Asian Journal of Marketing Management (AJMM)
2024, Vol (III), Issue (1), 32-55

ISSN: 2820-2031 (Printed)
ISSN: 2820-2082 (Online)
DOI: https://doi.org/10.31357/ajmm.v3i01.7304
Reprints and Permission: ajmm@sjp.ac.lk

AI-Driven Sustainable Video Marketing Strategies: Harnessing Deep Learning Algorithms to Sustainable Advertising Campaigns with Special Reference to the Education Industry

C. Ediriweera*
SLIIT City Uni (Pvt.) Ltd, chinthaje@gmail.com

M.T. Fernando
Blue Ocean Insights (Pvt.) Ltd, tajan@blueoceaninsights-lk.com

H. Pramudika
Blue Ocean Insights (Pvt.) Ltd, hansini@blueoceaninsights-lk.com

ABSTRACT

Purpose: *This research explores the interplay between deep learning algorithms, trust in sustainable advertising, and prior knowledge of deep learning algorithms in shaping perceptions of sustainable advertising in the context of education. The study aims to uncover the impact of these factors on sustainable advertising and examine the moderating role of prior knowledge of deep learning algorithms.*

Design/methodology/approach: *The study employs a quantitative research design, utilizing a structured survey instrument for data collection. Simple random sampling techniques were used to select participants from a population of 194,366 1st year students. Data analysis includes multiple regression, mediation analysis, and moderation analysis using Hayes PROCESS Model 58.*

Findings: *The results reveal significant positive effects of deep learning algorithms (independent variable) and trust in sustainable advertising (mediator variable) on sustainable advertising (dependent variable). Prior knowledge of deep learning algorithms (moderator variable) also has a positive influence on sustainable advertising. Trust on sustainable advertising mediates the relationship between deep learning algorithms and sustainable advertising. However, above mediator relationship is negatively moderated by prior knowledge of deep learning algorithms. This suggests that prior knowledge can weaken the positive impact of trust.*

Originality: *This research contributes to the understanding of how AI-driven marketing strategies, trust, and knowledge influence sustainable advertising perceptions. It offers valuable insights into the moderating role of prior knowledge in this context.*

Implications: *The findings have implications for educational institutions and marketing practitioners. They suggest that deep learning algorithms and trust in sustainable advertising can*

***Corresponding Author**: C. Ediriweera, SLIIT City Uni (Pvt.) Ltd, Sri Lanka, Email: chinthaje@gmail.com*

positively impact sustainable advertising perceptions. However, practitioners should be cautious in situations where individuals have high prior knowledge, as trust can reduce impact. Educational institutions can use these insights to optimize their marketing campaigns and foster sustainable advertising in the education sector. Limitations of the study include the reliance on self-reported data and the potential for response bias, which may affect the generalizability of the findings. For future research, investigating the role of other potential moderators and mediators in the relationship between deep learning algorithms and sustainable advertising could provide a more comprehensive understanding of this phenomenon.

Keywords: *Deep Learning Algorithms, Education Industry, Prior Knowledge of Deep Learning Algorithms, Sustainable Advertising, Trust in Sustainable Advertising*

INTRODUCTION

The fast development and integration of Artificial Intelligence technologies in recent years has transformed a variety of industries, including marketing. AI-driven sustainable video marketing techniques have become a potent tool for companies to develop effective marketing campaigns. To tailor the content and increase the efficacy of marketing initiatives, these techniques make use of deep learning algorithms (Denicolai et al., 2021)

Deep learning algorithms have significantly improved the state-of-the-art in speech recognition, navigation, and picture recognition (Bhat et al., 2023). The marketing industry has been significantly impacted by this, enabling businesses to create customized and targeted marketing campaigns using AI technology. Deep learning algorithms enable businesses to evaluate vast volumes of data and gather useful information about the preferences, actions, and purchasing patterns of their customers (Denicolai et al., 2021). They are able to create tailored video marketing content as a result, which appeals to their target demographic and boosts engagement and conversion rates. Additionally, thanks to the integration of AI technology in video marketing, organizations can now optimize their marketing initiatives for sustainability. Using deep learning algorithms, businesses may assess the environmental effects of their video marketing campaigns and select sustainable choices in terms of energy use, resource use, and waste generation (Donti & Kolter, 2021; Forootan et al., 2022; Namoun et al., 2022). A long-lasting video marketing campaign has a lot to gain by using AI in the education industry.

The research problem revolves around exploring the impact of AI-driven sustainable video marketing techniques on perceptions of sustainable advertising in the education industry. Objectives include investigating the effectiveness of deep learning algorithms in tailoring marketing content, promoting sustainability through advertising, and understanding the interplay between technology, trust, and prior knowledge in shaping perceptions of sustainable advertising.

Significance of study

The interplay of deep learning algorithms usage and sustainable advertising campaigns in the education industry offers great potential for not only enhancing marketing effectiveness but also promoting sustainability. The application of AI in the education industry has the potential to improve learning adaptability and increase students' enthusiasm for learning (Chaudhry & Kazim, 2022; Grassini, 2023; Kamalov et al., 2023). By applying deep learning algorithms to sustainable video marketing strategies in the education industry, businesses can create personalized and engaging content that resonates with students' unique experiences and preferences (Dwivedi et al., 2021; Haleem et al., 2022). This personalized advertising approach can enhance the overall learning experience for students and increase their engagement with educational materials. Furthermore, by incorporating sustainable practices into their advertising (Moravcikova et al., 2017) campaigns, businesses may contribute to a greener and more environmentally friendly future. The significance of this study lies in its potential to revolutionize marketing efforts in the education industry through the integration of deep learning algorithms and sustainable practices. This research could pave the way for more environmentally conscious marketing strategies in the education sector, benefiting both students and the planet. Moreover, the significance of this study extends beyond the education industry and can be applied to other sectors as well. For example, the findings of this study can be extrapolated to other industries such as healthcare, manufacturing, and transportation, where AI technology is also being utilized. In these industries, the integration of deep learning algorithms with sustainable practices in advertising campaigns could lead to more efficient and environmentally friendly marketing strategies.

Overall, the significance of this study lies in its potential to promote sustainability through the application of AI technology and deep learning algorithms in the education industry.

LITERATURE REVIEW

In the context of marketing, it has been found that gender is a significant demographic variable that can impact consumer behavior and preferences (Rodney Graeme Duffett, 2017). Researchers noted that gender-based differences can influence how individuals respond to advertising messages. They further highlighted that men and women may exhibit distinct preferences in their reactions to marketing content (Duan et al., 2021; Melnyk & van Osselaer, 2012). Therefore, understanding the role of gender in the context of this study on AI-driven sustainable video marketing strategies is essential, as it may shed light on variations in responses to these strategies among different gender groups. Furthermore, educational background plays a pivotal role in shaping individuals' receptiveness to advertising and their ability to comprehend complex concepts, such as deep learning algorithms (Webb et al., 2021). The individuals with higher levels of education may adopt a more critical and analytical approach when evaluating advertising content. Thus, the educational background of respondents in this study becomes relevant, as it may influence their

understanding of the sophisticated technology involved in AI-driven marketing strategies and, subsequently, their responses to such advertising campaigns.

In delving into the independent variable of deep learning algorithms, it is imperative to recognize their pivotal role within the realm of advertising campaigns, specifically when applied to the higher education sector (Golab-Andrzejak, 2022; Haleem et al., 2022). A seminal study conducted by Pratt et al., (2010) underscores the profound influence of advertising campaigns on individuals' decisions to embark on a journey of exploration into various degree programs. Their findings illuminate the significant impact these campaigns have in shaping the educational choices of prospective students. As elucidated by Hübscher et al., (2022); Jeklin et al., (2016), these advertising campaigns serve as the crucial initial point of contact between potential students and the multifaceted world of universities. Their research elucidates how these campaigns function as the metaphorical doorstep, where aspiring students take their first steps toward higher education. It is on this doorstep that these marketing endeavors wield their most substantial influence. Moreover, the efficacy of these advertising campaigns can be attributed to their ability to craft compelling and relevant messaging (Haleem et al., 2022; Huang & Rust, 2021). In the studies, they underscore the art of creating messaging that is not merely persuasive but also deeply resonates with the aspirations and interests of individuals who are contemplating higher education (Chaudhry & Kazim, 2022; Denicolai et al., 2021; Haleem et al., 2022; Rodney Graeme Duffett, 2017). These messages are carefully designed to capture the attention of the target audience, which primarily comprises individuals at a pivotal juncture of their academic and career pursuits. Meanwhile, the effectiveness of these campaigns extends beyond the confines of simply conveying information; it lies in their capability to tell a compelling story. Through a blend of engaging visuals, relatable narratives, and persuasive rhetoric, advertising campaigns become more than just promotional materials; they become a narrative of opportunity, personal growth, and transformation (Alvarez-monzoncillo, 2022; Kang et al., 2020; Milfeld & Flint, 2020; Rehman et al., 2022). In essence, deep learning algorithms play a vital role in shaping the nature and impact of these campaigns. By harnessing the power of AI-driven algorithms, universities and educational institutions can customize and optimize their messaging to align seamlessly with the preferences and needs of prospective students (George & Wooden, 2023; Kamalov et al., 2023). Thus, this interplay between deep learning algorithms and advertising campaigns has the potential to revolutionize the higher education landscape by ensuring that each interaction, starting from the very first point of contact, is tailored to engage and resonate with the unique aspirations and interests of individuals pursuing higher education (George & Wooden, 2023; Saaideh, 2023). This not only makes the educational journey more appealing but also increases the likelihood of attracting students who are genuinely passionate about their chosen fields of study, resulting in a more engaged and motivated student body (Pisica et al., 2023). Additionally, the content of advertising campaigns is pivotal in education context as well (Huang & Rust, 2021; Hübscher et al., 2022). The study highlighted the importance of informative and engaging campaign materials for attracting and retaining the interest of prospective students (Funeka et al., 2023). Meanwhile, well-designed content not

only informs but also influences decision-making. According to Cordero-Gutiérrez & Lahuerta-Otero, (2020); Golab-Andrzejak, (2022), advertising campaigns have a direct influence on prospective students' decisions to consider enrolling in degree programs, as they create a positive impression in the minds of potential students.

When examining the dependent variable of sustainable advertising practices, it becomes evident that their significance extends far beyond the realm of marketing campaigns (Eklund et al., 2020; Park et al., 2022; Rathee & Milfeld, 2023). The ability of these practices to promote environmentally friendly behaviors and practices is a matter of profound importance, as evidenced by the extensive research conducted by (Alkhatib et al., 2023; Krstić et al., 2021) and further supported by the findings of (Gong et al., 2023; Jia et al., 2023). Polonsky, (2011); Stevens & Kanie, (2016) underscored the transformative potential of sustainable advertising practices. These studies illuminated the capacity of such campaigns to influence not only consumer attitudes but also behaviors toward environmentally responsible actions. Sustainable advertising goes beyond mere promotion; it acts as a catalyst for positive change, encouraging individuals to adopt greener lifestyles, make eco-conscious choices, and embrace sustainability as a way of life (Jia et al., 2023; Polonsky, 2011). Moreover, Gong et al., (2023; Jia et al., (2023) unveiled a pivotal dimension of sustainable advertising - its alignment with social responsibility initiatives. Their findings spotlighted how companies that consciously synchronize their advertising efforts with broader social responsibility goals tend to be perceived more favorably by consumers. Such alignment transcends profit-driven motives and signals a commitment to ethical values and societal betterment (Dyck & Manchanda, 2021). Consequently, it fosters positive relationships and trust with consumers (Paduraru et al., 2018). The interplay between sustainable advertising practices and social responsibility initiatives represents a powerful synergy. When companies authentically align their advertising campaigns with social causes and environmental stewardship, they not only convey a commitment to noble principles but also provide consumers with a platform to engage in meaningful societal contributions (Gong et al., 2023). This alignment extends beyond marketing rhetoric; it reflects an organization's genuine dedication to making a positive impact on society and the environment (Verleye et al., 2023). In essence, sustainable advertising practices emerge as a dynamic force, capable of driving not only brand affinity but also substantive societal change (Gong et al., 2023; Hasan & Ali, 2015). By promoting eco-friendly behaviors and aligning with social responsibility initiatives, these practices enable companies to transcend traditional profit-driven motives (Hussain, 2023). Instead, they become catalysts for a more sustainable and socially conscious world. Consumers, in turn, recognize and appreciate these efforts, leading to the development of positive relationships, trust, and a shared commitment to a greener, more responsible future (Dyck & Manchanda, 2021; Jia et al., 2023; Krstić et al., 2021). Consequently, the study of sustainable advertising practices within the context of your research gains further importance, as it explores the transformative potential of advertising in fostering positive environmental and societal outcomes. Moreover, advertising campaigns can serve as powerful drivers of sustainable consumption and lifestyle choices (Krstić et al., 2021). These campaigns can shape consumer behavior

by encouraging choices that align with sustainability principles (Pramudika, Fernando, & Piyasena, 2023). Additionally, sustainable advertising practices consider the environmental impact of materials used in campaigns, contributing to the broader goals of sustainability.

Within the scope of this study the exploration of the mediator variable, trust in sustainable advertising, takes on paramount significance. Bachnik & Nowacki, (2018); Tee et al., (2022) unveiled the pivotal role played by trust in sustainability-related advertising campaigns. They highlighted that the degree of trust often hinges on the campaigns' accuracy in reflecting an organization's genuine commitment to sustainability. This accuracy is not merely a matter of marketing finesse; it is a litmus test of authenticity and credibility (Verleye et al., 2023). Transparency and authenticity, as underlined as fundamental pillars in the construction of trust (Verleye et al., 2023). When organizations are transparent about their sustainability efforts and goals, they establish a foundation upon which trust can be built. Authenticity in communicating these efforts further solidifies this foundation, demonstrating that the organization's commitment to sustainability is not mere lip service but a genuine ethos that drives its actions adds another layer to the concept of trust in sustainable advertising (Eklund et al., 2020). Their findings illuminate how engaging with sustainability initiatives promoted through advertising can contribute significantly to the process of trust-building. When consumers perceive that the organization actively involves itself in sustainability-related activities and initiatives, trust is nurtured (Tee et al., 2022). This involvement signifies a tangible commitment beyond marketing campaigns, reinforcing the authenticity of the organization's sustainability endeavors. Furthermore, personal involvement in these initiatives, as indicated in the same research, enhances consumers' perceptions of the organization's dedication to sustainability. When individuals themselves become participants in these sustainability efforts promoted by advertising, they develop a more profound sense of trust. This participation implies that the organization values not only its own sustainability commitments but also actively seeks to involve and engage its audience in this shared mission. In essence, trust in sustainable advertising emerges as a linchpin that connects the authenticity of sustainability-related advertising campaigns to consumer perceptions and actions. It serves as a bridge of assurance, assuring consumers that the organization's commitment to sustainability is genuine, transparent, and involves personal engagement. Therefore, the examination of this mediator variable within this research is indispensable, as it unravels the intricate dynamics of trust-building within the context of sustainability-focused advertising campaigns.

The moderator variable, prior knowledge of deep learning algorithms, constitutes a pivotal element in comprehending how individuals respond to technology-related advertising, as delineated in (Taye, 2023). This variable underscores the significance of one's exposure to deep learning algorithms through academic coursework or independent learning in shaping their understanding and interpretation of marketing and advertising content. It serves as the gateway through which individuals engage with and make sense of the complex technological aspects embedded within

advertising campaigns (Kietzmann et al., 2018). Moorman et al., (2004) further underscores the profound impact of this moderator variable. Their findings highlight that not only does prior knowledge influence comprehension, but it also significantly contributes to individuals' confidence in recognizing and understanding the role of deep learning algorithms in marketing. This confidence, in turn, can profoundly affect how individuals respond to technology-related advertising. Individuals with a robust grasp of deep learning algorithms are more likely to perceive technology-driven advertising campaigns as credible and effective (Ahmed et al., 2019; Dwivedi et al., 2021). They possess the cognitive tools to decode the intricacies of such campaigns, allowing them to appreciate the innovation and sophistication embedded within the content. Consequently, their responses may be more favorable, characterized by heightened engagement and a deeper appreciation for the campaign's effectiveness. Conversely, individuals lacking prior knowledge may find themselves less equipped to grasp the nuances of technology-related advertising. Their responses may lean towards skepticism or disinterest, as the content may appear convoluted or beyond their comprehension (Li, 2022).

Lastly, control variables (Nielsen & Raswant, 2018) such as interactions with university representatives, financial incentives and scholarships, reputation and ranking of the university, and the cost of tuition and fees should not be overlooked (Amado Mateus & Juarez Acosta, 2022; Frenette, 2005; Gunnes et al., 2013; Komarraju et al., 2010). These variables can significantly impact decisions to enroll in higher education institutions, as reported in various studies. For instance, Kuh et al., (2006) noted that interactions with university representatives, including admission counselors, can shape an individual's perception of the institution. Financial incentives, like scholarships, often serve as strong motivators for enrollment decisions. The reputation and ranking of the university can significantly influence perceptions of quality and desirability (Kethüda, 2022). Additionally, the cost of tuition and fees is a critical factor in enrollment decisions, impacting affordability and accessibility.

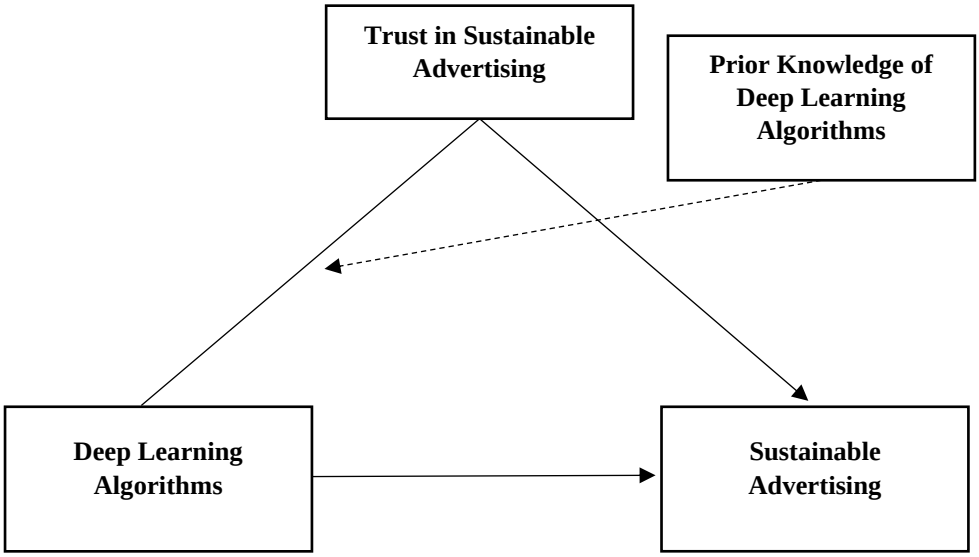
METHODOLOGY

The research adopts a quantitative research design to gather and analyze numerical data, which is essential for evaluating relationships between variables and measuring their impact. To navigate the multifaceted nature of the interplay of the variables concerned in this study the quantitative approach was selected. The direct mutual relationship between deep learning algorithms and sustainable advertising which is statistically significant may open up opportunities to unveil the inhibitors, moderators or mediators concerned in the study.

The data collection process in this research is methodically structured to ensure accuracy, reliability, and ethical considerations. It primarily revolves around quantitative data collection, which entails the following crucial steps; a fundamental component of data collection is the construction of a structured survey instrument. This survey questionnaire has been meticulously crafted to capture quantitative data effectively. It is a comprehensive tool that covers various facets, including

participants' demographics, the variables of interest pertinent to the study, and their responses to AI-driven marketing campaigns. The careful design of the survey instrument is essential in ensuring that the research can gather pertinent and actionable data that directly addresses the research objectives. Meanwhile, to ensure that the study benefits from a diverse and representative sample, a simple random sampling technique is employed. This approach guarantees the impartiality and fairness of participant selection, minimizing bias and allowing for generalizability of findings. Every potential participant within the defined population has an equal chance of being selected, enhancing the robustness of the research outcomes. Further, the actual data collection phase involves the electronic administration of the survey to the selected participants. This method ensures efficiency and timeliness in gathering responses. Participants are reassured of the strict confidentiality and anonymity of their responses, fostering an environment of trust and openness. Online survey platforms are utilized to facilitate this process, offering convenience for both participants and researchers, while also enabling the secure storage and management of data.

Figure 01: Conceptual Framework



Source: Developed by Author, 2023

Table 01: Research Hypotheses

Hypotheses	Explanation
There is a significant impact of deep learning algorithms on sustainable development.	Deep learning algorithms have a direct impact on sustainable development, suggesting that AI-driven marketing practices influence sustainability outcomes.
The impact of deep learning algorithms on sustainable development mediates by trust in sustainable advertising.	Trust in sustainable advertising mediates the relationship between deep learning algorithms and sustainable development, indicating that trust plays a role in this connection.
The impact of deep learning algorithms on sustainable development moderates by prior knowledge of deep learning algorithms.	The impact of deep learning algorithms on sustainable development is moderated by prior knowledge of deep learning algorithms, suggesting that prior knowledge influences the strength of this relationship.
The mediator impact of trust in sustainable advertising on deep learning algorithms and sustainable development moderates by prior knowledge of deep learning algorithms.	The mediating effect of trust in sustainable advertising on deep learning algorithms and sustainable development is moderated by prior knowledge of deep learning algorithms, indicating that the interaction of trust and prior knowledge affects sustainability outcomes.

The population for this study comprises 1st year students (new comers) in the year 2023 within the education industry. As per the University Grants Commission statistics (based on the year 2021 statistics), the population is defined as Approximately 194,366 students, reflecting the total number of qualified students in this specific year. The study's sample 384 will be drawn from this population using a simple random sampling technique, ensuring a representative subset of participants. However, from the 384 sample only 306 respondents have provided complete feedback for the questionnaire.

The data collected for the study, primarily composed of numerical data, undergoes a systematic and precise analysis to reveal meaningful patterns and informed conclusions. The focal point centers on the quantitative data extracted from the structured survey. Specialized software, such as SPSS (Statistical Package for the Social Sciences), is employed to conduct a thorough examination of this data. This tool serves as a valuable asset in exploring the depths of the data and extracting insightful findings. Commencing with a descriptive analysis, the initial step involves organizing and presenting participant profiles and their responses to survey inquiries. Descriptive statistics furnish a comprehensive overview of the data, enhancing accessibility for both readers and researchers. It functions akin to creating a snapshot, facilitating an understanding of the participant demographics and response distribution. Beyond this preliminary stage, more advanced statistical techniques come into play. These methods encompass regression analysis, analysis of variance (ANOVA), and correlation analysis, multiple regression analysis and mediator and moderator analysis (Hayes Process – SPSS) enabling a deeper exploration. They are

indispensable for investigating the relationships among diverse variables of interest. For instance, the interest lies in comprehending how variables like gender, educational background, ethical viewpoints regarding advertising, and prior exposure to deep learning algorithms influence responses to AI-driven marketing campaigns. Termed inferential analysis, these methods unearth concealed patterns, correlations, and connections within the data, contributing to a comprehensive understanding of the research queries. Through this data analysis strategy, valuable insights into the intricate determinants influencing people's reactions to AI-driven marketing are sought. Utilizing statistical techniques and specialized software, the aim is to present results that furnish significant perspectives on the efficacy of sustainable advertising strategies in the education sector. It is akin to piecing together a puzzle – methodically and meticulously, until the larger image becomes evident.

Considerations for Ethical Behavior

This study is based on a firm commitment to ethical norms in the context of human subject's research. Every facet of this study is intertwined with ethical concerns, demonstrating commitment to sustaining the highest standards of research integrity and participant well-being. All participants will be provided with thorough information about the study's goal, data collecting procedures, and the intended use of their replies prior to their involvement in the research. Their informed permission will be obtained, guaranteeing that their participation is completely voluntary. This method empowers participants by allowing them to make educated decisions regarding their participation, fostering a sense of autonomy and agency.

DATA ANALYSIS AND RESULTS

The data analysis consists with descriptive statistics, reliability and validity assessments, correlation results, multiple regression analysis, and mediation/moderator analyses. These analyses shed light on the relationships between variables and contribute to the overall insights of the study.

Table 02: Descriptive Statistics

	Mean Values
Deep Learning Algorithms	4.49
Sustainable Advertising	4.46
Trust in Sustainable Advertising	4.43
Prior Knowledge of Deep Learning Algorithms	3.87

Source: Developed based on analyzed data, SPSS 26 (2023)

The descriptive statistics reveal the mean values for key variables in the study. Deep Learning Algorithms, Sustainable Advertising, and Trust in Sustainable Advertising exhibit relatively high mean scores of 4.49, 4.46, and 4.43, respectively, indicating a favorable perception of these concepts. On the other hand, Prior Knowledge of Deep

Learning Algorithms has a lower mean value of 3.87, suggesting a somewhat lower level of familiarity among participants. These mean values provide an initial glimpse into the participants' attitudes and knowledge related to the study's variables.

Table 03: Reliability

Variable	Cronbach's Alpha	N of Items
Deep Learning Algorithms	.971	8
Sustainable Advertising	.951	5
Trust in Sustainable Advertising	.928	4
Prior Knowledge of Deep Learning Algorithms	.973	4

Source: Developed based on analyzed data, SPSS 26 (2023)

Reliability measures the internal consistency and stability of a scale or set of items within a questionnaire. In this study, Cronbach's Alpha values were calculated to assess reliability. The results indicate high levels of reliability for all key variables: Deep Learning Algorithms 0.971, Sustainable Advertising 0.951, Trust in Sustainable Advertising 0.928, and Prior Knowledge of Deep Learning Algorithms 0.973. These values demonstrate that the items within each variable reliably measure the intended constructs, enhancing the validity of the research findings.

Table 04: Validity

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.925
Bartlett's Test of Sphericity	Approx. Chi-Square	10423.537
	df	300
	Sig.	.000

Source: Developed based on analyzed data, SPSS 26 (2023)

Validity assesses the degree to which a measurement instrument or questionnaire accurately measures the intended constructs. In this study, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy yielded a high value of 0.925, indicating that the data was well-suited for factor analysis, suggesting that the variables chosen for the study were appropriate. Bartlett's Test of Sphericity was highly significant ($p < 0.001$), signifying that correlations between variables were sufficiently strong to support factor analysis. These results confirm the validity of the measurement model used in the study.

Table 05: Correlation

		Sustainable Advertising
Deep Learning Algorithms	Pearson Correlation	.822**
	Sig. (2-tailed)	.000
	N	306
Trust in Sustainable Advertising	Pearson Correlation	.801**
	Sig. (2-tailed)	.000
	N	306
Prior Knowledge of Deep Learning Algorithms	Pearson Correlation	.362**
	Sig. (2-tailed)	.000
	N	306
Sustainable Advertising	Pearson Correlation	1
	Sig. (2-tailed)	
	N	306

Correlation is significant at the 0.01 level (2-tailed).**

Source: Developed based on analyzed data, SPSS 26 (2023)

The results show that Deep Learning Algorithms exhibited a highly significant positive correlation with Sustainable Advertising 0.822, indicating that as participants' perception of deep learning algorithms increased, so did their favorable view of sustainable advertising. Trust in Sustainable Advertising also had a strong positive correlation with Sustainable Advertising 0.801, demonstrating that trust was closely linked to positive perceptions of sustainable advertising. Additionally, Prior Knowledge of Deep Learning Algorithms showed a significant but lower positive correlation with Sustainable Advertising 0.362 and suggesting that participants with more knowledge of deep learning algorithms tended to have more favorable views of sustainable advertising. The correlation analysis in this study revealed strong relationships between the key variables.

The multiple regression analysis explored the relationships between the independent variables; Deep Learning Algorithms, Trust in Sustainable Advertising, Prior Knowledge of Deep Learning Algorithms, and a Control Variable and their impact on the dependent variable, Sustainable Advertising. The results revealed several key findings. Deep Learning Algorithms had a significant positive impact 0.485 on Sustainable Advertising and this result indicating that a favorable perception of deep learning algorithms was associated with a more positive view of sustainable advertising. Trust in Sustainable Advertising also had a positive and significant impact 0.287 and this suggests that trust played a crucial role in shaping perceptions

of sustainable advertising. Conversely, Prior Knowledge of Deep Learning Algorithms had a negative impact -0.074. This simply that participants with more knowledge of deep learning algorithms held somewhat less favorable views of sustainable advertising. The Control Variables also had a positive impact 0.231, indicating its influence on Sustainable Advertising. These results provide insights into the complex relationships between the variables in the study and their effects on perceptions of sustainable advertising.

Table 06: Coefficients - Multiple Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.219	.133		1.652	.099
	Deep Learning Algorithms	.480	.047	.485	10.180	.000
	Trust in Sustainable Advertising	.288	.048	.287	6.018	.000
	Prior Knowledge of Deep Learning Algorithms	-.044	.019	-.074	-2.282	.023
	Control Variables	.221	.042	.231	5.224	.000

a. Dependent Variable: Sustainable Advertising

Source: Developed based on analyzed data, SPSS 26 (2023)

Table 07: Path Analysis - Hayes PROCESS (Model 58)

OUTCOME VARIABLE:

Sustainability

Model Summary

R	R-sq	MSE	F	df1	df2	P
.8901	.7923	.1231	228.8651	5.0000	300.0000	.0000

Model	coeff	se	t	P	LLCI	ULCI
constant	-.7557	.2573	-2.9365	.0036	-1.2621	-.2492
Deep_Lea	.4050	.0489	8.2759	.0000	.3087	.5013
Trust_in	.5819	.0817	7.1211	.0000	.4211	.7427
Prior_Kn	.3538	.0930	3.8063	.0002	.1709	.5367
Int_1	-.0852	.0195	-4.3735	.0000	-.1235	-.0468
Control	.2115	.0411	5.1483	.0000	.1307	.2924

Source: Developed based on analyzed data, SPSS 26 (2023)

The mediation and moderator analysis conducted using Hayes PROCESS Model 58 explored the relationships among various variables, with the outcome variable being "Sustainability – (Sustainable Advertising)" The analysis revealed several significant findings. The model exhibited a strong overall fit R = 0.8901, R-sq = 0.7923, F = 228.8651, and p < 0.001. This indicates that the variables collectively explain a substantial portion of the variance in Sustainable Advertising.

Individual coefficients showed the following relationships.

- Deep Learning Algorithms had a significant positive effect (coefficient = 0.4050, p < 0.001) on Sustainable Advertising.
- Trust in Sustainable Advertising also had a significant positive effect (coefficient = 0.5819, p < 0.001) on Sustainable Advertising.
- Prior Knowledge of Deep Learning Algorithms had a significant positive effect (coefficient = 0.3538, p = 0.0002) on Sustainable Advertising.
- The interaction term (Int_1) between Trust in Sustainable Advertising and Prior Knowledge of Deep Learning Algorithms had a significant negative effect (coefficient = -0.0852, p < 0.001) on Sustainable Advertising, suggesting a moderation effect.
- The Control Variables had a significant positive effect (coefficient = 0.2115, p < 0.001) on Sustainable Advertising.

These results indicate that Deep Learning Algorithms, Trust in Sustainable Advertising, and Prior Knowledge of Deep Learning Algorithms positively influence Sustainable Advertising. Additionally, the interaction between Trust in Sustainable Advertising and Prior Knowledge of Deep Learning Algorithms moderates the relationship with Sustainable Advertising. These findings provide valuable insights into the complex interplay between these variables in shaping perceptions of Sustainable Advertising.

Table 08: Direct and Indirect Effects - Hayes PROCESS (Model 58)

DIRECT EFFECT of X on Y					
Effect	se	t	p	LLCI	ULCI
.4050	.0489	8.2759	.0000	.3087	.5013
Conditional indirect effects of X on Y:					
INDIRECT EFFECT:					
Deep_Lea -> Trust_in -> Prior_Kn		Sustaina Effect	BootSE	BootLLCI	BootULCI
		2.2500	.1634	.0423	.0918	.2562
		4.5000	.0547	.0340	.0109	.1426
		5.0000	.0380	.0316	.0023	.1229

Source: Developed based on analyzed data, SPSS 26 (2023)

Deep Learning Algorithms has a significant positive direct effect on Sustainable Advertising. The coefficient of 0.4050 with a p-value of 0.0000 suggests that an

increase in favorable perceptions of deep learning algorithms is associated with a substantial increase in Sustainable Advertising. This finding underscores the pivotal role of AI-driven technology in shaping perceptions of Sustainable Advertising in the context of higher education marketing (Yasarathne, Pramudika, & Fernando, 2024).

These results indicate the indirect effects of Deep Learning Algorithms (X) on Sustainable Advertising (Y) through the mediator variable Trust in Sustainable Advertising (M) under different levels of the moderator variable Prior Knowledge of Deep Learning Algorithms. The indirect effect of Deep Learning Algorithms on Sustainable Advertising through Trust in Sustainable Advertising is 0.1634. This indirect effect is significant, and the 95% bootstrap confidence interval; BootLLCI to BootULCI doesn't include zero, suggesting that when Prior Knowledge is relatively low (2.2500), the positive impact of Deep Learning Algorithms on Sustainable Advertising is partially mediated by Trust in Sustainable Advertising. Meanwhile, when Prior Knowledge is at 4.5000, the indirect effect is 0.0547. This indirect effect is also significant, indicating that at this level of Prior Knowledge, Deep Learning Algorithms still positively influences Sustainable Advertising through Trust in Sustainable Advertising. On the other hand, when Prior Knowledge is at 5.0000, the indirect effect is 0.0380, and it remains significant. Even at the highest level of Prior Knowledge, Deep Learning Algorithms continue to exert a positive influence on Sustainable Advertising through Trust in Sustainable Advertising. These results demonstrate that the mediation effect of Trust in Sustainable Advertising between Deep Learning Algorithms and sustainable advertising is consistent across varying levels of Prior Knowledge. In other words, Trust in Sustainable Advertising plays a mediating role in the relationship between Deep Learning Algorithms and sustainable advertising, regardless of individuals' prior knowledge of deep learning.

DISCUSSION OF THE FINDINGS

Deep Learning Algorithms were found to have a significant positive effect on Sustainable Advertising. This aligns with the existing literature, emphasizing the pivotal role of technology-driven advertising campaigns in shaping educational choices and perceptions (Pratt et al., 2010; Haleem et al., 2022). The positive influence of deep learning algorithms on sustainable advertising underscores the transformative potential of AI-driven marketing strategies in the higher education sector, allowing universities to customize and optimize messaging to engage prospective students effectively (George & Wooden, 2023; Kamalov et al., 2023). Secondly, Trust in Sustainable Advertising exhibited a significant positive effect on Sustainable Advertising, reinforcing the importance of trust-building in sustainability-related advertising campaigns. This finding aligns with literature highlighting the role of trust in enhancing consumer perceptions and fostering positive relationships with organizations (Bachnik & Nowacki, 2018; Tee et al., 2022). It emphasizes the need for transparent and authentic communication in sustainable advertising initiatives, providing consumers with assurance of an organization's genuine commitment to sustainable advertising. Thirdly, Prior Knowledge of Deep Learning Algorithms had a significant positive impact on Sustainable Advertising. This supports the literature that emphasizes how individuals'

prior knowledge influences their understanding and interpretation of technology-related advertising content (Moorman et al., 2004; Taye, 2023). It underscores the significance of education and exposure to technology in shaping responses to marketing campaigns. The moderation analysis revealed that the interaction between Trust in Sustainable Advertising and Prior Knowledge of Deep Learning Algorithms had a significant negative effect on sustainable advertising. This aligns with the literature suggesting that individuals with a deeper understanding of technology may approach advertising content more critically (Webb et al., 2021). It emphasizes the importance of tailoring advertising campaigns to align with the varying degrees of knowledge among the audience. Additionally, the Control Variable exhibited a significant positive effect on sustainable advertising, consistent with the literature highlighting the impact of factors such as interactions with university representatives, financial incentives, reputation, and cost on enrollment decisions (Kuh et al., 2006; Frenette, 2005). These variables significantly influence individuals' perceptions of higher education institutions.

CONCLUSION

In conclusion, this study delved into the intricate web of variables that shape perceptions of Sustainable Advertising within the context of AI-driven sustainable video marketing strategies for higher education. The results of the mediation and moderation analysis, as well as the robust theoretical framework provided by the literature review, offer valuable insights into the dynamics of this multifaceted landscape. The findings underscore the significant and positive influence of Deep Learning Algorithms on Sustainable Advertising, demonstrating the transformative potential of technology-driven advertising campaigns in shaping educational choices and perceptions. Trust in Sustainable Advertising was revealed as a crucial element, emphasizing the importance of transparent and authentic communication in Sustainable Advertising initiatives to foster positive relationships with consumers. Furthermore, the role of Prior Knowledge of Deep Learning Algorithms was highlighted, illustrating how individuals' understanding of technology significantly impacts their responses to marketing content. The interaction between Trust in Sustainable Advertising and Prior Knowledge also pointed to the need for tailored advertising campaigns to cater to varying levels of audience knowledge.

The control variable for interactions with university representatives demonstrates a significant positive effect on Sustainable Advertising. This suggests that positive interactions with university representatives can enhance participants' perceptions of sustainable advertising. In the overall model, this variable contributes to the explanation of variance in Sustainable Advertising. It implies that the quality of interactions with university representatives influences the overall effectiveness of sustainable advertising campaigns. While not explicitly analyzed in the path model, the presence of financial incentives and scholarships can have a substantial impact on enrollment decisions. This variable likely contributes indirectly to the model by influencing participants' considerations of enrollment, which, in turn, could affect their perceptions of sustainable advertising. The positive or negative impact of

financial incentives and scholarships may vary based on how they are offered and communicated in advertising campaigns. Meanwhile, this control variable's impact on the overall model was not explicitly revealed in the analysis. However, university reputation and ranking typically play a critical role in students' decisions. While not directly included in the model, these factors can indirectly affect students' perceptions of sustainable advertising by influencing their overall perception of the university. A university with a strong reputation may be more attractive to potential students, leading to a more positive reception of advertising campaigns. Similar to reputation and ranking, the effect of the cost of tuition and fees was not explicitly examined in the path analysis. Nevertheless, the cost of education is a crucial factor in enrollment decisions. If a university's tuition and fees are competitive or if financial aid options are available, this can indirectly influence participants' perceptions of the university and, by extension, their perceptions of sustainable advertising. In the path analysis results, the control variable exhibits a significant effect of 0.2115 on the outcome variable, sustainable advertising. This indicates that the control variable significantly contributes to explaining variations in sustainable advertising. The control variable, which comprises factors like interactions with university representatives, financial incentives, university reputation, and tuition costs, plays a substantial role in shaping perceptions of sustainable advertising. While the control variable itself contributes to the model's explanatory power, the R-squared value, representing the proportion of variance in Sustainability explained by all variables in the model, increases. In practical terms, this means that considering and managing these control factors can enhance the overall model's ability to predict and understand Sustainability outcomes.

In this context, prior knowledge is influencing the relationship between deep learning algorithms and sustainable advertising indirectly through trust in sustainable advertising. As prior knowledge increases, the strength of the indirect effect weakens. This suggests that prior knowledge moderates the indirect effect of deep learning algorithms, trust, and sustainable advertising. Moderators affect the strength or direction of a relationship between two other variables. In this case, as prior knowledge increases, the indirect effect gradually decreases. This indicates that individuals with higher prior knowledge of deep learning algorithms might rely less on trust as an intermediary factor in shaping their perceptions of sustainable advertising. Their understanding of the technology might lead them to directly connect deep learning algorithms with Sustainable Advertising, bypassing the need for trust to mediate the relationship. The role of a moderator depends on the specific context and variables being studied. Here, prior knowledge's influence on the indirect effect aligns with the concept of moderation because it shapes the relationship. In conclusion, the variable "prior knowledge" in this analysis acts as a moderator, influencing the indirect relationship between deep learning algorithms and sustainable advertising through trust. It does so by gradually altering the strength of this relationship based on individuals' varying levels of prior knowledge of deep learning algorithms, reflecting the complexity and nuances of their role in shaping perceptions of sustainable advertising.

CONFLICT OF INTEREST

The authors declared no conflict of interest.

REFERENCES

Ahmed, R. R., Streimikiene, D., Berchtold, G., Vveinhardt, J., Channar, Z. A., & Soomro, R. H. (2019). Effectiveness of Online Digital Media Advertising as A Strategic Tool for Building Brand Sustainability: Evidence from FMCGs and Services Sectors of Pakistan. *Sustainability*, *11*(12), 3436. https://doi.org/10.3390/su11123436

Alkhatib, S., Kecskés, P., & Keller, V. (2023). Green Marketing in the Digital Age: A Systematic Literature Review. *Sustainability (Switzerland)*, *15*(16), 1–16. https://doi.org/10.3390/su151612369

Alvarez-monzoncillo, J. M. (2022). *The Dynamics of Influencers Marketing* . (Issue September).

Amado Mateus, M., & Juarez Acosta, F. (2022). Reputation in Higher Education: A Systematic Review. *Frontiers in Education*, *7*(June), 1–19. https://doi.org/10.3389/feduc.2022.925117

Bachnik, K., & Nowacki, R. (2018). How to build consumer trust: Socially responsible or controversial advertising. *Sustainability (Switzerland)*, *10*(7), 1–21. https://doi.org/10.3390/su10072173

Bhat, M., Rabindranath, M., Chara, B. S., & Simonetto, D. A. (2023). Artificial intelligence, machine learning, and deep learning in liver transplantation. *Journal of Hepatology*, *78*(6), 1216–1233. https://doi.org/10.1016/j.jhep.2023.01.006

Chaudhry, M. A., & Kazim, E. (2022). Artificial Intelligence in Education (AIEd): a high-level academic and industry note 2021. *AI and Ethics*, *2*(1), 157–165. https://doi.org/10.1007/s43681-021-00074-z

Cordero-Gutiérrez, R., & Lahuerta-Otero, E. (2020). Social media advertising efficiency on higher education programs. *Spanish Journal of Marketing - ESIC*, *24*(2), 247–262. https://doi.org/10.1108/SJME-09-2019-0075

Denicolai, S., Zucchella, A., & Magnani, G. (2021). Internationalization, digitalization, and sustainability: Are SMEs ready? A survey on synergies and substituting effects among growth paths. *Technological Forecasting and Social Change*, *166*(March 2020), 120650. https://doi.org/10.1016/j.techfore.2021.120650

Donti, P. L., & Kolter, J. Z. (2021). Machine Learning for Sustainable Energy Systems. *Annual Review of Environment and Resources*, *46*, 719–747. https://doi.org/10.1146/annurev-environ-020220-061831

Duan, L., Ai, H., Yang, L., Xu, L., & Xu, P. (2021). Gender Differences in Transnational Brand Purchase Decision Toward Mixed Culture and Original Culture Advertisements: An fNIRS Study. *Frontiers in Psychology*, *12*(June), 1–7. https://doi.org/10.3389/fpsyg.2021.654360

Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., Jain, V., Karjaluoto, H., Kefi, H., Krishen, A. S., Kumar, V., Rahman, M. M., Raman, R., Rauschnabel, P. A., Rowley, J., Salo, J., Tran, G. A., & Wang, Y. (2021). Setting the future of digital and social media marketing research: Perspectives and research propositions. *International Journal of Information Management*, *59*(August). https://doi.org/10.1016/j.ijinfomgt.2020.102168

Dyck, B., & Manchanda, R. V. (2021). Correction to: Sustainable marketing based on virtue ethics: addressing socio-ecological challenges facing humankind. *AMS Review*, *11*(1–2), 133–133. https://doi.org/10.1007/s13162-021-00194-z

Eklund, S., Jernberg, A., Jönköping, A.-J. R., Roman, A.-J., & Pizzichini, L. (2020). *The Impact of Sustainable Advertising and its Relationship to Consumer Brand Loyalty*. *May*, 63. https://www.diva-portal.org/smash/get/diva2:1434824/FULLTEXT01.pdf

Forootan, M. M., Larki, I., Zahedi, R., & Ahmadi, A. (2022). Machine Learning and Deep Learning in Energy Systems: A Review. *Sustainability (Switzerland)*, *14*(8). https://doi.org/10.3390/su14084832

Frenette, M. (2005). The impact of tuition fees on university access: Evidence from a large-scale price deregulation in professional programs. *Analytical Studies Branch Research Paper Series*, *11*, 1–29. http://www.statcan.gc.ca/pub/11f0019m/11f0019m2005264-eng.pdf

Funeka, L. P., Govender, N., & Govender, V. (2023). *Attracting and Retaining University Students through Effective Marketing and Public Relations Strategies*. *February*.

George, B., & Wooden, O. (2023). Managing the Strategic Transformation of Higher Education through Artificial Intelligence. *Administrative Sciences*, *13*(9), 196. https://doi.org/10.3390/admsci13090196

Golab-Andrzejak, E. (2022). Enhancing Customer Engagement in Social Media with AI - a Higher Education case study. *Procedia Computer Science*, *207*, 3022–

3031. https://doi.org/10.1016/j.procs.2022.09.361

Gong, Y., Xiao, J., Tang, X., & Li, J. (2023). How sustainable marketing influences the customer engagement and sustainable purchase intention? The moderating role of corporate social responsibility. *Frontiers in Psychology*, *14*(March). https://doi.org/10.3389/fpsyg.2023.1128686

Grassini, S. (2023). Shaping the Future of Education: Exploring the Potential and Consequences of AI and ChatGPT in Educational Settings. *Education Sciences*, *13*(7), 692. https://doi.org/10.3390/educsci13070692

Gunnes, T., Kirkebøen, L. J., & Rønning, M. (2013). Financial incentives and study duration in higher education. *Labour Economics*, *25*, 1–11. https://doi.org/10.1016/j.labeco.2013.04.010

Haleem, A., Javaid, M., Asim Qadri, M., Pratap Singh, R., & Suman, R. (2022). Artificial intelligence (AI) applications for marketing: A literature-based study. *International Journal of Intelligent Networks*, *3*, 119–132. https://doi.org/10.1016/j.ijin.2022.08.005

Hasan, Z., & Ali, N. A. (2015). The Impact of Green Marketing Strategy on the Firm's Performance in Malaysia. *Procedia - Social and Behavioral Sciences*, *172*, 463–470. https://doi.org/10.1016/j.sbspro.2015.01.382

Huang, M. H., & Rust, R. T. (2021). A strategic framework for artificial intelligence in marketing. *Journal of the Academy of Marketing Science*, *49*(1), 30–50. https://doi.org/10.1007/s11747-020-00749-9

Hübscher, C., Hensel-Börner, S., & Henseler, J. (2022). Social marketing and higher education: partnering to achieve sustainable development goals. *Journal of Social Marketing*, *12*(1), 76–104. https://doi.org/10.1108/JSOCM-10-2020-0214

Hussain, Z. (2023). Examining the Impact of Green Marketing Strategies on Organizational Performance and Competitive Advantage. *NUST Business Review*, *5*(1), 1–18. https://doi.org/10.37435/nbr23053002

Jeklin, A., Bustamante Farías, Ó., Saludables, P., Para, E., Menores, P. D. E., Violencia, V. D. E., Desde, I., Enfoque, E. L., En, C., Que, T., Obtener, P., Maestra, G. D. E., & Desarrollo, E. N. (2016). 済無No Title No Title No Title. In *Correspondencias & Análisis* (Issue 15018).

Jia, T., Iqbal, S., Ayub, A., Fatima, T., & Rasool, Z. (2023). Promoting Responsible Sustainable Consumer Behavior through Sustainability Marketing: The

Boundary Effects of Corporate Social Responsibility and Brand Image. *Sustainability (Switzerland)*, *15*(7). https://doi.org/10.3390/su15076092

Kamalov, F., Santandreu Calonge, D., & Gurrib, I. (2023). New Era of Artificial Intelligence in Education: Towards a Sustainable Multifaceted Revolution. *Sustainability (Switzerland)*, *15*(16), 1–27. https://doi.org/10.3390/su151612451

Kang, J. A., Hong, S., & Hubbard, G. T. (2020). The role of storytelling in advertising: Consumer emotion, narrative engagement level, and word-of-mouth intention. *Journal of Consumer Behaviour*, *19*(1), 47–56. https://doi.org/10.1002/cb.1793

Kethüda, Ö. (2022). Evaluating the influence of university ranking on the credibility and perceived differentiation of university brands. *Journal of Marketing for Higher Education*, *April*, 1–18. https://doi.org/10.1080/08841241.2022.2059733

Kietzmann, J., Paschen, J., & Treen, E. (2018). Artificial intelligence in advertising: How marketers can leverage artificial intelligence along the consumer journey. *Journal of Advertising Research*, *58*(3), 263–267. https://doi.org/10.2501/JAR-2018-035

Komarraju, M., Musulkin, S., & Bhattacharya, G. (2010). Role of student-faculty interactions in developing college students' academic self-concept, motivation, and achievement. *Journal of College Student Development*, *51*(3), 332–342. https://doi.org/10.1353/csd.0.0137

Krstić, J., Kostić-Stanković, M., & Cvijović, J. (2021). Green advertising and its impact on environmentally friendly consumption choices: A review. *Industrija*, *49*(1), 93–110. https://doi.org/10.5937/industrija49-31692

Kuh, G. D., Kinzie, J., & Buckley, J. A. (2006). What Matters to Student Success : A Review of the Literature. *Commissioned Report for the National Symposium on Postsecondary Student Success Spearheading a Dialog on Student Success*, *18*(July), 156. http://cpe.ky.gov/NR/rdonlyres/AFA304F0-C125-40C2-96E5-7A8C98915797/0/WhatMatterstoStudentSuccessAReviewoftheLiterature.pdf

Melnyk, V., & van Osselaer, S. M. J. (2012). Make me special: Gender differences in consumers' responses to loyalty programs. *Marketing Letters*, *23*(3), 545–559. https://doi.org/10.1007/s11002-011-9160-3

Milfeld, T., & Flint, D. J. (2020). When brands take a stand: the nature of consumers' polarized reactions to social narrative videos. *Journal of Product and Brand*

Management, *30*(4), 532–548. https://doi.org/10.1108/JPBM-10-2019-2606

Moorman, C., Diehl, K., Brinberg, D., & Kidwell, B. (2004). Subjective knowledge, search locations, and consumer choice. *Journal of Consumer Research*, *31*(3), 673–680. https://doi.org/10.1086/425102

Moravcikova, D., Krizanova, A., Kliestikova, J., & Rypakova, M. (2017). Green marketing as the source of the competitive advantage of the business. *Sustainability (Switzerland)*, *9*(12), 1–13. https://doi.org/10.3390/su9122218

Namoun, A., Tufail, A., Khan, M. Y., Alrehaili, A., Syed, T. A., & BenRhouma, O. (2022). Solid Waste Generation and Disposal Using Machine Learning Approaches: A Survey of Solutions and Challenges. *Sustainability (Switzerland)*, *14*(20). https://doi.org/10.3390/su142013578

Nielsen, B. B., & Raswant, A. (2018). The selection, use, and reporting of control variables in international business research: A review and recommendations. *Journal of World Business*, *53*(6), 958–968. https://doi.org/10.1016/j.jwb.2018.05.003

Paduraru, T., Vatamanescu, E.-M., Andrei, A. G., Pinzaru, F., Zbuchea, A., Maha, L. G., & Boldureanu, G. (2018). Sustainability in Relationship Marketing: an Exploratory Model for the Industrial Field. *Environmental Engineering and Management Journal*, *15*(7), 1635–1647. https://doi.org/10.30638/eemj.2016.176

Park, J. Y., Perumal, S. V., Sanyal, S., Ah Nguyen, B., Ray, S., Krishnan, R., Narasimhaiah, R., & Thangam, D. (2022). Sustainable Marketing Strategies as an Essential Tool of Business. *American Journal of Economics and Sociology*, *81*(2), 359–379. https://doi.org/10.1111/ajes.12459

Pisica, A. I., Edu, T., Zaharia, R. M., & Zaharia, R. (2023). Implementing Artificial Intelligence in Higher Education: Pros and Cons from the Perspectives of Academics. *Societies*, *13*(5), 1–13. https://doi.org/10.3390/soc13050118

Polonsky, M. J. (2011). Transformative green marketing: Impediments and opportunities. *Journal of Business Research*, *64*(12), 1311–1319. https://doi.org/10.1016/j.jbusres.2011.01.016

Pramudika, H., Fernando, M. T., & Piyasena, U. (2023). SMEs' attitudes toward natural resource conservation within their supply chain to enhance sustainability: a study in Sri Lanka. *Asian J of Management Science and Applications*, 8(1):31-52 DOI: 10.1504/AJMSA.2023.134462.

Pratt, S., McCabe, S., Cortes-Jimenez, I., & Blake, A. (2010). Measuring the effectiveness of destination marketing campaigns: Comparative analysis of conversion studies. *Journal of Travel Research*, *49*(2), 179–190. https://doi.org/10.1177/0047287509336471

Rathee, S., & Milfeld, T. (2023). Sustainability advertising: literature review and framework for future research. *International Journal of Advertising*, *0*(0), 1–29. https://doi.org/10.1080/02650487.2023.2175300

Rehman, S. ul, Gulzar, R., & Aslam, W. (2022). Developing the Integrated Marketing Communication (IMC) through Social Media (SM): The Modern Marketing Communication Approach. *SAGE Open*, *12*(2). https://doi.org/10.1177/21582440221099936

Rodney Graeme Duffett. (2017). Influence of social media marketing communications on young consumers' attitudes. *Young Consumers*, *18*(1), 18.

Saaideh, M. (2023). AI-Driven transformations in higher education: Opportunities and challenges. *International Journal of Educational Research and Studies*, *5*(1), 29–36. https://www.researchgate.net/publication/370864917

Stevens, C., & Kanie, N. (2016). The transformative potential of the Sustainable Development Goals (SDGs). *International Environmental Agreements: Politics, Law and Economics*, *16*(3), 393–396. https://doi.org/10.1007/s10784-016-9324-y

Taye, M. M. (2023). Understanding of Machine Learning with Deep Learning : *Computers MDPI*, *12*(91), 1–26.

Tee, P. K., Lim, K. Y., Ng, C. P., & Wong, L. C. (2022). Trust in Green Advertising: Mediating Role of Environmental Involvement. *International Journal of Academic Research in Business and Social Sciences*, *12*(1). https://doi.org/10.6007/ijarbss/v12-i1/12046

Verleye, G., De Ruyck, A., Vermeulen, W., & Schoenaers, I. (2023). Credibility of green advertising: six elements that drive credibility in green advertising. *Frontiers in Communication*, *8*. https://doi.org/10.3389/fcomm.2023.1056020

Webb, M. E., Fluck, A., Magenheim, J., Malyn-Smith, J., Waters, J., Deschênes, M., & Zagami, J. (2021). Machine learning for human learners: opportunities, issues, tensions and threats. *Educational Technology Research and Development*, *69*(4), 2109–2130. https://doi.org/10.1007/s11423-020-09858-2

Yasarathne, V., Pramudika, H., & Fernando, M. (2024). Impact of Renewable Energy Integration on Technology-Driven Sustainability in Sri Lanka within the Dynamic and Uncertain Global Environment, Marked by VUCA Elements. *20th International Conference on Business Management (ICBM 2024)*, 205 - 2029.