

Digital marketing and sustainability: a study on consumer perceptions

Luzia Arantes¹

¹ Universidade do Minho, luziaarantes94@gmail.com

Abstract

The use of digital marketing to promote sustainability is also a controversial topic. Nevertheless, digital marketing allows reaching consumers globally and the promotion of sustainability is urgent in our society. In this sense, this study aims to investigate the relationship between digital marketing, its tools and the presence on social networks by brands with the communication of sustainability online and thus test the proposed structural model. In this sense, in the empirical part, a questionnaire survey was carried out with 423 participants who responded to measures that aim to assess the presence of brands on social networks, the use of digital marketing by organizations, the importance attached to digital marketing tools and the communication of sustainability online. After conducting the analysis of paths, practical examples of the use of digital marketing, its tools and social networks to promote sustainability and to better communicate it are discussed.

Keywords: digital marketing, social networks, consumer behavior, sustainability, climate change

1. INTRODUCTION

Despite the growing importance attached to digital marketing by organizations (Man, 2020) and the constant warnings about climate change and, in turn, the need to foster the adoption of sustainable behaviors by individuals (Intergovernmental Panel on Climate Change, 2022), there is still scarce research that addresses the use of digital marketing tools to promote sustainability. In this sense, the present study aims to contribute to this gap in the scientific community, as well as an opportunity for innovation and business strategy for the future.

The purpose of this study is to investigate the relationship between digital marketing, its tools and the presence of brands on social networks with the communication of sustainability online and thus test the proposed structural model. In this line of thought, research hypotheses were defined with the objective of defining the possible relationships between the constructs present in the study and measures were also defined that aim to assess the presence of brands on social networks, the use of digital marketing by organizations, the importance attributed to digital marketing tools and online sustainability communication.

For this study development, questionnaire surveys were used, where it was possible to obtain 423 participants for three months period, more specifically between January 28, 2022 and April 28, 2022. The obtained results allowed to test the structural model and to perform a path analysis which allowed to confirm the hypotheses under study, as well as to prove the model's adequacy to the data.

This article consists of six main sections. After the present introduction, the second section is dedicated to the literature review, which summarizes the contributions on digital marketing and its tools, social networks and the communication of sustainability. Subsequently, the third section presents the methodology of this study, section four consists of the analyses performed and section five presents the results obtained, as well as the discussion of them. The article ends with the conclusion, the main limitations, and suggestions for future research.

2. LITERATURE REVIEW AND RESEARCH HYPOTHESES

In this section, the theoretical framework that supports the formulated research hypotheses and the relations between the constructs present in the structural model is summarized. Digital marketing strategies are increasingly relevant for brands and organizations to remain competitive among the market offer those consumers have available, in turn, the use of social networks is part of this strategy, as a space of relationship between the parties. Nevertheless, digital marketing and social networks should also be used for the development of sustainable communication aimed at fostering the adoption of sustainable behaviors by consumers.

2.1. DIGITAL MARKETING AND ITS TOOLS

Digital marketing allows you to attract and interact with customers through digital platforms and thus retain them and increase sales (Kannan & Hongshuang, 2017), therefore, digital marketing can be presented as the use of digital technologies that allow the implementation of marketing strategies, thus improving the knowledge of organizations towards their audiences and better meet their needs (Chaffey & Smith, 2013).

Thus, digital marketing can be understood as “any and all company marketing actions directed at the online environment. This action may involve the purchase decision of a consumer on the internet, the dissemination of new products/services or even the strengthening of a brand's positioning on social networks” (Silva et al., 2020, p.66). In fact, the internet is an extremely powerful tool for brands and organizations, which influences prices, product distribution, and promotion strategies (Bala & Verma, 2018).

Digital marketing tools have been developed, as well as ways to measure the strategies applied by brands and organizations, such as the website, mobile marketing (e.g., apps, QR-codes, SMS), e-mail marketing (e.g., newsletter), social media, search engine marketing (e.g., web master tools, Google Ads), content marketing (e.g., white papers, videos, documents), marketing analytics (e.g., Google Analytics, Social Bakers, among others (Bala & Verma, 2018).

In this sense, the following hypothesis was formulated. **Hypothesis 1: Organizations' use of digital marketing is estimated to be directly related to the importance placed on digital marketing tools.**

2.2. SUSTAINABILITY COMMUNICATION

Due to climate change, exploitation of limited natural resources, use of fossil fuels, among other aspects, an awareness of climate change and its effect on humans, the environment and ecosystems has developed, the continued use of fossil fuels and the risks posed by behaviors of the present generations will have in future generations. In this sense, the term sustainability is increasingly recurring and as such evokes some ambiguity. In this sense, it is important to present a definition of the concept for the present study.

The term sustainable derives from the Latin “sub-tenēre” and has been used in politics, technology, economics and ecology, as “the ability to achieve current goals without putting futures at risk” (Fabio & Peiró, 2018, p.1), so current generations must frame their development and growth, in a sustainable development considering three dimensions: the economic, the social and the environmental (United Nations, 2015).

Climate change has an increasing impact on human life, in fact there has been an increase in mortality and morbidity, cases of food and water diseases, animal and human diseases, including zoonoses (diseases transmitted to humans through animals), cholera and problems cardiovascular and respiratory events resulting from extreme heat events that have been felt more intensely (Intergovernmental Panel on Climate Change, 2022). Furthermore, the impacts of climate change also occur in ecosystems with the increase of heavy rainfall in some regions causing floods, increased drought in other regions, heat waves, cold or hurricanes (Stevens, et al., 2021), a multitude of extreme events that call into question the survival of humans and ecosystems, for example the increase in rainfall and flooding that allow the increase of climate-sensitive aquatic pathogens and toxic substances from harmful freshwater cyanobacteria, thus increasing the likelihood of new diseases and pandemics (Intergovernmental Panel on Climate Change, 2022).

In this sense, communicating sustainability and fostering the adoption of sustainable behaviors by individuals is increasingly pressing.

The communication of sustainability is relevant because it allows to contribute to the adoption of sustainable behaviors by individuals, in addition, it must contribute to improve the levels of knowledge and awareness of the subject, allowing individuals to access information, education, different points of view and news, in short, the possibility of an active participation of several stakeholders (Shahzalal & Hassan, 2019). This interaction is possible with digital marketing and presence on social networks by brands and organizations.

Based on what was mentioned above, the following research hypothesis was developed. **Hypothesis 2: Organizations' use of digital marketing is estimated to relate directly to online sustainability communication.**

Although some authors argue that the use of digital marketing as a tool for fostering sustainability is an antithesis, since digital marketing, as previously presented, focuses on continuous consumption, in the sense of involving and disseminating new products or strengthening the brand in digital media, as opposed to sustainability advocates reuse, reduction of purchases and limits on non-renewable resources (e.g., Jones et al., 2008; Kemper & Ballantine, 2019; Lim, 2016). Nevertheless, digital marketing can contribute to a greater understanding of consumer behavior and persuade their attitudes, behaviors and beliefs directed towards the adoption of sustainable behaviors, or on the other hand, sustainability, product differentiation, access to conscious investors. environmentally and even greater commitment to employees at the environmental level (Diez-Martin et al., 2019), that is, they are two areas that worked together have much to offer each other and, above all, allow environmental awareness for all involved.

In this duality, new technologies affect companies, which drives them to new adaptations, innovations, means of production and ways to generate competitive value. In this sense, social networks play a relevant role, as they allow the possibility of any user to create, share and exchange information and thus a possibility of interaction between various groups such as companies, customers or stakeholders in general (Russo et al., 2021).

This way the following hypothesis was formulated. **Hypothesis 2.1: Organizations' use of digital marketing is estimated to indirectly relate to online sustainability communication through the importance placed on digital marketing tools.**

2.3. SOCIAL MEDIA

Brands and organizations quickly realized the importance that social networks occupy in defining their strategies and communicating with consumers, in fact, social networks are an open door to the world where brands and organizations can communicate and relate to millions of people, which entails unlimited market possibilities (Bala & Verma, 2018).

The data indicate, in April 2022, that around 58.7% of the world's population is using social networks, which is equivalent to 6.65 billion people who spend an average of two and a half hours a day on social networks, which is equivalent to 15% of each person's daily time (Data Reportal, 2022). This confirms the need for brands and organizations to be present on social networks since it is the space where consumers spend the most time. Thus, the following research hypothesis is proposed. **Hypothesis 3: Organizations' use of digital marketing is estimated to be directly related to their social media presence.**

In fact, there is an increase in social networks and the need for brands and organizations to be present in these networks, thus increasing connectivity and interaction with consumers (Kieling et al., 2022), which also allows the development of strategies for the communication of sustainability, through actions on “sustainability education, generalized design, digital media and gamification concepts and methods” (Al-Mulla et al., 2022, p. 1). Thus, the following hypothesis will be tested. **Hypothesis 3.1: Organizations' use of digital marketing is estimated to be indirectly related to communicating sustainability online through organizations' social media presence.**

3. METHODOLOGY

Based on conducted literature review and formulated research hypotheses, a structural model presented in figure 1 is proposed, which aims to clarify the relationships between the dimensions of the structural model.

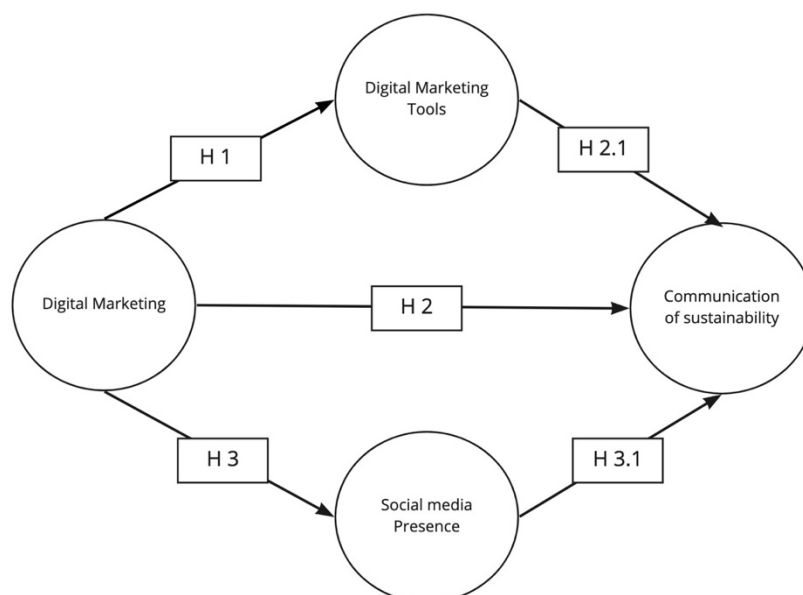


Figure 1- Proposed Structural Model

3.1. PROCEDURE AND CHARACTERIZATION OF THE PARTICIPANTS

The study was conducted with a convenience sample, not probabilistic. Questionnaire surveys were made available exclusively online during the three-month period, more specifically between January 28, 2022 and April 28, 2022. As a result, the protocol is no longer available after the deadline set for data collection.

At first, the request for informed consent was submitted, which contained the purpose of the study, the voluntary nature of the participation, and the guarantee of confidentiality regarding the analysis of the data and the dissemination of results. Next, the questionnaire on the presence of brands on social networks was presented, followed by the questionnaire on the use of digital marketing by organizations, followed by the questionnaire on the importance attached to digital marketing tools, and the questionnaire on the continuous sustainability communication online and finally the sociodemographic questionnaire was presented.

The sample includes 423 participants, 149 (35.2%) men, 273 (64.5%) women and 1 (0.2%) participants of another gender. The age of the participants is between 18 and 73 years, with an average age of 42.74% (SD = 15.94%), 240 (99.3%) of Portuguese nationality, 2 (0.5%) of Brazilian nationality and 1 (0.2%) of Italian nationality.

More concretely, according to the geographical regions of mainland Portugal, we can distribute the participants as follows: 174 (41.1%) are from the North region, 114 (27%) are from the Central region, 80 (18.9%) are from the Lisbon Metropolitan area, 20 (4.7%) 9 are from the Alentejo region, 15 (3.5%) are from the Algarve region, 8 (1.9%) are from the Autonomous Region of the Azores, 5 (1.2%) are from the Autonomous Region of Madeira and 1 (0.2%) from the Abruzzo region of Italy.

Regarding marital status 175 (41.4%) are married, 164 (38.8%) are single, 36 (8.5%) are divorced, 36 (8.5%) are in a de facto union, 4 (0.9%) are separated, similarly 4 (0.9%) are widowed and also 4 (0.9%) are in another level of civil commitment. With regard to education, 166 (39.2%) have a doctorate, 100 (23.6%) have a degree, 86 (20.3%) have a master's degree, 38 (9%) have a post-doctoral degree, 31 (7.3%) have a secondary degree, 1 (0.2%) have a specialization and, finally, 1 (0.2%) have a bachelor's degree.

3.2. INSTRUMENTS

To measure the variables under study, the measures were structured based on the literature review presented previously. To assess the presence of brands on social networks, a scale consisting of four items (e.g., item 1 "Information exchange") was constructed, answered on a Likert-type response scale, between 1 (strongly disagree) to 5 (strongly agree), which for the sample of the present study, presented an index of acceptable internal consistency, according to Cronbach's Alpha ($\alpha=.78$) presented by Gliem and Gliem (2003).

To evaluate the use of digital marketing by organizations, a scale consisting of four items was constructed (e.g., item 1 "Measuring digital marketing results is perceived as very important for the companies"), answered on a Likert-type response scale, between 1 (strongly disagree) to 5 (strongly agree), which for the sample of this study presented good internal consistency index ($\alpha=.86$).

To assess the importance attributed to digital marketing tools, a scale consisting of eight items (e.g., item 2 "Mobile Marketing (app, QR-codes, SMS)") was constructed, answered on a Likert-type response scale, between 1 (very low) to 5 (very high), which for the sample of the present study, showed good internal consistency index ($\alpha=.81$).

To assess sustainability communication online, a scale consisting of six items was constructed (e.g., item 1 "Sustainability must be communicated through digital."), answered on a Likert-type response scale, between 1 (strongly disagree) to 5 (strongly agree), which for the sample of the present study, presented a good internal consistency index ($\alpha=.88$).

4. ANALYSES

Statistical analyses were performed using the Statistical Package for the Social Science (IBM SPSS), version 27.0 for Mac and Analysis of Moment Structures (AMOS), version 27.0 for Windows.

Table 1 shows the correlations between the variables under study, the internal consistency indices of the variables of the structural model, for the total sample (n=423), the mean values and the standard deviations. The magnitude of the relations indicates the presence of moderate relations ($.30 < r < .50$) and strong relations ($r > .50$) (Cohen, 1988) between the variables, without the existence of multicollinearity, moreover, the correlations are statistically significant ($p < .001$), thus fulfilling the linearity assumption.

Table 1 – Correlations between study variables, mean values, standard deviations, and internal consistency indices (N=423)

	Digital marketing	Sustainability communication	Social media	M	DP	α
Digital Marketing	.	.	.	16.88	2.23	.86
Sustainability communication	.54***	.	.	24.89	3.59	.88
Social media	.40***	.42***	.	14.26	2.83	.78
Digital marketing tools	.51***	.52***	.50***	29.38	4.95	.81

Note: *** $p < .001$

As it is possible to verify two of the statistical assumptions inherent to structural equation models, namely: (1) absence of multicollinearity (Cohen, 1988); (2) the principle of linearity of relations (statistically significant correlations between the variables, Marôco, 2010); (3) minimum size of the sample between 100 and 200 participants (Schumacker & Lomax, 2010); (4) multivariate normality when $sk=ku=0$, (Mardia coefficient ≤ 3), which was not verified for the present sample, so when there is a violation of normality, the bootstrapping method with 500 samples and a confidence interval of 95% (e.g. Marôco, 2010; Gilson et al., 2013) and the absence of extreme outliers (Mahalanobis distance $< .001$), and in the case of the presence of outliers, the analyses were performed without them. The remaining assumptions were met.

Subsequently, multi-group confirmatory analyses were performed to assess the psychometric properties of the measures, and it was possible to verify the adjustment indices of each instrument in table 2.

Table 2 – Adjustment indexes by measurement instrument (values without outliers)

	GFI	CFI	RMSEA	AIC
Digital Marketing	.99	.99	.10	25.45
Sustainability communication	.98	.99	.07	48.51
Social media	.95	.92	.23	62.19
Digital marketing tools	.84	.73	.16	331.86

To assess the fit indices of the measurement instruments, as well as the adjustment indices of the model, we used the following indices: Goodness of Fit Index (GFI) Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA) and Akaike Information Criterion (AIC) (e.g., Gilson et al., 2013; Marôco, 2010).

Bootstrapping analyses were also performed with 500 samples, with a 95% confidence interval (Cheung & Lau, 2007; Marôco, 2010).

Considering the values presented in the table above, according to Marôco (2010), it is possible to affirm that the questionnaire that aims to evaluate the use of digital marketing by organizations and the questionnaire that aims to evaluate the communication of sustainability online, without outliers, present GFI and CFI values very good ($\geq .95$) and good RMSEA values ($.05 < \text{RMSEA} < .10$), in turn, the questionnaire that aims to assess the presence on the social networks of brands, without outliers, presents good GFI and CFI values ($.90 < \text{GFI} < .95$) and unacceptable RMSEA values ($> .10$), finally the questionnaire that aims to assess the importance attributed to Digital marketing tools, without outliers, have poor GFI values ($.80 < \text{CFI} < .90$), CFI values bad ($< .80$) and unacceptable RMSEA values ($> .10$).

These results made it possible to proceed to the path analysis, which was then performed, to assess whether the structural model presented a good fit to the data and whether the hypotheses defined later were verified, thus confirming the existence, or not, of the proposed relationships between the constructs.

The structural model showed a very good CFI value ($\geq .95$; for the present sample .96), a good GFI value ($.90 < \text{GFI} < .95$; for the present sample .90), an unacceptable RMSEA value ($> .10$; for the present sample .22) and an AIC value of 56.21. Although the RMSEA value is unacceptable, this index is sensitive to the sample size and the complexity of the model (Chen, 2007), in this line of thinking we decided to accept the model based on the CFI, since this is a more robust index (Cheung & Rensvold, 2002).

5. PRESENTATION OF RESULTS AND DISCUSSION

The results of the confirmatory factor analyses performed show that the measurement models, without outliers, present a good adjustment to the data, although the instrument that aims to assess the importance attributed to digital marketing tools presents poor CFI values, however it was maintained in the structural model.

Regarding the structural model, a very good fit was found to the data, without outliers ($\text{CFI} = .96$). In a more concrete way, in figure 2, the standardized estimates among the constructs of the final structural model are presented.

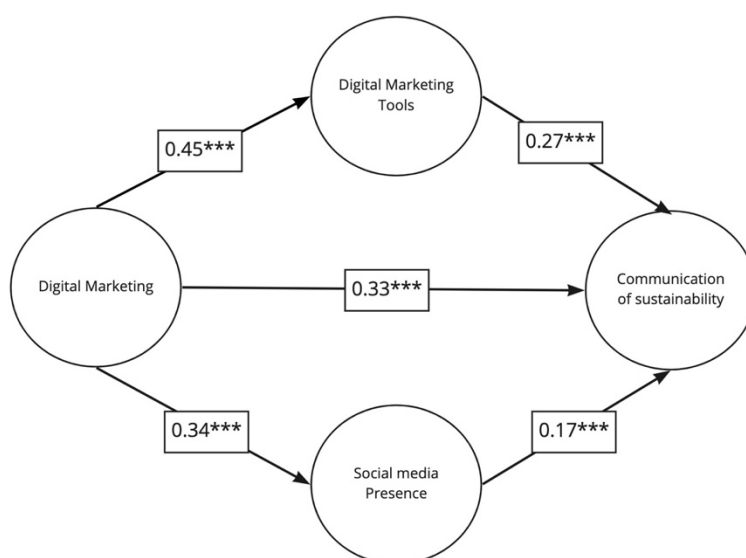


Figure 2– Final structural model (*) $p < .001$**

The results point to statistically significant relationships between the constructs, and it is possible to verify that there is a direct relationship between the use of digital marketing by organizations and the importance attributed to digital marketing tools ($\beta = .45$); the use of digital marketing by organizations and the communication of sustainability online ($\beta = .33$) and there is also a direct relationship between the use of digital marketing by organizations and the presence on the social networks of brands ($\beta = .34$). Regarding indirect effects, it is possible to verify that digital marketing tools act as a mediator between digital marketing and online sustainability communication ($\beta = .12$) and that the presence on social networks is a mediator between the use of digital marketing by organizations and the online sustainability communication ($\beta = .06$).

Table 3 – Beta values (β) of the hypotheses

Hypotheses	β
H: 1	.45
H: 2	.45
H: 2.1	.12
H: 3	.34
H: 3.1	.06

In view of these results, it is possible to confirm all the hypotheses initially formulated, as shown in table 3.

Nevertheless, hypothesis 3.1 presents the lowest value ($\beta = .06$), which can be justified by the type of questions present in the questionnaire about the presence on social networks by organizations, since this questionnaire presents questions such as “The presence of brands on social networks allows... Information exchange” and the questions in the online sustainability communication questionnaire were of the type “Sustainability must be communicated through digital”. Nevertheless, social networks allow the conception of individuals without social, geographical and cultural barriers, thus allowing various options of influence of individuals for the adoption of sustainable behaviors, through positive and negative reinforcements, adjustment of norms, feedback, sharing and pushing (Al- Mulla et al., 2022).

Currently, the environmental impacts of the human being are widely discussed, considering the economy, society and the environment, although it is necessary that the use of resources by current generations does not jeopardize the survival and resources for future generations. In this sense, the use of digital marketing allows a clear and direct interaction with all stakeholders, in the sense of, on the one hand, communicating the sustainable behaviors adopted by brands and organizations and, on the other hand, encouraging the adoption of sustainable behaviors by consumers and general population.

Digital marketing has been transforming the way organizations communicate and how they relate with their audiences, and sustainability is a challenge for organizations (Diez-Martin et al., 2019). In this sense, digital marketing can contribute to the understanding of consumer buying behavior, in the sense of influencing decision-making for more sustainable options, working to educate societies about the impacts of climate change at the present time and to make events more concrete futures and close to each one, develop digital marketing strategies on the sustainability of products and the need for reuse and transformation of them that can be measured and adjusted over time (e.g., marketing analytics) or even gaming with the aim of developing competences and environmental awareness through entertainment (Whittaker et al., 2021). On the other hand, sustainability can be seen to differentiate products or services and to improve the production chain (McDonagh & Prothero, 2014).

In short, the participants perceive that the use of marketing is directly related to the importance that digital marketing tools have, for example, it is perceived that the organization's website is very important in its digital

marketing strategy. It was also perceived that "sustainability should be communicated through digital" with 357 participants agreeing or totally agreeing with this statement, corresponding to 84% of the participants, which is a relevant data for the communication of sustainability since consumers consider important this communication through this medium, which ends up giving it credibility.

Nevertheless, it is relevant to mention the use of greenwashing by organizations as an attempt to convey an image and communication of environmental responsibility that does not happen (Huang et al., 2022). Therefore, it is necessary that organizations have a clear and transparent communication, which allows a direct connection of their economic activities and environmental impacts in a measurable way without second interpretations, so that the various stakeholders do not feel deceived in some way (Stoknes & Rockström, 2018).

6. CONCLUSIONS

The purpose of this study was to investigate the relationship between digital marketing, its tools and the presence of brands on social networks with the communication of sustainability online and thus test the proposed structural model, and we can affirm that this purpose was achieved by the conceptual model presented a good fit to the data, in addition, the relationship between the constructs proved to be statistically significant despite the hypothesis 3.1, where it was estimated that the use of digital marketing by organizations is indirectly related to the communication of sustainability online through the presence on social networks by organizations has shown a low value ($\beta = .06$).

This study presents as theoretical implications the contribution to the growth of these research areas together and to reaffirm the possibility of using digital marketing to promote sustainability, because although it is controversial to use marketing to communicate and promote sustainability, this research showed that 84% of the participants agree or totally agree with communicating sustainability through digital marketing. From a practical point of view, it is possible to develop digital marketing strategies and campaigns that contribute to sustainability, such as used clothing donation campaigns or clothing recycling campaigns that turn into discounts for customers, on the one hand there is the recycling of clothes by brands and, on the other hand, encouraging consumption, enabling economic growth without consuming new resources.

The study has limitations that must be mentioned to frame the conclusions presented. One of the limitations is the lack of deepening of sustainable consumer behavior in relation to the variables studied, which would be important to explore in future studies.

It would be relevant to repeat the study with a population with low levels of education, because in the present sample 390 participants out of the total of 423 have higher education and therefore, redoing the study with a population with less education would allow an understanding of the influence that the level of education may have adopted from individuals' sustainable behavior and their perspective on sustainable communication. It was also pertinent to reapply the study by generational cohorts and understand the possibility of different views on the use of digital marketing in communication and promotion of sustainability. Finally, a study focused on the use of digital marketing to promote and influence sustainable behaviors, for example the role of digital influencers in sustainability.

BIBLIOGRAPHICAL REFERENCES

- Al-Mulla, S., Ari, I. & Koç, M. (2022). Social media for sustainability education: gaining knowledge and skills into actions for sustainable living. *International Journal of Sustainable Development & World Ecology*, 29 (4), 1-18.
- Bala, M. & Verma, D. (2018). A Critical Review of Digital Marketing. *International Journal of Management, IT & Engineering*, 8 (10), 1-19.
- Chaffey, D. & Smith, P. R. (2013). *Emarketing Excellence: Planning and optimizing your digital marketing*, Taylor & Francis Group, Routledge.
- Chen, F.F. (2007). Sensitivity of Goodness of Fit Indexes to Lack of Measurement Invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 14, 464-504.

- Cheung, G. W., & Lau, R. S. (2007). Testing Mediation and Suppression Effects of Latent Variables. *Organizational Research Methods*, 11, 296-325.
- Cheung, G. W., & Rensvold, B. R. (2002). Evaluating Goodness-of-Fit Indexes for Testing Measurement Invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 9, 233-255.
- Cohen, J. E. (1988). The significance of a Product Moment rs. In Cohen, J. E. Statistical Power Analysis for the Behavioral Sciences (pp. 75-105). New York: Lawrence Erlbaum Associates.
- Data Reportal (2022). Global Social Media Statistics. Available at: <https://datareportal.com/social-media-users>
- Diez-Martin, F., Blanco-Gonzalez, A. & Prado-Roman, C. (2019). Research Challenges in Digital Marketing: Sustainability. *Sustainability*, 11(10), 1-13.
- Fabio, A. D. & Pairó, J. M. (2018). Human Capital Sustainability Leadership to Promote Sustainable Development and Healthy Organizations: A New Scale. *Sustainability*, 10(7), 1-11.
- Gilson, K.M., Bryant, C., Bei, B., Komiti, A., Jackson, H., & Judd, F. (2013). Validation of the Drinking Motives Questionnaire (DMQ) in older adults. *Addictive Behaviors*, 38 (5), 2196-2202.
- Gliem, J. A. & Gliem, R. R. (2003). Calculating, Interpreting, and Reporting Cronbach's Alpha Reliability Coefficient for Likert-Type Scales. Midwest Research to Practice Conference in Adult, Continuing, and Community Education.
- Huang, R., Xie, X. & Zhou, H. (2022). 'Isomorphic' behavior of corporate greenwashing. *Chinese Journal of Population, Resources and Environment*, 20 (1), 29-39.
- Intergovernmental Panel on Climate Change. (2022). Climate Change 2022: Impacts, Adaptation and Vulnerability.
- Jones, P., Clarke-Hill, C., Comfort, D., & Hillier, D. (2008). Marketing and sustainability. *Marketing Intelligence & Planning*, 26(2), 123-130.
- Kannan, P.K., & Hongshuang, L. (2017). Digital marketing: A framework, review and research agenda. *International Journal of Research in Marketing*, 34(1), 22-45.
- Kemper, J. A. & Ballantine, P. W. (2019). What do we mean by sustainability marketing? *Journal of Marketing Management*, 35 (3-4), 277-309.
- Kieling, A. P., Tezza, R. & Vargas, G. L. (2022). Website stage model for Brazilian wineries: an analysis of presence in digital and mobile media. *International Journal of Wine Business Research*, 1751-1062
- Lim, W. M. (2016). A blueprint for sustainability marketing: Defining its conceptual boundaries for progress. *Marketing Theory*, 16(2), 232-249.
- Man, M. M. K. (2020). Book review: Essentials of Digital Marketing. *Journal of General Management*, 45 (4), 1-2.
- Marôco, J. (2010). Análise de Equações Estruturais: Fundamentos teóricos, Software & Aplicações. ReportNumber.
- McDonagh, P. & Prothero, A. (2014). Sustainability marketing research: past, present and future. *Journal of Marketing Management*, 30 (11-12), 1186-1219.
- Russo, S., Schimperna, F., Lombardi, R. & Ruggiero, P. (2021). Sustainability performance and social media: an explorative analysis. *Meditari Accountancy Research*, 1-23.
- Schumacker, R. E. & Lomax, R. G. (2010) A Beginner's Guide to Structural Equation Modeling (3rd ed.) Routledge Taylor & Francis Group.
- Shahzalal, M. D., & Hassan, A. (2019). Communicating sustainability: Using community media to influence rural people's intention to adopt sustainable behaviour. *Sustainability*, 11(3), 1-28.
- Silva, C. M. M., Boschi, M. R., Rocha, J. V. & Bezerra, S. L. A. (2020). O uso de Mídias Sociais por Empresas listadas no Índice de Sustentabilidade Empresarial. *Journal on Innovation and Sustainability RISUS*, 11(3), 62-72.
- Stevens, L., Maycock, t. & Stewart, B. (2021). Climate change in the human environment: Indicators and impacts from the Fourth National Climate Assessment. *Journal of the Air & Waste Management Association*, 71(10), 1210-1233.
- Stoknes, P. E. & Rockström, J. (2018). Redefining green growth within planetary boundaries. *Energy Research & Social Science*, 44, 41-49.
- United Nations. (2015). Transforming our world: the 2030 Agenda for Sustainable Development.