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Evaluating Tumbler Use in High Schools: A Case Study on Sustainability and Fostering Environmental Stewardship

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Abstract:- This study evaluated the utilization of tumblers among high school students in Dominican High School of Sto. Domingo, N.E., Inc. towards sustainability and fostering environmental stewardship. One hundred twelve (112) high school students were chosen randomly as respondents. Data were presented in frequency tables, and an analysis of the information gathered from the Likert scale was illustrated using descriptive tables. Results revealed that all of the respondents use tumblers. In addition, the practices and dynamics showed that respondents use an insulated tumbler with water as the most common stored drink on a daily basis. Furthermore, the results indicated positive participation in bringing tumblers among these students to reduce the waste of single-use plastics and to promote sustainability. Lastly, a positive perception of the long-term effects of using a tumbler towards sustainability and environmental stewardship was evident.

Keywords:- *Environmental Stewardship, High School Students, Student Participation, Sustainable Practices, Single Use Plastics, Sustainability, Tumbler.*

I. INTRODUCTION

Every year, global emissions of carbon footprints are increasing due to industrialization and unsustainable development. Harmful wastes include excessive food waste, hazardous chemicals, agricultural wastes, and one of the most abundant contributors to global warming, plastic. The production of plastics began around the 1950s, whereas currently, more than 8.3 billion metric tons of plastics have been produced to date (Cohen, J., 2017). Aside from the large-scale production, there is also a lack of sustainable management practices of wastes globally; approximately 79% in natural ecosystems, while 12% are incinerated, and only 9% of the plastic wastes that have been produced are recycled (Geyer, R., et al. 2017). Emissions may increase to 53 million metric tons annually, due to the ambitious commitments set by countries (Borelle, S., Ringma, J., et al., 2020). There is also a concern about floating microplastics, which amount to up to 37 times higher than before; identically the mass of more than 1300 blue whales (Law, K., Sebille, E. 2016). Moreover, the ecosystem's wildlife is negatively affected as millions of animals, as birds and marine organisms such as fish, including other endangered species, die annually due to plastic ingestion or entanglement (Parker, L., 2019). Research revealed that marine fish ingest plastic globally since two-thirds of the 555 fish species were investigated (McInturf, A., Savoca, M. 2019). Researchers also estimate that more or less 21 million metric tons of plastic waste accessed the ocean ecosystems in 2016 alone (Borelle, S., Ringma, J., et al. 2020). Furthermore, microplastics pass across the Arctic Ocean, where particles are released when the ice melts, influencing global temperature rise (Rhodes, C., 2018). These findings suggest that the production, use, and disposal of plastics in an unsustainable manner are significant concerns that require attention through participation in the movement toward sustainable development goals.

Based on the current issues regarding plastic pollution, promoting awareness and providing solutions are necessary to prevent its harmful effects on environmental sustainability. Reducing the use of single-use plastics, recycling waste, and identifying excellent substitutes are some sustainable practices that have the potential to lower our carbon footprints overall. An example is utilizing a tumbler rather than purchasing a beverage stored in a plastic bottle. A tumbler is a drinking container that comes in different materials like stainless steels, glass or plastic. Depending on its size, this container can usually hold 250 ML to 5 Liters of water. The use of tumbler may significantly aid in the reduction of plastic waste, particularly if this practice is reinforced by policies and rules of the school, raising awareness about environmental problems and encouraging environmental responsibility towards environmental stewardships

In Dominican High School, students participate in the implementation of different environmental programs. One of which is bringing a sustainable water canister instead of purchasing single-use plastic bottles. This stems from the Philosophy, Mission,Vision, Goals and Objectives (PMVGO) of the school, particularly the mission statement number 3 that states “Empower students through grit, resilience and leadership, self directed learning, and social and environmental sustainability”. However, to gain a comprehensive understanding of the student's practices, intentions, and perception about the issue, it is critical to understand how these methods have been effective. Hence, the motivation of the study.

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Furthermore, this study sought to answer the following objectives: (1) To determine the practices and dynamics of students in using a sustainable tumbler, (2) To describe the students' participation in the implementation of bringing a sustainable tumbler, and (3) To describe the perceived long term effects of having a sustainable tumbler towards environmental sustainability.

II. METHODOLOGY

The researchers utilized a descriptive-quantitative research method to gather the necessary data, which was then quantitatively and statistically analyzed. There were 112 respondents in total for the study using simple random sampling. In addition, information was obtained via a distributed survey questionnaire that the researcher created and verified to address the study goals concerning tumbler practices and dynamics, student involvement, and their perceptions of the long-term impacts on environmental sustainability. In addition, the researchers used frequency tables and an analysis of the Likert scale for the presentation of data to review the successful implementation of bringing a sustainable tumbler among students. Furthermore, these were analyzed using Google Sheets for the computations needed, including frequency, percentage, and weighted mean. Lastly, collected data was described using both adjectival and numerical values. A 1.00 -- 1.75 weighted mean indicates a "strongly disagree" verbal description, 1.76 -- 2.50 for "disagree," 2.51 -- 3.25 implies an "agree" description, while a 3.26 -- 4.00 range means "strongly agree.".

III. RESULTS AND DISCUSSION

This section presents the findings of the study regarding the tumbler use among the students of the subject school

A. Practices and Dynamics in Using a Sustainable Tumbler among Students

The respondents were surveyed about if they use a tumbler, their type, most-stored drink, and how often they use them in school. It is vital to consider the students' practices and dynamics of using a tumbler to gain a sense of how one utilizes it for environmental sustainability.

Table 1 Students' Use of Tumbler

Responses	Frequency (f)	Percentage (%)
Yes	112	100
No	0	0
TOTAL	**112**	**100**

Table 1. reveals that all respondents use a tumbler. This indicates that students are encouraged and empowered to do practices promoting environmental sustainability. However, it is also fundamental to know whether the kind of tumbler students use is sustainable.

Table 2 Type of Tumblers Used

Responses	Frequency (f)	Percentage (%)
Plastic Tumbler	21	18.75
Insulated Tumbler	87	77.68
Tumbler Mug	4	3.57
TOTAL	**112**	**100**

Table 2 shows that most of the participants use an insulated tumbler, with 87 out of 112 (77.7%) responses, followed by 18.8%, or 21 students, using plastic tumblers. The data highlights that students at Dominican High School may either prefer hot or cold drinks. Therefore, it's also interesting to find out what kind of beverage the respondents store.

Table 3 Most-stored Drink in Tumblers

Responses	Frequency (f)	Percentage (%)
Water	109	97.32
Juice	3	2.68
TOTAL	**112**	**100**

Based on the results presented in Table 3, the respondents prefer storing water in their tumblers, with 109 (97.32%) responses. The majority of this data indicates that the respondents want a much healthier option. Thus, Dominican students prefer to make sustainable choices. However, it is also vital to consider their consistency in using a tumbler to know how often students practice sustainability by having a tumbler.

Table 4 Tumbler Usage Frequency

Responses	Frequency (f)	Percentage (%)
Daily	101	90.18
A few times a week	8	7.14
A few times a month	0	0
Rarely	3	2.68
TOTAL	**112**	**100**

As shown in Table 4, most students use their tumblers daily, while only a few respondents barely use theirs. This information implies that the majority (90.18%) practice sustainable actions by bringing a canister around daily. Therefore, it is also necessary to consider their purpose in having a tumbler aside from knowing the students' practices and dynamics to have a deeper understanding of their intentions.

A. Purposes of Tumbler Use Among Students

In gaining a more comprehensive review of the successful implementation of bringing a tumbler among students, the researchers asked why students participated in this sustainable movement. Thus, this section will interpret the data collected regarding the reason for bringing a sustainable tumbler around.

Table 5. Students participation in using a tumbler

No.	Item Statement	Weighted Mean	Verbal Description
1	I use a sustainable tumbler to reduce the environmental impact associated with the disposal of single-use plastics.	3.55	Strongly Agree
2	I use a sustainable tumbler to contribute to the reduction of wastes that end up in landfills or as litter.	3.51	Strongly Agree
3	I use a sustainable tumbler to save money, avoiding the cost of purchasing single-use plastic bottles.	3.61	Strongly Agree
4	I use a sustainable tumbler because of its convenience which I can always carry around me	3.52	Strongly Agree
5	I use a sustainable tumbler to inspire others and spread awareness about the importance of sustainable practices.	3.32	Strongly Agree
6	I use a sustainable tumbler to include myself in social and cultural trends as I take pride in carrying a branded tumbler.	2.98	Agree
Average Weighted Mean		**3.42**	**Strongly Agree**

The results from Table 5 show that the average weighted mean of the responses from the Likert scale regarding the purposes of bringing a tumbler is 3.42. This indicates a "Strongly Agree" verbal description, meaning that Dominican High School students have a positive attitude towards sustainable actions to reduce the disposal of single-use plastics (3.55), contribute to the reduction of wastes ending up in landfills or as litter (3.51), to save money avoiding the purchase of plastics (3.61), to have a convenient experience as tumblers are portable (3.52), to promote and encourage others about its importance (3.32), and somehow include themselves in social and cultural trends by having a branded tumbler (2.98). These findings imply that there is a positive engagement regarding the purpose of bringing a tumbler among students. However, knowing their perception of its long-term effects on a sustainable environment is relevant to achieving a more comprehensive review of the successful implementation of using a tumbler in Dominican High School.

B. Perceived Long-term Effects of Tumbler Usage towards Environmental Stewardship

Table 6. Students Perceived Long-Term Effects of Using Tumblers

No.	Item Statement	Weighted Mean	Verbal Description
1	Using a tumbler will reduce my overall waste, especially in single-use plastics.	3.31	Strongly Agree
2	Using a tumbler will help spread awareness about sustainable practices for environmental sustainability.	3.40	Strongly Agree
3	Using a tumbler will influence other people to decrease reliance on single-use plastics.	3.37	Strongly Agree
4	Using a tumbler will have a positive long-term impact on reducing my carbon footprint.	3.38	Strongly Agree
5	Using a tumbler will decrease my chances of consuming harmful chemicals leached by plastics to the liquid.	3.40	Strongly Agree
Average Weighted Mean		**3.37**	**Strongly Agree**

The findings in Table 3 illustrate the average weighted mean of 3.37 for all the item statements regarding the perceived long-term effects of using a tumbler towards environmental sustainability. The results indicate a "strongly agree" verbal description, which denotes that the students have a positive perception of the benefits of having a sustainable water canister in the future. Aside from reduced waste (3.31), it helps spread awareness about proper practice towards sustainability (3.40) and influence people to decrease their reliance on single-use plastics (3.37), which harm wildlife and our natural environment (Food and Agriculture Organization, 2019). In addition, having a sustainable tumbler also enables the students to reduce their carbon footprint (3.38) and prevent ingesting chemicals leached by plastics (3.40) (Gayle, D., 2022). The findings imply that perception is

also necessary for the successful implementation of using a tumbler in a community. Thus, it is vital to advocate for and educate people about sustainable actions to achieve a greener environment for everyone.

Table 7. Students' Perception on the Role of the School in Using Tumblers towards Sustainability and Environmental Stewardship

No.	Item Statement	Weighted Mean	Verbal Description
1	The efforts of the school community to promote the use of sustainable tumblers have effectively reduced plastic waste.	4.00	Strongly Agree
2	The school's educational campaigns and initiatives on using sustainable tumblers have made me more aware of the environmental benefits.	4.00	Strongly Agree
3	There is a noticeable decrease in single-use plastic water bottles on campus since the launch of the sustainable tumbler initiative.	4.00	Strongly Agree
4	The school's efforts to promote sustainable tumblers have a positive impact on environmental sustainability within the school community.	4.00	Strongly Agree

IV. CONCLUSION

In summary, the practices and dynamics, purposes in participation, and perceived long-term effects of using a tumbler served as an indicator in evaluating the use of tumblers towards sustainability and environmental stewardship among the high school students.

- Based on the overall results regarding the students' practices in utilizing a sustainable tumbler, the respondents are well aware of the environmental responsibilities towards sustainability. All of the 112 high school students use a tumbler, and the majority preferred making sustainable choices, as most of the respondents use an insulated tumbler to store water daily to keep them hydrated in school.
- The findings revealed that the majority of the students have positive participation in the implementation of having a tumbler, as results showed an average weighted mean of 3.42, indicating a "strongly agree" verbal description as they use a sustainable canister to reduce waste, especially single-use plastics, to save money by avoiding the cost of purchasing plastic goods, for its convenience, to raise awareness, and to include themselves in social and cultural trends.
- Most of the students have a positive perception of the long-term effects of using a tumbler towards environmental sustainability, with a 3.37 average weighted mean that indicated another "strongly agree" verbal description regarding the reduction of overall waste and carbon footprint, spreading awareness and promoting sustainability, distrusting single-use plastics, and preventing ingestion of harmful chemicals leached by plastics.

RECOMMENDATIONS

Harnessing form the results of the study, the following recommendations are created:

- Decrease the single use plastic bottle consumption by developing circular economy models to retain the value of plastics instead of becoming waste. This will help increase domestic recycling rates to attain a sustainable plastics future through the 3Rs (reduce, reuse, and recycle) (Walker, T., Fequet, L., 2023).
- Legislate policies in school that promote minimization to zero-plastic bottle waste by removing the options of single-use plastic bottles in school canteens' inventory and replacing it with sustainable water stations. This not only helps reduce plastic consumption, but also reminds students towards a vision of a sustainable future.
- Coordinate a tumbler day in schools where activities involving the dynamics, sustainable practices and importance of tumblers are implemented. It may be a day where no single-use plastic is purchased. It also engages students within programs in a unique way through orientations, games, and other meaningful activities.
- Organize workshops and seminars about the continuous student empowerment inusing a sustainable tumbler, highlighting its positive effects and how it contributes to the environment. This will help increase awareness among students on the importance of having a tumbler.
- Develop long-term sustainability plans to maintain and expand knowledge of how using a tumbler reduces reliance on single-use plastics despite unsustainable industrialization. It is vital to address the issue by minimizing the production of plastics and retaining a sustainable approach to producing and consuming plastics, preferably single-use, low-value, and disposable. (Kumar, R., Verma, A., et al., 2021).
- Coordinate character education towards environmental sustainability in schools and other communities by strengthening policies and innovating lesson plans based on the SDGs (Sustainable Development Goals)
- Implement water bottle refilling stations on campuses or other public areas to promote sustainability by reducing the purchase of single-use plastic bottles. (Uehara, T., Ynacay-Nye, A., 2018).
- Explore sustainable consumption patterns that aim to reduce carbon emissions by considering proper decisions in how we run our community like schools (Sustainable Consumption Roundtable, 2017).

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