



University of Mumbai

DEPARTMENT OF STATISTICS

Vidyanagari, Mumbai-400 098

CERTIFICATION

This is to certify that the following group of students of MSc Part-II has successfully completed the project “Awareness and Practices Related to Sustainability Among University Students (A Study Aligned with the UN Sustainable Development Goals)” during the academic year 2024-2025.

Team Members:

Flora Machado

Zaiba Sayyed

Riya Chavan

Abdul Ahad

Naresh Lohar

PROJECT MENTOR

Dr. V. U. Dixit

Prof. Sheetal Chabukswar

HEAD OF THE DEPARTMENT

Dr. Santosh P. Gite

ACKNOWLEDGEMENT

We are deeply grateful to the Department of Statistics, University of Mumbai, for providing us with the platform to undertake this research study aligned with the UN Sustainable Development Goals. Our heartfelt thanks to our guide, **Dr. V. U. Dixit**, for her continuous guidance, support, and valuable insights throughout the project. We would also like to thank **Prof. Sheetal Chabukswar** for her encouragement and academic inputs, which enriched our understanding.

This research would not have been possible without the participation of university students who generously shared their views and practices related to sustainability. We extend our gratitude to all the faculty members and staff of the department for their cooperation during various stages of the dissertation. We appreciate the resources provided by the university which aided our data collection and analysis processes. We are also thankful to various digital platforms, social media influencers, and environmental initiatives that inspired the thematic focus of our study.

Lastly, we express our sincere gratitude to everyone who helped us transform this idea into a meaningful academic endeavour.

Your contributions have been instrumental in shaping the outcome of this dissertation.

Thank you all for being part of this important journey.

ABSTRACT

Sustainability is a critical global concern, and the United Nations Sustainable Development Goals (SDGs) offer a comprehensive framework to address interconnected environmental, social, and economic challenges. This research investigates the level of awareness and the sustainability-related practices among university students, aiming to understand how well they align with the principles of the SDGs. The study captures insights into students' knowledge of sustainability, their daily behaviours, and their engagement with sustainability initiatives on campus as well as off campus. The findings reveal a significant gap between awareness and actionable practice, with many students demonstrating general familiarity with sustainability concepts but lacking in-depth understanding of specific SDGs and their practical implications. Although many students say they want to live more sustainably, they face challenges like not enough support from their educational institutions, limited access to resources, and a lack of sustainability topics in their education, which makes it hard for them to take real action. This study highlights the importance of creating awareness programs, adding sustainability topics to the curriculum, and improving university policies to close the gap between what students know and what they do. When universities align their teaching with the SDGs, they can help shape a generation of students who not only understand sustainability but also take action and encourage others to do the same.

INDEX

Sr. No	Title	Pg. No.
1.	Introduction	1
2.	Literature Review	3
3.	Problem Statement	6
4.	Objectives	8
5.	Methodology	9
6.	Result and Discussion	13
	Objective 1	14
	Objective 2	21
	Objective 3	25
	Objective 4	32
7.	Conclusion	39
8.	Suggestions	40
9.	R-code	41
10	References	48
11	Questionnaire	49

INTRODUCTION

Due to escalating environmental degradation, climate change, and resource depletion, the need for sustainable development has become more urgent than ever. Universities play a pivotal role in shaping the minds and values of future leaders, making them crucial platforms for instilling a sense of responsibility toward sustainability. This research project, **"Awareness and Practices Related to Sustainability Among University Students: A Study Aligned with the UN Sustainable Development Goals (SDGs),"** seeks to explore how well university students understand and engage with sustainability in their daily lives. By examining both awareness and practical behaviours, this study contributes to ongoing efforts in promoting sustainability at the grassroots level, ultimately supporting global development agendas. The findings aim to identify knowledge gaps, behavioural patterns, and opportunities for strengthening sustainability education within higher education institutions.

What is Sustainability?

Sustainability refers to meeting the needs of the present without compromising the ability of future generations to meet their own needs. It maintains a balance between environmental protection, economic development, and social equity. In practice, sustainability calls for the responsible use of natural resources, reduction in waste and pollution, and promotion of inclusive and equitable communities. In the context of education, promoting sustainability involves encouraging eco-friendly habits, critical thinking about long-term consequences, and a culture of ethical responsibility. For students, this translates into everyday choices—from reducing plastic use to engaging in community service—that collectively contribute to a more sustainable planet.

Understanding the UN Sustainable Development Goals (SDGs)-

The United Nations Sustainable Development Goals (SDGs), adopted in 2015 as part of the 2030 Agenda for Sustainable Development, comprise 17 interconnected goals aimed at addressing global challenges such as poverty, inequality, climate change, and environmental degradation. These goals provide a comprehensive framework for building a better, more resilient world. For young people, especially university students, the SDGs offer a clear blueprint for action and a vision for the future. Educational institutions are increasingly aligning their curricula and campus initiatives with the SDGs, empowering students to become informed and active participants in achieving sustainable development. This study aligns itself with this global vision by assessing how students perceive and integrate the SDGs into their academic, personal, and social lives.

This study places a particular emphasis on Sustainable Development Goal 12 – Responsible Consumption and Production.

Goal 12 promotes sustainable consumption habits, waste reduction, and mindful use of resources. These are the areas where student behaviours can make a significant impact. This vital goal seeks to ensure that consumption and production patterns are not only efficient but also environmentally friendly, thereby significantly reducing our ecological footprint. By promoting resource efficiency, the aim is to optimize the use of resources throughout their lifecycle, minimize waste, and enhance sustainability in both industrial and household practices.

A key aspect of SDG 12 is the concept of decoupling economic growth from environmental degradation. This means that countries and societies can thrive economically while still protecting their natural resources and ecosystems. The initiative encourages individuals and businesses to achieve more with less, utilizing innovative technologies and methods to reduce the consumption of materials and energy.

Moreover, SDG 12 promotes the adoption of sustainable lifestyles, which involve making conscious choices about consumption habits that have a minimal impact on the environment. This encompasses supporting sustainable practices like responsible sourcing, reducing food waste, and promoting recycling and reuse. By integrating these principles, SDG 12 aspires to build a resilient, sustainable global economy that benefits both people and the planet.

LITERATURE REVIEW

Neelima Jerath (2021) carried out a study at Pushpa Gujral Science City, Punjab, involving school students from both rural and urban areas who visited the Science City during the study period. The objective was to assess their understanding, perception, and behaviour towards the environment and sustainable development, with a specific focus on municipal solid waste management. The study employed a questionnaire-based methodology. Findings revealed that while awareness levels were relatively high, particularly among higher and higher secondary school students, the actual implementation of sustainable practices and participatory engagement was lacking.

Although 80% of respondents acknowledged that municipal solid waste management is a shared responsibility between the government and the public—especially concerning waste reduction and source segregation—over 10% felt they had no role to play at the individual level. Furthermore, 10% of urban respondents stated they had begun waste segregation at home, but stopped due to waste collectors mixing it during collection. Family structure showed no significant influence ($p > 0.05$) on household waste management behavior. Knowledge about the Sustainable Development Goals (SDGs) was alarmingly low, at only 4%. The study did highlight that some government initiatives had successfully reached grassroots levels and helped raise awareness. No notable differences were observed between rural and urban students.

Tanvi Khandhar (2024) sought to examine the buying patterns and decision-making criteria of consumers regarding sustainable products. By analyzing consumer behavior in the Mumbai region, the study aimed to identify the challenges and opportunities involved in promoting sustainable product use. A total of 108 responses were collected through a questionnaire. The results showed that consumers were generally open to paying more and waiting longer for sustainable products. However, major obstacles to broader adoption included higher costs compared to conventional alternatives, limited product availability, and the comfort of sticking to familiar, non-sustainable choices. The study also identified demographic variables such as age and gender as influential in shaping consumer behavior.

A study by Manisha Lineswala, Saumya Singh, and Seema Mishra (2017) aimed to educate students on the role of plastics in everyday life, plastic waste management, and associated environmental concerns. Four out of 14 selected schools participated, involving students aged 12–16 years, both boys and girls. The impact of the training program was evaluated through pre- and post-training questionnaires. Results showed a marked improvement in knowledge following the training. Analysis using a paired t-test indicated a statistically significant difference between pre- and post-training scores across all student groups. The study concluded that such training programs effectively enhance awareness and recommended that similar initiatives on recycling and plastic reuse be introduced more broadly among students.

Tasneem Alsaati, Samir El-Nakla, and Darin El-Nakla (2020) developed and administered a questionnaire across seven universities in the Eastern Province of Saudi Arabia, gathering responses from 500 students from various academic disciplines. The study aimed to assess students' awareness and understanding of sustainability.

While many participants had encountered the term “sustainability” through educational channels, their practical knowledge—especially in identifying recyclable or renewable materials and energy-saving practices—was limited. It was also observed that most students were not actively participating in recycling. Despite this, a significant number reported engaging in sustainable or conservation-oriented behaviors. The study concluded that universities, alongside other institutions such as governments, schools, and municipalities, must collaborate to effectively raise sustainability awareness among students.

The study by I.M. Ridwan, I. Kaniawati, A. Suhandi, A. Samsudin, and R. Rizal (2021) aimed to evaluate the level of sustainability awareness among pre-service physics teachers at a university in Tasikmalaya, with a focus on gender-based analysis. Data was collected using a closed-ended questionnaire. The findings showed a high level of awareness (mean score of 0.77), but students were found to rarely engage in sustainable practices.

Additionally, female students demonstrated slightly higher awareness levels (78.1%) compared to their male counterparts (75.5%). The researchers concluded that while awareness was high, actual implementation of sustainable practices was limited, and students needed to translate their understanding into more effective and consistent actions that support sustainable development.

Arba'at Hassana, Tajul Ariffin Noordina, and Suriati Sulaimana (2010) examined the level of environmental awareness related to sustainable development among secondary school students. The study surveyed 340 Form Four and Form Five students from both urban and suburban schools in Hulu Langat district, Selangor (specifically Bandar Baru Bangi and Mukim Hulu Langat). The dependent variables included environmental awareness, sustainability practices, attitudes, and moral values.

Independent variables such as gender, subject stream, and school location were also assessed. Data were analyzed using SPSS software version 11.5 through descriptive statistics, t-tests, and Pearson correlation. Results revealed a high level of environmental awareness among students. Further, t-test results at a 95% confidence level ($p < 0.05$) indicated significant differences in awareness based on:

(i) gender – with female students showing higher awareness than males,

- (ii) academic stream – with science students scoring higher than arts students,
- (iii) school location – with urban students displaying greater awareness than their suburban counterparts.

The study categorized environmental awareness into emotional understanding, attitudinal orientation, and sustainable practice.

Lintang Auliya Kurdiati and Apit Fathurohman conducted a systematic literature review, analyzing 11 research articles published between 2020 and 2024 that focused on sustainability awareness. The review yielded several key findings:

- (1) Sustainability awareness was addressed in multiple ways, including instruments (7 articles), gender-based comparisons (1 article), and categorized awareness levels (3 articles);
- (2) There were inconsistent trends in research focused on sustainability awareness among Indonesian high school students;
- (3) The geographical distribution of such research was uneven, with several provinces in Indonesia underrepresented.

This review highlighted the need for broader and more balanced studies on sustainability awareness across different regions and populations.

PROBLEM STATEMENT

Despite growing global concern about sustainability and environmental issues, there is limited understanding of how aware students are of sustainable practice and how it is integrated into their daily lives. Environmental challenges such as climate change, pollution, and resource depletion have made it increasingly evident that current patterns of consumption and waste are unsustainable. Many educational institutions focus on promoting sustainability, yet it is not clear whether students are genuinely incorporating sustainable habits and programs into their lifestyles. Some of them do not even know the term sustainability. Eco-friendly practices are either limited or absent altogether. People rely heavily on single-use plastics, waste is often not properly sorted for recycling, and energy is largely consumed from non-renewable sources. As students, we are deeply concerned about the unsustainable lifestyle patterns we see and the lack of awareness about how our everyday choices impact the environment.

Our primary objective is to conduct a thorough evaluation of the effectiveness of sustainability initiatives implemented among students in Mumbai. We aim to systematically identify and comprehend the diverse sustainable practices that these students actively incorporate into their daily lives. This evaluation will provide valuable insights into the influence of such practices on their behaviours and overall commitment to sustainability. Through this process, we seek to contribute to a deeper understanding of the role of sustainability initiatives in shaping environmentally conscious habits among the student population. The insights gained from this research can serve as valuable guidance for educational institutions to develop and implement more efficient waste management strategies, thereby reducing waste from various sources. Furthermore, the findings can help universities and policymakers work towards achieving broader sustainable development goals and promoting environmental sustainability on a larger scale by closing resource loops and fostering circular practices. This study offers comprehensive insights into waste management, environmental conservation, and the role of individual and institutional efforts in building a sustainable future. By examining why students may know about sustainability but fail to act on it, the research can reveal key issues such as knowledge-action gaps, ineffective curricula, psychological resistance, structural limitations, and social influences. This study on the relationship between sustainability awareness and practices among students is vital for identifying gaps in sustainability education and the barriers hindering the adoption of eco-friendly habits.

This study holds significant relevance as it provides a comprehensive examination of sustainability education and its role in fostering behavioural change among students. The research rigorously investigates the relationship between environmental awareness and the adoption of sustainable practices, aiming to identify specific gaps within current educational frameworks. By employing a combination of qualitative and quantitative research methods, the study seeks to highlight the existing challenges faced in effectively communicating the

principles of sustainability. It emphasizes the need for innovative educational strategies that go beyond traditional teaching methods.

Furthermore, by creating a deeper understanding of sustainability concepts and offering a range of practical tools and incentives, the study aspires to equip students with the knowledge and skills necessary to become proactive members of their communities. Ultimately, the goal is to encourage the development of environmentally responsible individuals capable of making a substantial positive impact on both local and global scales.

OBJECTIVES

This research project aims to raise awareness and promote sustainable practices related to eco-friendly products among students. Sustainable development is a holistic approach that balances economic growth, environmental protection, and social well-being, ensuring prosperity for both current and future generations. By investigating students' perceptions, behaviours, and knowledge regarding sustainability, this study will contribute to developing more effective educational strategies and policies that encourage the adoption of environmentally responsible habits.

Objective no. 1 –

To examine students' perceptions of eco-friendly products and their level of environmental awareness.

Objective no. 2 –

Analyse the relationship between product quality, pricing, and the belief in environmental protection.

Objective no. 3 –

To evaluate the impact of environmental awareness and know-how much students actively incorporate it into their daily lives.

Objective no. 4 –

To evaluate students' understanding of resource consumption by focusing on essential areas such as energy conservation, waste reduction, and the use of sustainable products.

METHODOLOGY

- Research Methodology:

Target Population & Pilot Study

This study focuses on university students, as they represent a crucial demographic for shaping future sustainable consumption patterns. Their behaviours, attitudes, and awareness levels can influence broader societal trends in environmental responsibility.

Before the main study, a **pilot survey** was conducted with **30-50 students** to:

- Refine the questionnaire for clarity and relevance.
- Identify ambiguous or redundant questions.
- Ensure the survey effectively captures key variables (awareness, behaviour, barriers).

- Data Collection Methods

A structured **questionnaire** was used. It was distributed via **Google Forms** (for digital reach)

The survey accessed-

1. Demographic Information

- Age, gender, academic year, field of study (to analyse trends across the course of fields).

2. Environmental Awareness & Beliefs

- Knowledge of global sustainability issues (climate change, pollution).
- Familiarity with concepts like **Eco-Friendly** and **Sustainable Development Goals (SDGs)**.
- **Sources of sustainability information** (social media, university courses, news).
(*Likert scale: Not aware → Highly aware*)

3. Sustainable Practices & Behaviour

- Frequency of:
 - Recycling
 - Using reusable products (bags, bottles)
 - Energy/water conservation
 - Preference for eco-friendly products
(*Scale: Never → Always*)

4. Factors Influencing Sustainable Behaviour

- Perceived importance of sustainability.
- Availability of eco-friendly options on campus.
- Influence of peers, social norms, and institutional policies.
(*Likert scale: Strongly Disagree → Strongly Agree*)

5. Barriers to Sustainable Practices

- Lack of knowledge, time, or resources.
- High cost or limited availability of sustainable products.
- Uncertainty about effectiveness.

- Data Analysis Techniques:

- Descriptive Statistics-
Mean, Median, Mode: To summarize awareness and practice scores.
- Bar charts and Pie charts- To visualize the distribution of awareness.
- Chi-Square Test: Tests associations between categorical variables.
Example: Is there a link between the field of study (e.g., Science vs Commerce or Arts) and sustainable habits?
- Analysis of Variance (ANOVA)

Statistical Techniques:

Objective 1 focused on **assessing students' perceptions of eco-friendly products alongside their level of environmental awareness**. To analyze the relationship between these variables, the **Chi-square test** was employed. This non-parametric statistical test is commonly utilized to ascertain whether there is a significant association between two categorical variables. It effectively evaluates whether the distribution of the sample's categorical data aligns with a scenario in which the variables are independent.

For Objective 2: **To examine how product quality, pricing, and the belief in environmental protection are interconnected, the Chi-square test** was employed to analyse the relationships among these variables. This statistical test evaluates the differences between the observed frequencies and the expected frequencies in each cell of a contingency table, under the assumption that no association exists between the variables. A significant disparity between the observed and expected frequencies may indicate a meaningful relationship among the factors being studied.

For Objective 3, **we want to understand how environmental awareness affects students and how they include it in their daily lives**. To do this, we used **Binary Logistic Regression**. This is a statistical method that helps us look at the relationship between a yes/no outcome (like 0 or 1) and one or more other factors. It allows us to predict the chances of the outcome being a particular value (usually 1) based on these factors. This method is specifically meant for situations where the result is a binary choice.

For Objective 4, **students' understanding of resource consumption is evaluated through key topics like energy conservation, waste reduction, and sustainable products**. **Analysis of Variance (ANOVA)** is primarily used for this assessment, allowing comparison of means among multiple groups to identify any significant differences. This method analyses the variance within groups concerning the variance between group means, offering valuable insights.

In our comprehensive analysis, we leveraged various data visualizations, including vibrant bar graphs and informative pie charts, to deepen our understanding of the data. These visual tools not only illuminate key trends and patterns but also make complex information more accessible. By presenting our findings in a visually engaging manner, we are able to facilitate clearer insights and enhance the interpretation of data across all objectives. In our in-depth

analysis, we employed an array of data visualizations, prominently featuring colorful bar graphs and detailed pie charts, to enrich our understanding of the datasets. These visual tools serve as powerful aids, transforming raw data into compelling narratives that highlight key trends and correlations. The bar graphs provide a straightforward comparison of variables, enabling us to quickly identify significant differences across categories, while the pie charts effectively illustrate the proportional relationships within the data. By utilizing these visual representations, we enhance clarity and accessibility, allowing for more nuanced interpretations of our findings and fostering a deeper engagement with the information across all objectives.

RESULT AND DISCUSSION

Objective 1: To examine students' perceptions of eco-friendly products and their level of environmental awareness.

Chi-Square Test of Association

Introduction

The Chi-square test of association, frequently referred to as the Chi-square test of independence, is a non-parametric statistical method utilized to assess the presence of a significant association between two categorical variables. This test aims to determine if the observed distribution of categorical data aligns with a scenario in which the variables are independent from one another.

Commonly employed in fields such as survey research, contingency tables, and social sciences, the Chi-square test serves to investigate potential relationships among nominal or ordinal variables. By comparing the observed frequencies recorded in each cell of a contingency table to the frequencies that would be anticipated under the assumption of no association, researchers can identify discrepancies. A notable difference between the observed and expected frequencies may indicate a significant relationship between the variables in question.

Types of Chi-Square Tests

1. **Chi-Square Goodness of Fit Test:** This test determines whether the frequency distribution of a categorical variable matches an expected distribution. For example, it can be used to test if a die is fair by comparing the observed frequencies of each face to the expected frequencies.
2. **Chi-Square Test of Independence:** This test assesses whether two categorical variables are independent of each other. It is often used in survey data analysis to see if there is a relationship between variables, such as gender and voting preference.

Advantages of Chi-Square Test

The advantages of the Chi-Square Test include the following.

- Its robustness concerning the distribution of the data, its ease of computing data, and the detailed information that can be derived from this test.
- Its use in studies where parametric assumptions cannot be met.
- Its flexibility in handling data from both group and multiple-group studies.

The Chi-square test statistic is calculated using the formula:

$$\chi^2 = \sum \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

Where:

- O_{ij} : Observed frequency in the cell at row i and column j
- E_{ij} : Expected frequency in the same cell, calculated as:

$$E_{ij} = \frac{(\text{Row Total})_i \times (\text{Column Total})_j}{\text{Grand Total}}$$

Steps to perform the test:

1. Set up the null hypothesis H_0 : There is no association between the two variables.
2. Create a contingency table with observed frequencies.
3. Calculate the expected frequencies.
4. Compute the Chi-square statistic.
5. Compare the statistic to the critical value from the Chi-square distribution (based on degrees of freedom and significance level) or use the p-value approach.
6. Draw conclusions based on the result.

Assumptions

- The variables are categorical (nominal or ordinal).
- Observations are independent of each other.
- The sample size is sufficiently large.
- The expected frequency in each cell should generally be at least 5.
- Data are from a random sample.

Chi-square test

- **Null Hypothesis (H_0):** The null hypothesis is a fundamental component of statistical analysis, asserting that no significant relationship exists between the examined categorical variables. Any observed differences or patterns are solely due to random chance. Upholding this hypothesis is crucial for protecting the analysis from biases, ensuring conclusions are based on objective data.

- **Alternative Hypothesis (H₁):** In contrast, the alternative hypothesis claims that a significant relationship does exist between the two categorical independent variables. This assertion indicates that observed connections are genuine rather than coincidental. Validating this hypothesis enables researchers to present compelling evidence, fostering a deeper understanding of the variables and their interactions.

Defining Hypothesis:

H₀: There is no association between Field of Study and Eco-Product Awareness.

H₁: There is an association between the Field of Study and Eco-Product Awareness.

Interpretation:

$p < 0.05$

There is a significant association between the Field of Study and Eco-Product Awareness.

Microsoft Power BI

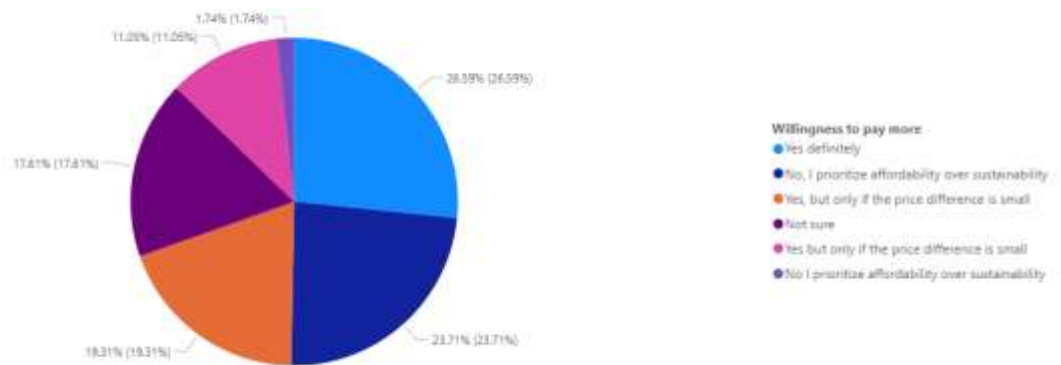
Power BI is a sophisticated business intelligence and data visualization software created by Microsoft that enables users to transform raw data into compelling and informative stories. Thanks to its user-friendly interface and drag-and-drop functions, Power BI is particularly effective for creating interactive dashboards and detailed reports that vividly showcase data.

In this project, Power BI was employed to effectively visualize survey responses, thereby revealing complex trends related to sustainability awareness and behaviours among students. The selection of this analytical tool was strategic, given its capability to manage large datasets, provide real-time visualizations, and facilitate the interpretation of intricate data. By transforming raw data into accessible and informative graphics, Power BI enhances the overall understanding of student engagement with sustainability practices, enabling informed decision-making and targeted interventions.

The platform's interactive visuals significantly enhance the accessibility of research findings, presenting insights in a manner that is both engaging and informative for a diverse audience. Through the use of compelling graphics, dynamic charts, and user-friendly design elements, the platform facilitates a deeper comprehension of vital sustainability issues. This methodology not only promotes active engagement with the content but also fosters an informed dialogue regarding the implications of sustainability in everyday contexts and the necessity for collective action.

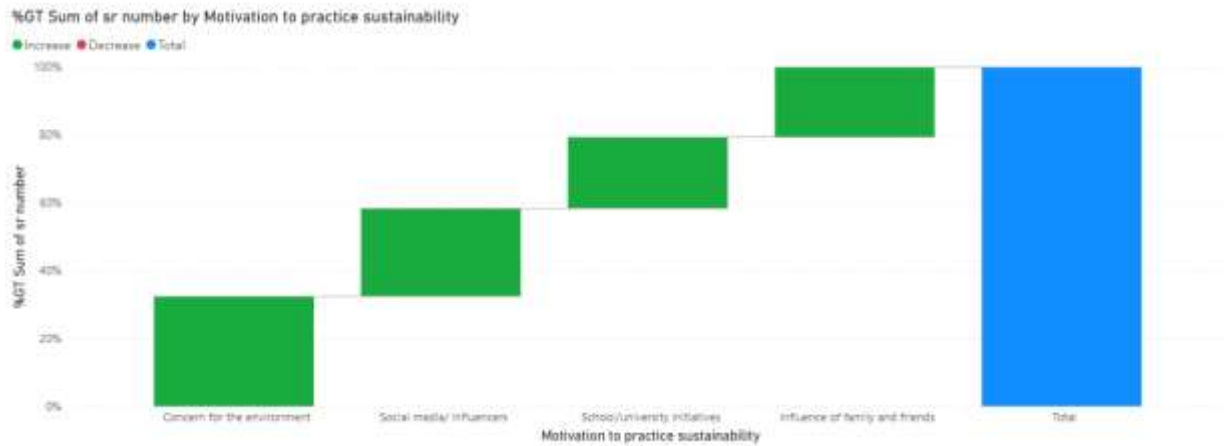
❖ Data Visualization 1-

Students by Willingness to pay more



- The pie chart illustrates students' perspectives on spending more for sustainable products.
- A significant portion, about 26.59%, expresses a definite willingness to invest extra for sustainability.
- Nearly a quarter of respondents prioritize affordability over sustainability, while others (19.31%) indicate a readiness to pay more, provided the price difference is minimal.
- Approximately 17.61% of participants remain undecided, suggesting there may be an opportunity to enhance awareness or conviction regarding sustainable options.
- A smaller group appears to prioritize affordability or may feel hesitant even with minor price differences.

❖ Data Visualization 2 –



- This percentage-driven waterfall chart provides a detailed visualization of the various motivations that drive students to engage in sustainable practices, highlighting the relative importance of each factor in shaping their behaviors toward environmental responsibility.
- "Concern for the environment" accounts for approximately one-third of the total motivation. The influences of social media and influencers, school and university initiatives, and family and friends each contribute progressively, reflecting a layered impact.
- The chart demonstrates that no single factor dominates; instead, they combine cumulatively. Together, these motivators provide a complete representation of the influences within the sample of 344 students, totalling 100%.

Objective 2: Analyse the relationship between product quality, pricing, and the belief in environmental protection.

Chi-square test:

Introduction:

A Chi-square test of independence was conducted to examine whether there is a significant association between students' awareness of eco-friendly products and their willingness to pay more for such products. This test examines whether two categorical variables are independent of each other. It determines if there is a statistically significant association between the two variables. A Chi-Square or comparable nonparametric test is required to test a hypothesis regarding the distribution of a categorical variable. Categorical variables, which indicate categories such as animals or countries, can be nominal or ordinal. They cannot have a normal distribution because they have only a few values.

Key Points:

- Chi-square is useful for analysing such differences in categorical variables, especially that are nominal in nature.
- χ^2 depends on the size of the difference between actual and observed values, the degrees of freedom, and the sample size.
- χ^2 can be used to test whether two variables are related or independent of each other.
- It can also be used to test the goodness of fit between an observed distribution and a theoretical distribution of frequencies.

Variables in the Test

Independent Variable (Predictor):

Students' awareness of eco-friendly products

- This is what is presumed to influence the other variable.
- Categories might be: *Aware* vs. *Not Aware*

Dependent Variable (Outcome):

Willingness to pay more

- This is the outcome being tested.
- Categories might be: *Willing to pay more* vs. *Not willing*

The test evaluates whether **awareness (independent)** influences **willingness to pay more (dependent)**.

Null Hypothesis (H_0):

There is no association between students' awareness of eco-friendly products and their willingness to pay more.

Alternative Hypothesis (H_1):

There is an association — awareness and influences willingness to pay more.

Interpretation:

Since $p = 0.0064 < 0.05$, we reject the null hypothesis.

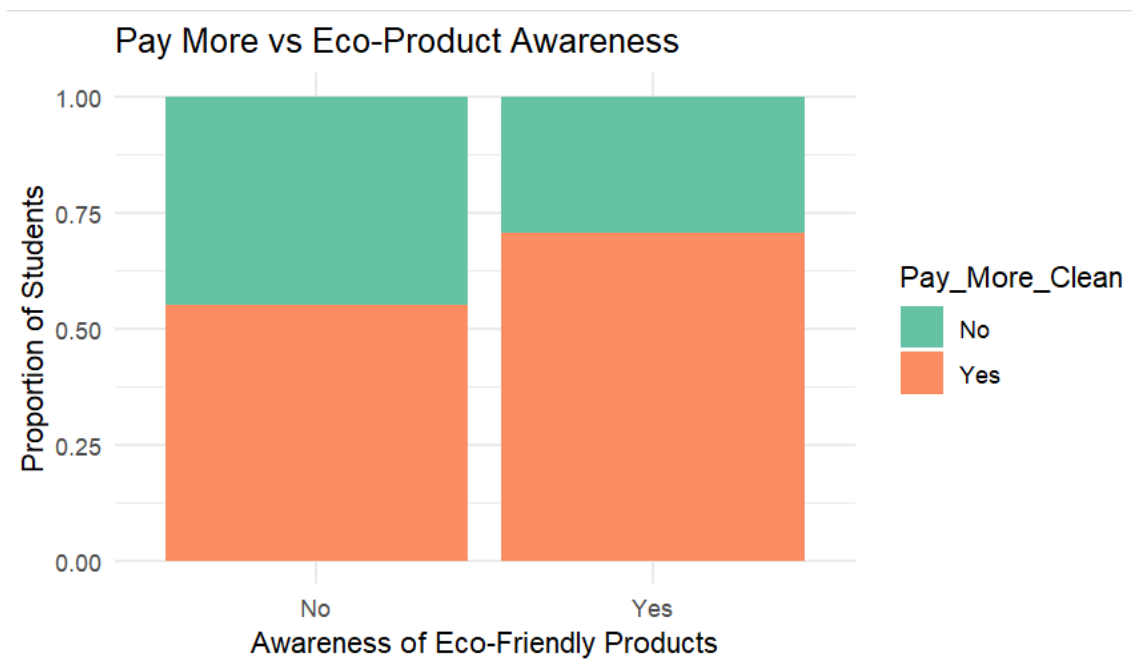
A Chi-square test of independence was conducted to examine the relationship between students' awareness of eco-friendly products and their willingness to pay more for such products. The test yielded a p-value of **0.0064**, which is **less than the conventional significance level of 0.05**.

There is a statistically significant association between students' awareness of eco-friendly products and their willingness to pay more for them.

Students who are aware are more likely to say they would pay extra for such products.

Students who are **aware** of eco-friendly products are **more likely** to indicate a willingness to pay a premium for such products compared to those who are not aware.

❖ Data Visualization –



Consequently, students who have knowledge of eco-friendly products are prepared to spend more.

As a result, students who are informed about eco-friendly products display a greater readiness to invest additional money.

The data illustrated in the graph indicates that students demonstrate a stronger tendency to express a willingness to pay a premium for these environmentally conscious products, in contrast to those who are unaware of their benefits.

Objective 3: To evaluate the impact of environmental awareness and know-how much students actively incorporate it into their daily lives.

Binary Logistic Regression Analysis: Predicting Awareness of Eco-Friendly Products

- Introduction to Logistic Regression

Logistic regression is a predictive statistical technique used when the outcome variable is binary (i.e., it has only two categories, such as "yes" or "no"). Unlike linear regression, which predicts a continuous outcome, **binary logistic regression** estimates the probability that a certain event occurs—such as being aware of eco-friendly products—based on one or more predictor variables.

The model produces outputs in the form of **odds ratios (OR)**, which reflect how a one-unit change in a predictor affects the odds of the outcome occurring. It also provides **confidence intervals (CI)** and **p-values** to determine the reliability and significance of these effects. Logistic regression is ideal for studies involving behavioral predictions or choices, particularly when the outcomes are categorical in nature.

- Why Binary Logistic Regression Was Used

In this research project, the dependent variable—**awareness of eco-friendly products**—is binary: students either are aware or they are not. The key predictor variable is **Consider_Impact**, which reflects whether or how much a student considers the environmental impact when making purchases. Since the goal was to determine whether this predictor significantly influences the likelihood of being aware of eco-friendly products, binary logistic regression was the most appropriate statistical method.

Alternative models like linear regression would not suit the binary nature of the outcome variable. Logistic regression also enables the interpretation of **how strongly** and **in what direction** the predictor variable affects the outcome, which is highly useful for applied insights in sustainability education.

- Variable Definitions

1. Dependent Variable:

- **Awareness of Eco-Friendly Products:** A binary variable coded as 1 (aware) or 0 (not aware). It measures whether a student is aware of eco-friendly products available in the market.

2. Independent Variable:

- **Consider_Impact:** A numeric or ordinal variable representing the extent to which a student considers the environmental impact of their purchases. Higher values indicate greater consideration.

- Model Results and Interpretation

The binary logistic regression model was **statistically significant ($p < 0.001$)**, indicating that the independent variable significantly predicts awareness of eco-friendly products. The model fits the data well and provides key insights into the behavioral patterns influencing environmental awareness among students.

Key Findings:

1. Group Comparison:

- Students who consider the environmental impact of their purchases are **4.26 times more likely** to be aware of eco-friendly products compared to those who do not.
- **Odds Ratio (OR) = 4.26**, 95% Confidence Interval: **[2.10, 8.62]**
- This result is highly significant and supports the hypothesis that environmental values are associated with eco-awareness.

2. Continuous Effect of Consideration (OR = 1.383):

- For each 1-point increase in the **Consider_Impact** score, the odds of awareness increase by **38.3%**.
- 95% CI: **[1.159, 1.658]**
- This shows a **dose-response relationship**, meaning that even small increases in environmental concern can have a meaningful effect on awareness.

3. Baseline Odds (Consider_Impact = 0):

- The baseline odds of awareness when a student does **not** consider environmental impact at all are **0.696**, which is **not statistically significant ($p = 0.239$)**.
- This highlights that students with no environmental consideration are less likely to be aware, and the association is not meaningful unless some level of consideration is present.

- Implications and Practical Significance

This model confirms that **behavioral attitudes**, particularly **consideration of environmental impact during purchasing**, play a vital role in shaping **awareness** of sustainable alternatives. The strong and statistically significant odds ratios imply that interventions encouraging students to reflect on the consequences of their consumption choices can be an effective strategy for promoting eco-consciousness.

For educators, sustainability advocates, and institutions, this provides evidence to design targeted programs or campaigns that enhance students' environmental awareness by nurturing habits of reflection and responsible decision-making. For instance, integrating green purchasing topics in coursework or hosting sustainability challenges may positively influence both attitude and awareness.

- Conclusion

The binary logistic regression analysis clearly supports the hypothesis that students who are more mindful of the environmental effects of their purchases are significantly more likely to be aware of eco-friendly products. The findings reinforce the importance of attitudinal factors in sustainability education and suggest practical pathways for influencing behavior. With a statistically robust model and meaningful odds ratios, the analysis offers valuable insight into the mechanisms that drive environmental awareness among young individuals.

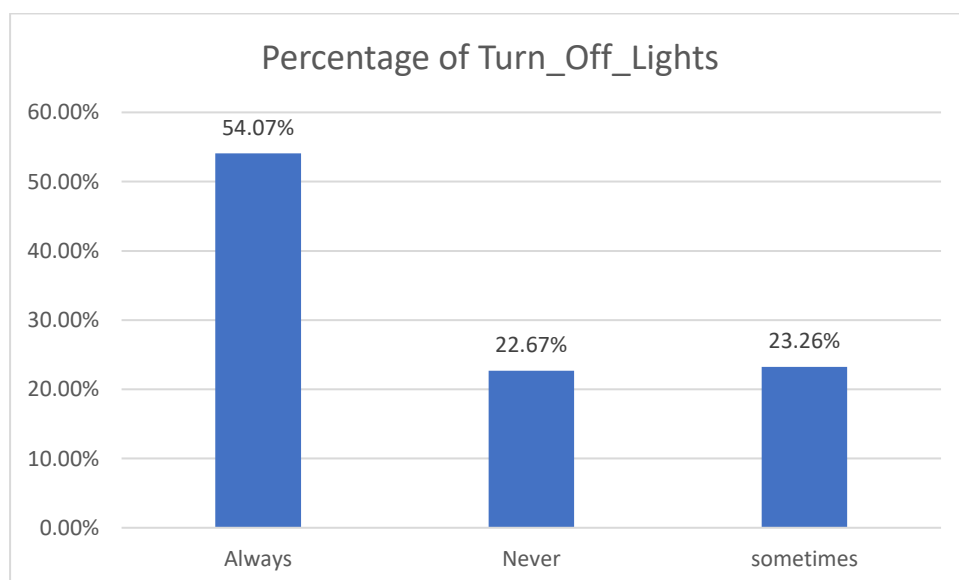
The visualizations prepared for Objective 3 play a crucial role in illustrating how environmental awareness translates into real-life practices among students. By transforming survey responses into clear and engaging visuals, these charts help uncover the extent to which students not only understand environmental issues but also take conscious steps to act on that knowledge—such as reducing plastic use, conserving energy, or choosing sustainable products. These visual tools make it easier to identify behavioural patterns, levels of engagement, and gaps between awareness and action. They provide meaningful insights that are essential for educators, policymakers, and sustainability advocates to design more targeted interventions and foster a culture of everyday environmental responsibility among the youth.

Microsoft Excel

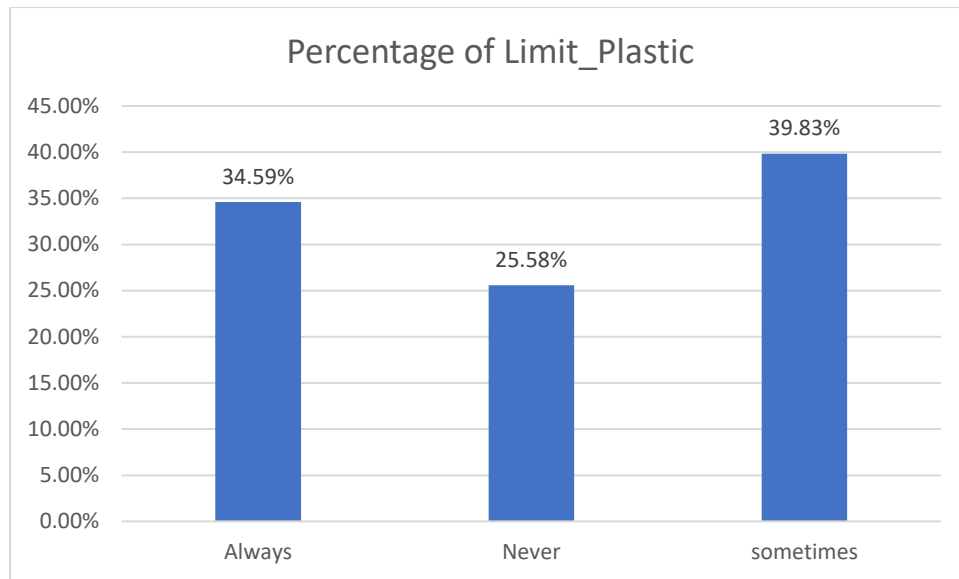
We used Microsoft Excel to create the visualizations for Objective 3 because it is easy to use and helps in making clear and simple charts from survey data. These visualizations are important as they show how well students understand environmental issues and how much they apply this knowledge in their daily lives. The charts help us see if students are taking actions like saving electricity, reducing plastic use, or choosing eco-friendly products. They make it easier to understand patterns in student behavior and show where improvements can be made. This information is useful for teachers and others who want to encourage students to live in more environmentally friendly ways.

❖ Data Visualization –

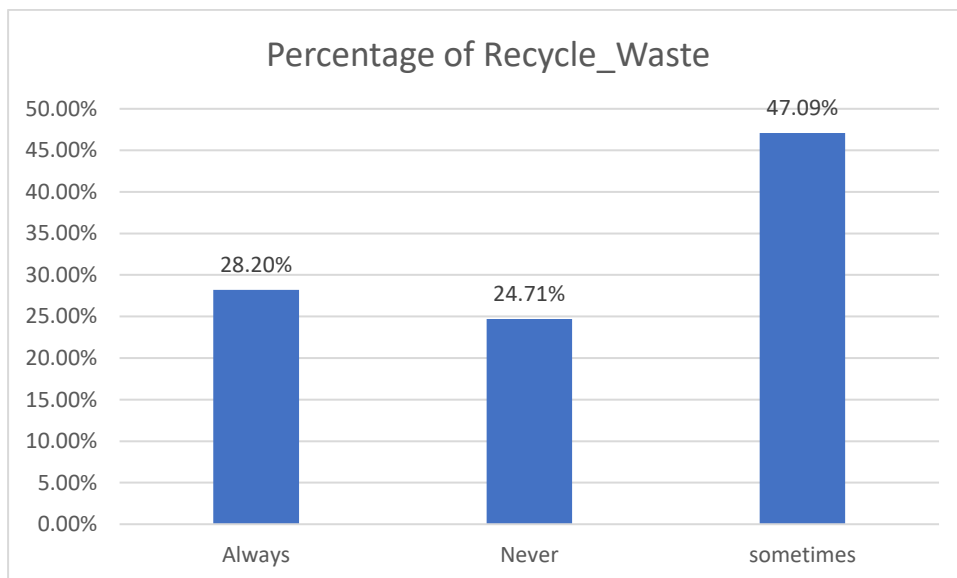
Frequency	How often do students reuse plastic or cloth bags	How often do students reuse waste	How often do they limit the use of plastic	How often do students turn off lights and fans when not in use
Always	54.07%	28.20%	34.59%	39.24%
Never	22.67%	24.71%	25.58%	19.19%
sometimes	23.26%	47.09%	39.83%	41.57%



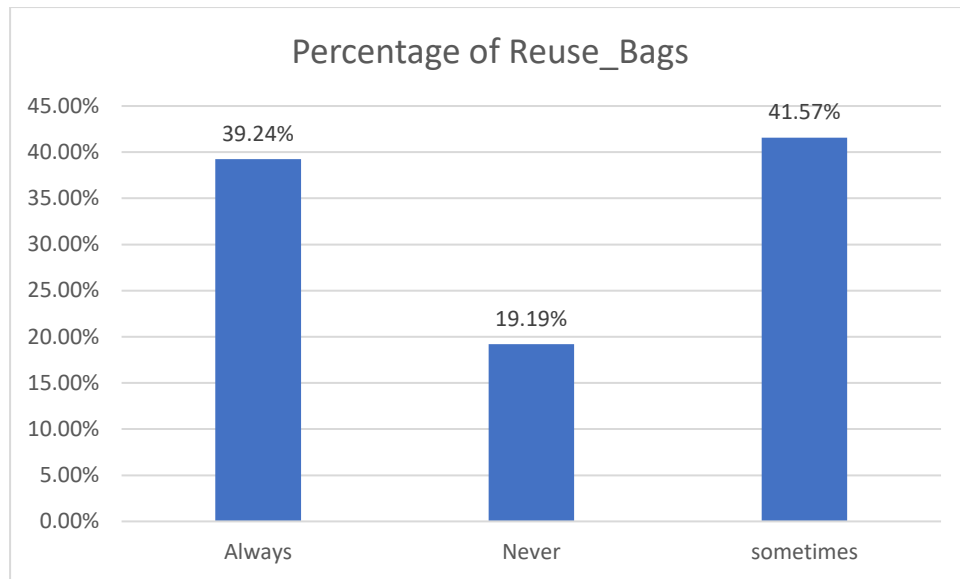
- The chart shows that most students always turn off lights and fans when not in use. A much smaller number either never or only sometimes do so, with both categories having around 78–80 students. This suggests that energy-saving behaviour is common but not yet practiced by all



- The chart indicates that the majority of students either always or sometimes try to limit their use of plastic, with “sometimes” being the most common response. A smaller group, however, admits to never limiting plastic use. This suggests growing awareness, though there is still a need to encourage consistent plastic-reduction habits among all students.



- The graph shows the 28.20 % of students always recycle waste, 24.71 % never do and 47.09 % sometimes do.

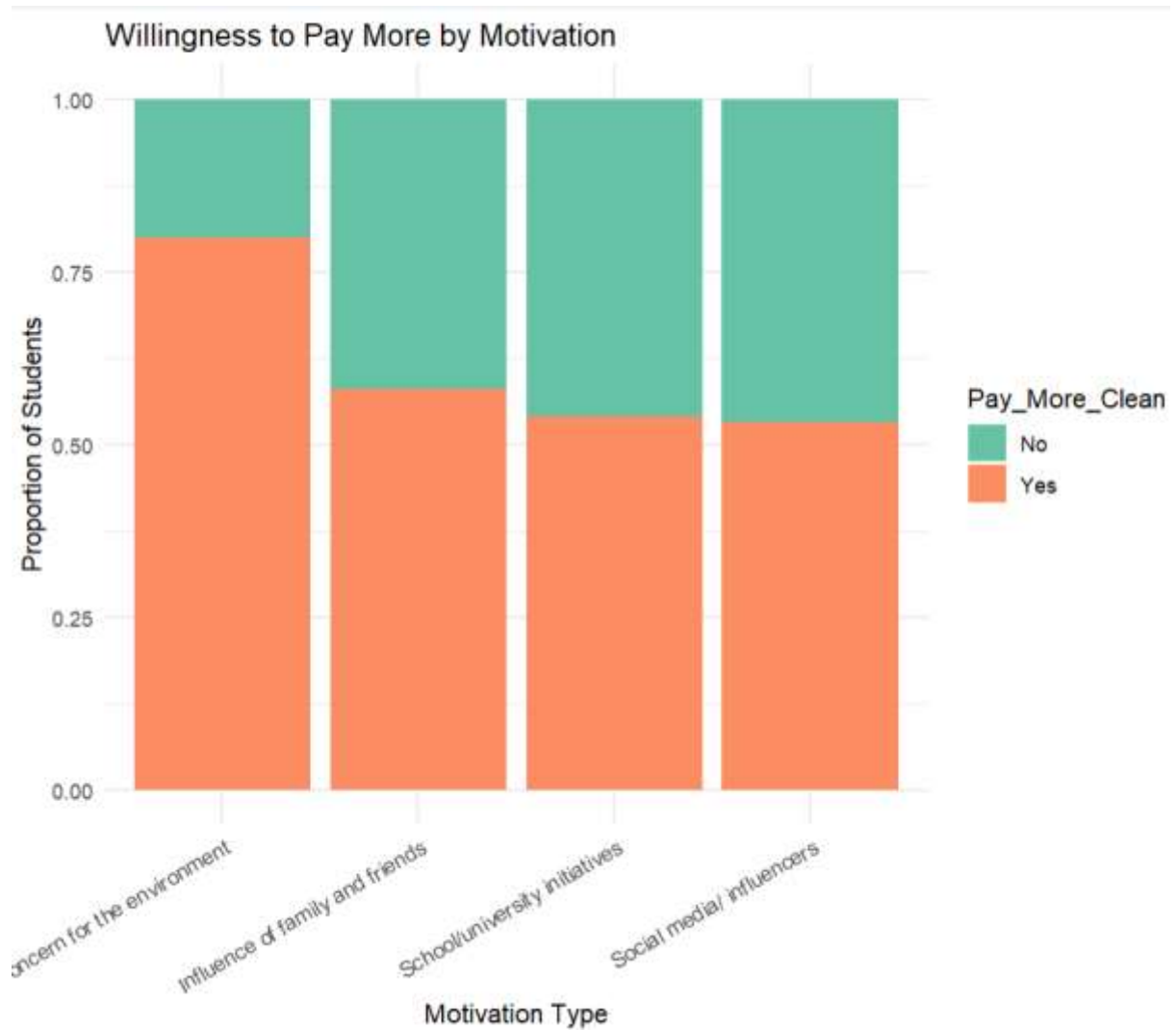


- The graph shows the 39.24 % of students always use reusable bags, 19.19 % never do and 41.57 % sometimes do.

Overall the data shows that many students practice eco-friendly habits, with a majority regularly turning off lights/fans and reusing bags. However, actions like reusing waste and limiting plastic use are less consistent, with many doing them only sometimes. A smaller group of students never engages in these practices, indicating room for improvement in daily sustainability habits.

Objective 4: To evaluate students' understanding of resource consumption by focusing on essential areas such as energy conservation, waste reduction, and the use of sustainable products.

❖ Data Visualization –



- A considerable proportion of students, approximately 80%, demonstrate a willingness to incur higher expenses due to their concerns regarding environmental issues (as depicted by the orange bar).
- The influence of family and friends on students is evenly balanced, with an equal number of participants indicating "Yes" and "No" in their responses.

- Programs implemented in educational institutions, including schools and universities, exhibit a comparable effect, indicating a moderate influence on students' willingness to incur additional expenses.
- Regarding social media and influencers, it is noteworthy that approximately half of the students express a willingness to invest more. This insight highlights the significant role that these platforms and personalities play in shaping their purchasing decisions.

One-Way ANOVA Analysis: Familiarity with SDGs Across Fields of Study

Introduction to ANOVA

Analysis of Variance (ANOVA) is a powerful statistical technique that serves the crucial purpose of comparing the means across three or more independent groups. This method allows researchers to assess whether at least one group mean is significantly different from the others, providing deeper insights into the relationships between different variables in a study. It is beneficial in situations where the influence of a single categorical independent variable—such as gender, education level, or in this case, academic field—is being measured against a continuous dependent variable, like test scores or familiarity levels.

One of the noteworthy advantages of employing ANOVA rather than conducting multiple t-tests is its capacity to control the risk of Type I error, which refers to the rejection of the null hypothesis. ANOVA offers a solution to this issue by consolidating the analysis into a single framework that examines all group differences simultaneously, thus providing a more reliable and comprehensive interpretation of the data.

Among the various forms of ANOVA, the One-Way ANOVA is particularly relevant for studies focused on one independent variable with multiple levels or groups. This method assesses the data to determine whether any statistically significant differences exist among the means of the groups being compared, thereby shedding light on potential trends or patterns that may not be evident through other statistical methods.

ANOVA formula is made up of numerous parts. The best way to tackle an ANOVA test problem is to organize the formulae inside an ANOVA table. Below are the ANOVA formulae.

Source of Variation	Sum of Squares	Degree of Freedom	Mean Squares	F Value
Between Groups	$SSB = \sum n_j(\bar{X}_j - \bar{X})^2$	$df_1 = k - 1$	$MSB = SSB / (k - 1)$	$f = MSB / MSE$ or, $F = MST / MSE$
Error	$SSE = \sum n_j(\bar{X} - \bar{X}_j)^2$	$df_2 = N - k$	$MSE = SSE / (N - k)$	
Total	$SST = SSB + SSE$	$df_3 = N - 1$		

Where,

- F = ANOVA Coefficient
- MSB = Mean of the total of squares between groupings
- MSW = Mean total of squares within groupings
- MSE = Mean sum of squares due to error
- SST = total Sum of squares
- p = Total number of populations
- n = The total number of samples in a population
- SSW = Sum of squares within the groups
- SSB = Sum of squares between the groups
- SSE = Sum of squares due to error
- s = Standard deviation of the samples
- N = Total number of observations

Purpose of Using One-Way ANOVA in This Study

In the specific context of the current study, the primary objective was to explore whether students' familiarity with the Sustainable Development Goals (SDGs) varies significantly depending on their academic field of study. The research narrowed its focus to three distinct disciplines: Science, Commerce, and Arts, each representing unique educational perspectives and professional aspirations. By examining the mean scores that reflect students' awareness and understanding of the SDGs—an essential benchmark for global sustainability education—One-Way ANOVA was the most fitting statistical approach.

Utilizing traditional t-tests would not have sufficed for this analysis; t-tests are designed to compare only two groups at a time, and conducting multiple t-tests across the three fields would have led to inefficiency and increased error rates. The potential for accumulating Type I errors significantly undermines the integrity of the findings, hence diminishing the credibility of the research. Therefore, the decision to employ One-Way ANOVA was made, as it offers a robust, reliable, and precise means of conducting multi-group comparisons.

This method enhances the validity of the results and lays a solid groundwork for further investigation into the relationships between different academic fields and their students' awareness of the SDGs. Through this comprehensive analytical approach, the study aims to contribute valuable insights to the discourse on education and sustainability practices in various academic disciplines.

Variable Definitions

1. Dependent Variable:

- **Familiarity with SDGs:** This is a continuous variable representing the self-reported level of awareness or understanding that a student has about the United Nations Sustainable Development Goals. It may be measured on a scale (e.g., 1 to 5 or 1 to 10), where higher values indicate greater familiarity.

2. Independent Variable:

- **Field of Study:** This is a categorical variable with three levels:
 - **Science**
 - **Commerce**
 - **Arts**

Each field represents a group for which we want to compare the average familiarity with SDGs.

Hypotheses

- **Null Hypothesis (H_0):** The mean familiarity with SDGs is the same across all fields of study (Science = Commerce = Arts).
- **Alternative Hypothesis (H_1):** At least one field of study has a mean familiarity score that is significantly different from the others.

ANOVA Output Interpretation

The results of a One-Way ANOVA conducted on a dataset comprising 344 students yielded the following significant finding:

p-value: ≥ 0.05

This p-value indicates that the observed differences in the mean familiarity with Sustainable Development Goals (SDGs) among the three identified academic groups—Science, Commerce, and Arts—are not statistically significant at the conventional 5% significance level ($\alpha = 0.05$). As a result, we do not reject the null hypothesis, which posits that there are no differences in SDG familiarity among these groups.

These findings suggest that students from the varied disciplines of Science, Commerce, and Arts possess a comparable level of awareness and knowledge regarding the SDGs. This

relative consistency implies that, regardless of their academic focus, students do not differ significantly in their understanding of sustainable development issues, a potentially critical consideration for policymakers and educators aiming to enhance SDG awareness across diverse student populations. This outcome underscores the need for tailored educational interventions to improve familiarity with SDGs among all fields of study.

What do these findings imply?

Many students across different subjects are aware of the Sustainable Development Goals (SDGs). This shows that knowledge of sustainability issues is not limited to one field of study. Various factors contribute to this awareness, such as well-designed educational programs, engaging media, and active initiatives by institutions that involve students regardless of their major.

It is positive that no specific discipline falls behind in awareness. However, this also highlights the need for better strategies to promote sustainability. Creating awareness programs that connect different departments can help students gain a complete understanding of sustainability. This approach will deepen their insights into sustainability challenges and build a strong academic community focused on finding solutions. By working together, students can become informed advocates for sustainable practices in their future careers and personal lives.

Conclusion

The One-Way ANOVA served as a valuable statistical method in examining how students' familiarity with the Sustainable Development Goals (SDGs) varied across different fields of study. By analyzing data from students in Science, Commerce, and Arts, the findings indicated that there were no significant differences in their levels of awareness and understanding of the SDGs. This result suggests that regardless of their academic discipline, students possess a comparable level of knowledge about these global goals, highlighting a potentially uniform educational emphasis on sustainability across these diverse fields of study.

CONCLUSION

This study reveals a concerning gap between students' general awareness of sustainability and the actual integration of sustainable practices into their daily lives. While many students are familiar with basic environmental concepts and express a willingness to support sustainable products, their understanding of deeper sustainability principles, especially the UN Sustainable Development Goals (SDGs), remains limited. The findings indicate that despite students' positive attitudes, many lack the knowledge, motivation, and institutional support needed to translate awareness into meaningful action.

Sustainability is not yet embedded as a consistent habit among students. Daily actions such as waste segregation, the use of reusable materials, and mindful consumption are still not widely practiced. Several barriers, including limited access to sustainable options, high costs, and insufficient exposure to sustainability education, contribute to this disconnect.

This gap between awareness and action emphasizes the urgent need for targeted educational interventions, supportive infrastructure, and sustained awareness programs within universities. When students are empowered with practical knowledge, tools, and opportunities, they are more likely to adopt and promote environmentally responsible behaviours. Universities must take the lead in transforming sustainability from a theoretical concept into a lived value, both in the classroom and across campus life.

Importantly, this study itself aims to be a catalyst for change by highlighting the awareness around sustainability in academic settings. By shedding light on existing gaps and encouraging reflection, this research hopes to raise the awareness that is urgently needed among students, educators, and institutions alike.

SUGGESTIONS

This study sheds light on university students' awareness, attitudes, and sustainable practices, with a particular focus on Sustainable Development Goal 12 – Responsible Consumption and Production. While most students express a general understanding of sustainability and a willingness to support eco-friendly initiatives, there remains a significant gap between awareness and consistent, actionable behaviour. Factors such as limited institutional support, high costs of sustainable alternatives, and lack of accessibility were identified as key barriers.

Despite these challenges, the research highlights encouraging trends, as many students show a growing inclination toward eco-conscious habits when provided with the right incentives, knowledge, and infrastructure. Universities have a critical role to play in bridging the knowledge-action divide by embedding sustainability into curricula, campus life, and policy frameworks. Universities should take the lead in promoting sustainability awareness among students by integrating environmental education into their curricula, organizing workshops and seminars, and encouraging campus-wide initiatives. This proactive approach can help students understand the importance of sustainable practices, foster a sense of responsibility for the environment, and inspire them to become active participants in creating a more sustainable future.

Ultimately, fostering a culture of sustainability requires more than individual awareness; it demands collective action supported by systemic changes in education and infrastructure. This study underscores the urgency of integrating sustainability education into higher learning and calls for collaborative efforts among students, faculty, and policymakers to nurture environmentally responsible citizens equipped to lead a more sustainable future.

R-CODES

Objective 1:

R-code:

```
data <- read.csv("C:\\Users\\Administrator\\Downloads\\Cleaned_Data_Sustainability.csv")
data$Field_Study <- as.factor(data$Field_Study)
> data$Aware_EcoProducts <- as.factor(data$Aware_EcoProducts)
> table_data <- table(data$Field_Study, data$Aware_EcoProducts)
> print(table_data)
```

Output:

	No	Yes
Arts	40	37
Commerce	41	69
Science	35	122

```
> chisq_test_result <- chisq.test(table_data)
> print(chisq_test_result)
```

Output:

```
Pearson's Chi-squared test
data: table_data
X-squared = 21.241, df = 2, p-value = 2.441e-05
```

Objective 2:

R code:

```
# Clean version of Pay_More

> data$Pay_More_Clean <- ifelse(grepl("yes", data$Pay_More, ignore.case = TRUE), "Yes",
+ifelse(grepl("no", data$Pay_More, ignore.case = TRUE), "No", +"Not Sure"))

> data$Pay_More_Clean <- factor(data$Pay_More_Clean, levels = c("No", "Yes", "Not
Sure"))

> data$Aware_EcoProducts <- as.factor(data$Aware_EcoProducts)

> # Filter only Yes and No

> data_filtered <- subset(data, Pay_More_Clean %in% c("Yes", "No"))

> # Drop unused levels

> data_filtered$Pay_More_Clean <- droplevels(data_filtered$Pay_More_Clean)

> # Build table

> table_awareness <- table(data_filtered$Pay_More_Clean,
data_filtered$Aware_EcoProducts)

> print(table_awareness)
```

Output:

```
  No Yes
No  52 67
Yes 64 161
```

```
> # Run Chi-Square test

> chisq.test(table_awareness)
```

Output:

Pearson's Chi-squared test with Yates' continuity correction

```
data: table_awareness
```

```
X-squared = 7.4342, df = 1, p-value = 0.0064
```

Objective 3:

```
# Fit logistic model
```

```
model <- glm(Aware_EcoProducts ~ Consider_Impact,  
             data = awareness, family = "binomial")
```

```
# Model summary
```

```
summary(model)
```

```
# Exponentiated coefficients (odds ratios)
```

```
exp(coef(model)) %>% round(3)
```

```
# Confidence intervals for odds ratios
```

```
exp(confint(model)) %>% round(3)
```

```
# Load required packages first
```

```
library(tidyverse) # Includes dplyr and pipe operator (%>%)
```

```
library(readxl)
```

```
# Now the pipe will work
```

```
data <- readxl::read_excel("C:/Users/Sanjay Chavan/OneDrive/Desktop/awareness.xlsx")  
%>%
```

```
  mutate(Aware_EcoProducts = as.factor(Aware_EcoProducts))
```

```
# Fit logistic model
model <- glm(Aware_EcoProducts ~ Consider_Impact,
             data = awareness, family = "binomial")

# Model summary
summary(model)

# Exponentiated coefficients (odds ratios)
exp(coef(model)) %>% round(3)

# Confidence intervals for odds ratios
exp(confint(model)) %>% round(3)
# Load required packages first
library(tidyverse) # Includes dplyr and pipe operator (%>%)
library(readxl)

# Now the pipe will work
data <- readxl::read_excel("C:/Users/Sanjay Chavan/OneDrive/Desktop/awareness.xlsx") %>%
  mutate(Aware_EcoProducts = as.factor(Aware_EcoProducts))
```



```

> # Model summary
> summary(model)

Call:
glm(formula = Aware_EcoProducts ~ Consider_Impact, family = "binomial",
    data = awareness)

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)   -0.36187    0.30725  -1.178 0.238891
Consider_Impact  0.32429    0.09106   3.561 0.000369 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 439.75  on 343  degrees of freedom
Residual deviance: 426.66  on 342  degrees of freedom
AIC: 430.66

Number of Fisher Scoring iterations: 4

>
> # Exponentiated coefficients (odds ratios)
> exp(coef(model)) %>% round(3)
      (Intercept) Consider_Impact
           0.696           1.383
>
> # Confidence intervals for odds ratios
> exp(confint(model)) %>% round(3)
Waiting for profiling to be done...
              2.5 % 97.5 %
(Intercept)   0.380  1.272
Consider_Impact 1.159  1.658
> |

```

Objective 4:

R code:

```

data$Pay_More_Clean <- ifelse(grepl("yes", data$Pay_More, ignore.case = TRUE), "Yes",
+                             ifelse(grepl("no", data$Pay_More, ignore.case = TRUE), "No",
+                                     "Not Sure"))
>
> # Filter only Yes/No
> data_filtered <- subset(data, Pay_More_Clean %in% c("Yes", "No"))
> data_filtered$Pay_More_Clean <- droplevels(as.factor(data_filtered$Pay_More_Clean))
>
> # Ensure Motivation is a factor
> data_filtered$Motivation <- as.factor(data_filtered$Motivation)

```

```

>
> # Create contingency table
> table_motivation <- table(data_filtered$Motivation, data_filtered$Pay_More_Clean)
> print(table_motivation)

```

OUTPUT:

	No	Yes
Concern for the environment	29	115
Influence of family and friends	26	36
School/university initiatives	28	33
Social media/ influencers	36	41

R code:

```

> # Run Chi-Square test
> chisq_result <- chisq.test(table_motivation)
> chisq_result

```

Output:

Pearson's Chi-squared test

data: table_motivation

X-squared = 23.254, df = 3, p-value = 3.575e-05

R code for ANOVA

```

> data$Field_Study <- as.factor(data$Field_Study)
> data$Familiarity_SDG <- as.numeric(data$Familiarity_SDG)
> anova_model <- aov(Familiarity_SDG ~ Field_Study, data = data_clean)
> summary(anova_model)

```

```

      Df Sum Sq Mean Sq F value Pr(>F)
Field_Study  2   9.1   4.564   2.425  0.09 .
Residuals 341 641.7   1.882

```

```
---
```

```
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

REFERENCES

Tanvi Khandhar (2024). A Study on Behaviour of Customers towards Sustainable Products in Mumbai Region.

B. Arslan and H.Gogce (2013). In the Framework of Green Marketing Activities: A study to determine the tendencies of University students towards using environment-friendly products.

Jerath, N. (2021). Awareness and Attitude of Students towards Municipal Solid Waste Management to Achieve Sustainable Development Goals - A Case Study. *International Journal of Plant and Environment*. 7(1), 78-85

Sellamuthu M, Krishnasamy HN, Isa MBM., et al. Determinants of intention to purchase online eco-friendly items amongst university students in Nilai, Malaysia. *Environment and Social Psychology* 2024; 9(9): 2865. doi:10.59429/esp.v9i9.2865

Mishra, S., Srinivas, C., Singh, S. and Savant, D. (Current Perspectives in Sustainable Environment Management © 2017 SIES Indian Institute of Environment Management).

Tasneem Alsaati, Samir El-Nakla and Darin El-Nakla (2020). Level of Sustainability Awareness among University Students in the Eastern Province of Saudi Arabia

M Ridwan et al 2021 *J. Phys.: Conf. Ser.* **1806** 012135

Arba'at Hassan, Tajul Ariffin Noordin, Suriati Sulaiman, The status on the level of environmental awareness in the concept of sustainable development amongst secondary school students, *Procedia - Social and Behavioral Sciences*, Volume 2, Issue 2, 2010, Pages 1276-1280, ISSN 1877-0428.

Kurdiati, L.A. & Fathurohman, A. 2024. Exploring next generations for a sustainable future: a systematic literature review on sustainability awareness among high school students in Indonesia. *JUPI (Jurnal IPA dan Pembelajaran IPA)*, 8(2):168-182.

<https://sdgs.un.org/goals>

QUESTIONNAIRE

- Name: _____
- Email ID: _____
- Age: _____
- Gender: ☐ Male ☐ Female
- Level of Study: ☐ Bachelors ☐ Masters
- Field of Study: ☐ Arts ☐ Commerce ☐ Science
- Year of Study: ☐ 1st ☐ 2nd ☐ 3rd
- College / University Name: _____

AWARENESS AND KNOWLEDGE

1) On a scale of 1–5, how familiar are you with the term “sustainable development”?

Not at all	1	2	3	4	5	Extremely
familiar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	familiar

2) How do you rate your knowledge about sustainability?

Least	1	2	3	4	5	Highly
Aware	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	aware

3) Are you aware of Eco-friendly products? ☐ Yes ☐ No

4) Where did you learn about eco-friendly products?

- ☐ School / College
- ☐ Family / peers
- ☐ Internet / Social Media

ATTITUDE AND BELIEFS

5) I feel responsible for making environmentally friendly choices.

- ☐ Strongly agree
- ☐ Strongly disagree

6) Buying eco-friendly products help reduce environmental damage.

- ☐ Strongly agree
- ☐ Strongly disagree

7) I consider environmental impact when making a purchase.

- ☐ Strongly agree
- ☐ Strongly disagree

8) Do you make an effort to conserve natural resources like water and energy in your daily life?

- ☐ Yes
- ☐ No
- ☐ Maybe

PRACTICES AND BEHAVIOURS

9) How often do you do the following:

- | | | | |
|---------------------------------|------------------------------|---------------------------------|-----------------------------|
| Use reusable bags | <input type="radio"/> Always | <input type="radio"/> Sometimes | <input type="radio"/> Never |
| Recycle waste | <input type="radio"/> Always | <input type="radio"/> Sometimes | <input type="radio"/> Never |
| Limit plastic usage | <input type="radio"/> Always | <input type="radio"/> Sometimes | <input type="radio"/> Never |
| Turn off lights when not in use | <input type="radio"/> Always | <input type="radio"/> Sometimes | <input type="radio"/> Never |

10) Do you check for eco-certifications or eco-symbols on packaging?

- ☐ Yes
- ☐ No
- ☐ Sometimes

11) What sustainable packaging options do you prefer? (Multiple selection are allowed)

- ☐ Biodegradable ☐ Reusable ☐ Recyclable ☐ Plastic free

12) What motivates you to practice sustainability?

- ☐ Concern for the environment
- ☐ Influence of family and friends
- ☐ Social media/ influencers
- ☐ School/university initiatives

13) Would you be willing to pay a higher price for a sustainable product if the quality is same or better than non-sustainable product?

- ☐ Yes definitely
- ☐ Yes, but only if the price difference is small
- ☐ No, I prioritize affordability over sustainability
- ☐ Not sure

14) Do you resell or purchase second hand products with the intention of reducing waste?

- ☐ Yes, always ☐ Yes, sometimes ☐ Occasionally ☐ Rarely ☐ Never

BARRIERS, MOTIVATORS AND INSTITUTIONAL ROLE

15) What challenges do you face in adopting sustainable practices? (Multiple selection are allowed)

- ☐ Lack of knowledge
- ☐ High cost of sustainable products
- ☐ Lack of support from peers or family
- ☐ Limited access to sustainable options

16) My college encourages students to follow sustainable practices.

Strongly disagree	1	2	3	4	5	Strongly Agree
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

17) Has your university / department incorporated sustainability into its curriculum?

- ☐ Yes ☐ Yes to some extent ☐ No

18) Would you like to participate in Sustainability initiatives in college?

- ☐ Yes ☐ No ☐ Maybe

19) Do you agree with the phrase, "I would like to see the University implement more sustainability initiatives in its infrastructure and in processes"?

Strongly	1	2	3	4	5	Strongly
disagree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Agree

20) What do you think would encourage more students to adopt sustainable practices? (Multiple selection are allowed)

- ☐ Strong social influence from peers and role models
- ☐ More university led sustainability programs
- ☐ Rewards for sustainable actions
- ☐ Greater awareness of sustainability issues in their locality
- ☐ Making sustainable choices more affordable and accessible

21) Any additional comments or suggestions regarding eco-friendly products and sustainability practices?

THANK YOU FOR YOUR TIME!

