

To cite this article: Quan Nguyen Van and Anh Vu Nhat (2024). Factors Influencing The Green Apparel Manufacturing Implementation Among Fashion Enterprises In Vietnam. International Journal of Education, Business and Economics Research (IJEBER) 4 (3): 212-226

**FACTORS INFLUENCING THE GREEN APPAREL MANUFACTURING
IMPLEMENTATION AMONG FASHION ENTERPRISES IN VIETNAM**

Quan Nguyen Van¹ and Anh Vu Nhat²

¹Faculty of Business Administration, Academy of Policy and Development, Ministry of Planning and Investment Hoai Duc District, Hanoi, Vietnam

²HNUE High School for Gifted Students,
Cau Giay District, Hanoi, Vietnam

<https://doi.org/10.59822/IJEBER.2024.4314>

ABSTRACT

The trend of focusing on sustainable development in business and industry requires various companies in the apparel sector to gradually integrate and implement greener and more environmentally friendly manufacturing activities. It is important to consider what drives and hinders for green apparel manufacturing (GAM) implementation of firms, especially in the context of developing countries. This study was conducted using a quantitative method aimed at studying the factors influencing green apparel manufacturing implementation of fashion enterprises in Vietnam. Through a survey of 289 leaders at top management level representing for fashion enterprises, the study found important evidences for the positive impact of environmental awareness, environmental orientation and corporate stakeholders' engagement on GAM. However, a negative relationship between lack of R&D on technology and GAM is not proven. Since then, the research has provided a number of necessary management and policy implications such as setting common goals and targets for green production activities, training employees and building organizational culture and greener working environment, which is essential to promote environmental awareness and orientation of the whole companies. Enterprises also need to build close relationships with outside stakeholders and strictly comply with the enterprise's green manufacturing goals. From a macro management perspective, the government needs to be the focal point to issue general regulations on green manufacturing standards, and disseminate more propaganda to spread and raise awareness for the entire community about green apparel products and production practices.

KEYWORDS: - Fashion enterprises, green apparel manufacturing, green apparel practices, and sustainable development.

1. INTRODUCTION

Apparel is a continuously evolving and investment-driven business field that is closely associated with different trends, which is constantly improved and updated. Particularly in the current market trend, there is an increasing number of fashion brands entering the market with diverse designs, products, and materials. Additionally, consumers tend to engage more in the buying and usage of fast fashion products, leading to a growing production and replacement of old items. The fashion industry requires more complex production and refinement processes, from material production to the creation of a marketable product. According to Filho et al. (2019), apparel is considered an unsustainable industry and is among the most polluting industries worldwide, with the clearest environmental impacts, especially in terms of fashion waste generated by the fast fashion system. Qutab (2017) also stated that the fashion industry is ranked as the second-largest polluter after the oil industry. Fashion production activities contribute to 10% of carbon emissions and 20% of wastewater treatment, and the production system alone accounts for approximately 80% of the industry's impact on climate change (Appolloni et al., 2023). Faced with such extreme impacts, the awareness of consumers, governments, and social organizations regarding the importance of sustainable fashion production and related social and environmental issues is increasingly emphasized (Abdul-Rashid et al., 2017; Waheed et al., 2020).

In the current context, the trend of green, sustainable, and environmentally-friendly fashion is booming worldwide, including in developing countries like Vietnam (Nguyen et al., 2019; Sarker & Bartok, 2024). This is not just a trend but also a promising new approach in the fashion industry, which is closely linked to the implementation of the United Nations' Sustainable Development Goals in various countries. Consumers are not only concerned about the aesthetics and quality of the products they purchase but also pay significant attention to the origin of the products and how they are produced. They desire to own eco-friendly fashion items made from sustainable materials that do not harm the environment during the production and transportation processes. With the growing demand for green fashion products from consumers (Abdulrazak & Quoquab, 2018), focusing on implementing the production of sustainable and environmentally-friendly products has become a top priority for businesses in the fashion industry.

Regarding the topic of green apparel, there have been several studies primarily approaching the topic of green fashion from the perspective of consumer behaviors (Abdulrazak & Quoquab, 2018; Botwinick, 2023; Nguyen et al., 2019). However, research focusing on the practices of green fashion production from the perspective of businesses and organizations is still relatively scarce (Guo, 2023; Sarker, 2024). Guo's study (2023) emphasized that alongside the driving factors for businesses to transition to greener production, there are also numerous barriers in this endeavor. According to Thorisdottir & Johannsdottir (2020), based on the theory of corporate social responsibility (CSR), the responsibility of fashion businesses extends beyond creating products to meet societal demand and generate economic profit. It also includes implementing processes to produce sustainable and environmentally-friendly products to meet environmental requirements. Consequently, leading companies in the industry are making commitments to use energy-efficient practices, sustainable materials, recycled resources, and environmentally-friendly production techniques. They are also striving to minimize production waste and seeking more sustainable supply chains. Implementing green fashion production not only benefits the environment but also

helps businesses build a positive image in the community and enhance consumer trust (Jain & Kalapurackal, 2023). Particularly in the context of developing countries, there is a need to conduct more research on the implementation of green fashion production, where the majority of fashion production activities take place.

The objective of this study is to investigate the factors influencing the green apparel manufacturing implementation among fashion enterprises in Vietnam. Drawing on two foundational theories, which are Corporate Social Responsibility theory (CSR theory) and the Value-Belief-Norm theory (VBN theory), this research is conducted in the business perspective instead of focusing on consumers' view, which are business entities, organizations, and enterprises involved in fashion production activities. In addition to the introduction part, the study will clarify the theoretical basis for identifying the factors that impact the implementation of green apparel production to develop hypotheses and a proposed research model. Next, the authors will describe the scale measurement of the variables in the model as well as the method of sampling and data collection. The survey data will then be analyzed through SPSS version 27 software to examine the research hypotheses and evaluate the impact level of these independent variables. This will be the basis for the authors to propose management and policy implications to promote businesses' strategies and activities in deploying green apparel manufacturing implementation in the context of Vietnam.

2. THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

2.1 Green apparel manufacturing

In recent years, there has been a significant surge in both practical and academic interest surrounding the concept of green manufacturing. This growing attention can be attributed to its remarkable capacity to mitigate carbon emissions and mitigate environmental catastrophes (Bhatt et al., 2020; Pang & Zhang, 2019). Green manufacturing offers a powerful strategy to address the detrimental effects of the manufacturing industries on the environment. It encompasses a novel approach to manufacturing that fosters sustainable development through the efficient and effective utilization of materials, water, chemicals, and energy in the production process, while concurrently reducing CO₂ emissions (D'Adamo & Lupi, 2021). By embracing and implementing green manufacturing practices, companies can enhance their sustainability and minimize adverse impacts on society, the environment, and the economy (Akter et al., 2022). In the context of the apparel industry, green apparel manufacturing (GAM) shows its growing importance today. According to Jain & Kalapurackal (2023), GAM refers to green practices in the apparel industry encompassing various stages such as product design, raw material procurement, fabric spreading, cutting, sewing and assembly, washing, printing and embroidery, finishing, and packing. Besides, there is a noticeable dearth of research pertaining to developing countries, which notably serve as the primary hub for apparel production (Jain & Kalapurackal, 2023; Oelze, 2017). And the diverse and intricate nature of green apparel practices adopted by fashion companies may demonstrate the comprehensiveness of the GAM term. A recent study by Guo (2021) clearly pointed out that the mechanisms for GAM can be separated into green design, green procurement, green production, green packing and distribution, green end of life management, and remanufacturing. Moreover, besides the factors that promote the implementation of green apparel manufacturing, there are also many factors that hinder fashion businesses from applying this activity, which requires more further research (Guo, 2021; 2023).

2.2 Theoretical foundation

The conceptual framework of this study is based on two foundational theories, which are Corporate Social Responsibility theory (CSR theory) and the Value-Belief-Norm theory (VBN theory) on the perspective of the enterprises. The concept of corporate social responsibility (CSR) is a relatively contemporary notion that has evolved over time, as evidenced by several influential studies. Many

scholars widely acknowledge Howard Bowen's Social Responsibilities of the Businessman (1953) as the pioneering effort to establish a theoretical framework regarding the interplay between corporations and society. Over the past two decades, there has been a gradual rationalization of CSR, aligning it with broader organizational objectives such as reputation and image management. Consequently, the environmental dimension of CSR has garnered substantial support. According to the European Commission (2001), CSR theory implies a concept in which businesses integrate social and environmental concerns into their business operations and interactions with stakeholders across the world. voluntary basis. In other words, CSR proves that business activities not only help bring profits to businesses, but also welfare to the whole society, and aim to protect the environment and natural resources. Accordingly, many scholars have explicitly highlighted the significance of GAM emphasizing its relevance not only in terms of environmental considerations but also regarding its social and economic dimensions (Kleindorfer, 2015). Venkatesh (2015) also concluded that GAM plays a critical role in fostering sustainable development and simultaneously offers apparel industries and fashion enterprises a competitive edge. That means based on the CSR theory, promoting green apparel manufacturing is considered one of the corporate responsibilities that firms need to fulfill.

The second based theory to conduct the research is the Value-Belief-Norm theory (VBN theory) by Stern & Dietz (1994), which is a combination and also a further expansion of value theory (Schwartz, 1992) and norm activation theory (Schwartz, 1977). As Stern et al (1999) mentioned by focusing on values, beliefs, and personal norms, VBN theory sheds light on how these factors shape an individual's ethical actions. In fact, the implementation of green manufacturing practices at fashion businesses stems from their long-term strategies and is decided by top leaders such as the director or chairman of the board of directors. Accordingly, in addition to producing conventional fashion products in the traditional way, business owners have to spend costs to invest in a number of activities in GAM if their norms and beliefs are about to reach various environmental values. Stern (2000) concluded that a key component of the VBN theory pertains to the notion that the relationship between values and environmentalism is influenced by specific beliefs. These beliefs encompass individuals' perceptions regarding the groups or entities that are impacted by environmental conditions, as well as their beliefs regarding the efficacy of individual actions in mitigating threats to valued entities or causes. Consequently, the formation of personal norms associated with environmentalism and the inclination towards engaging in pro-environmental actions can be influenced by information that shapes these underlying beliefs.

2.3 Factors influencing green apparel manufacturing implementation

2.3.1. Environmental awareness

Environmental awareness is not a new term but it is still investigated by many scholars. This term can be defined by Yeung (1998) as an individual's ability to comprehend the intricacies of environmental processes and issues, their level of concern for environmental well-being, and their commitment to engaging in environmentally responsible actions in their daily lives. This concept is seen as a mutually beneficial relationship between humans and their environment, encompassing three key dimensions: environmental attitude, knowledge, and behavior (Rannikko, 1996). Environmental awareness is widely recognized as a foundational element of environmental sustainability (Holt & Barkemeyer, 2012). In a recent research endeavor undertaken by Li et al. (2019), the primary objective was to aid organizations in augmenting their environmental awareness and adopting green manufacturing practices. The study unveiled that corporate stakeholders possess the potential to exert a favorable influence on practice performance through the adoption of GAM. Furthermore, it was suggested that organizations ought to enhance their green apparel manufacturing technology to ensure the seamless implementation of environmentally friendly manufacturing practices. Wu et al. (2015) further reinforced this notion by indicating that

the incorporation of green, lean, and CSR management systems as standalone practices can yield positive outcomes for sustainability performance of firms. Other quantitative studies also suggested that environmental awareness entails a comprehensive understanding of clean and sustainable green manufacturing practices, as well as proficiency in the concept of the Triple Bottom Line and an acute consciousness of the environmental footprint (Eijdenberg et al., 2018), which have a positive impact on green apparel manufacturing implementation of companies. Moreover, in the context of developing country like Bangladesh, Hossain et al. (2020) also concluded the positive association between environmental awareness and firms' green manufacturing practices. Based on above arguments, the study proposes the hypothesis as follows:

H1: Environmental awareness has a positive influence on green apparel manufacturing implementation among fashion enterprises in Vietnam.

2.3.2. Environmental orientation

The concept of environmental orientation has been extensively discussed by researchers in the field of environmental management, which reflects the increasing concern among organizations regarding environmental issues raised by various stakeholders through CSR theory (Chan et al., 2012). EO serves as a crucial mechanism for gathering information about stakeholders to pursue corporate environmentalism, which provides valuable insights into the perceptions of stakeholders who hold influential roles in organizational decision-making processes (Peng & Wei, 2015). According to Banerjee (2001), environmental orientation refers to the extent to which organizations recognize the significance of the environmental challenges they are facing. Banerjee (2001) also proposed two main categories which are internal and external environmental orientation serving as vital inputs for strategic decision-making within organizations. Based on VBN theory, internal environmental orientation encompasses managerial perspectives on the firm's moral norms, efforts, and intrinsic values related to environmental protection (Feng et al., 2018). Environmental orientation also plays a vital role in fostering a shared awareness among companies regarding the significance of environmentally sustainable operations. This awareness, in turn, motivates firms to actively pursue strategies such as GAM aimed at minimizing the environmental impacts of their operations. The managerial recognition influences corporate values and beliefs regarding environmental practices, which can lead to GAM practices of firms. On the other hand, external environmental orientation refers to organizational efforts in response to the demands imposed by stakeholders. Some empirical studies, for instance, Chan et al. (2012) conducted a study involving 194 foreign-invested companies operating in China and found that environmental orientation exerts a positive influence on green practices. Feng et al. (2018) discovered the positive correlation between environmental orientation and green product and process innovation practices. The impact of environmental orientation on GAM and green practices of firms is also concluded by the research of Bu et al. (2020). Based on above arguments, the study proposes the hypothesis as follows:

H2: Environmental orientation has a positive influence on green apparel manufacturing implementation among fashion enterprises in Vietnam.

2.3.3. Corporate stakeholders' engagement

In today's society, there is a growing emphasis on sustainable development and environmental concerns, with a particular focus on the desirability of green manufacturing of fashion companies (Li et al., 2019). The CSR theory has emphasized the importance of corporate stakeholders on the application and implementation of green practices and green behaviors of firms. The positive stance of corporate stakeholders, encompassing internal staff, consumers, the government, and society at large, exerts a significant influence on the strategic decision-making process and adoption of green

practices within enterprises (Li et al., 2019). A study by Gualandris & Kalchschmidt (2014) conducted an investigation into the interrelationships between suppliers and customers' pressure and innovativeness using a conceptual model. Their findings demonstrated a positive and significant association between customer pressure, innovativeness, and green supply chain practices. Li et al. (2019) then also assumed that stakeholders maintain a positive association with green manufacturing in the fashion business. Corporate stakeholders can be divided into internal and external parts. External stakeholders encompass a diverse range of individuals and entities, such as customers, suppliers, the government, and society at large. While internal stakeholders are individuals or groups directly engaged in the operational processes of the organization, predominantly including employees, managers, and owners. Stakeholder engagement as defined by Friedman & Miles (2006), pertains to the effective solicitation of stakeholders' perspectives regarding their relationships with the organization. In recent times, there has been a notable surge in the level of interest exhibited by both external and internal stakeholders in advocating for the integration of environmental considerations into the daily operations of apparel companies (Beh et al., 2016). Indeed, a series of previous quantitative studies have also demonstrated the positive impact of corporate stakeholders' engagement on GAM and green practices in apparel businesses (Guoyou et al., 2011; Kozlowski et al., 2012; Liu et al., 2017; Zhou et al., 2017). Based on above arguments, the study proposes the hypothesis as follows:

H3: Corporate stakeholders' engagement has a positive influence on green apparel manufacturing implementation among fashion enterprises in Vietnam.

2.3.4. Research and development on technology

Besides some drivers which were found out having positive relationships with GAM, there still remain some barriers to the implementation of green practices within the companies, especially in developing countries. According to Wang et al. (2016), the absence of effective environmental measures, challenges in translating positive environmental attitudes into practical actions, the intricacy of designing processes for reusing/recycling used products, the complexity of designing processes to minimize resource and energy consumption, and the insufficiency of technology, processes, and materials have been identified as barriers by scholars. Beh et al. (2016) emphasized that the GAM implementation nowadays requires the application of many advanced and modern technologies in all stages of production in comparison to the classic and less economical way of used apparel recycling methods. In many developing countries despite of the top garment production capacity in the world, many enterprises may encounter challenges in adopting GAM due to the lack of suitable technology or processes for implementation. Additionally, the materials utilized in the manufacturing process may not possess optimal eco-friendly characteristics (Wang et al., 2016). The investment on green technology is considered an important way to promote green innovation practices in Vietnamese manufacturing companies (Le et al., 2021). Quantitative findings from several studies concluded that insufficient focus on technology R&D hinders the identification and development of new manufacturing processes and GAM that have minimal adverse environmental impacts (Ghazilla et al., 2015; Wakeford et al., 2017; Luo et al., 2018). Based on above arguments, the study proposes the hypothesis as follows:

H4: Lack of R&D on technology has a negative influence on green apparel manufacturing implementation among fashion enterprises in Vietnam.

Based on the above hypotheses, the authors proposes the following research model:

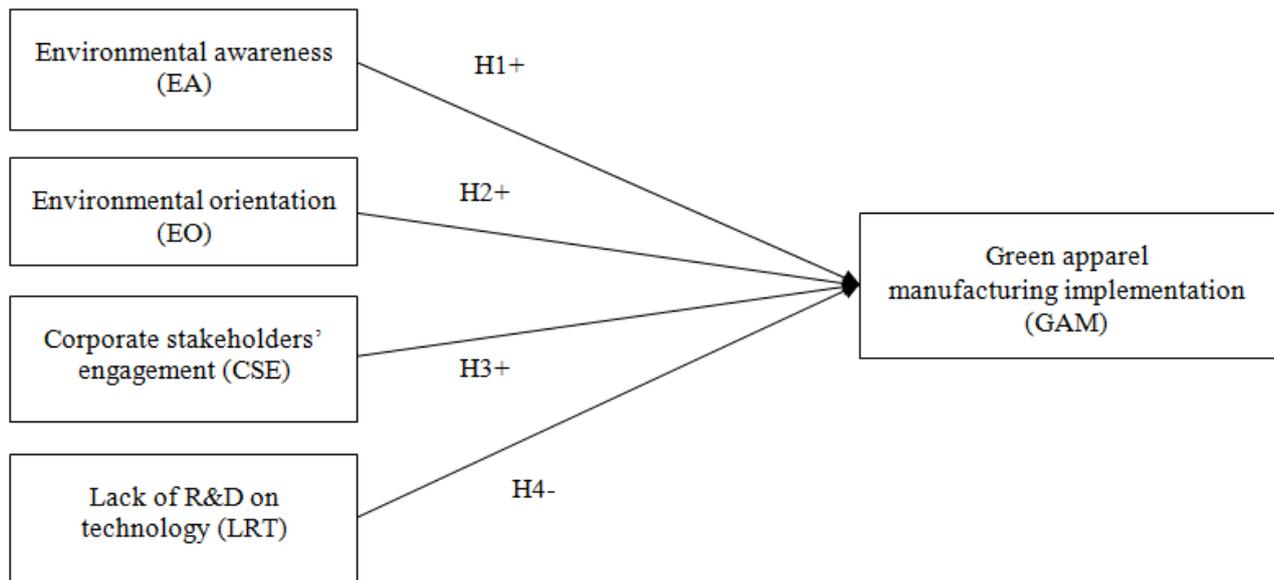


Figure 1: Proposed research model

Source: Authors' analysis

3. METHODOLOGY

3.1 Measures

The study is conducted by using the quantitative research method. The measurement scales for all variables within the above model are inherited and adjusted to fit the research context. Among those independent variables, environmental awareness was measured by Ozden (2008) with 8 indicators. Environmental orientation scale was adopted from the study of Banerjee (2001) with 8 items. The measurements for corporate stakeholders' engagement and lack of R&D on technology were inherited from the study of Guo (2021) with 12 indicators and 3 indicators respectively. The scale for green apparel manufacturing implementation also came from Guo (2021) with 13 indicators. The author used a 5-level Likert scale as the basis to conduct the survey and collect data for all the variables in this study from 1- "Completely disagree" to 5 – "Completely agree".

3.2 Sample population and data collection

The study collected research data from high-level executives including presidents, directors, and CEOs, who represents for fashion companies in three major cities in Vietnam (Hanoi, Ho Chi Minh City, and Binh Duong) in May 2024. These big cities were chosen due to their high population density and level of development, with a majority of fashion company headquarters located there. In accordance with Green's (1991) recommendations, a minimum sample size of $50 + 8m$ (m being the number of independent variables or predictors in the regression analysis) was adhered to ensure compliance with regulations. Similarly, Hair et al. (2014) suggest a minimum sample size of $5 * n$ (n representing the number of items across all variables) to ensure compliance with regulations for exploratory factor analysis (EFA). To ensure reliability, a total of 289 valid responses from managers in Vietnam were collected through official surveys. The study employed the stratified random sampling method, considering respondents' demographics as criteria, to select suitable participants.

3.3 Data analysis

Based on the research data collected, the author used SPSS 27 software to conduct data analysis. First, the author analyzed the reliability of the scales using Cronbach's Alpha coefficient to eliminate unnecessary indicators. After ensuring the reliability of the scales, the author conducted

EFA exploratory factor analysis to test the value of the scale as well as consider the convergence of indicators forming components. Next, the author conducted Pearson correlation analysis to examine the correlation between independent and dependent variables and multicollinearity of the data if any. Independent variables that are correlated with the dependent variable would be retained for inclusion in multiple linear regression analysis after that. Based on the results of the regression analysis, the author will determine the significance of the model as well as the level of impact of the factors, thereby drawing conclusions for the research hypotheses. This will be the basis for providing necessary management and policy implications.

4. Findings and discussion

4.1 Descriptive statistics result

The study was conducted through surveying 289 managers and administrators at top level such as CEOs, directors and presidents of firms, who presented for 289 fashion companies in Vietnam. Table 1 shows that, among those participants, there are 132 male and 157 female managers. In which, there are almost all CEOs and directors accounting for 41.9% and 53.6%. Regarding the age of companies, most of the fashion companies participating in the survey are from 5 to 10 years old (174 firms), which accounts for 60.2%. Companies operating smaller than 5 years and more than 10 years account for 24.9% and 14.9% respectively. In these fashion companies, there are 135 and 111 companies having smaller than 50 employees and from 50 to 100 employees respectively. Moreover, there are 172 companies located in Ho Chi Minh city and 91 companies in Hanoi, only 26 firms are from Binh Duong province.

Table 1: Sample descriptive statistics result

Characteristics		Frequency	Proportion (%)
Gender	Male	132	45.7
	Female	157	54.3
Position	CEO	121	41.9
	Director	155	53.6
	President	13	4.5
Company age	Smaller than 5 years	72	24.9
	5 to 10 years	174	60.2
	More than 10 years	43	14.9
Number of employees	Smaller than 50	135	46.7
	50 to 100	111	38.4
	More than 100	43	14.9
Location	Binh Duong	26	9.0
	Hanoi	91	31.5

	Ho Chi Minh city	172	59.5
--	------------------	-----	------

Source: Authors' analysis

4.2 Reliability and EFA analysis

Table 2 presents Cronbach's Alpha coefficient of all variables within the model which is used to evaluate the reliability of the scales. The results show that all 44 indicators (EA, EO, CSE, LRT and GAM) have corrected item – total correlation greater than 0.3 and no item has the Cronbach's Alpha if item deleted is greater than Cronbach's Alpha of the scale. Cronbach's Alpha coefficients of independent and dependent variables are all in the range of 0.9 and above. These findings are extremely ideal showing that the questionnaire is designed to be intuitive and without bad samples. All observed variables are accepted to conduct the EFA method.

Table 2: Reliability statistics

<i>Variables</i>	<i>N of items</i>	<i>Cronbach's Alpha</i>	<i>Smallest corrected item – Total correlation</i>
Environmental awareness (EA)	8	0.927	0.690 (EA2)
Environmental orientation (EO)	8	0.937	0.718 (EO6)
Corporate stakeholders' engagement (CSE)	12	0.937	0.647 (CSE4)
Lack of R&D on technology (LRT)	3	0.950	0.879 (LRT1)
Green apparel manufacturing implementation (GAM)	13	0.950	0.683 (GAM1)

Source: Authors' analysis

The first time of performing the EFA method with all independent variables shows that CSE4 indicator of the corporate stakeholders' engagement variable belonged to the component of EO in the rotated matrix, so that the authors will remove CSE4 and conduct the analysis again. The final EFA results of the independent variables (Table 3) show that the KMO value is equal to 0.931, which is in the range from 0.5 to 1 showing that the factor analysis is appropriate for the data. The sig value of Bartlett's test < 0.05 shows that the observed variables are meaningful and have a strong correlation with each other. The Eigenvalues is 1.426 with 4 components and total variance explained of 68.776% (>50%). Factor loadings of items are all valid and > 0.5. After that, the authors conduct EFA for dependent variable " Green apparel manufacturing implementation (GAM)", which also shows that all indicators converge to a single variable with the KMO = 0.960 and total variance explained of 62.721%.

Table 3: Exploratory factor analysis EFA for independent variables

<i>Environmental awareness (EA)</i>	<i>Environmental orientation (EO)</i>	<i>Corporate stakeholders' engagement (CSE)</i>	<i>Lack of R&D on technology (LRT)</i>
0.822 (EA7)	0.770 (EO1)	0.807 (CSE7)	0.912 (LRT3)
0.807 (EA4)	0.750 (EO4)	0.721 (CSE8)	0.898 (LRT2)

0.677 (EA1)	0.738 (EO3)	0.719 (CSE1)	0.889 (LRT1)
0.675 (EA5)	0.731 (EO5)	0.719 (CSE10)	
0.616 (EA8)	0.725 (EO2)	0.716 (CSE2)	
0.586 (EA6)	0.640 (EO6)	0.704 (CSE9)	
0.571 (EA2)	0.604 (EO8)	0.684 (CSE3)	
0.540 (EA3)	0.562 (EO7)	0.655 (CSE12)	
		0.655 (CSE11)	
		0.637 (CSE6)	
		0.600 (CSE5)	
KMO = 0.931; Sig of Bartlett's Test = 0.000; Eigenvalues = 1.426; Total Variance Explained = 68.776%			

Source: Authors' analysis

4.3 Regression analysis and hypothesis conclusion

The findings show that all independent variables have a correlation with the dependent variable GAM, in which EA and LRT show a weak correlation with GAM due to the coefficients in range of 0.1 to 0.2. Moreover, there is no violation of multicollinearity because pairs of independent variables are not strongly correlated. After that, the author performed multiple linear regression analysis to conclude the proposed hypotheses given above. Firstly, to determine the existence of the model, the author uses the ANOVA table in SPSS regression through the sig value of the F test. The results show that the F value is 122.231 with sig equal to $0.000 < 0.05$, showing an statistical significance. This confirms the existence of the research model. Then, the authors evaluate the goodness of fit of the research model. The model summary shows that the Durbin-Watson value of 2.294, which is in range of 1.5 to 2.5 showing no violation of order series autocorrelation. The R Square and Adjusted R Square values are 0.633 and 0.627 (>50%), respectively, showing that the model has a fairly high level of significance. This finding shows that 62.7% of the variation of GAM is explained by independent variables in the EA, EO, CSE and LRT within the research model, the remaining 37.3% belongs to variables outside the model as well as random errors.

Table 4: Summary of multiple linear regression analysis results

<i>Independent variables</i>	<i>Standardized Coefficients Beta</i>	<i>Sig.</i>	<i>VIF</i>	<i>Hypotheses</i>	<i>Decision</i>
EA	0.182	.000	1.000	H1	Accepted
EO	0.455	.000	1.000	H2	Accepted
CSE	0.615	.000	1.000	H3	Accepted
LRT	0.119	.001	1.000	H4	Rejected
Dependent Variable: GAM					

Source: Authors' analysis

Along with that, there is no multicollinearity phenomenon because the VIF values of the independent variables are all smaller than 10. Table 4 also shows the impact level and direction of

the impact of the independent variables (EA, EO, CSE and LRT) to the dependent variable GAM. The results show that the independent variables EA, EO, CSE and LRT are all statistically significant and have a positive impact on GAM because the Standardized Coefficients Beta values are all positive while the sig value (p-value) are all less than 0.05. Thus, hypotheses H1, H2, H3 given above are all accepted and show that environmental awareness, environmental orientation and corporate stakeholders' engagement significantly have positive influences on green apparel manufacturing implementation among fashion enterprises in Vietnam. However, the quantitative findings for the LRT variable and hypothesis H4 are contradictory. This assumes that, in the Vietnamese context, lack of R&D on technology does not have a negative impact on green apparel manufacturing implementation of fashion businesses, so hypothesis H4 is not accepted. Based on the Standardized Coefficients Beta, the authors also determined the level of impact of the factors. Accordingly, the impact levels from high to low are CSE (0.615), EO (0.455) and EA (0.182), respectively. The standardized regression equation can be expressed as follows:

$$GAM = 0.615 * CSE + 0.455 * EO + 0.182 * EA + \varepsilon$$

The study provides important theoretical contributions through the quantitative findings found. There are many different theoretical approaches such as Nature Resource-Based View (NRBV) theory that are often used to study green fashion purchasing behavior of consumers and green fashion production at fashion businesses. in several countries around the world. However, this study was conducted from the perspective of Corporate Social Responsibility (CSR), which showed remarkable results when corporate stakeholders' engagement is an important factor representing responsibility activities of firms. This factor is also proven to have a positive influence on green apparel manufacturing implementation among fashion enterprises in Vietnam. The quantitative results of this study support a series of previous studies such as that of Beh et al. (2016); Guoyou et al. (2011); Kozlowski et al. (2012); Li et al. (2019); Liu et al. (2017); Zhou et al. (2017). In addition to many studies conducted in developed countries and from the perspective of business practices, our research shows the importance of the above influencing factors in the context of developing countries with fashion production in large quantities like Vietnam. Along with that, the impact of EO on GAM was also found in this study through CSR theory. This emphasizes the importance of pursuing corporate environmentalism from the perspective of stakeholders in order to better implement green manufacturing practices. This finding goes along with the results from Bu et al. (2020), Chan et al. (2012) and Feng et al. (2018). In addition, this study shows the importance of VBN theory to form and conclude the positive impact of environmental orientation and awareness on green apparel manufacturing implementation. Usually VBN theory is used based on an individual's perspective, but when that perspective is formed by stakeholders or top management of a company, it can be turned into action on behalf of the business to implement greener and more sustainable manufacturing activities. This positive effect from EA on GAM supports recent research by Eijdenberg et al. (2018) and Hossain et al. (2020). However, the results did not find out a negative effect of the lack of R&D on technology on GAM, which goes against the results of Ghazilla et al. (2015); Wakeford et al., (2017); Luo et al., (2018).

5. IMPLICATIONS AND CONCLUSION

This research used a quantitative method approached from the perspective of businesses. The authors' aim is to investigate factors influencing the green apparel manufacturing implementation among fashion enterprises in Vietnam. The findings in this study may bring about some important management implications for business leaders and some related policy implications. For the most important impact of corporate stakeholders' engagement on green apparel manufacturing implementation, businesses need to identify specific goals and commit to implementing green fashion production. This may include setting targets for the use of recycled materials, emissions

reduction, energy efficiency, and social equity that all individuals must consistently adhere to. Moreover, businesses need to work with suppliers, manufacturers and distributors to build a sustainable supply chain that ensures that fashion products are produced according to green and fair standards. Besides, it is also important to establish partnerships with government organizations, non-governmental organizations, non-profit organizations and consumer communities to jointly implement projects and campaigns to promote fashion production green. Some policy implications that can be considered are that the Government can issue clear regulations and standards on green fashion production. This includes defining standards for the use of recycled materials, emissions reduction, energy efficiency, social equity and other factors related to sustainability in the fashion industry. In addition, consider investing in training and education programs on green fashion, to raise awareness and capacity of workers in the industry, provide and disseminate detailed information about fashion products. Green page aims to raise awareness and create easier access for consumers. To promote the positive impact of environmental awareness and environmental orientation on the implementation of green apparel manufacturing practices, fashion companies need to develop specific strategies and action plans to realize their goals and commitments, which include evaluating and improving production processes, researching and applying advanced technology, identifying sustainable raw material sourcing and enhancing environmental risk management. It is also more important to build up a green organizational culture and educate employees about the importance of the environment and sustainability. When employees are trained in green production processes and methods, businesses can create a work environment that encourages creativity and input, promoting environmental awareness and social responsibility throughout the entire organization.

REFERENCES

- Abdul-Rashid, S.H., Sakundarini, N., Ghazilla, R.A.R., & Thurasamy, R. (2017). The impact of sustainable manufacturing practices on sustainability performance: empirical evidence from Malaysia. *International Journal of Operations & Production Management*, 37, 182–204.
- Abdulrazak, S., & Quoquab, F. (2018). Exploring consumers' motivations for sustainable consumption: a self-deterministic approach. *Journal of International Consumer Marketing*, 30(1), 14-28.
- Akter, M.M.K., Haq, U.N., Islam, M.M., & Uddin, M.A. (2022). Textile-apparel manufacturing and material waste management in the circular economy: A conceptual model to achieve sustainable development goal (SDG) 12 for Bangladesh. *Cleaner Environmental Systems*, 4, 100070.
- Appolloni, A., Centi, G., & Yang, N. (2023). Promoting carbon circularity for a sustainable and resilience fashion industry. *Current Opinion in Green and Sustainable Chemistry*, 39, 100719.
- Banerjee, S.B. (2001). Managerial perceptions of corporate environmentalism: Interpretations from industry and strategic implications for organizations. *Journal of Management Studies*, 38, 489-513.
- Beh, L-S., Ghobadian, A., He, Q., Gallear, D., & O'Regan, N. (2016). Second-life retailing: a reverse supply chain perspective. *Journal Supply Chain Management: An International Journal*, 21(2), 259-272.
- Bhatt, Y., Ghuman, K., & Dhir, A. (2020). Sustainable manufacturing: Bibliometrics and content analysis. *Journal of Cleaner Production*, 260, 120988.
- Botwinick, A., & Lu, S. (2023). Explore U.S. retailers' merchandising strategies for clothing made from recycled textile materials. *International Journal of Fashion Design, Technology and Education*, 16(2), 131–140.
- Bu, X., Dang, W.V.T., Wang, J., & Liu, Q. (2020). Environmental Orientation, Green Supply Chain Management, and Firm Performance: Empirical Evidence from Chinese Small and Medium-Sized Enterprises. *International Journal of Environmental Research and Public Health*, 17(4), 1199.

- Chan, R.Y., He, H., Chan, H.K., & Wang, W.Y. (2012). Environmental orientation and corporate performance: The mediation mechanism of green supply chain management and moderating effect of competitive intensity. *Industrial Marketing Management*, 41, 621-630.
- D'Adamo, I., & Lupi, G. (2021). Sustainability and resilience after COVID-19: A circular premium in the fashion industry, *Sustainability*, 13, 1861.
- Eijdenberg, E., Sabokwigina, D., & Masurel, E. (2018). Performance and environmental sustainability orientations in the informal economy of a least developed country. *International Journal of Entrepreneurial Behaviour & Research*, 25(1).
- European Commission (2001). *Green Paper 'Promoting a European Framework for Corporate Social Responsibility*. COM (2001) 366 final, Brussels.
- Feng, L., Zhao, W., Li, H., & Song, Y. (2018). The Effect of Environmental Orientation on Green Innovation: Do Political Ties Matter?. *Sustainability*, 10, 46-74.
- Filho, W.L., Ellams, D., Han, S., Tyler, D., Boiten, V.J., Paco, A., Moora, H., & Balogun, A-L. (2019). A review of the socio-economic advantages of textile recycling. *Journal of Cleaner Production*, 218(1), 10-20.
- Ghazilla, R.A.R., Sakundarini, N., Abdul-Rashid, S.H., Ayub, N.S., Olugu, E.U., & Musa, S.N. (2015). Drivers and barriers analysis for green manufacturing practices in Malaysian SMEs: a preliminary findings. *Procedia Cirp*, 26, 658-663.
- Guo, H. (2021). Promoting Green Manufacturing in Apparel Companies from a Circular Economy Perspective. *Durham theses, Durham University*.
- Guo, H. (2023). Analysing the barriers to green apparel manufacturing implementation. *Journal of Fashion Marketing and Management*, 27(3), 531-560.
- Guoyou, Q., Saixing, Z., Chiming, T., Haitao, Y., & Hailiang, Z. (2011). Stakeholders' Influences on Corporate Green Innovation Strategy: A Case Study of Manufacturing Firms in China. *Corporate Social Responsibility and Environmental Management*, 20(1), 1-14.
- Holt, D., & Barkemeyer, R. (2012). Media Coverage of Sustainable Development Issues – Attention Cycles or Punctuated Equilibrium?. *Sustainable Development*, 20, 1–17.
- Jain, S., & Kalapurackal, J.J. (2023). A Systematic Review of Green Apparel Manufacturing. *Journal of Environmental Research, Engineering and Management*, 79(4), 124–133.
- Kleindorfer, P. (2015). Sustainable operations management. *Production and Operation Management*, 482-492.
- Kozlowski, A., Bardecki, M., & Searcy, C. (2012). Environmental Impacts in the Fashion Industry: A Life-cycle and Stakeholder Framework. *The Journal of Corporate Citizenship*, (45), 17-36.
- Le, T.H., Doan, N.T., & To, T.T. (2021). Effects of R&D, Networking and Leadership Roles on Environmental Innovation Adoption in Vietnam's SMEs. *Economic Research-Ekonomiska Istraživanja*, 35(1), 1211–1242.
- Li, G., Lim, M.K., & Wang, Z. (2019). Stakeholders, green manufacturing, and practice performance: Empirical evidence from Chinese fashion businesses. *Annals of Operations Research*, 290, 961-982.
- Liu, P., Zhou, Y., Zhou, D., & Xue, L. (2017). Energy Performance Contract models for the diffusion of green-manufacturing technologies in China: A stakeholder analysis from SMEs' perspective. *Energy Policy*, 106, 59-67.
- Luo, Y., Jie, X., Li, X., & Yao, L. (2018). Ranking Chinese SMEs Green Manufacturing Drivers Using a Novel Hybrid Multi-Criterion Decision-Making Model. *Sustainability*, 10(8), 2661.
- Nguyen, M.T.T, Nguyen, L.H, & Nguyen, H.V. (2019). Materialistic values and green apparel purchase intention among young Vietnamese consumers. *Young Consumers*, 20(4), 246–263.
- Oelze, N. (2017). Sustainable Supply Chain Management Implementation-Enablers and Barriers in the Textile Industry. *Sustainability*, 9(8), 1435.

- Pang, R., & Zhang, X. (2019). Achieving environmental sustainability in manufacture: A 28- year bibliometric cartography of green manufacturing research. *Journal of Cleaner Production*, 233, 84–99.
- Peng, X.R., & Wei, J. (2015). Stakeholders' environmental orientation and eco-innovation: The moderating role of top managers' environmental awareness. *Studies in Science of Science*, 33(7), 1109-1120.
- Qutab, M. (2017). What's the Second Most Polluting Industry?. *One Green Planet*. Retrieved from <http://www.onegreenplanet.org/environment/clothing-industry-second-most-polluting/>.
- Rannikko, P. (1996). Local Environmental Conflicts and the Change in Environmental Consciousness. *Acta Sociologica*, 39, 57–72.
- Sarker, M.S.I., & Bartok, I. (2024). Global trends of green manufacturing research in the textile industry using bibliometric analysis. *Case Studies in Chemical and Environmental Engineering*, 9, 100578.
- Schwartz, S.H. (1977). Normative Influences on Altruism. *Advances in Experimental Social Psychology*, 10, 221-279.
- Schwartz, S.H. (1992). Universals in the Content and Structure of Human Values: Theoretical Advances and Empirical Tests in 20 Countries. *Advances in Experimental Social Psychology*, 25, 1-65.
- Stern, P.C. (1999). Information, incentives, and proenvironmental consumer behavior. *Journal of Consumer Policy*, 22, 461–478.
- Stern, P.C. (2000). Toward a Coherent Theory of Environmentally Significant Behavior. *Journal of Social Issues*, 56(3), 407–424.
- Stern, P.C., & Dietz, T. (1994). The Value Basis of Environmental Concern. *Journal of Social Issues*, 50(3), 65-84.
- Thorisdottir, T.S., & Johannsdottir, L. (2020). Corporate social responsibility influencing sustainability within the fashion industry: A systematic review. *Sustainability*, 12(21), 9167.
- Venkatesh, V.G. (2015). Factor influencing successful implementation of green manufacturing. *International Journal of Industrial Engineering*, III, 1-16.
- Waheed, A., Zhang, Q., Rashid, Y., Tahir, M.S., & Zafar, M.W. (2020). Impact of green manufacturing on consumer ecological behavior: Stakeholder engagement through green production and innovation. *Sustainable Development*, 28, 1395–1403.
- Wakeford, J.J., Gebreyesus, M., Ginbo, T., Yimer, K., Manzambi, O., Okereke, C., & Mulugetta, Y. (2017). Innovation for green industrialisation: An empirical assessment of innovation in Ethiopia's cement, leather and textile sectors. *Journal of Cleaner Production*, 166, 503-511.
- Wang, Z., Mathiyazhagan, K., Xu, L., & Diabat, A. (2016). A decision-making trial and evaluation labouratory approach to analyse the barriers to Green Supply Chain Management adoption in a food packaging company. *Journal of Cleaner Production*, 117, 19-28.
- Wu, L., Subramanian, N., Abdulrahman, M.D., Liu, C., Lai, K-H., & Pawar, K.S. (2015). The Impact of Integrated Practices of Lean, Green, and Social Management Systems on Firm Sustainability Performance—Evidence from Chinese Fashion Auto-Parts Suppliers. *Sustainability*, 7, 3838-3858.
- Yeung, S. (1998). Environmental Consciousness among Students in Senior Secondary Schools: The Case of Hong Kong. *Environmental Education Research*, 4, 251–268.
- Zhou, Y., Pan, M., Zhou, D., & Xue, L. (2017). Stakeholder Risk and Trust Perceptions in the Diffusion of Green Manufacturing Technologies: Evidence from China. *The Journal of Environment and Development*, 27(1), 46-73.

Appendices

