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Article

Impact of green supply chain management on social performance through economic undergraduate's view

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Abstract: The perspectives of economic students in Can Tho City, Vietnam were investigated in order to have a deeper understanding of the relationship between green supply chain management (GSCM) and social performance. A comprehensive survey was conducted on a sample size of 526 undergraduate students enrolled in business administration and international business courses. This study effort examined the impact of several subcomponents of GSCM on social performance. The inclusion of green production, green distribution, green supply chain management, and environmental education was seen. The coefficients of 0.24 and 0.115 suggest a favorable relationship between green procurement and internal environmental management and social performance. The existing scholarly literature presents several instances in which the implementation of Green Supply Chain Management (GSCM) has resulted in enhanced societal performance. The objective of this study is to contribute to the existing literature by investigating the many factors that influence the performance of Green Supply Chain Management (GSCM) in improving financial outcomes. The investigation also encompasses the examination of Green Supply Chain Management (GSCM) and its influence on societal performance. The authors propose that the extent to which graduates were exposed to GSCM education throughout their college years will have a substantial impact on their contributions to their respective fields and to society as a whole. Individuals who proactively pursue higher education by enrolling in college and focusing their studies on attaining a business degree are more likely to increase their chances of achieving success as entrepreneurs. Hence, these affluent proprietors of companies possess the potential to expand their operations and provide significant economic benefits at a macro level. In order to ensure the enduring viability of businesses, local communities, and the natural environment, educational institutions should provide curricula including corporate social responsibility, volunteerism, and ecologically conscious manufacturing methods. The integration of environmental stewardship with ethical business practices is crucial.

Keywords: student; sustainable development; performance; education

1. Introduction

The area of supply chain management often employs multidisciplinary methodologies. The significance of production management throughout the manufacturing and distribution chain, including the whole process from raw materials to the finished product, is emphasized by both Lambert and Cooper (2000), and Bowersox et al. (2007). The effective execution of supply chain operations enables firms to provide value for their consumers and sustain a competitive advantage in the long run (Bozarth et al., 2008; Tekin et al., 2020). According to Lambert and Cooper

(2000) and Peijia and Siqi (2013), the industry should demonstrate excellence in various domains, including planning and control, work and organizational structures, product and information flows, facility structures, management techniques, power and leadership structures, risk and reward structures, culture and attitude, and supply chain management. The implementation of meticulous supply chain management has the potential to enhance a company's competitive advantage and overall performance, therefore establishing supply chain competitiveness as an essential component. The decisions made by firms regarding the drivers of a supply chain have a direct influence on its efficiency. Scholars in the field have already highlighted the need of prioritizing either operational efficiency or customer service, as shown by the works of Hugos (2011), Peijia and Siqi (2013), and Tekin et al. (2020).

Supply Chain Management (SCM) and GSCM are two discrete fields of study. While conventional supply chain management (SCM) largely emphasizes financial aspects, "green" SCM (GSCM) also incorporates environmental considerations. Beamon (1999), Gilbert (2000), and Ho et al. (2009) have all emphasized the environmental sustainability, organizational integration, and ecological optimization of GSCM. The standard supply chain management (SCM) technique does not include human toxicological issues. In the realm of manufacturing and distribution, GSCM prioritizes stringent product control above environmental effect mitigation. Both Ho et al. (2009) and Luthra et al. (2013) contend that the achievement of corporate success necessitates the simultaneous pursuit of competitiveness and profitability, with strict adherence to environmental regulations pertaining to the production of commodities and the associated manufacturing processes. Green supply chains are of significant importance in promoting sustainability due to their ability to facilitate cost savings, generate additional revenue streams, identify untapped sources of income, effectively manage and mitigate risks, enhance employee motivation, and ensure compliance with environmental regulations (Tekin et al., 2020). GSCM refers to a strategic approach aimed at improving company operations by including environmental considerations.

Srivastava's (2007) research has provided a comprehensive view of GSCM, including environmental, economic and social factors. The author argues that GSCM can create social benefits such as increased customer, employee and community satisfaction, improved relationships with stakeholders, and enhanced corporate image and reputation enterprise. However, the study does not mention how to measure and evaluate these benefits. In addition, another study by Zhu and Sarkis (2007) proposed a model to measure the effectiveness of GSCM, including criteria environmental, economic and social. However, this model is only applied to businesses in China, and is only based on survey data from participating businesses. Therefore, this model may not reflect the actual situation of businesses in other countries, and may also be affected by biases in the data collection process. Another study by Ahi and Searcy (2013) attempted to build a comprehensive view of GSCM's social performance, including aspects such as occupational safety and health, business ethics, and corporate responsibility society, and impact on the community. However, the author only stops at the level of theoretical proposal and analysis, there is no empirical research to verify and apply this view.

Previous studies have examined the impact of GSCM on social performance (SP), but have mainly focused on the perspectives of business stakeholders. This study aims

to examine the impact of GSCM on product through the perspective of economics students. From there, we can answer "What are the views of economics students on the impact of GSCM on sustainable performance?" in Vietnam. This research can help them better understand economics students' views on GSCM. This can help businesses improve the effectiveness of their GSCM programs. For economics students, this study can help them better understand the impact of GSCM on society. This can help them become environmentally and socially responsible business leaders.

Student perspectives can offer valuable insights into local contexts and perceptions of GSCM and its impact on social performance. Their understanding of local social issues, cultural values, and economic realities can complement expert views and provide a more nuanced picture. While student views may not be directly applicable to all international contexts, they can still contribute to broader discussions about the potential social implications of GSCM practices. Sharing student perspectives from diverse countries can foster cross-cultural learning and highlight common concerns or challenges related to GSCM and social performance. The study believes the current introduction does not conform to these generally accepted standards of a good introduction for a publication article. While expert opinions carry valuable weight, student perspectives can offer fresh insights and innovative approaches not yet established in the industry. Their lack of entrenched biases and closer touch with emerging trends can be illuminating. This is especially relevant for local contexts where industry practices might be evolving, and student ideas can inform future developments.

From a theoretical standpoint, examining student perspectives can contribute to a more nuanced understanding of the relationship between GSCM and social performance. Their perceptions might highlight overlooked aspects or challenge existing assumptions, enriching the theoretical framework. Combining student and expert perspectives could create a richer and more comprehensive understanding of the topic. Triangulation with other data sources, like case studies or surveys of the general public, could further strengthen the research. Ultimately, the necessity of involving economic students depends on the specific research objectives and context. However, their inclusion can offer valuable contributions to both practical and theoretical understandings of the relationship between GSCM and social performance, especially when combined with other perspectives and data sources.

This study aims to build a model to measure and evaluate the impact of GSCM on social performance, based on criteria and indicators appropriate to the Vietnamese context, and apply this model to businesses, with a focus on the role of economics university students. Activities such as environmentally sustainable manufacturing, sustainable procurement, sustainable logistics, and sustainable education are all integral components of a concept known as GSCM. Zhu et al. (2008), Green et al. (2012), and Cankaya and Sezen (2018) have shown that many indicators of economic performance have a significant impact on the sustainability of a system. The research will be presented according to the structure of Introduction - Literature review - Methodology - Results - Discussion - Conclusion.

2. Literature review

2.1. The theoretical foundation of the study

The term "supply chain" refers to the network of businesses and organizations involved in the production and distribution of goods, from the initial procurement of raw materials to the collection of finished goods for recycling (Damert et al., 2017). The Supply Chain is composed of two major processes that operate in tandem with one another: 1) the Production Planning and Inventory Control Process, and 2) the Distribution Process (Carola et al., 2013).

There is a tendency to conflate the terms "green" with "sustainable", emphasizing the impact on the economy, society, and environment (Dobers and Wolff, 2000; Rahimifard and Clegg, 2007; Saha and Darnton, 2005). "Green supply chain management" (GSCM) has become popular as environmental awareness has grown (Srivastava, 2007). GSCM, which diverged from conventional supply chain methodology, was motivated by the "quality revolution" of the 1980s and the supply chain revolution of the 1990s. Scholars and experts in the field have taken notice of the GSCM's emphasis on waste minimization and the preservation of natural resources. Remanufacturing and eco-efficiency are becoming more and more important in enhancing daily operations (Ashley, 1993; Srivastava, 2007).

Green supply chain management (GSCM) is a subset of sustainable supply chain management that emphasizes collaboration across departments and with consumers and suppliers in environmental management (Zhu and Sarkis, 2004; Zhu et al., 2008; Yu et al., 2013). Management techniques and collaboration between downstream customers and upstream suppliers increase environmental sustainability (Rao and Holt, 2005; Vachon and Klassen, 2006; Green et al., 2012; Wong et al., 2013). GSCM relies on supply chain partners' practices, such as green purchasing embedded in supply interchanges between manufacturers, suppliers, and customers and cross-functional cooperation to maximize long-term benefits. When the supply chains work together, firms benefit from environmental management (Walton et al., 1998; Van Hoek, 1999; Zhu and Sarkis, 2004; etc.). Thus, GSCM must be entrenched throughout departments inside and across enterprises, and environmental practices can only be realized through collaboration and communication (Apsan, 2000; Zhu and Geng, 2001; Mengying et al., 2018).

Recently, academic and industry interest in cross-disciplinary GSCM has increased (Sarkis et al., 2011). Air pollution, solid waste disposal, and natural resource use must be monitored and managed throughout the development (Zhu et al., 2007). Environmentally conscious businesses, governments, organizations, and individuals have formed procurement and purchasing strategies that incorporate environmental requirements, displaying their collective bargaining and buying strength (Massoud et al., 2010; Kannan et al., 2010). Product control trumps environmental effects in GSCM manufacturing and delivery. A company must be lucrative and environmentally friendly (Ho et al., 2009; Luthra et al., 2013). Green supply chains contribute to sustainability and provide firms with a competitive edge in cost reduction, revenue growth, risk management, employee motivation, and environmental compliance (Tekin et al., 2020).

The effects of GSCM practices on customer loyalty and satisfaction, staff health and safety, and product and corporate image are measured through social performance (Zailani et al., 2012; Ashby et al., 2012). Lorenzo Sacconi (2006) proposes a new view of social performance, based on the concept of corporate social responsibility, which is a business commitment to social principles and values, including external stakeholders. Social performance is not only an ethical goal, but also an important competitive factor for businesses in globalized markets. Damiano Garofalo and Valentina Michelangeli (2014) a new evaluation system for the social performance of microfinance institutions, including criteria such as coverage, sustainability, customer impact, governance and transparent, this system can help microfinance institutions improve their social performance, while attracting the interest of investors and other stakeholders.

Schmidt et al. (2017) found a correlation between GSCM practices and both market and financial success. According to Paulraj (2011), there is a shown correlation between eco-friendly purchasing behaviors and a commitment to advocating for environmental sustainability. This proposition posits that the enhancement of environmental sustainability may be achieved by the meticulous choice of products and the incorporation of social, economic, and environmental factors into decision-making processes. The findings of this study provide support for the assertion put out by Chan et al. (2012) that the implementation of an effective internal environmental management system may enhance a company's sustainability outcomes. Furthermore, Singh and Pandey (2012) claim that incorporating environmental factors into a company’s advertising strategy has the potential to enhance its Corporate Social Performance (CSP) through cultivating public trust and cultivating a positive reputation. The impact of green marketing in promoting environmental sustainability is comparable to that of eco-friendly practices in shipping and packing. Zsidisin and Siferd (2001) conducted a study that revealed significant findings about the effectiveness of green packaging in mitigating negative environmental impacts via the implementation of recycling practices. Research conducted by Kumar et al. (2015) demonstrates that the use of green distribution strategies may effectively manage petroleum consumption by optimizing the efficiency of shipping routes.

According to Cankaya and Sezen (2018), the inclusion of environmental education is crucial in fostering human development and ensuring equitable opportunities for everyone to contribute to the establishment of a sustainable society. This concept has extensive support within academic circles and is substantiated by several trustworthy sources. The findings of a new quantitative analysis highlight the significance of adopting environmentally sustainable practices for firms. In order for environmental education to be deemed effective, it must satisfy two primary goals. It is important for every team member to possess a comprehensive understanding of the distinct environmental factors that impact their respective areas of responsibility. Modifying one’s conduct has the potential to facilitate the development of ethically aware relationships within the broader global community. Manufacturers will be obligated to adopt environmentally sustainable business practices as a result of widespread adoption of legislative measures, regulatory frameworks, and internal corporate objectives. Organizations may potentially achieve financial benefits by adopting environmentally sustainable practices across several domains, such as

reducing labor expenses, enhancing transportation efficiency, and expediting material procurement. Contemporary technologies, methodologies, and repositories of information have the potential to optimize manufacturing processes, resulting in enhanced precision and, ultimately, an improved end product of superior quality. Ali (2022) posits that the use of green supply chain strategies by organizations has the potential to enhance their reputation and facilitate the achievement of their environmental performance goals.

In their study, Zhu and Sarkis (2004) performed an investigation of several GSCM techniques that are potentially used by enterprises operating in China. The field of GSCM has been the subject of scholarly investigation, with researchers also examining the areas of quality control and Just-in-Time (JIT) manufacturing. The scholarly research done by Hervani et al. (2005) is strongly suggested for gaining a comprehensive comprehension of the difficulties associated with assessing the efficacy of GSCM. The findings suggest that Chinese automotive supply chain enterprises have a strong intrinsic drive to embrace GSCM. The prevalence of GSCM implementation in many industries serves as a testament to the existence of this phenomenon. The concerns pertaining to commercial and regulatory issues inside companies are progressively exerting a discernible influence on consumers. By using the ISM framework, a model was developed with the objective of facilitating the dissemination of environmentally responsible supply chain management techniques. The recognition of case studies as a significant addition to the advancement of knowledge in this field has been well-established. The study conducted by Eltayeb et al. (2011) indicates that the adoption of green supply chain solutions has positive outcomes for society, the economy, and the environment. According to Zailani et al. (2012) and Ashby et al. (2012), the evaluation of GSCM approaches is conducted by examining their effects on employee satisfaction, customer loyalty, and brand reputation, with a focus on social performance.

2.2. Empirical of past studies

In contrast to prioritising considerations of cost, quality, or environmental impact, GSCM strategies emphasise the growth of future management, product development, and technical capabilities (Lee and Klassen, 2008). When there is a higher level of cooperation or support activities, customers are more likely to view suppliers as partners rather than independent contractors, according to Nyaga et al. (2010). Acquiring this knowledge strengthens the connection between the two individuals. Suppliers perceive customer cooperation and engagement in the form of technical support, education, and training as indications of commitment and collaboration (Krause et al., 2007). Thus, by utilising social capital, the implementation of GSCM techniques may be facilitated. It is imperative to foster strong supplier relationships in order to maximise the efficiency of supply chain management, which necessitates the synchronisation of numerous critical processes. Baraniecka (2016) asserts that social capital is an indispensable factor in reducing both economic and social volatility (**Table 1**).

Sustainability within the realm of business refers to the ever-evolving condition in which an organisation reliably produces value for its shareholders and stakeholders.

Sustainable value is produced when an organisation exceeds anticipated levels of customer satisfaction, increases shareholder profits, and optimises its operations in a manner that benefits the environment and society at large. An analysis of Dunphy's (2011) sustainability concept. The business opportunity entails improving the organization's capacity to aid individuals, fostering the reestablishment and sustainability of the planet's biosphere, protecting a wide range of life forms, bolstering societal resilience to substantial challenges, and guaranteeing the comfort, liberty, and active engagement of individuals in shaping the current and future world. Promoting progressive and inventive organisational cultures is an essential component in facilitating the shift towards more environmentally conscious business methodologies. The cultures and communities in question experience positive effects on society, the economy, and the environment through the efficient allocation of resources (Dunphy, 2011). Organisations have the ability to procure financial and human resources through their social networks. Insufficient social capital can be characterised as a dearth of robust engagement between the internal and external stakeholders of the organisation. In contrast, through personal connections, actors can foster camaraderie and a sense of shared comprehension (Tsai and Ghoshal, 1998). As a result, organisations can simultaneously safeguard positive financial outcomes and augment their social capital. An abundance of research has demonstrated a correlation between performance and social capital, encompassing both positive and negative aspects (Park and Luo, 2001; Rowley, et al., 2000). A consistent body of research has demonstrated that social capital and enduring performance are positively correlated. The available research indicates that social capital has a substantial impact on the sustainability of an organisation over an extended duration.

2.3. Research hypothesis

The objective of this study was to acquire knowledge on the interconnections between GSCM activities and other supply chain operations. Several studies have examined several solutions for GSCM. For instance, Ninlawan et al. (2010), Green et al. (2012), Lee et al. (2012), Laosirihongthong et al. (2013), and Thoo et al. (2014) have contributed to this body of study. Zhu et al. (2005) highlighted four fundamental components of GSCM. The areas of focus in this study were internal environmental management, external GSCM, eco-design, and investment return. The study conducted by Holt and Ghobadian (2009) provided a comprehensive list of essential stages involved in the implementation of GSCM. This area encompasses several aspects such as logistics, supplier assessment, green logistics and procurement policy formulation, supplier education and mentoring, and the building of industrial networks. The implementation of green buying, manufacturing, distribution, and logistics is considered to be of utmost importance in the field of GSCM, as highlighted by Ninlawan et al. (2010) and Thoo et al. (2014). It is widely acknowledged throughout many industrial sectors that the implementation of these measures is crucial for enhancing sustainable performance. GSCM encompasses several strategies and practices aimed at addressing environmental concerns inside an organization. In their study, Green et al. (2012) put forward several solutions, including internal environmental management, green information systems, green procurement, customer

interaction, eco-design, and investment recovery, as potential approaches to implementing GSCM. Lee et al. (2012) claim that GSCM encompasses many corporate and operational practices, such as internal environmental management, green procurement, customer engagement, and eco-design. Thoo et al. (2015) conducted an assessment of GSCM systems, focusing on four primary perspectives: internal environmental management, green purchasing, green manufacturing, green distribution, and environmental education.

The term "intra-organizational environment management" (IEM) is used to describe the actions undertaken inside an organization to advance environmental sustainability. Numerous scholarly investigations have been conducted on this particular topic. This claim has been substantiated by many studies conducted by Zhu et al. (2005), Ann et al. (2006), Kim et al. (2011), Huang et al. (2012), Kuei and Lu (2013), and Cheng et al. (2014).

H1: There is a positive influence of internal environment management on social performance.

One definition of "green procurement" is "the practice by which a buyer chooses its suppliers with an eye toward the extent to which they share the buyer's commitment to environmental protection and support the buyer's efforts to achieve its environmental objectives" (Paulraj, 2011). What we call "green procurement" is the process of selecting vendors for an organization after carefully weighing their technical, environmental, and social qualifications. In the research, the 3Rs (reuse, recycle, and reduce) play a crucial role in the green procurement process for paper and component containers (such as plastic bags and cartons). The survey also highlights the need of doing things like emailing purchase orders to cut down on paper use. Essential parts of the green procurement process include eco-labelling items, validating suppliers' environmental compliance certification, and auditing suppliers' internal environmental management (Ninlawan et al., 2010; Lee et al., 2012).

H2: There is a positive influence of green procurement on social performance.

According to the study conducted by Green et al. (2012) and Lee et al. (2012), a firm may be deemed environmentally sustainable if it offers items that possess the characteristics of easy reusability, recyclability, and recoverability. The concept of "green manufacturing" pertains to a production approach that incorporates environmental concerns across all stages of the manufacturing process. The proposed strategy included a reduction in the use of detrimental chemicals, an enhancement in the efficiency of lighting and heating systems, a broader implementation of the principles of reduce, reuse, and recycle (3Rs), and a decrease in the amount of waste disposed of in landfills (Ninlawan et al., 2010).

H3: There is a positive influence of green manufacturing on social performance.

Various strategies may be used to mitigate the environmental impact of green distribution methods. These techniques include several strategies, such as reducing package number, using recyclable or reusable materials, standardizing supplier packaging, and enhancing the visibility of returnable packing. According to a study conducted by Holt and Ghobodian (2009), the use of recyclable pallets has the potential to reduce material usage, unpacking time, and warehouse energy consumption.

H4: There is a positive influence of green distribution on social performance.

The recognition of the need of green environmental education for the advancement of humanity and the promotion of inclusivity in a sustainable society is generally acknowledged. In order for environmental education to have success, it must fulfill two primary goals. The first stage involves delivering thorough training sessions to all employees on the company's environmental strategy. Cankaya and Sezen (2018) believe that the process of modifying one's own behaviors has the potential to enhance global order and foster a sense of responsibility.

H5: There is a positive influence of environmental education on social performance.

2.4. Brief description of variables

Table 1. Main variables in analysis model.

Factors	Items	Code	Sources
Internal Environment Management	Commit GSCM from senior managers	IEM1	Zhu et al. (2008); Huang et al. (2012); Kuei et al. (2013); Cheng et al. (2014); Feng et al. (2015)
	Support to GSCM from mid-level managers	IEM2	
	Establish cross-functional cooperation team	IEM3	
	Take criteria to measure green quality	IEM4	
Green Procurement	Ensure suppliers meet their environmental objectives	GP1	Rao and Holt (2005); Min and Galle (1997); Zhu et al. (2008); Salam (2009)
	Require suppliers to have ISO 14000	GP2	
	Purchase materials with green attributes	GP3	
	Purchase equipment that saves energy	GP4	
	Purchase goods with eco-labeling	GP5	
Green Manufacturing	Ensure product have recyclable contents	GM1	Al-Sheyadi et al. (2019); Schmidt et al. (2017); Rao and Holt, (2005); Zhu and Sarkis, 2004; Carter et al. (2000)
	Minimize the use of materials in packaging	GM2	
	Encourage reuse of products and recycled materials	GM3	
	Use Life Cycle Assessment to evaluate environmental load	GM4	
Green Distribution	Recyclable whether reusable package or containers in logistics	GD1	Cankaya and Sezen (2018)
	Reuse of valuable components of an end-of life product	GD2	
	Select a method about cleaner transportation	GD3	
	Use routing systems to reduce travel activity	GD4	
	Identify defective merchandise to reuse	GD5	
Environmental Education	Participate in non-government and government subsidized program about GSCM and sustainability	EE1	Cankaya and Sezen (2018)
	Participate training courses on GSCM and sustainability for executives	EE2	
	Participate training courses on GSCM and sustainability for managers and members	EE3	
Social Performance	Increase social and environmental responsibility	SP1	Zailani et al. (2012); Ashby et al. (2012)
	Increase organizational capability	SP2	
	Increase employees' motivation, health and safety	SP3	
	Increase customer interest and satisfaction from green products	SP4	
	Create trust to society or public	SP5	
	Get government support for enforcement	SP6	

Source: Field survey data by authors, 2023.

3. Methodology

3.1. Data collection

The initial research collected 630 samples in the Can Tho area in Vietnam and then eliminated 104 samples that did not meet the requirements due to insufficient and incomplete information provided by the surveyor. Purposive sampling was used to select due respondents. to their in-depth knowledge and involvement in execution and strategy formulation with regard to issues related to supply chains and logistics. All selected students had experienced courses such as supply chain management, global procurement, logistics, and omni-channels. Walks in follow-ups were made to classes to be collected by QR codes in 10 weeks (from 1 November 2022, to 15 January 2023). After ten weeks of data collection, 526 questionnaires were retrieved, representing an 85% response rate, which was considered appropriate for data analysis. The questionnaire was composed of two sections, along with a section on the control variables. Control variables considered as categorical measures included sex, age, and educational level. The two main sections were rated on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree. This study had a sample size of 526 economics university students surveyed. The above-mentioned students were positive engaged in pursuing academic degrees in a variety of fields, such as business administration, international business, hotel management, multimedia, and communications. The study used purposive sampling such as a method for selecting participants The experimental design of this study was a survey design. Researchers developed a questionnaire to collect data from economics students in Vietnam. The questionnaire included questions about students' perceptions of GSCM and SP. This experimental design was appropriate to the aims of the study. The study aims to investigate the impact of GSCM on SP through the perspective of economics students. The survey design allowed researchers to collect data from a large group of students, which increased the reliability of the study results.

The first 27 survey questions were specifically crafted to assess the efficacy of the Green Supply Chain Management (GSCM) approach. The examination consisted of a total of nine questions, with four focusing on internal environmental management, five on green procurement, four on green manufacturing, five on green distribution, and three on environmental education. The parameters were fine-tuned using prior research conducted by Xie and Breen (2012), Ghobakhloo et al. (2013), Dadhich et al. (2015), and Bu et al. (2020). During the second phase, an assessment tool consisting of a series of six questions was used to examine the social dimension of sustainability.

3.2. Analysis method

Structural Equation Model (SEM) is a hybrid methodology that considers elements from both factor and regression analyzes. Nevertheless, in contrast to the regression model, the Structural Equation Model (SEM) is predicated on the covariance matrix and uses a confirmatory method to evaluate research hypotheses in a unified procedure by modelling complicated interactions among a large number of observable and latent variables. In addition, SEM analyzes the observed variables to determine the measurement errors as well as the correlations between the errors. In

contrast to the regression model, which can only identify direct impacts, the structural equation model can identify both direct and indirect influences. Cronbach's alpha test is the first stage in the SEM analysis process, followed by numerous further procedures that culminate in the generation of SEM estimations. In the first step of the process, the reliability of the newly developed scale was assessed using Cronbach's alpha. In the second stage, Exploratory Factor Analysis (EFA) was conducted to select eligible items for inclusion in the models and to exclude items whose factor loadings were lower than 0.5.

The most notable aspect of the third step was Structural Equation Modeling (SEM) estimation, which involved an iterative process based on theoretical and empirical analyzes to obtain a structural model fit. This was done to evaluate the rationality of the fundamental multidimensional constructs. The SEM evaluates not only the measurement model but also the structural model. Confirmatory factor analysis will make use of the measurement model to establish the nature of the link between latent variables and observable variables. Hence, in the event that the model fit indices are poor, testing the structural model will not be guaranteed (Dursun and Kocagoz, 2010). This helps narrow the gap between a confirmatory strategy, in which only one model is tested, and an exploratory approach, in which several models are tried (Garetti and Taisch, 2009). Statistics such as the chi-square fit test index (CMIN/DF), Tucker-Lewis index (TLI), goodness-of-fit index (GFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA) were included in the indicator developed by Yu et al. (2013) to evaluate how well a model fits its data. Finally, the structural model is evaluated to establish the nature of the connection between the endogenous variable (sustainability performance) and the exogenous factors (GSCM). The software packages SPSS 22.0, and AMOS 22.0, were used to process the collected data.

4. Result and discussions

In their study, Wang and Rhemtulla (2021) used advanced statistical techniques, such as Structural Equation Modeling (SEM), with other contemporary approaches, to conduct a comprehensive analysis of the interrelationships among several variables. The researchers used the widely utilized research software program AMOS.22 and employed the Structural Equation Modeling (SEM) approach. The ideas proposed by the research group were subjected to experimental testing and evaluation, using the methodology described before. Confirmatory Factor Analysis (CFA) and other statistical methodologies were used to evaluate the accuracy and reliability of the assertions. **Table 2** displays the degree of conviction and confidence associated with each concept. The Cronbach's alpha coefficients demonstrate a significant level of internal consistency for the constructs of internal environmental management, green purchasing, green manufacturing, green distribution, environmental education, and economic performance. The constructs of internal environmental management, green buying, green manufacturing, green distribution, environmental education, and economic efficiency have a high level of internal consistency, as shown by the Alpha Cronbach scores ranging from 0.82 to 0.93. De Leeuw et al. (2019) found that Alpha

Cronbach values over 0.7 are indicative of strong dependence between latent and observable variables.

Table 2. Factor loading and the Cronbach's alpha estimates.

Internal environment management (Cronbach's Alpha)		**0.836**
IEM1	Commit GSCM from senior managers	0.783
IEM2	Support to GSCM from mid-level managers	0.785
IEM3	Establish cross-functional cooperation team	0.786
IEM4	Take criteria to measure green quality	0.816
Green procurement (Cronbach's Alpha)		**0.930**
GP1	Ensure suppliers meet their environmental objectives	0.916
GP2	Require suppliers to have ISO 14000	0.915
GP3	Purchase materials with green attributes	0.911
GP4	Purchase equipment that saves energy	0.912
GP5	Purchase goods with eco-labeling	0.915
Green manufacturing (Cronbach's Alpha)		**0.828**
GM1	Ensure product have recyclable contents	0.781
GM2	Minimize the use of materials in packaging	0.775
GM3	Encourage reuse of products and recycled materials	0.755
GM4	Use Life Cycle Assessment to evaluate environmental load	0.818
Green distribution (Cronbach's Alpha)		**0.911**
GD1	Recyclable whether reusable package or containers in logistics	0.899
GD2	Reuse of valuable components of an end-of life product	0.896
GD3	Select a method about cleaner transportation	0.893
GD4	Use routing systems to reduce travel activity	0.888
GD5	Identify defective merchandise to reuse	0.880
Environmental education (Cronbach's Alpha)		**0.907**
EE1	Participate in non-government and government subsidized program about GSCM and sustainability	0.871
EE2	Participate training courses on GSCM and sustainability for executives	0.856
EE3	Participate training courses on GSCM and sustainability for managers and members	0.871
Social Performance (Cronbach's Alpha)		**0.820**
SP1	Increase social and environmental responsibility	0.786
SP2	Increase organizational capability	0.783
SP3	Increase employees' motivation, health and safety	0.785
SP4	Increase customer interest and satisfaction from green products	0.781
SP5	Create trust to society or public	0.827
SP6	Get government support for enforcement	0.785

Source: Field survey data by authors, 2023.

The results shown in **Table 3** demonstrate that the factor loadings exhibit statistical significance, as indicated by a p-value of less than 0.5. The established range is considered to be within acceptable boundaries according to the academic research conducted by Al-Lozi et al. (2018) and Sung et al. (2019). The study conducted by Rimkeviciene et al. (2017) used a comparative approach using covariance structural

equation modeling (SEM) in order to examine the concept of discriminant validity. The appropriateness of the factor analysis of the scale was evaluated by conducting the Kaiser-Meyer-Olkin (KMO) test on the relationship performance measures. All the aggregated figures were determined to exceed the threshold of 0.5. Kaiser-Meyer-Olkin (KMO) ratings beyond 0.5 are indicative of statistical significance. In the present study, the obtained KMO score was 0.871, thereby meeting the criterion for statistical significance. Elements with eigenvalues above the threshold of 1.176 were also eliminated. The assessment of the interrelationships among the observed variables inside the factor necessitates the use of Bartlett's test of sphericity. The Bartlett's test indicates a statistically significant correlation among the variables inside the factor ($p < 0.05$, $\chi^2 = 0.00$). The factor loading coefficient is a statistical measure used to assess the degree of correlation between two variables within the field of statistics. All seven parameters exhibited loadings with values above 0.60. According to a study conducted by Yu et al. (2013), it has been shown that loading factors equal to or above 0.50 are deemed suitable. The means for each multivariate construct were computed at the completion of data collection. The appropriate distribution of items among the specified dimensions, in accordance with the results obtained from the Exploratory Factor Analysis (EFA), is of utmost importance in order to adhere to the requirements of the Structural Equation Modeling (SEM) framework.

Table 3. Scale of factors and test parameters in exploratory factor analysis (EFA).

Items	Factors							
	F1	F2	F3	F4	F5	F6	F7	F8
IEM1	0.830							
IEM3	0.772							
IEM2	0.769							
IEM4	0.671							
GP3		0.876						
GP4		0.870						
GP2		0.854						
GP1		0.846						
GP5		0.840						
GM3			0.840					
GM2			0.738					
GM1			0.734					
GD5				0.891				
GD4				0.858				
GD3				0.842				
GD2				0.836				
GD1				0.807				
EE2					0.841			
EE3					0.819			
EE1					0.811			
SP2						0.771		

Table 3. (*Continued*).

Items	Factors							
	F1	**F2**	**F3**	**F4**	**F5**	**F6**	**F7**	**F8**
SP3						0.762		
SP4						0.759		
SP1						0.757		
SP6						0.729		
Parameters of test								
Kaiser-Meyer-Olkin (KMO)						0.871		
Cumulative % (Initial Eigenvalues)						70.901%		
Bartlett's Test of Sphericity (Sig.)						0.000		
Initial Eigenvalue						1.077		

Source: Field survey data by authors, 2023.

The present study assessed the varied validity of the measures by using the methodologies described by Khan et al. (2020). In order for this strategy to be effective, it is necessary for the *r*-squared value of the extracted average variance (AVE) to be lower than the correlation observed between any two concepts. The whole of the data is shown in **Table 4**. The average extracted variance (AVE) may be calculated by taking the square root of the diagonal elements. The results indicate that the square root of the average variance extracted (AVE) is 0.675%, which is the lowest diagonal value. It should be noted that the summation of any diagonal element exceeds the correlation between any two variables. The basis for this phenomenon is established by the inverse relationship between the greatest correlation value (r = 0.673) and the minimum value on the diagonal. All the altered terms in this study exhibit distinct characteristics and serve as indicators of various cognitive approaches.

Table 4. Discriminant validity.

	CR	**AVE**	**MSV**	**MaxR (H)**	**EE**	**GP**	**GD**	**IEM**	**GM**
EE	0.777	0.585	0.354	0.908	**0.765**	-	-	-	-
GP	0.905	0.627	0.354	0.931	0.595	**0.792**	-	-	-
GD	0.860	0.555	0.116	0.921	0.235	0.159	**0.745**	-	-
IEM	0.783	0.456	0.466	0.843	0.383	0.139	0.340	**0.675**	-
GM	0.695	0.458	0.466	0.829	0.336	0.100	0.245	0.673	**0.677**

Source: Field survey data by authors, 2023.

A *p*-value of 0.000 ($p < 0.01$) obtained from the statistical analysis provides compelling evidence to reject the null hypothesis. The chi-square test conducted to assess the integrity and robustness of the study's structural model resulted in a score of 1289.551, with 283 degrees of freedom. The model's validity is supported by both the good fit index (GFI) score of 0.900 and the obtained analytical result of 0.925. All of these indicators have significant importance. The Tucker-Lewis index (TLI) obtained in this study is 0.959, surpassing the established threshold of 0.900. Similarly, the comparative fit index (CFI) achieved a value of 0.964, exceeding the cutoff of

0.900. Additionally, the root mean square error of approximation (RMSEA) yielded a value of 0.044, falling below the threshold of 0.080. Consequently, this study satisfies the specified criteria. The study conducted by Hair et al. (2009) offers evidence supporting the validity and consistency of the research paradigm. The collected data is shown in **Table 5**.

Table 5. Model fit indicators in SEM.

Indicators	Cut-off values	Calculated values	Conclusion
Chi-square	≤ 2793.800	567.257	Fit
df	≤ 300.000	283.000	Fit
Chi-square/df	≤ 5.000	2.004	Fit
CFI	≥ 0.900	0.964	Fit
GFI	≥ 0.900	0.925	Fit
TLI	≥ 0.900	0.959	Fit
RMSEA	≤ 0.080	0.044	Fit

Source: Field survey data by authors, 2023.

Regression analysis and the correlation coefficient were used to quantify the impact of Green Supply Chain Management (GSCM) on economic efficiency. The correlation between Green Supply Chain Management (GSCM) methodologies and the achievement of social performance criteria is shown in **Table 6**. Multiple studies have shown that the implementation of Green Supply Chain Management (GSCM) has a positive impact on societal performance. The diverse outcomes may be succinctly summarized as follows: The first hypothesis testing yielded findings indicating a positive correlation between the management of the internal environment and social performance (β = 0.115, critical ratio = 1.488, $p < 0.10$). The statistical analysis revealed a substantial association between social performance and eco-friendly purchasing (r = 0.244, t = 5.434, $p < 0.1$). Both H1 and H2 have consented to participate in the interview. The values indicating the importance of eco-friendly production (−0.080, CR = −1.392, $P > 0.1$), distribution (−0.013, CR = −0.352, $P > 0.1$), and education (−0.039, CR = −3.073, $P > 0.1$) are all shown to be statistically significant at a significance level of 10%. The implementation of GSCM actions H3 and H4 (Reject) is not feasible given the existing data. The present data set does not provide sufficient evidence to accept or reject with negative regression coefficient with $P < 0.1$ in the regression Equation (1).

Table 6. Final Estimates of the relationship between GSCM and Economic Performance (EP).

Relationship	Estimate β	S.E	C.R	*P*-value	Hypothesis	Hypothesis Result
SP ← IEM	0.115	0.077	1.488	0.097	H1	Accepted
SP ← GP	0.244	0.045	5.434	***	H2	Accepted
SP ← GM	−0.080	0.058	−1.392	0.164	H3	Reject
SP ← GD	−0.013	0.038	−0.352	0.725	H4	Reject
SP ← EE	−0.161	0.052	−3.073	0.002	H5	Not accepted

Source: Field survey data by authors, 2023.

$$EP = 0.244\ GP + 0.115\ IEM - 0.161\ EE \quad (1)$$

Internal environmental management and green procurement have a positive relationship with SP. The findings of the study show that the internal environmental management practices of GSCM contribute to social performance (**Figure 1**). This confirms the findings of Benedict et al. (2022), Febry et al. (2022), and Adnan et al. (2021) that when the activities of internal environmental management are senior managers' commitment, mid-level managers support, cross-functional cooperation teams, and green quality criteria. The findings of the study indicate that the implementation of green procurement practices and internal environmental management systems has a substantial positive impact on many customer-related outcomes, such as customer pride, loyalty, dedication to social principles, and satisfaction.

EE is statistically significant to social performance with a significance level of less than 10%, despite the beta value being negative 0.161 (**Table 6**). It can be seen raising awareness and understanding of green supply chains, actively participating in training programs on green supply chain knowledge, promoting sustainable development organized by the Government and non-governmental organizations position. The training course on production and business management according to green and sustainable supply chains for managers and workers has had a positive impact and improved social efficiency. But with the negative results of this study on economics students, it can be seen that environmental education is often theoretical and lacks practicality. Students learn about the concepts and principles of environmental education environment, but do not practice the skills to apply that knowledge into practice. Environmental education is often taught separately from other subjects. This prevents students from having the opportunity to connect environmental knowledge with other knowledge, thereby making it difficult to form a sense of environmental protection in daily life. So the results of this study are different from the studies by Rizki and Augustine (2022), Adnan et al. (2021). By contrast, green manufacturing and green distribution are not significant and have a positive impact on social performance. Thus, green manufacturing and green distribution do not improve sustainability performance. Similar results have been reported by Febry et al. (2022), Le (2020), and Ardian et al. (2018).

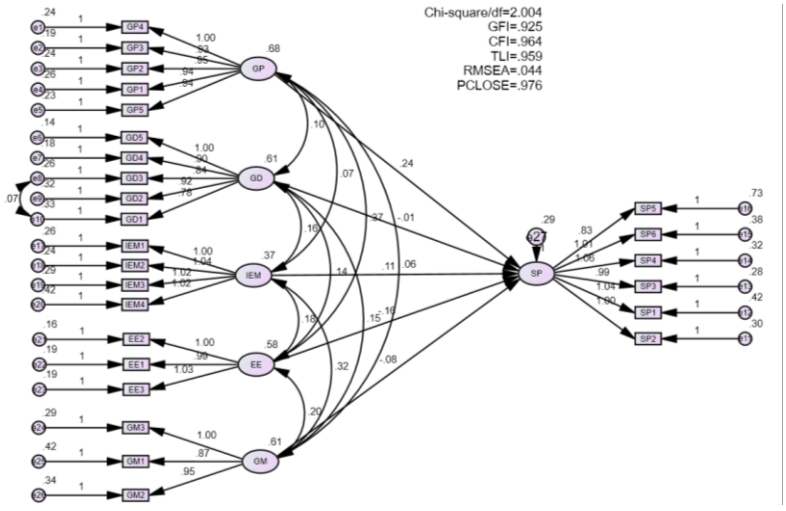

Figure 1. Model SEM of influence of GSCM on social performance.
(Source: Developed by authors).

5. Conclusion

This study focuses on the analysis of the relationship between GSCM factors and social performance. The result shows that IEM and GP have positive influence on social performance. However, EE factor has negative impact on social performance. Moreover, the findings show that there is not the relationship of GM, GD on sustainability performance. This is evidence about poor awareness of economic learners for impact of GM, GD, and EE on social performance. Therefore, university education needs to emphases on vital role of five factors (internal environmental management, green procurement, green manufacturing, green distribution, and environmental education) for social performance. Upgrading awareness of economic learners plays important role in establishing businesspeople, enterprises towards social responsibility, community action, eco-friendly production for sustainability.

The extent to which students' familiarity with the green supply chain and social performance impacts their purchase patterns, career aspirations, and civic involvement exhibits variability. Enhancing students' understanding of sustainable behaviors, circular economies, and social performance is both crucial and advantageous. The findings of this study provide novel perspectives on the potential impact of environmentally responsible supply chain strategies on sustainability performance indicator across diverse contexts. The findings contribute to the existing body of knowledge by demonstrating the incorporation of both types of sustainable performance evaluations in the context of environmentally responsible purchasing. Promoting environmental consciousness among students studying economics is crucial to foster the broad adoption of sustainable consumption practices throughout society.

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