consumers against the threat of greenwashing. The study emphasizes that information validating authenticity not only fosters the development of sustainable products but also protects intellectual property rights for suppliers and ensures a secure supply of green products to consumers. In challenging the conventional reliance on certifications, the findings advocate for the robust potential of blockchain technology to empower green consumers and enhance the credibility of sustainable development initiatives.

Another recent study employs machine-aided textual analysis on a comprehensive dataset of 725 corporate sustainability reports, aiming to empirically assess the extent to which climate discourse, or 'talk,' within these reports aligns with actual performance outcomes, or 'walk,' measured by changes in greenhouse gas emissions over a decade [5]. The investigation reveals nuanced findings regarding the 'talk-walk' relationship, contingent upon the nature of the discourse and the involved climate change actors. The study identifies a divergence in climate commitments, discerning between genuine intentions and instances of 'greenwashing,' where symbolic gestures overshadow substantive action. This discrepancy is attributed to a phenomenon of false signaling in climate transitioning, driven by misaligned incentives. A notable outcome of the research is the identification of operational improvements talk as a significant predictor of climate performance enhancement, providing a more optimistic perspective. Conversely, reactive strategies are found to correlate with poor climate performance. These results underscore the importance of considering diverse corporate climate strategies beyond emissions reduction, emphasizing the multifaceted nature of businesses' contributions to the climate transition.

It is crucial to evaluate environmental claims based on the product's major environmental consequences throughout its lifecycle and supply chain. When these claims are false or difficult to verify, the term “greenwashing” is applied, reflecting a deceptive marketing practice that can also be termed eco-washing, eco-bleaching, green makeup, or whitewash. The ongoing challenge remains in establishing standardized criteria and metrics to objectively assess and communicate the environmental impact of products and services, thereby curbing the prevalence of greenwashing in the marketplace.

To address the ambiguity surrounding environmental claims, European regulations and guidelines have sought to define terms like “green” or “environmentally friendly.” According to the European Commission definitions, greenwashing is described as the practice of suggesting or creating the impression, through commercial communication, marketing, or advertising, that a product has a positive or no impact on the environment or is less damaging than competing goods or services. Such claims may pertain to the product's composition, manufacturing process, disposal methods, or anticipated reductions in energy consumption or pollution during usage.

### ***2.1. Greenwashing in business-to-consumer communication***

Greenwashing in business-to-consumer communication has been a persistent issue, with origins dating back to the mid-1980s when oil firms like Chevron first engaged in deceptive green advertising practices by downplaying their environmental impact. Despite early violators, the trend of companies attempting to portray their products as environmentally friendly has intensified over the years, with many seeking to cultivate an eco-conscious corporate image.

In recent years, the Volkswagen emission crisis in 2015 emerged as a pivotal event, representing a significant case of greenwashing that impacted consumer engagement on Facebook brand pages across several European countries. Investigating the effects in France, Germany, Turkey, and the United Kingdom, the study conducted a six-year analysis of consumer interactions, including likes, comments, and shares on Volkswagen's Facebook brand page from January 2012 to December 2017. A study employing autoregressive–moving average models to discern the nuances of online consumer engagement revealed distinct country-specific attitudes toward greenwashing, with negative engagement observed in the United Kingdom and Turkey, positive engagement in Germany, and no change in France during the fourth quarter of 2015 [6].

When consumers perceive a business's environmental claims as misleading or insincere, greenwashing becomes evident. This phenomenon has prompted increased scrutiny and a growing awareness of the need for transparency in environmental communication practices.

Meanwhile, the pervasive issue of greenwashing in the context of increased consumption of green products was also addressed. Introducing a computational model incorporating fuzzy logic techniques, a study aimed to mitigate uncertainty in decision analysis processes related to consumer satisfaction with green products [7]. The fuzzy rule-based system facilitated the analysis of consumer behavior and perception of greenwashing, offering insights into the impact of deceptive practices on green product confidence in retail. This

approach contributes to understanding the attitudes of green consumers and provides a quantitative method for decision-making regarding variables influencing consumer behavior in the face of greenwashing [7].

In recent paper, authors delve into the impact of perceived greenwashing on customer satisfaction, focusing on cases where firms overcommit or fail to deliver on socially responsible actions [8]. The study, utilizing data from the American Customer Satisfaction Index (ACSI) for U.S. companies, reveals a negative link between perceived greenwashing related to green product innovation (GPI) and the ACSI index. The effect is attributed to corporate policies exceeding corresponding actions, not lower implementation levels. The study further demonstrates that a firm's capability reputation mitigates the negative effect of greenwashing on customer satisfaction. This research provides a distinct perspective by associating greenwashing with corporate hypocrisy and emphasizes the role of capability reputation in shaping customer perceptions, offering essential insights for corporate strategies in managing greenwashing concerns.

## ***2.2. Greenwashing in the EU***

In business-to-consumer communication, promotional practices involving green attributes encompass a wide range of elements, including statements, information, symbols, logos, graphics, and brand names. These elements, along with their interplay with colors, can be found on packaging, labeling, advertising, and across various media channels, including websites. The European Commission defines these practices broadly, emphasizing that any organization qualifying as a 'trader' and engaging in commercial practices toward consumers falls under the scope of scrutiny.

As the global landscape evolves and awareness of environmental issues grows, the challenge persists in developing more robust frameworks and regulations to effectively combat greenwashing. Achieving clarity in guidelines, both at the EU level and within individual Member States, remains crucial to fostering greater accountability and transparency in business-to-consumer communication, thereby curbing the prevalence of deceptive green practices in the marketplace. Recent studies and developments in this area emphasize the ongoing need for vigilance and regulatory measures to protect consumers from misleading green claims.

Addressing deceptive green claims in the European Union, the primary legislative instrument is the Directive 2005/29/EC, known as the Unfair Commercial Practices Directive. This directive targets unfair practices that impact the economic interests of consumers, explicitly addressing deceptive green claims. While some Member States have implemented national guidelines to complement EU-level regulations, there is still a notable need for greater clarity in this domain. Existing guidelines primarily focus on environmental claims but do not comprehensively regulate all aspects of greenwashing practices.

In Romania, a study published recently investigates greenwashing in business-to-consumer communication in Romania, aiming to understand its causes and distinct characteristics [9]. Interviews with senior practitioners in sustainability-related fields were conducted,

revealing the complexity of greenwashing driven by unclear terminology, inadequate regulation, and a lack of education. Two primary forms of greenwashing were identified: misleading product claims visible to customers and image-oriented claims, often associated with corporate social responsibility efforts. Challenges include difficulties in composting biodegradable products and a lack of clear regulations in sustainability reports. Participants expressed concerns about public information gaps and proposed solutions at both the public and individual levels. Notably, no specific action points for companies were identified, suggesting a subconscious reluctance to associate profit-making with genuine sustainability actions. Overall, the study emphasizes the need for education, regulatory clarity, and transparency to address deceptive green claims in Romania.

### **3. Methodology**

This section outlines the research methodology employed to capture practical insights from students in socio-economic fields in Romania, with a focus on three operationalized concepts: education, perception, and impact.

The research adopted a quantitative approach, utilizing a structured questionnaire to collect data. A cross-sectional design was employed to capture a snapshot of students' perceptions and experiences regarding greenwashing. The study aimed to understand the relationships between the operationalized concepts and employ structural equation modeling (SEM) analysis using SmartPLS.

#### ***3.1. Participants***

The participants in this study were university students in Romania, aged 18 to 25 years old. A convenience sampling technique was utilized to recruit participants, targeting diverse academic backgrounds and ensuring representation from different educational institutions.

The primary data collection instrument was a structured questionnaire consisting of 16 questions. The questionnaire was designed to measure three main constructs: education (students' knowledge about greenwashing and sustainability practices), perception (how students perceive greenwashing in marketing communications), and impact (the influence of greenwashing on students' decision-making and consumer behavior).

The questionnaire was developed based on a thorough review of the literature on greenwashing, consumer behavior, and sustainability education. Questions were framed to align with the operationalized concepts and were designed to be clear, concise, and applicable to the Romanian context. The survey utilized a Likert scale for most questions, allowing participants to express their agreement or disagreement on a scale from 1 to 5.

The survey link was distributed to participants via email, university platforms, social media channels, and in person at physical meetings. Participants were informed about the purpose of the study, the voluntary nature of their participation, and the confidentiality of their responses. The survey was conducted from September to November 2023, with a complete pool of 103 relevant responses from students in socio-economical sciences, aged 18-24. To ensure the self-assessment was accurate, validation questions have been included in the first section of the questionnaire.

The table 1 below presents the gender distribution of the respondents, indicating at a balanced sample of respondents, with 60.2% percent of respondents women and 39.8% men.

Table 1. Gender distribution among respondents

	Frequency	Percentage
Female	62	60.2%
Male	41	39.2%

*Source: Author's own research*

Respondents in this study are pursuing diverse master's degrees in communication-related fields such as public relations, social media, marketing, foreign languages, philosophy, business administration, educational sciences, and advertising. This reflects a comprehensive approach to communication, showcasing interdisciplinary expertise in digital strategies, market insights, cross-cultural understanding, and creative advertising within today's professional landscape.

### 3.2. Data Analysis

SmartPLS was chosen as the analytical tool for this study due to its suitability for structural equation modeling. PLS-SEM, a causal-predictive approach to Structural Equation Modeling (SEM), prioritizes prediction in statistical model estimation, providing causal explanations for observed relationships. SmartPLS, a variation-based SEM tool, specifically PLS-SEM 2.0, is employed for theory confirmation, exploration, and target construct prediction in complex structural model analyses. The research method has gained widespread attention, especially in disciplines like organizational management, international management, and human research management. This study contributes to enhancing the application of PLS-SEM in the knowledge management discipline. Literature sources offer detailed guidance on the utilization of PLS-SEM. The selected approach is particularly suitable for research aiming at theoretical framework validation with a prediction component, complex structural models, and theory development for a better understanding.

The analysis will primarily focus on the relationships between the three operationalized variables: education, perception, and impact. The measurement model will assess the reliability and validity of the latent constructs, while the structural model will explore the direct and indirect effects between variables. The table 2 presents the type of each variable.

Table 2. Independent and dependent variables

Independent/ exogenous variables	EDU
Dependent/endogenous variable	PER, IMP

*Source: Author's own research*

**Hypothesis 1** – The way students perceive greenwashing in marketing communications (PERception) significantly influences its impact on their decision-making and consumer behavior (IMPact).

**Hypothesis 2** – Students' knowledge about greenwashing and sustainability practices (EDUcation) significantly influences how they perceive greenwashing in marketing communications (PERception).

The table 3 presents the concepts and indicators’ operationalization for quantitative research based on author’s previous research, supported by literature review. A total of 3 variables, and 12 indicators define the scale.

Table 3. Constructs and indicators operationalization based on author’s previous research and supported by literature review

Questions	Indicators	Construct
1. How actively do you seek information to verify environmental claims made by companies before making a purchase?		
2. How confident are you in your ability to recognize and distinguish between genuinely eco-friendly products and those engaging in greenwashing?	EDU-1	EDU (education and proactive interest in greenwashing)
	EDU-2	
3. How would you rate your ability to describe a situation or product that led to your feelings of being deceived by environmental claims?	EDU-3	
1. To what extent do you believe greenwashing is a common practice in the business world in Romania?		
2. To what degree have you ever felt deceived by environmental claims made by a company or product in Romania?	PER-1	PER (percieved actions of greenwashing)
	PER-2	
3. How would you rate your ability to understand of “greenwashing” concept?	PER-3	
4. How strongly do you consider certain signs or factors as indicative of greenwashing in advertising or product labeling?	PER-4	
5. How would you rate your ability to notice a situation or product promoted through greenwashing activities?	PER-5	
1. How often do you choose one product over another because of the claim that it is more environmentally friendly?		
2. To what extent does a company's reputation regarding the environment and sustainability practices influence your purchasing decisions?	IMP-1	IMP (impact of identified greenwashing activities)
	IMP-2	
3. To what degree do you believe companies in Romania should bear responsibility in ensuring that their environmental claims are accurate and transparent?	IMP-3	
4. How strongly do you agree that there should be stricter regulations in Romania to prevent greenwashing?	IMP-4	

*Source: Author’s own research*

In this study, we have chosen to retain the PER-5 item despite its comparatively weaker load (0.68). High outer loadings on a construct signify that the associated indicators share a substantial amount of commonality, effectively contributing to the overall representation of the construct. While a standardized outer loading of 0.708 or higher is often considered a benchmark, it is noteworthy that newly developed scales may yield weaker outer loadings. Instead of automatically discarding indicators below the 0.70 threshold, we conducted a thorough examination in this paper. Our analysis focused on the potential effects of removing the item on composite reliability. Importantly, this scrutiny revealed that the removal did not adversely impact the content validity of the construct.



Table 3. Constructs and indicators operationalization based on author’s previous research and supported by literature review

	EDUCATION	IMPACT	PERCEPTION
EDU-1	0.738		
EDU-2	0.824		
EDU-3	0.876		
IMP-1		0.807	
IMP-2		0.829	
IMP-3		0.817	
IMP-4		0.745	
PER-1			0.798
PER-2			0.798
PER-3			0.912
PER-4			0.869
PER-5			0.681

*Source: Author’s own research*

Subsequently, an examination of internal consistency reliability was conducted, as depicted in the table below (Table 5). The results confirm the model's internal consistency, with composite reliability values surpassing 0.70. These values range from 0.85 (EDU) to 0.90 (PER). Jöreskog (1971) has established a direct association between high rho\_a values and reliability levels. Generally, values falling within the range of 0.70 to 0.90 are considered acceptable, while those equal to or exceeding 0.95 are viewed as problematic. Proceeding with the analysis, convergent validity is substantiated by the AVE values, all exceeding 0.50. The range spans from 0.64 (IMP) to 0.66 (PER), indicating that the constructs have the capacity to clarify at least 50 percent of the observed variability in their respective items.

Table 5. Measurement model – reliability and convergent validity values

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
EDUcation	0.856	0.860	0.855	0.664
IMPact	0.877	0.878	0.877	0.640
PERception	0.908	0.914	0.908	0.665

*Source: Author’s own research*

The subsequent examinations focus on discriminant validity through heterotrait-monotrait (HTMT) ratio. Initially, according to Henseler et al. (2015), the HTMT ratio of correlations should not surpass 0.85 (HTMT < 0.85). In this study, all values remain below this threshold, with a range between 0.53 and 0.64.

Table 6. Discriminant validity – Heterotrait-monotrait (HTMT) ratio

	EDUcation	IMPact	PERception
EDUcation			
IMPact	0.532		
PERception	0.589	0.645	

*Source: Author’s own research*

In summary, this comprehensive analysis affirms the model's robustness. While the conventional benchmark for standardized outer loadings is 0.708, this nuanced approach

considered newly developed scales, avoiding automatic dismissal of indicators below this threshold. The internal consistency reliability analysis confirmed the model's strength, with composite reliability values ranging from 0.85 to 0.90. Convergent validity was substantiated by AVE values exceeding 0.50, indicating constructs' ability to clarify over 50 percent of observed variability. Discriminant validity, assessed through the heterotrait-monotrait (HTMT) ratio, adhered to guidelines, with all values below 0.85. These results highlight the model's reliability, validity, and robustness, providing a strong foundation for future research applications.

### 3.2. Results discussion

After evaluating the measurement model, a bootstrapping technique involving 5000 resamples was applied to assess the structural model. The model, highlighting p values, is depicted in Table 7. To validate the significance of obtained p values, R-square and F-square were calculated. Since the significance of the findings and the predictive significance of the constructs has proven medium to highly significant, Table 7 presents the the total indirect and direct effects.

Table 7. Total effects – Mean, STDEV, T values, p values– PLS-SEM

Relationship	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values	Hypothesis
EDUcation -> IMPact	0.385	0.385	0.085	4.516	0.000	
EDUcation -> PERception	0.594	0.590	0.087	6.789	0.000	H2 confirmed
PERception -> IMPact	0.649	0.647	0.074	8.816	0.000	H1 confirmed

*Source: Author's own research*

The results of the analysis confirm the validity of both Hypothesis 1 and Hypothesis 2. Hypothesis 1, asserting that the way students perceive greenwashing in marketing communications significantly influences its impact on decision-making and consumer behavior, has been substantiated. This underscores the crucial role of perception in shaping the influence of greenwashing on consumer actions.

Furthermore, Hypothesis 2, positing that students' knowledge about greenwashing and sustainability practices significantly influences how they perceive greenwashing in marketing communications, is also supported. This emphasizes the pivotal role of education in shaping students' perceptions regarding greenwashing, highlighting the importance of knowledge in influencing their attitudes and responses to marketing messages.

The confirmation of both hypotheses underscores the interconnected nature of perception, education, and their collective impact on consumer behavior in the context of greenwashing in marketing communications.

### Conclusions

The confirmation of both Hypothesis 1 and Hypothesis 2 underscores the intertwined dynamics of perception and education in shaping consumer behavior regarding greenwashing in marketing communications. Students' perceptions significantly influence

the impact of greenwashing on their decision-making and consumer behavior, while education plays a pivotal role in shaping how they perceive such marketing practices.

The study holds significant implications for academics, researchers, and practitioners engaged in sustainable communication and consumer behavior. For the development of smart cities, addressing gaps in students' awareness of greenwashing becomes paramount. The study suggests that integrating sustainability into urban education can empower citizens to make more informed choices, contributing to the overall goal of creating environmentally conscious communities. At the community level, the battle against greenwashing necessitates targeted programs that foster environmental literacy among citizens.

Consequently, in academia, the identified gaps underscore the need for integrated greenwashing modules, preparing future professionals to navigate and address sustainability challenges in their respective fields. These implications highlight the potential for positive change at both individual and community levels through enhanced awareness, education, and informed decision-making regarding greenwashing practices.

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