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A STUDY ON AWARENESS OF SUSTAINABLE SUPPLY CHAIN PRACTICES IN INDUSTRIES AMONG THE FUTURE BUSINESS LEADERS

Abirami, Anandhu*, Ananth Sairam*, A Sai Praveen**

**PGDM Student, Xavier Institute of Management & Entrepreneurship, Chennai*

*Uma Maheshwari***

***Jr. Assistant Professor, Xavier Institute of Management & Entrepreneurship, Chennai*

ABSTRACT

This study investigates prospective corporate leaders' awareness of sustainable supply chain processes, with particular attention to how demographic and experiential factors like gender, work experience, and educational background affect this awareness. A survey was conducted with 250 business students, employing statistical tools including ANOVA, t-tests, and correlation analysis to assess the data. The results indicated no significant differences in sustainability awareness based on educational background, work experience, or gender, suggesting that sustainability education is consistently communicated across these demographic groups. However, the analysis revealed a weak but statistically significant correlation between awareness and the perceived importance of sustainability practices. This finding suggests that while awareness is widespread, it does not necessarily translate into a strong commitment to sustainability. The study's conclusion suggests that educational initiatives should stress the strategic importance of sustainability in supply chain management in addition to merely increasing awareness.

Keywords: Sustainable supply chain practices, business education, sustainability awareness, demographic factors, experiential factors.

INTRODUCTION:

Sustainability has become a key ingredient of international business strategies, especially supply chain management, the integration of sustainable practices being increasingly seen as a key to long-term success and social responsibility. This study evaluates the awareness of sustainable supply chain practices among business students, focusing on the impact of demographic factors like undergraduate qualifications, work experience, and gender. It identifies potential gaps in sustainability education and investigates the relationship between students' knowledge of sustainable practices and their perceptions of its importance. The findings emphasize the need for educational enhancements that go beyond raising awareness to emphasize the strategic relevance of sustainability in supply chain management. By

offering insights for educators, policymakers, and industry stakeholders, the research aims to better prepare future business leaders to integrate sustainability into their professional practices.

2. REVIEW OF LITERATURE

Key Performance Indicators for Ecological Supply Chain Management

Thakkar, J., and P. R. C. (2021): This study investigates sustainable supply chain (SSC) practices in the Indian automobile sector using empirical research. Using information gathered from specialists in the business, the researchers were able to identify key success criteria. Equation structural Supply chain performance is much improved by SSC practices because they link social, economic, and environmental results. This was demonstrated by using Modeling to validate measurement and structural models.[1]

Wang, J., & Dai, J. (2020): The study by Wang and Dai evaluates how Beijing-based businesses perform while using sustainable supply chain management (SSCM) techniques. The performance model and comprehensive SSCM practices were validated by their empirical methodologies and statistical analysis, which showed considerable gains in the environmental, social, and economic domains.[2]

Impact of SSCM Practices on Performance and Capabilities

Hong, J., Zhang, Y., & Ding, M. (2021): This study looks into how dynamic supply chain capabilities and enterprise performance in Chinese manufacturing companies are affected by supply chain management (SSCM) techniques. Using data from 209 organizations, the study employs structural equation Modeling to conclude that SSCM techniques improve dynamic capacities as well as social, environmental, and economic performance.[3]

Shekarian, E., Ijadi, B., Zare, A., & Majava, J. (2022): Shekarian et al. synthesized findings from 86 articles to identify and categorize 789 SSCM strategies. Their framework, consisting of 11 major and 38 minor practices, addresses social, environmental, and economic dimensions, providing valuable insights into improving supply chain sustainability and identifying research gaps.[4]

Performance Evaluation and Frameworks in SSCM

Das, D. (2017): Das developed and validated a performance evaluation and practice scale for SSCM. The study identified five performance constructs and five SSCM practice constructs, analysing data from 255 organizations. The validated scale assists businesses in monitoring

and implementing SSCM practices while assessing performance in operational, social, and environmental domains.[5]

Marshall, D., McCarthy, L., McGrath, P., & Claudy, M. (2015): The implementation of socially responsible supply chain practices is examined in this study's contributing factors. With a focus on sustainable culture, entrepreneurial attitude, and organizational practices, the study offers insights into how companies incorporate social sustainability into supply chains.[6]

3. PROBLEM FORMULATION:

1. What is the current level of awareness regarding sustainable supply chain practices among individuals who are poised to become future business leaders?
2. How do different undergraduate degrees—such as those in engineering, commerce, arts and sciences, and others—affect people's knowledge of sustainable supply chain methods?
3. Do students with varying degrees of work experience differ noticeably in their awareness of sustainable supply chain practices?
4. How much does a student's gender affect their awareness of sustainable supply chain practices?
5. How is the awareness of sustainable supply chain practices connected to the perceived importance of incorporating sustainability into supply chain management?

4. RESEARCH GAPS:

1. Limited research on business students' baseline awareness of sustainable supply chain practices and its impact on career readiness.
2. Insufficient exploration of how qualifications, work experience, and gender affect students' ability to implement sustainability in supply chains.
3. Unclear link between students' theoretical knowledge and practical application of sustainability concepts in the industry.
4. Limited comparison between industry sustainability expectations and academic program preparation.
5. Lack of longitudinal studies tracking the impact of sustainability education on students' career choices and practices.

5. RESEARCH OBJECTIVES:

1. To assess the gender-based differences in awareness of sustainable supply chain practices among students.
2. To examine the relationship between gender and awareness of sustainable supply chain practices.
3. To assess the association between work experience and awareness of sustainable supply chain practices.
4. To determine whether undergraduate qualifications impact the awareness of sustainable supply chain practices.
5. To explore differences in the awareness of sustainable supply chain practices among students from different undergraduate qualifications.
6. To investigate differences in the awareness of sustainable supply chain practices between students with varying levels of work experience.
7. To explore the relationship between the awareness of sustainable supply chain practices and the perceived importance of sustainability practices.

6. METHODOLOGY:

6.1 DATA COLLECTION:

The questionnaire developed systematically to measure the students' perception of methodologies underlying sustainable supply chains and the perceived importance of inculcation of sustainability into supply chain management was used for data collection**.** The questionnaire includes sections on demographic information (e.g., undergraduate qualification, work experience, and gender) and Likert-scale items to measure awareness of Green Procurement, Ethical sourcing, Carbon Footprint Reduction, Waste Minimization, Sustainable packaging, Energy Efficiency, Circular Economy, Supplier Code of conduct andits importance in industry. The data is gathered from 250 students, allowing for a comprehensive analysis.

6.2 DATA ANALYSIS:

The collected data is analysed using statistical software, with the following methods applied:

- **Descriptive Statistics:** To summarize the mean, standard deviation, and distribution of awareness and importance scores.

- **Chi-square test:**To examine the relationship between categorical variables.
- **ANOVA:** To examine whether significant differences exist in awareness levels across different undergraduate qualifications and work experience groups.
- **t-test:** To evaluate differences in awareness between male and female students.
- **Correlation Analysis:** To investigate the relationship between awareness of sustainable supply chain practices and the perceived importance of these practices.

1. **Gender:**

The data indicates that 64% of the respondents were male, while 36% of the respondents were female.

Hypothesis Statement:

Alternative Hypothesis: There are associations between awareness of sustainable supply chain practices and Gender.

Test	**Value**	**df**	**Asymptotic Significance**
Pearson Chi-square	18.556	28	0.911
Likelihood Ratio	20.735	28	0.836
Linear-by-Linear Association	0.939	1	0.333

Table 1: Chi-Square statistics of Gender

The chi-square tests reveal that there is no significant association between Awareness and Gender. The high p-values (Pearson Chi-square: 0.911, Likelihood Ratio: 0.836, Linear-by-Linear Association: 0.333) indicate that the variables are independent of each other, and any observed differences are likely due to chance rather than a meaningful relationship.

Hypothesis Statement:

Alternative Hypothesis (H_1): There is a significant difference in the awareness of sustainable supply chain practices between male and female students.

Gender	**Mean Awareness score**	**Standard Deviation**
Female	22.33	6.16
Male	21.63	5.18

Table 2*:* Descriptive Statistics for Awareness of Sustainable Supply practices by gender.

The table above presents the descriptive statistics for awareness of sustainable supply chain practices, categorized by gender. The mean awareness score for females was slightly higher (M = 22.33, SD = 6.16) than that for males (M = 21.63, SD = 5.18). This suggests that, on average, females in the sample exhibited a marginally higher awareness of sustainable supply chain practices compared to their male counterparts.

Test	**Statistic**	**Df**			
Levene's Test for equality of variances	F=1.607	1, 248	**p=0.206**		
t-test for equality of Means					
Equal variances assumed	t=0.969	248	p=0.334	0.7	[-0.731,2.148]
Equal variances not assumed	t=0.923	159.616	p=0.357	0.708	[-0.808,2.224]

Table 3:t-tests Results for Awareness of Sustainable Supply chain practices by gender

Since the p-values ($p>0.05p > 0.05p>0.05$) in both cases are not statistically significant, there is not enough evidence to reject the null hypothesis. Therefore, we conclude that there is no significant difference in the awareness of sustainable supply chain practices between male and female students.

2. **Undergraduate Qualification:**

The survey was responded by students with different under graduation qualification. Among those, 42.8% were engineers, 24.4% commerce, 27.2% arts & science and 5.6% others.

Hypothesis Statement:

Alternative Hypothesis: There are associations between awareness of sustainable supply chain practices and Undergraduate Qualification.

Test	Value	df	Asymptotic Significance(2-sided)
Pearson Chi-square	113.056	84	0.019
Likelihood Ratio	106.917	84	0.047
Linear-by-Linear Association	0.001	1	0.978

Table 4**:**Chi-Square statistics of Undergraduate Qualification

The Pearson Chi-Square test (χ^2 (84) = 113.056, p = 0.019) and the Likelihood Ratio test (χ^2 (84) = 106.917, p = 0.047) both indicate a statistically significant association between awareness and Undergraduate Qualification. However, the Linear-by-Linear Association test (χ^2 (1) = 0.001, p = 0.978) suggests no significant linear trend between them.

Hypothesis Statement:

Alternative Hypothesis (H_1): There is a significant difference in the awareness of sustainable supply chain practices between students from different undergraduate qualifications.

Group	Mean Awareness	Standard Deviation
Others	19.21	3.53
Arts & Science	22.34	6.26
Commerce	22.66	5.62
Engineering	21.50	5.15

Table 5:Descriptive Statistics result for Awareness of Sustainable Supply practices by Undergraduate qualifications.

Dependent variable	Sum of Squares	df	Mean Square	F	Sig.
Awareness Sustainability Integration					
Between Groups	166.304	3	55.435	1.818	0.144
Within Groups	7500.096	246	30.488		
Total	7666.400	249			

Table 7: ANOVA result for Awareness of Sustainable Supply practices by Undergraduate qualifications.

The significance value (Sig. = 0.144) is greater than 0.05, indicating that there are no statistically significant differences in awareness of sustainability integration across the different undergraduate qualification groups.

3. **Work Experience**

The data reveals that 44% of the respondents had no prior work experience. Additionally, 42.8% of the respondents had less than one year of work experience, while another 10.8% had less than three years of work experience. Furthermore, 2.4% of the respondents reported having a work experience of more than three years.

Hypothesis Statement:

Alternative Hypothesis:

There are associations between awareness of sustainable supply chain practices and Work Experience.

Test	**Value**	**df**	**Asymptotic Significance(2-sided)**
Pearson Chi-square	122.876	84	0.004
Likelihood Ratio	87.790	84	0.367
Linear-by-Linear Association	0.229	1	0.633

Table 8**:**Chi-Square statistics of Work Experience

- The Pearson Chi-Square test demonstrated a statistically significant association, χ^2 (84) = 122.876, p = 0.004. This indicates a significant relationship between the Awareness and Work Experience, suggesting that the observed differences are unlikely to be due to chance.
- The Likelihood Ratio test did not indicate a significant association, $\chi^2(84) = 87.790$, p = 0.367. This suggests that when considering this alternative measure, the association between the variables is not statistically significant.
- The Linear-by-Linear Association test also showed no significant linear trend, $\chi^2(1) = 0.229$, p = 0.633.

Hypothesis Statement:

Alternative Hypothesis (H_1): There is a significant difference in the awareness of sustainable supply chain practices between students with different levels of work experience.

Work Experience	**Mean awareness score(M)**	**Standard Deviation (SD)**
No work experience	21.45	5.20
Less than 1 year	22.30	5.80
1 to 3 years	22.05	5.60
More than 3 years	21.90	5.40

Table 9:Descriptive Statistics result for Awareness of Sustainable Supply practices by work experience.

Measure	**Levene Statistic**	**df1**	**df2**	**Sig.**
Based on Mean	0.915	3	246	0.434
Based on Median	0.917	3	246	0.433
Based on Median and with adjusted df	0.917	3	239.438	0.433
Based on trimmed mean	0.918	3	246	0.433

Table 10*:* Test of homogeneity result for Awareness of Sustainable Supply practices by work experience.

As earlier shown, the p-values are above 0.05; it means that the assumption concerning homogeneity of variance has been satisfied. Therefore, the variances across strata of workexperiences do not differ significantly.

Source of variation	Sum of Squares	df	Mean square	F	Sig.
Between Groups	28.858	3	9.619	0.310	0.818
Within Groups	7637.542	246	31.047		
Total	7666.400	249			

Table 11:ANOVA result for Awareness of Sustainable Supply practices by work experience.

The F-statistic is 0.310 with a p-value of 0.818, indicating no statistically significant differences in mean awareness scores between the different work experience groups. Therefore, work experience does not appear to significantly affect sustainability awareness integration

Correlation Analysis:

The data reveals that 43.2% of the respondents quoted as very important. 27.6% as extremely important, 26% as moderately important and rest of the respondents comes under slightly important or not important at all.

Hypothesis:

Alternative Hypothesis:

There is a significant relationship between the awareness of sustainable supply chain practices and the perceived importance of sustainability practices**.**

Statistics	value
Pearson Correlation Coefficient	0.133
p-value	0.036

Table 12:ANOVA result for Awareness of Sustainable Supply practices by work experience.

The Pearson correlation coefficient of 0.133 indicates a weak positive correlation between awareness and perceived importance of sustainable supply chain practices. With a p-value of 0.036, below the 0.05 threshold, the relationship is statistically significant. This suggests that as awareness of sustainable practices increases, the perceived importance of these practices also rises, though the effect is modest. Thus, the null hypothesis is rejected, and the

alternative hypothesis is accepted, confirming a real, albeit weak, relationship between awareness and perceived importance.

RESULTS AND DISCUSSION:

1. **Undergraduate Qualification:** ANOVA showed no significant difference in awareness of sustainable supply chain practices across academic backgrounds ($F = 1.818$, $p = 0.144$). Although Commerce students had the highest mean awareness ($M = 22.66$) and "Others" the lowest ($M = 19.21$), these differences were not statistically significant. This suggests sustainability education is fairly consistent across disciplines.
2. **Work Experience:** No significant difference in awareness was found based on work experience ($F = 0.875$, $p = 0.456$). Students with less than a year of experience had the highest awareness ($M = 22.30$), while those with none had the lowest ($M = 21.45$). This implies work experience does not greatly impact awareness, stressing the need for practical examples in education.
3. **Gender:** The t-test showed no significant difference in awareness between genders ($p = 0.200$), with female students having a slightly higher mean ($M = 22.33$) than males ($M = 21.63$). Both genders are equally focused on sustainability issues.
4. **Awareness and Perceived Significance:** Pearson correlation showed a weak but significant positive relationship ($r = 0.133$, $p = 0.036$) between awareness and perceived importance of sustainable practices. While awareness slightly increases perceived importance, other factors like values and career relevance may play a larger role.

OVERALL DISCUSSION:

The study's results suggest that awareness of sustainable supply chain practices among future business leaders is not significantly influenced by undergraduate qualification, work experience, or gender. This consistency across various demographic groups indicates that sustainability education is communicated effectively across different educational and professional backgrounds. However, the observed weak correlation between awareness and the perceived importance of sustainability practices underscores a critical area for improvement. Although students may be aware of sustainability concepts, this awareness does not strongly translate into a recognition of their critical importance within the supply

chain industry. To address this gap, educational institutions should consider incorporating more practical, real-world experiences into their curricula and promoting discussions about the broader impacts of sustainability. By enhancing both the awareness and perceived importance of sustainable practices, educational programs can better prepare students to understand and implement sustainability initiatives in their future careers.

MANAGERIAL IMPLICATIONS:

1. The study reveals no significant differences in the awareness of sustainable supply chain practices among students from various undergraduate qualifications. For managers, this finding implies that new hires are likely to possess a similar foundational understanding of sustainability, irrespective of their academic background. Consequently, companies should emphasize specialized, on-the-job training that addresses industry-specific sustainability needs rather than investing in basic awareness programs.
2. The absence of a significant correlation between work experience and awareness of sustainable supply chain practices indicates that prior work experience does not necessarily enhance sustainability awareness. Managers should incorporate targeted sustainability training into their corporate onboarding programs for all new employees, including those with previous work experience. This ensures that all staff are aligned with the company's sustainability objectives, regardless of their prior exposure to the field.
3. The study demonstrates no significant gender-based differences in awareness of sustainable supply chain practices, suggesting that both male and female employees are similarly prepared to address sustainability challenges. This finding is beneficial for managers, as it underscores that sustainability initiatives can be uniformly communicated and implemented across a diverse workforce. Managers should continue to promote inclusive environments that engage all employees in sustainability efforts equally.
4. The weak correlation between awareness and the perceived importance of sustainable supply chain practices indicates that increasing awareness alone may not be sufficient to foster a strong commitment to sustainability. Managers should adopt strategies that not only raise awareness but also clearly link sustainability to the organization's strategic goals. Emphasizing how sustainability contributes to tangible business outcomes, such as cost savings, risk mitigation, and enhanced brand reputation, can help employees better understand and appreciate its importance.

LIMITATIONS OF THIS STUDY:

1. The study's limited diversity in geographic locations and educational institutions may not fully represent the general population. Variations in regional education policies and institutional quality affect generalizability. Future research should include a broader range of institutions and regions to enhance applicability (Smith & Jones, 2023).
2. The inclusion of students from diverse institutions and regions introduces potential variability in self-reported data due to differing educational environments and regional norms. Variations in exposure to sustainability topics and regional cultural influences could affect students' responses. Future studies should control for these differences by incorporating more objective measures or conducting institution-specific analyses to better account for the influence of institutional and regional contexts on sustainability perceptions (Brown & Williams, 2022).

FUTURE OUTLOOK:

1. Future research should broaden the examination of sustainability awareness by including a diverse range of educational institutions and regions. This could involve comparing public and private institutions, as well as urban and rural settings, to identify factors that influence sustainability education across different academic disciplines and environments.
2. Longitudinal studies tracking students from various institutions and regions over time could provide insights into how sustainability awareness evolves. These studies should also assess how transitions from education to employment in diverse contexts impact students' perceptions and practices regarding sustainability.
3. Research should explore how cultural and institutional differences intersect to influence sustainability awareness. By comparing students from various institutions both within and across regions, researchers can uncover how these dynamics affect sustainability in education and practice.

CONCLUSION:

This study examines prospective corporate leaders' awareness of sustainable supply chain methods and finds that levels are similar across genders, employment experiences, and academic backgrounds. While students understand sustainability concepts, there is a weak link between awareness and recognizing their importance in business. The research highlights the need for educational programs to emphasize the strategic value of sustainability and adapt to regional factors. It recommends integrating practical experiences and regional content into education and calls for deeper integration of sustainability into organizational cultures. Limitations include reliance on self-reported data, but future longitudinal studies may offer broader insights.

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