MIND YOUR PLASTIC

FROM POLLUTION AWARENESS TO ACTION:

How Environmental Education through the Circular Economy Ambassador Program Alters Students and Teachers' Perceptions and Behaviours

Contents

EXECUTIVE SUMMARY

The 2024 Circular Economy Ambassador Program (CEAP) by Mind Your Plastic sought to engage students and teachers in meaningful, hands-on activities focused on plastic pollution and sustainable waste management. The program's primary goal was to cultivate environmental literacy and inspire behavioural changes, encouraging participants to reduce plastic waste and adopt more sustainable practices.

The program's effectiveness was evaluated through pre- and post-program surveys that assessed participants' knowledge, attitudes, and behaviours regarding plastic pollution. **The findings revealed significant improvements in understanding waste management, recycling, and the environmental impact of plastic among both students and teachers**. Students expressed a strong desire to contribute to a cleaner environment and showed increased motivation to participate in future cleanups and adopt sustainable behaviours. Teachers, with their structured expectations, gained valuable insights into the systemic challenges of plastic waste and the principles of the circular economy.

Key findings from the program include:

- **Students' Expectations and Reflections**: Students initially sought actionable strategies to address environmental issues, focusing on reducing pollution and improving recycling. After participating in the cleanup, many were surprised by the volume of waste encountered and expressed a desire for continued involvement in environmental actions, such as reducing plastic use and participating in future cleanups.
- **Teachers' Expectations and Reflections:** Teachers aimed to deepen their understanding of plastic waste and its effects. Following the activity, they appreciated the students' heightened environmental awareness and felt inspired to organize future cleanups and adopt sustainable practices themselves.
- **Behavioural Shifts:** Both students and teachers demonstrated positive changes in waste management behaviours, including increased awareness of recycling, reducing plastic consumption, and embracing sustainable alternatives.

Although the program successfully promoted pro-environmental behaviours, **the findings also underscored the need for broader systemic changes to tackle the root causes of plastic pollution. The program highlighted the importance of upstream solutions, such as reducing plastic production and improving waste management infrastructure, to achieve lasting impact.**

The CEAP showcased the power of experiential learning in fostering environmental awareness and action among diverse age groups and roles. It effectively engaged participants in meaningful environmental activities, inspiring long-term sustainability and commitment to reducing plastic waste. Moving forward, the CEAP should continue to combine hands-on activities with education on systemic change to ensure that participants are empowered to drive both individual and societal efforts toward a more sustainable future.

INTRODUCTION

Plastic pollution is a growing global threat, impacting ecosystems, biodiversity, and human health. It disrupts food chains, introduces harmful chemicals, and affects marine and terrestrial environments, contributing to climate change and ecological degradation (Ritchie & Roser, 2018; Verma et al., 2020). Since its creation, plastic has become a vital material in many industries, especially for packaging, storage, and transportation. However, the overwhelming scale of its production, combined with excessive use and poor waste management, has resulted in plastic being widespread in natural environments, causing significant, and often permanent, damage (Jambeck et al., 2015). This issue affects not only marine and land ecosystems but also extends to the human food chain, as microplastics are now being found in food, adding another layer of concern (Eriksen et al., 2014).

Educational institutions have a key role to play in addressing this crisis by promoting environmental literacy and encouraging younger generations to create change. Students, who tend to be more adaptable and open to new ideas, are an essential group in the fight against plastic pollution. Through environmental education, they can gain a deeper understanding of the complexities of the issue and its wide-reaching impacts (Hungerford & Volk, 1990). Research shows that greater environmental awareness among students often leads to positive behavioural changes, both individually and within their communities, sparking broader environmental action (Stevenson et al., 2009).

RECOGNIZING THE POTENTIAL FOR CHANGE, THE CANADIAN CHARITY, MIND YOUR PLASTIC, LAUNCHED THE CIRCULAR ECONOMY AMBASSADOR PROGRAM (CEAP) IN 2021.

This initiative was designed to support teachers in engaging students with practical steps toward reducing plastic waste and adopting circular economy practices. By offering a range of educational materials, the CEAP aims to inspire students to become ambassadors of sustainability, influencing a wide variety of demographic groups and promoting systemic change.

This report explores students' and teachers' understanding of plastic pollution and behaviour towards this issue, before and after participating in the 2024 CEAP, highlighting their evolving role in advancing sustainability. The findings aim to inform future educational efforts and contribute to the development of long-term strategies to combat plastic pollution.

METHODS

STUDENT SURVEYS

Digital surveys were developed using the Google Form platform, tailored to accommodate two student age groups: 5-12 years and 13-18 years. However, this year teachers were also asked to fulfill the survey, which reflected the survey used for students between the ages of 13-18 years. Teachers were instructed to administer pre-program and post-program surveys as part of the CEAP. Despite being a mandatory component of the program, several logistical challenges, such as time constraints, comprehension barriers, and scheduling conflicts, prevented some schools from completing both surveys. Consequently, some schools provided only pre-program surveys, while others submitted only post-program responses. Therefore, to ensure a more controlled and reliable data analysis, only the schools that completed both pre-program and post-program surveys were included in this report. As a result, the analysis is based on 283 student survey responses (179 pre-program and 104 post-program) from five different schools, as well as 16 teacher survey responses (8 pre-program and 8 post-program) from seven different schools. This approach provides a more consistent and accurate representation of the program's impact, while maintaining the integrity of the data collected.

To analyze the survey data, the following assumptions were made:

1. Students completing pre-program surveys in a given school were the same individuals completing post-program surveys.
2. Each survey response was considered a unique participant, regardless of whether it was pre- or post-program.
3. In cases where the number of pre- and post-survey respondents from the same school differed, the higher count was used to estimate the total number of participants (e.g., if School A had three pre-program and 12 post-program responses, the total number of participants was considered 12).
4. All survey respondents participated in the CEAP.

These assumptions allowed for a standardized analysis of the available data, enabling a more comprehensive understanding of the program's impact.

The survey encompassed a range of questions designed to gather demographic information and assess participants' understanding and attitudes toward plastic pollution. These questions employed various formats, including multiple-choice items to evaluate participants' existing knowledge of plastic pollution, scaled questions to gauge their opinions and levels of agreement, and open-ended prompts to explore the nuanced perspectives, behaviours and emotions of both students and teachers regarding the elimination of plastic. This diverse approach provided a comprehensive insight into their awareness, attitudes, and potential motivations for adopting sustainable practices.

DATA ANALYSIS

PRESENT IN PRE-CLEANUP SURVEY	PRESENT IN POST-CLEANUP SURVEY	QUESTION TYPE	QUESTION	ANSWER
x	x	An open ended question to write their own answer	What is the name of your school?	Unique Answer
x	x	A multiple choice question with one possible answer.	Where do you live?	(i) Newfoundland and Labrador; (ii)Prince Edward Island (iii)Nova Scotia; (iv) New Brunswick; (v) Quebec; (vi) Ontario; (vii) Manitoba; (viii) Alberta; (ix) Saskatchewan; (x) British Columbia; (xi) Yukon; (xii) Northwest Territories; and (xiii) Nunavut
x	x	A multiple choice question that with one possible answer	What grade are you in?	(i) Kindergarten; (ii) Grade 1-3; (iii) Grade 4-6; (iv) Grade 7-9; (v) Grade 10-12; (vi) University/College; and (vii) None
x	x	A multiple choice question that with one possible answer	How old are you?	(i) 5-7; (ii) 8-10; (iii) 11-13; (iv) 14-16; (v) 16-17; and (vi) 18+
x	x	A multiple choice question that with one possible answer	What do you identify as?	(i) Male; (ii) Female; (iii) Non-binary and (iv) Prefer not to disclose
x	**x**	A multiple choice question that with one possible answer	How motivated are you to use less plastic?	(i) Extremely; (ii) Very; (iii) Moderately; (iv) Slightly; and (v) Not at all
x	**x**	A multiple choice question that with one possible answer	How often do you recycle?	(i) Always; (ii) Most of the time; (iii) Sometimes; (iv) Rarely; and (vi) Never
x	**x**	A multiple choice question that with one CORRECT answer	How many types of plastic exist?	(i) 1; (ii) 3; (iii) 5; and (iv) 7 (Correct Answer)

x	x	A multiple choice question that with one CORRECT answer	Which plastics have the highest recycling rate?	(i) Polyethylene terephthalate (PET) and High-density polyethylene (HDPE); (Correct answer) (ii) Polyvinyl chloride (PVC) and Low-density polyethylene (LDPE); (iii) Polypropylene (PP) and Polystyrene (PS); and (iv) Other (Polycarbonate, BPA)
x	x	A multiple choice question that with one possible answer Possible values: (i) Yes; (ii) No; and (iii) I don't know	Does your town or city help you recycle?	(i) Yes; (ii) No; and (iii) I don't know
x	x	A multiple choice question that with one possible answer	How do you try to use less plastic?	(i) I choose products packaged with recyclable plastics; (ii) I choose products that are plastic-free (Single-use Paper/compostable); (iii) I choose reusable alternatives (Reusable Water bottles); (iv) I do not minimize plastics; (v)I do not know how to minimize my plastic use
x	x	A multiple choice question that with one possible answer	How harmful is plastic pollution to the environment and its inhabitants?	(i) Very harmful; (ii) Somewhat harmful; (iii) A little harmful; and (iv) Not harmful
x	x	A multiple choice question that allowed students to choose more than one answer (All answers are correct but vi is the most correct)	What are the impacts of plastic pollution?	(i) City litter; (ii) Ocean pollution; (iii) Kills animals; (iv) Enters food chain; (v) Causes health issues in humans; (vi) All of the above (Is the most Correct Answer); (vii) None of the above
x	**x**	A multiple choice question that with one possible answer	How dirty/polluted is your city?	(i) Very polluted; (ii) Somewhat polluted; (iii) A little polluted; and (iv) Not polluted
x	**x**	A multiple choice question that with one CORRECT answer	How much plastic waste is sent to the landfill in Canada every year?	(i) 1.8 million tonnes; (ii) 2.8 million tonnes (Correct Answer); (iii) 3.8 million tonnes; and (iv) 4.8 million tonnes
x	**x**	A multiple choice question that with one CORRECT answer	How much of Canada's plastic actually gets recycled each year?	(i) 9% (Correct Answer); (ii) 12%; (iii) 25%; (iv) 37%; and (v) 63%

x	x	A multiple choice question that with one CORRECT answer	What are microplastics?	(i) Whole plastic items; (ii) Small plastic toys; (iii) Big pieces of plastic; (iv)Tiny pieces of plastic (Correct Answer)
x	x	A multiple choice question that with one CORRECT answer	How do microplastics affect humans and animals?	(i) Help us scrub our skin; (ii) Makes our food tasty; (iii) It does not affect humans and animals; and (iv) Enter the food chains causing health issues (Correct Answer)
x	x	A multiple choice question that with one CORRECT answer	What statement is true about plastic?	(i) Plastic is biodegradable; (ii) Plastic does not break down into smaller pieces; (iii) Almost every piece of plastic ever created is still on Earth today (Correct Answer)
x	x	A multiple choice question that with one CORRECT answer	What is a Circular Economy?	(i) An economy that extracts, uses, then disposes of resources/items; (ii) An economy that designs things to be disposable to keep making money; (iii) A circular economy uses waste as a resource to produce new materials /products (Correct Answer); and (iv) A circular economy DOES NOT use waste as a resource to produce new materials /products
x	x	A multiple choice question that with one possible answer	Where do you most learn about Plastic Pollution?	(i) Internet; (ii) School; (iii) Social media; (iv) Friends/Family; (v) Non-profit Organization awareness campaigns; (vi) Printed materials (posters, flyers, etc)
x	**x**	A multiple choice question that with one possible answer	What material do you mostly use as a single-use plastic alternative?	(i) Paper/Cardboard; (ii) Durable/reusable plastic; (iii) Cloth; (iv) Biodegradable; (v) Metal; (vi) Glass; (vi) Bamboo; (vii) Wood; (vii) Ceramic; (viii) Edible; and (ix) None of the above
x	**x**	A multiple choice question that with one possible answer	According to you, what is the best way to manage plastic pollution?	(i) Conducting environmental cleanups; (ii) Individuals should take daily actions; (iii) Government should increase regulations; (iv) Non-profit organizations should have more awareness campaigns; (v) Courses should be added to educational curriculum in schools; and (vi) Government should impose heavier fines

x		An open ended question to write their own answer	What do you think you will learn from doing a cleanup with your class?	Unique Answer. Answers were categorized to ease analysis.
x		An open ended question to write their own answer	What do you think will be the best part of the cleanup?	Unique Answer. Answers were categorized to ease analysis.
	x	An open ended question to write their own answer	What did you learn from doing the cleanup with your class?	Unique Answer. Answers were categorized to ease analysis.
	x	An open ended question to write their own answer	What surprised you the most during the cleanup?	Unique Answer. Answers were categorized to ease analysis.
	x	An open ended question to write their own answer	What do you think will be the best part of the cleanup?	Unique Answer. Answers were categorized to ease analysis.
	x	An open ended question to write their own answer	What action do you feel inspired to take after conducting your cleanup?	Unique Answer. Answers were categorized to ease analysis.

TABLE 1 Student/Teacher Survey Questions. The surveys were tailored to accommodate varying age groups. To enhance comprehension, of the younger students, aged 5 to 12, simplified language and engaging visuals suited to the developmental level of the participants were featured. Teachers were encouraged to assist younger students, ensuring they could actively engage, understand the questions, and express their thoughts with confidence. For older students, aged 13 to 18, the questions were presented using more advanced language, as outlined below. Teachers answered the questions in the survey designed for the student age group 13-18.

SURVEY RESPONSES

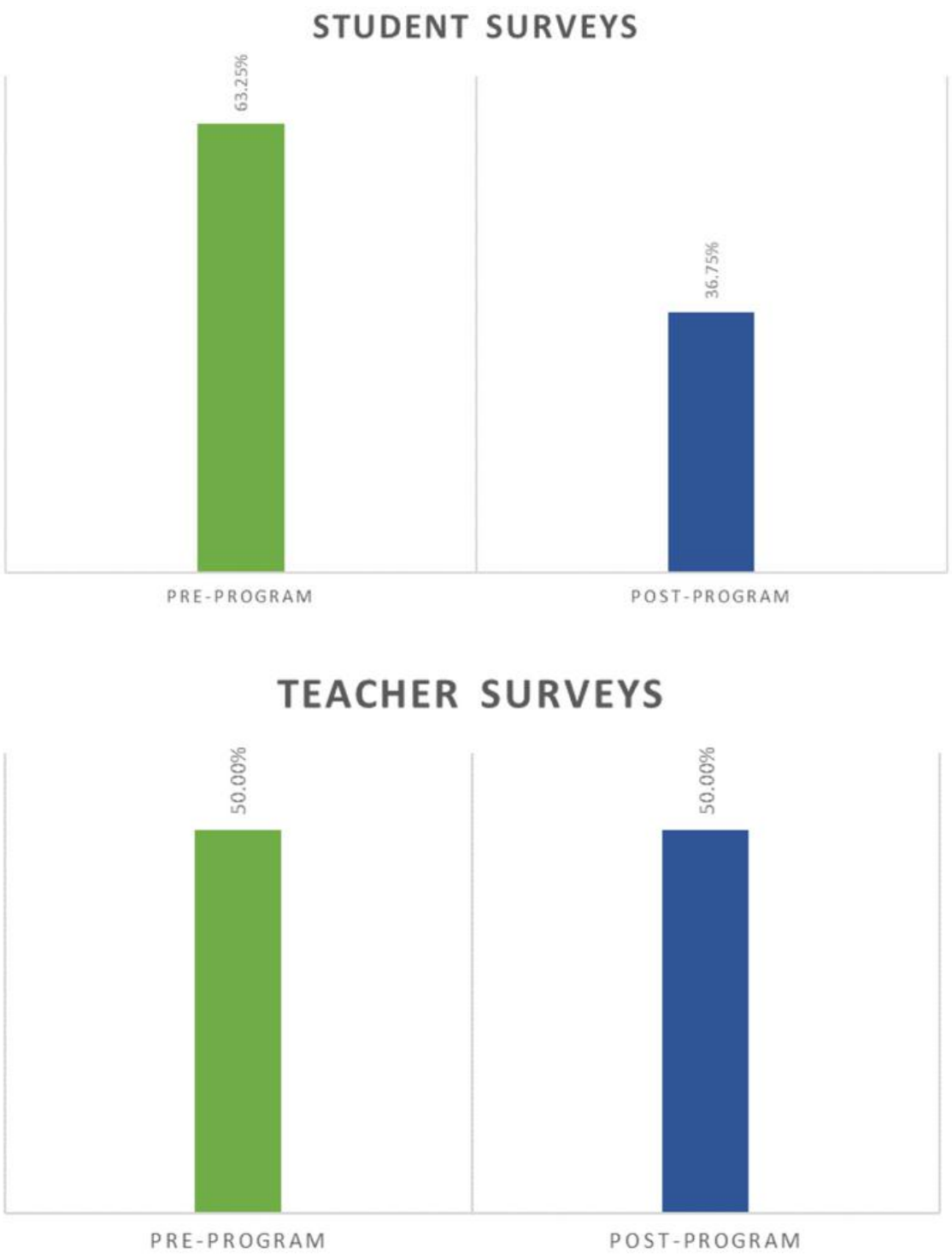


FIGURE 1. Survey responses collected from students (n = 283) and teachers (n = 16) who completed both the pre- and post-program survey.

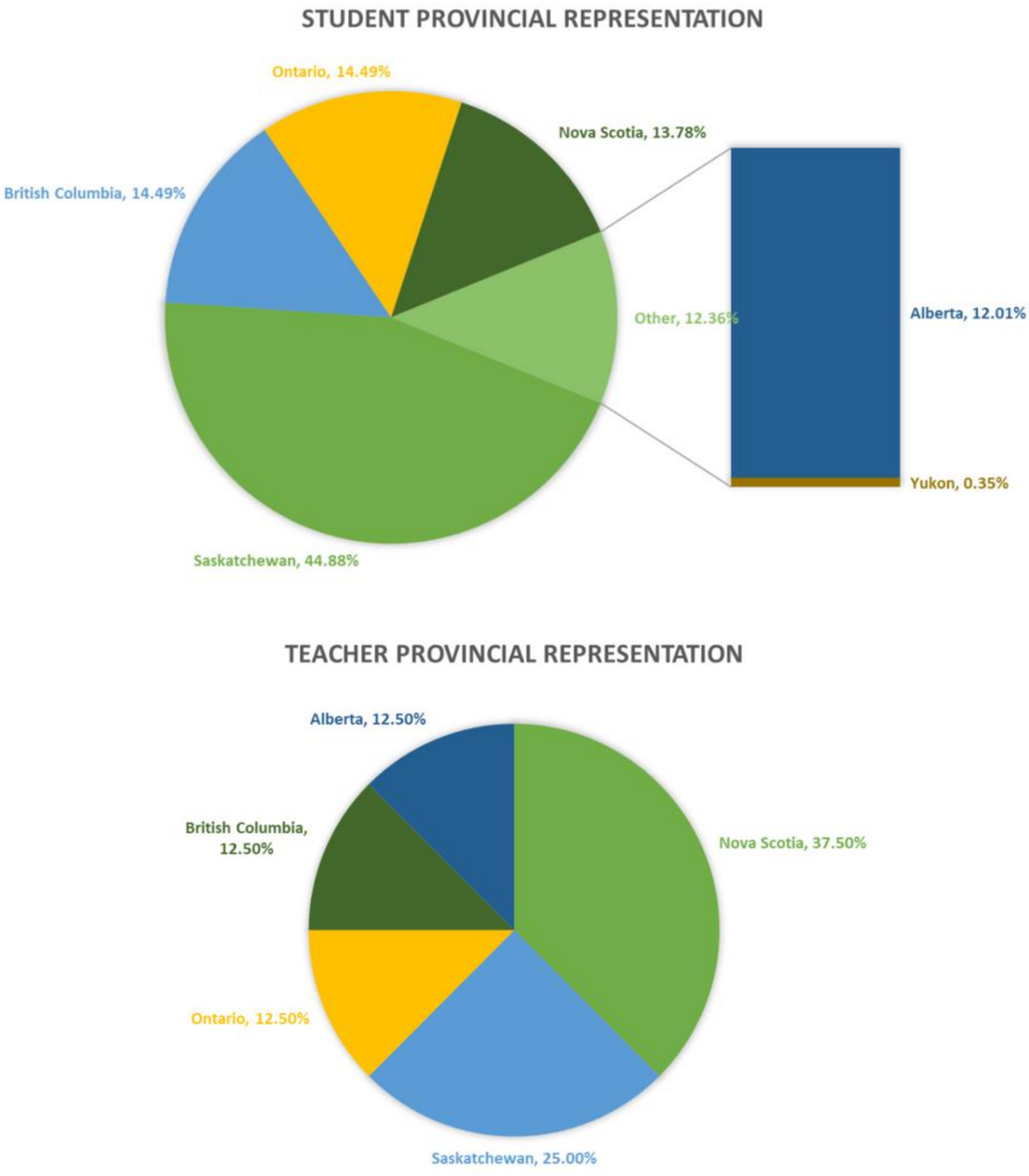


FIGURE 2. A provincial overview of the students (n = 283) and teachers (n = 16) that successfully conducted both pre- and post-program surveys

DEMOGRAPHICS

The survey responses from both students and teachers provide insights into the program's impact. For the student surveys, the percentage of students who fulfilled both the pre- and post-program surveys decreased from 63.25% pre-program to 36.57% post-program (Figure 1). For the teacher surveys, the proportion of teachers who fulfilled both surveys remained consistent at 50% both pre- and post-program (Figure 1).

For students, provincial representation was most heavily concentrated in Saskatchewan, which accounted for 44.8% of participants. Other important contributors included British Columbia and Ontario, both at 14.49%, and Nova Scotia at 13.78%. Smaller contributions came from Alberta (12.01%), and the Yukon, which had minimal representation at 0.35% (Figure 2). For teachers, the distribution was more evenly spread across provinces, with the largest group from Nova Scotia at 37.5%. Saskatchewan followed with 25%, while British Columbia, Ontario, and Alberta each contributed 12.50% (Figure 2). This data illustrates the program's wide reach across Canada, though certain provinces, such as Saskatchewan and Nova Scotia, had higher engagement levels among students and teachers, respectively.

The age distribution of students and teachers reveals some clear differences. Most students are between 8 and 10 years old, making up 36% of the group. This is followed by 27% of students who are 11 to 13 years old, and 23% who are 5 to 7 years old. Fewer students, about 13%, fall into the 14 to 16 age range, and only a small fraction, just 1%, are 18 or older (Figure 3). On the other hand, the majority of teachers are in their 40s, with 62% aged between 41 and 50. Another 25% are in their 30s, while a smaller group, 13%, are in their 20s (Figure 3). These numbers show that while students are primarily young children, teachers tend to be more experienced, with most being in the middle stages of their careers (Figure 3).

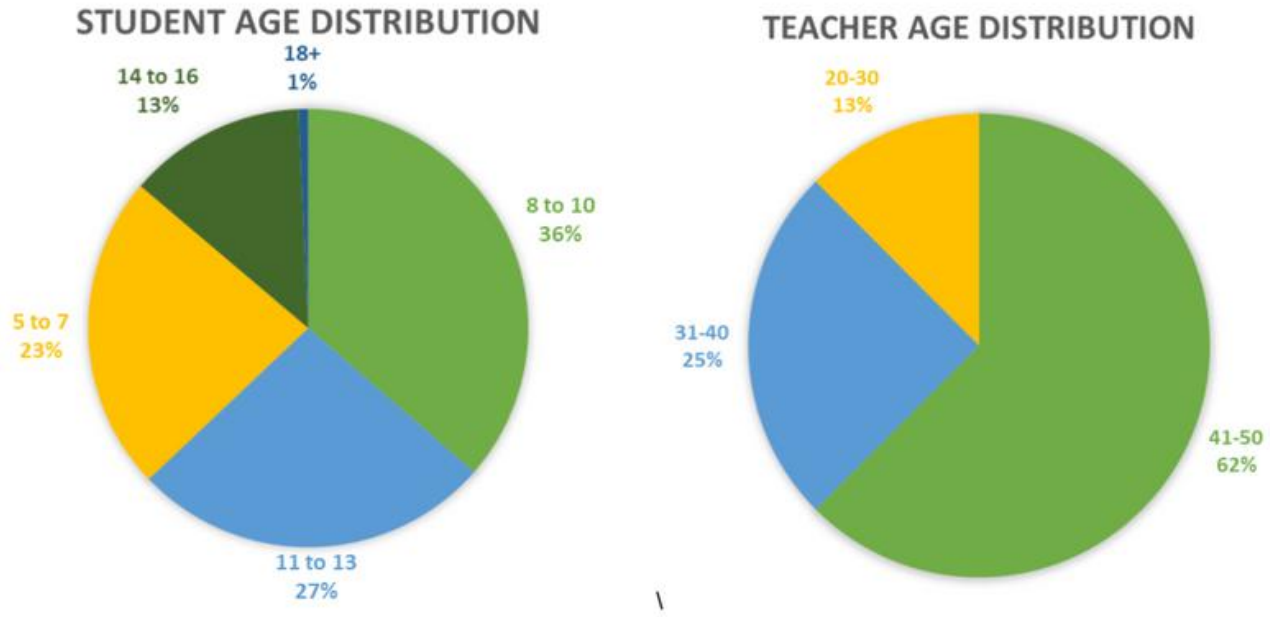
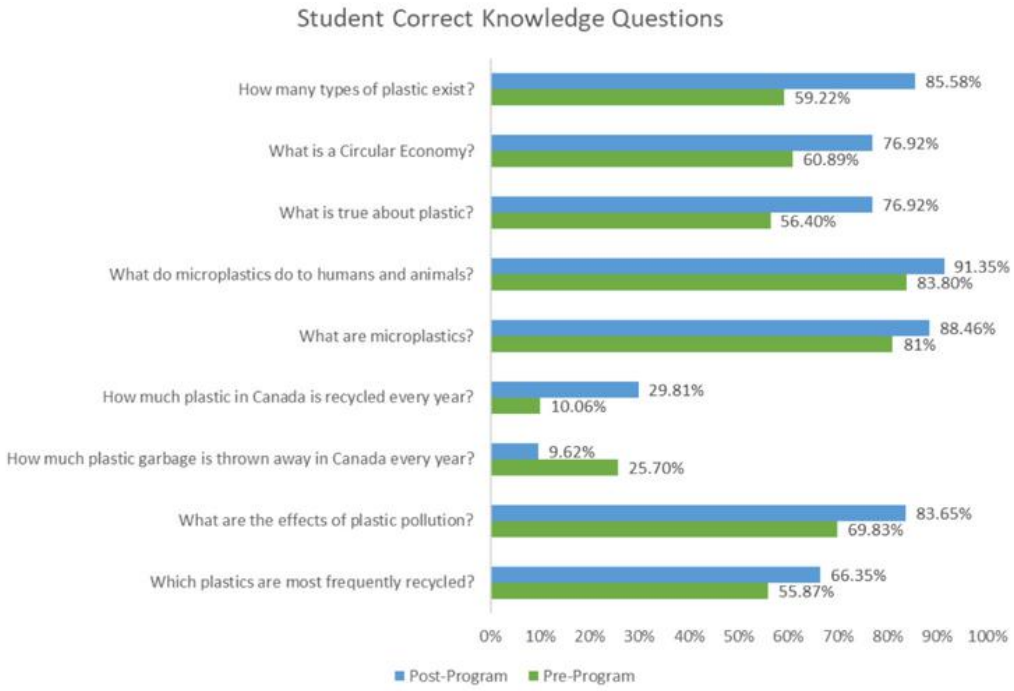


FIGURE 3. Age distribution of the students and teachers who completed both the pre- and post-program surveys.

KNOWLEDGE QUESTIONS

Students and teachers were asked a series of knowledge questions with correct and incorrect answers to better understand their assumptions about waste, both before and after they took part in the program. Here are some key insights from their responses:



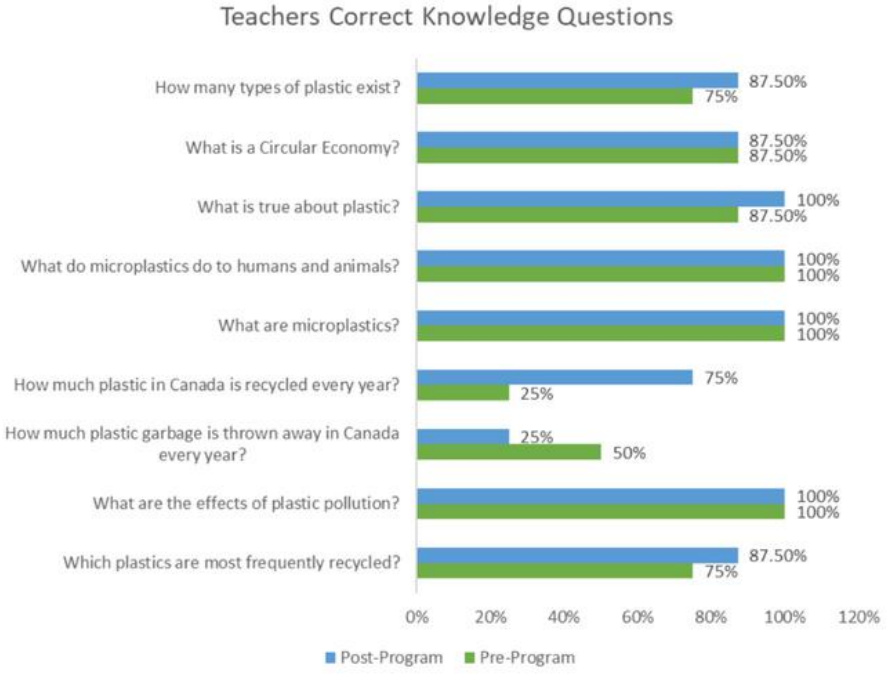
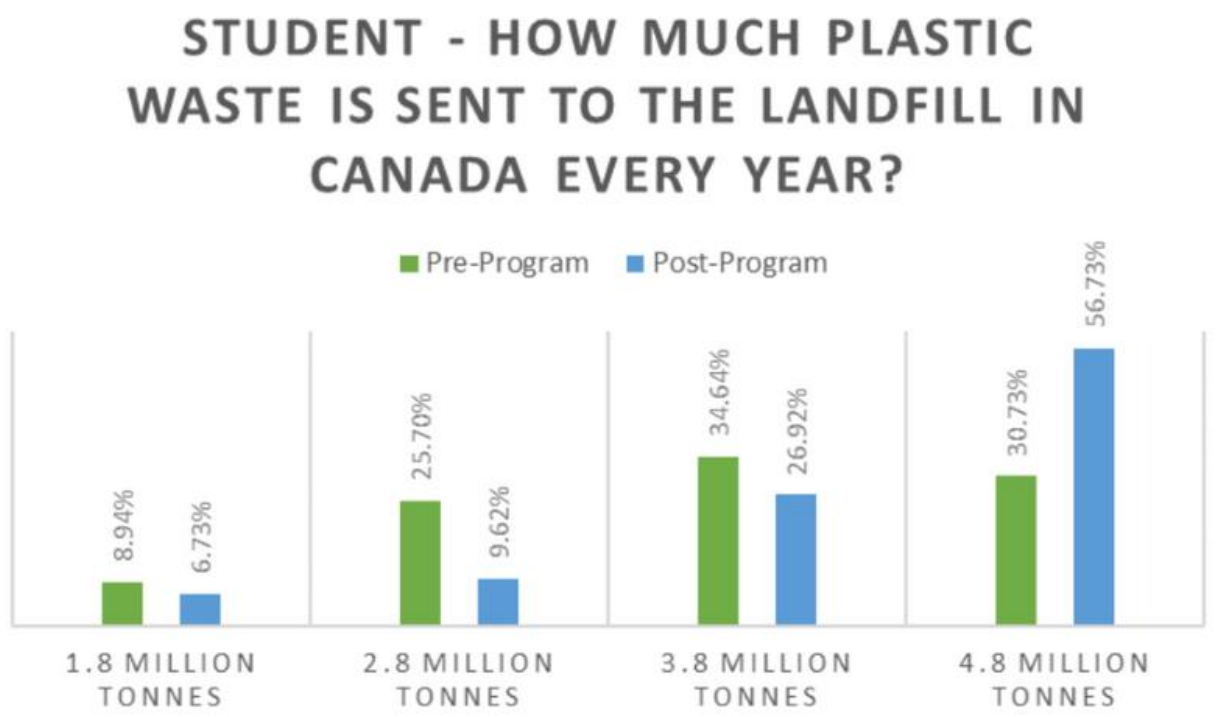


FIGURE 4A. Correct Knowledge questions answers by students and teachers.



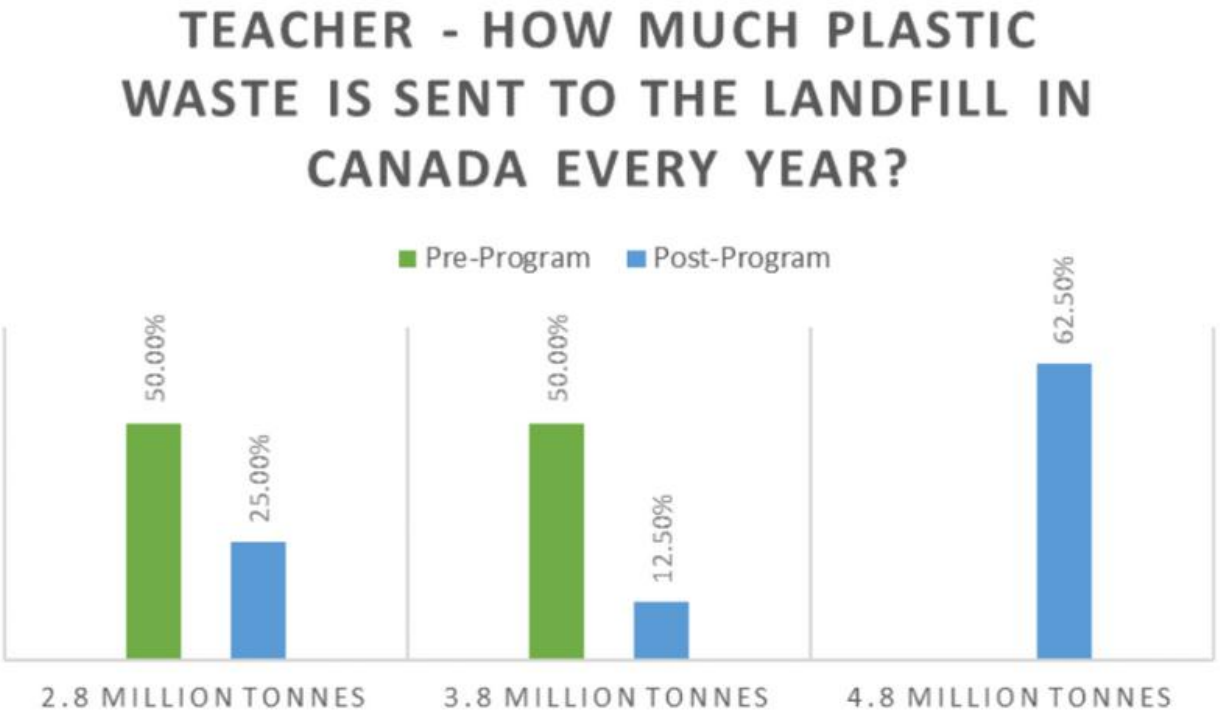


FIGURE 4B. Answers to Knowledge question "How much plastic waste is sent to the landfill in Canada every year" from students and teachers.

STUDENTS

Out of the nine knowledge questions, eight saw an increase in the number of students selecting the correct answer after participating in the program. However, the question “How much plastic garbage is thrown away in Canada every year” showed a different trend, with more students answering incorrectly following the cleanup. **Students' understanding of core plastic-related topics and environmental concepts improved post-cleanup, with the most gains in awareness about the types of plastic, the concept of a circular economy, and plastic recycling rates in Canada**. A knowledge decline was observed in understanding how much plastic garbage is thrown away in Canada annually, suggesting confusion or the need for clearer communication about this statistic. This highlights an opportunity to refine how complex information about waste management is communicated in the program in upcoming years, ensuring that students leave with a clearer understanding of these important facts. Pre-cleanup knowledge on complex topics, such as microplastics and their impact on animals and humans, was already relatively high and further improved post CEAP. These results suggest that the program effectively enhanced students' understanding of key plastic-related issues.

TEACHERS

Out of the nine knowledge questions, four saw an increase in the number of teachers selecting the correct answer after participating in the program. While another four stayed consistently the same pre and post-program, and one question “How much plastic garbage is thrown away in Canada every year?” saw a decline in correct answers. Teachers demonstrated great progress in their understanding of recycling rates, with a 50% increase in correct responses about how much plastic is recycled in Canada. Key environmental concepts, such as the circular economy, microplastics, and the effects of plastic pollution, remained well understood throughout the program, indicating a strong foundation in these areas. However, fewer teachers correctly answered the question about how much plastic garbage is discarded annually, suggesting that this information may need a clearer presentation or greater emphasis in future program seasons. Overall, the program effectively reinforced teachers' knowledge, particularly in recycling, while also identifying opportunities for deeper learning, especially around waste management and statistics.

Both students and teachers showed overall improvements in their knowledge following the cleanup program, particularly in areas related to recycling and plastic waste management. Both groups retained strong foundational knowledge on core environmental topics such as the circular economy, microplastics, and the effects of plastic pollution, reflecting the program’s effectiveness in reinforcing these essential concepts. However, challenges emerged in understanding waste disposal statistics. Fewer teachers correctly identified how much plastic garbage is discarded annually after the program, mirroring a similar difficulty among students. According to the results (Figure 4b), both students and teachers appeared to overestimate the proportion of plastic waste sent to landfills in Canada, by mostly choosing “4.8 million tons” as their answer post-program. This misconception may stem from their observations during the cleanup activity, where a great amount of plastic litter was collected, potentially skewing their perceptions of plastic waste management practices. This indicates that both groups would benefit from clearer explanations of complex waste management information. Although both students and teachers made some progress in understanding which plastics are most frequently recycled, the modest improvement shows there is still a need to place more emphasis on proper recycling practices and material sorting. In summary, the program successfully enhanced knowledge across both groups while identifying shared areas for further development, particularly around advanced recycling concepts and waste disposal statistics

DISCUSSION

KNOWLEDGE QUESTIONS

The program demonstrated its ability to enhance knowledge among both students and teachers about environmental and plastic-related topics, though differences in learning patterns highlight distinct areas for refinement. Students and teachers showed improvements in their understanding of key concepts, but challenges emerged in areas such as waste disposal statistics and recycling practices, suggesting the need for targeted interventions in future program designs.

Both groups displayed overall gains in knowledge. Students demonstrated the most significant improvements in understanding the types of plastic that exist, recycling rates, and the concept of a circular economy. Teachers, who began the program with a higher baseline understanding of environmental topics, exhibited substantial progress in recycling knowledge, with a 50% increase in correct responses about recycling rates in Canada. **These results align with educational theories suggesting that engaging and structured initiatives like the CEAP, can lead to measurable knowledge gains across diverse learner groups** (Kirkpatrick & Kirkpatrick, 2016). However, nuanced information, such as the volume of plastic waste discarded annually in Canada, appeared to be a point of confusion for both groups. Post-program declines in correct responses to this question suggest that the complexity or presentation of such data may have hindered comprehension. This finding is consistent with research indicating that statistical information requires clear, relatable framing to enhance understanding, particularly when addressing abstract or large-scale environmental issues (Okan et al., 2018).

Students, entering with relatively less pre-existing knowledge, showed pronounced improvements in introductory and foundational concepts. However, their struggle with advanced topics, like waste management statistics, highlights the idea behind cognitive load theory. This theory suggests that when information is too complex or overwhelming, it can make it harder for learners to absorb and remember it (Sweller, 2011). Teachers, with their stronger pre-program knowledge, retained high scores in areas such as microplastics and the effects of plastic pollution. Their slower progress in areas like proper material sorting suggests their learning might have leveled off. This could be because they need more engaging or advanced content, aligning with adult learning theories that highlight the importance of keeping tasks relevant and stimulating (Knowles, 1980).

The shared difficulty in understanding Canada's annual plastic waste disposal suggests an area for program refinement. Research shows that presenting data through interactive formats, such as infographics or storytelling, can make complex environmental statistics more accessible (McKenzie-Mohr, 2011). Both groups would likely benefit from the integration of these techniques to ensure a deeper understanding of such critical information.

In conclusion, while the program effectively enhanced knowledge across both students and teachers, the results underscore the importance of tailoring educational content to the specific needs and learning styles of diverse audiences. By refining the presentation of complex topics and emphasizing interactive and practical learning strategies, future programs can build on its successes and address identified areas for improvement.

PLASTIC USE

The program's results reveal differences in how students and teachers approach plastic use and waste management, reflecting unique motivations, habits, and challenges for each group. While both groups exhibited positive changes in their behaviours, these changes occurred in distinct ways.

Motivation to Reduce Plastic Use

For students, the program boosted motivation levels. The percentage of students who felt "Extremely" and "Very" motivated to reduce plastic use increased, while the number who were "Not at all" motivated declined. This upward shift suggests that the program effectively inspired students to take action against plastic usage. However, teachers demonstrated a more complex pattern. The proportion of teachers feeling "Moderately" motivated rose from 37.5% to 50%, whereas those feeling "Extremely" motivated dropped to 0%. This shift may indicate a move toward a more sustainable, balanced level of motivation, reflecting practical considerations or belief that a more gradual progress is being made. Notably, the percentage of teachers reporting they were "Very" motivated remained stable at 50%, indicating that a substantial group maintained strong commitment to reduce plastic use after completing the program.

Plastic Consumption Patterns

Students showed clear reductions in daily plastic use. Fewer students reported using plastic "Every day," while more described their usage as "Sometimes" and "Often." This change shows an increased mindfulness and a reduction in dependency on plastics. Teachers also reported declines in daily plastic use, with "Every day" usage dropping from 37.5% to 25%. However, teacher responses revealed a shift toward the extremes: the percentage using plastic "Rarely" rose from 0% to 12.5%, while "Often" increased from 25% to 50%. This may reflect practical challenges teachers face in reducing plastic use altogether, leading to more deliberate but uneven efforts to cut back which links to the results found for the reasons these groups continue to use plastics.

The program successfully fostered positive changes in both students and teachers, though the results highlight differing trajectories. Students displayed heightened motivation and reductions in daily plastic use, suggesting growing awareness and responsibility. Teachers, while still motivated, adopted more moderate levels of commitment, possibly reflecting the practical realities they face. **Both groups made strides in reducing single-use plastics and adopting comprehensive waste management practices, with teachers emphasizing reusability and students focusing on recycling and composting.**

Reasons for Plastic Use

The motivations for plastic consumption diverged between students and teachers. Among students, "It is everywhere/I do not seem to have another option" decreased, from 20.67% to 10.58%, suggesting growing awareness of alternatives after fulfilling the program. However, "All of the above" reasons, including affordability, durability, and convenience, rose from 34.61% to 50%, highlighting that multiple factors still influence their use. For teachers, affordability emerged as a new factor post-program, rising from 0% to 12.5%. Meanwhile, the percentage citing "Multi-Use" declined from 25% to 12.5%, perhaps signaling a reevaluation of plastic's long-term value as a reusable material.

Reducing plastic production at its source is critical to achieving long-term success in minimizing plastic consumption for both students and teachers. The survey findings underscore that while participants are motivated to reduce their plastic use, external factors such as affordability, durability, and convenience remain significant barriers.

Engagement with Single-Use Plastics

Students and teachers shared similar trends regarding single-use plastics. Packaging remained the most commonly used category for both groups. Among students, its usage increased from 51.96% to 63.46%, while teachers maintained a consistent 62.5%. Interestingly, students reduced their use of plastic bottles, bags, and dinnerware, whereas teachers saw increases in plastic bags and dinnerware but eliminated take-out containers entirely. These differences highlight varying approaches to single-use plastics, with teachers perhaps addressing specific categories of waste more effectively.

By addressing the root causes of plastic dependency, such as the overproduction of packaging and the lack of accessible, reusable alternatives, both groups can more easily make sustainable choices. **Policies that prioritize reducing single-use plastics and promoting circular economies can alleviate the burden on individuals to manage waste alone. For students, such systemic changes could further encourage their already strong motivation to reduce their plastic footprint. For teachers, practical solutions that align with their daily realities could boost their commitment and make sustainable behaviours more feasible.**

Moreover, the importance of industries adopting plastic alternatives for food packaging cannot be overstated. Packaging consistently ranked as the most commonly used single-use plastic across both groups, underscoring its prevalence and impact. Studies have shown that compostable materials, and other sustainable packaging options can significantly reduce environmental harm (European Bioplastics, 2022; Hottle et al., 2017). Transitioning to these alternatives could not only curb plastic waste but also shift societal norms toward prioritizing sustainability. This would ease the burden on individuals by offering more accessible, eco-friendly choices and reducing the systemic reliance on traditional plastics.

WASTE MANAGEMENT PRACTICES

Both groups demonstrated progress in adopting comprehensive waste management practices. Students showed a marked increase in combining recycling and composting, rising from 39.11% to 58.65%. Recycling alone decreased from 24.02% to 15.38%, indicating a shift toward more integrated methods. Teachers mirrored this trend, with recycling and composting together increasing from 50% to 62.5%. Additionally, teachers who prioritized reusing materials doubled, from 12.5% to 25%.

Questions regarding the frequency of recycling revealed contrasting patterns. Among students, the percentage who "Always" recycle dropped from 25.14% to 21.15%, but those who recycle "Often" increased from 19.55% to 30.77%. Teachers, on the other hand, experienced a sharper decline, with "Always" recycling decreasing from 87.5% to 62.5%. A new category of teachers who recycle "Sometimes" emerged at 37.5%, suggesting a shift toward integrating recycling with other sustainable practices rather than relying on recycling alone.

Despite the positive changes observed in recycling and waste management behaviours among students and teachers, the limitations of recycling as a solution to plastic pollution in Canada cannot be overlooked. While recycling rates improved post-program, the reality remains unchanged, where only 9% of plastic in Canada is effectively recycled, as reported by Environment and Climate Change Canada (2019). This highlights the inefficacy of recycling as a standalone approach to addressing the pervasive issue of plastic pollution. Recycling alone cannot resolve the structural challenges posed by the current rate of plastic production and waste, including contamination of recyclable materials, limited market demand for recycled plastics, and inadequate recycling infrastructure (World Economic Forum, 2024; Traviss, 2024; ISB Global, 2023). Studies have found that unless broader changes are made to reduce the reliance on plastic, recycling alone might unintentionally continue the cycle of overproducing and wasting plastic (Geyer, Jambeck, & Law, 2017). Given these limitations, there is an urgent need for a shift in thinking that focuses on reducing single-use plastics and encourages the use of reusable alternatives. Federal, provincial, and municipal governments must take the lead in this transition by supporting and promoting the production, availability, and adoption of reusable products. Policy measures such as subsidies for businesses that produce reusable items, bans on specific single-use plastics, and public education campaigns about sustainable consumption can help accelerate this change in our current society. For instance, studies show that policies encouraging the use of reusables not only reduce waste but also lessen the environmental impact linked to the lifecycle of plastics (Schmidt Rivera, Espinoza Orias, & Azapagic, 2019).

For students, the program had a transformative effect when considering the awareness of the municipal role on recycling. Before the CEAP, just over half (52.5%) of the students recognized that their town or city supported recycling. After the program, this awareness surged to 75.0%, demonstrating a substantial improvement in their understanding of local recycling efforts. Additionally, uncertainty among students decreased, with the proportion of those unsure about municipal support dropping from 37.9% to 19.2%. This reduction in ambiguity is particularly noteworthy because it suggests that the program not only informed students but also provided clarity about available resources, fostering a stronger connection to their community's environmental efforts. These results align with findings in environmental education literature, which emphasize that targeted programs can effectively enhance young people's awareness and pro-environmental attitudes (Ballantyne & Packer, 2009). In contrast, teachers entered the program with a relatively high level of awareness about municipal recycling support, with 87.5% already acknowledging local efforts. After the program, this figure rose to 100%, indicating a modest but meaningful reinforcement of their existing knowledge. The data also revealed that there were no feelings of being unsupported among teachers either before or after the program, and uncertainty among teachers was minimal, dropping from 12.5% to zero. These results suggest that while the program served to affirm and slightly enhance teachers' understanding, its impact was more pronounced in addressing gaps in students' awareness. The disparity in pre-program awareness levels between teachers and students likely reflects their different roles and experiences. Teachers, as adults, may already have greater exposure to municipal initiatives or personal involvement in recycling efforts, while students may rely more on school and community programs to learn about such resources. This aligns with research suggesting that environmental education programs have a stronger initial impact on groups with lower baseline awareness (Rickinson, 2001).

Despite these differences, **the outcomes for both groups underline the program's overall success in promoting awareness and eliminating uncertainty. By addressing gaps in knowledge among students and reinforcing existing understanding among teachers, the program fostered a shared recognition of the importance of municipal support for recycling. To build on this progress, future initiatives could incorporate collaborative activities between students and teachers, leveraging teachers' higher initial awareness to mentor students and deepen their engagement with local recycling efforts. Additionally, the findings highlight the need to move beyond traditional recycling frameworks by embracing comprehensive strategies that reduce plastic at its source. Empowering individuals to choose reusable options, coupled with robust government support, will be critical in building a sustainable, circular economy capable of addressing plastic pollution effectively.**

AWARENESS - PLASTIC POLLUTION

Plastic Pollution Perception

The program revealed distinct patterns in how students and teachers perceive the harmful effects of plastic pollution. These findings emphasize the program's effectiveness in enhancing students' understanding while reaffirming the high level of awareness among teachers.

For students, the program increased their recognition of plastic as "very harmful" to the Earth and animals, with this view rising from 34.6% to 44.2% post-program. This shift demonstrates the program's success in raising awareness about the severity of plastic pollution. Correspondingly, there was a reduction in students who perceived plastic as "somewhat harmful" (from 10.06% to 9.6%) or "a little harmful" (from 15.08% to 8.65%). The decline in students viewing plastic as "not harmful," from 40.2% to 37.5%, further underscores this trend toward understanding plastic's detrimental effects. These results align with studies showing that targeted environmental education programs effectively increase knowledge and concern about ecological issues (Ballantyne & Packer, 2009).

Students' comprehension of the multifaceted impacts of plastic pollution also improved. Before the program, 69.83% of students selected "All of the Above" when asked about the effects of plastic pollution, reflecting a broad understanding. This percentage rose significantly to 83.65% after the program, indicating an enhanced grasp of the diverse consequences, including city litter, harm to animals, and ocean pollution. The reduced focus on isolated impacts, such as "Kills Animals" or "Ocean Pollution," suggests that students are beginning to see these issues as interconnected rather than separate problems stemming from plastic pollution. Additionally, the decline in "None of the Above" responses, from 6.7% to 2.88%, indicates a reduction in misconceptions or underestimation of plastic pollution's effects. These trends reflect how environmental education can foster systems thinking, helping learners see the bigger picture (Tilbury, 1995).

In contrast, teachers exhibited a consistently high level of awareness about plastic pollution both before and after the program. All teachers identified plastic as "very harmful" to the Earth and animals and selected "All of the Above" as their response when asked about its effects. This consistency highlights teachers' pre-existing understanding of the comprehensive impacts of plastic pollution, encompassing environmental, societal, and health concerns. Their stable awareness likely stems from greater exposure to these issues through professional responsibilities and prior learning (Rickinson, 2001). The program thus served more as a reinforcement than a revelation for this group, underscoring the importance of tailoring educational programs to build upon participants' baseline knowledge.

The contrasting results between students and teachers underscore the need for differentiated approaches in environmental education. For students, who may begin with less awareness, foundational programs like the CEAP can bridge knowledge gaps and promote holistic understanding. For teachers, programs could focus on providing them with advanced strategies to teach and inspire action against plastic pollution. Collaborative learning opportunities between students and teachers could further enhance the program's impact, fostering a shared commitment to addressing environmental challenges.

Approaches to Plastic Alternatives and Solutions

The program revealed differences in how students and teachers perceive and adopt alternatives to plastic and their views on addressing plastic pollution. These results highlight the program's effectiveness in shifting attitudes and behaviours, although differently for each group.

For students, metal emerged as the most preferred alternative both before and after the program, with slight growth from 35.57% to 36.54%. This preference likely stems from metal's durability and recyclability, aligning with findings that emphasize practicality as a key factor in material choice (Dilkes-Hoffman et al., 2019). Other alternatives, such as edible materials also increased, reflecting growing interest in innovative and eco-friendly options. However, preferences for glass and paper/cardboard saw modest declines, possibly as students became more discerning about which materials offer true sustainability benefits. Notably, the drop in "None of the Above" responses from 5.93% to 3.85% signals a broader acceptance of non-plastic materials post-program, indicating a greater willingness to embrace sustainable alternatives..

Students' strategies to minimize plastic usage also evolved. Although reusable alternatives like water bottles remained the dominant choice, their preference slightly decreased from 47.49% to 43.27%. This shift may indicate saturation or a need for reinforcing the long-term benefits of reusables. Conversely, preference for plastic-free, single-use alternatives, such as compostable items, increased from 18.44% to 23.08%, highlighting a growing awareness of diverse strategies to combat plastic use. Encouragingly, fewer students selected "I do not minimize plastics," dropping from 22.35% to 19.23%, and uncertainty about how to reduce plastic use also declined from 11.73% to 8.65%, reflecting the program's role in clarifying actionable solutions.

When considering solutions to plastic pollution, students displayed a notable shift in focus. While the majority initially supported a comprehensive approach with "All of the above" (55.23%), this percentage dropped to 47% post-program, with more specific options gaining traction. **For example, support for government action to make alternatives more affordable rose from 4.65% to 18%, indicating increased recognition of the systemic barriers to sustainable practices.** Individual responsibility also gained attention, rising from 5.81% to 8.00%.

However, fewer students prioritized environmental cleanups (18.60% to 16.00%) and integrating courses into school curricula (5.81% to 1.00%), suggesting a shift toward long-term, systemic solutions over immediate, short-term actions.

For teachers, glass and paper/cardboard were the most preferred alternatives, with paper/cardboard showing an increase in preference from 37.5% to 50%. **Reusable options saw growth in adoption, rising from 50% pre-program to 87.5% post-program, suggesting that the program had a profound effect on reinforcing sustainable practices in daily life. Conversely, strategies like using recyclable packaging and plastic-free materials saw a decline, which may indicate a prioritization of solutions perceived as more impactful, such as reusables. Importantly, the percentage of teachers who reported not minimizing plastic use dropped from 12.5% to zero, showcasing the program's success in motivating action.**

Regarding solutions, teachers increasingly supported a multi-faceted approach, with this perspective rising from 62.5% to 75%. Interestingly, support for government intervention into making plastic alternatives more available and affordable, decreased from 25% to 0%, possibly indicating a shift toward emphasizing collective and individual actions over external regulatory measures. Similarly, advocacy for individual daily actions rose from 12.5% to 25%, reflecting a growing belief in personal responsibility as a critical component of broader efforts to combat plastic pollution.

Overall, the program fostered important growth in awareness and action among both students and teachers. For students, the focus expanded toward systemic solutions like government involvement and material innovation, while teachers reinforced their commitment to sustainable practices and collective responsibility.

Local Pollution Awareness and Environmental Education

The program's impact on perceptions of pollution and sources of information about plastic pollution reveals distinct shifts between students and teachers. For students, the question "How Dirty/Polluted is Your City?" demonstrates a nuanced shift in their perceptions of local pollution. Post-program, fewer students perceived their city as "not polluted" (9.5% to 3.85%), while more acknowledged some level of pollution, "very polluted" from 6.7% to 7.69%, "somewhat polluted" from 37.9% to 34.6%, "a little polluted" from 45.8% to 53.8%. This suggests that the program heightened students' environmental awareness and encouraged a more balanced understanding of pollution, moving away from extremes (Stevenson et al., 2014). In contrast, teachers' perceptions of pollution remained unchanged, with consistent responses equally divided between "a little polluted" and "somewhat polluted" at 50%. This steadiness might reflect a more mature and established awareness of environmental conditions, which the program did not alter (Fien, 2002).

In terms of sources of information about plastic pollution, the program appears to have influenced students and teachers differently. For students, schools remained the primary source of knowledge, increasing slightly from 43.02% to 44.23%. However, **there was a substantial rise in the influence of non-profit organization awareness campaigns (25.14% to 35.58%), suggesting that the program effectively highlighted the role of MYP as a credible resource** (Humes, 2013). Interestingly, reliance on informal sources such as the Internet, friends/family, and social media decreased. This shift implies that students preferred more structured and credible information channels, which is a positive outcome of the program (Jensen & Schnack, 1997).

Similarly, teachers experienced a notable transformation in their information sources. Before the program, 87.5% of teachers relied primarily on the Internet for information about plastic pollution. This reliance dropped to 25% post-program, replaced by a substantial increase in non-profit organization awareness campaigns and school-related resources, both rising to 37.5%. This shift suggests that the program successfully reoriented teachers toward more community-focused and formal educational channels (UNESCO, 2014), reinforcing the value of structured environmental programs like the CEAP.

Overall, the data highlights that while students and teachers both experienced shifts in their sources of information, students displayed a broader change in pollution awareness, likely reflecting their developing understanding of environmental issues. In contrast, teachers maintained a stable perception of pollution levels, likely due to their pre-existing awareness and experience. These findings underline the importance of focused educational interventions in enhancing environmental literacy, as they not only increase awareness but also guide individuals toward reliable sources of information, fostering a more informed and environmentally conscious community.

STUDENTS AND TEACHERS' OPINIONS

Expectations Before the Cleanup

Students began the program with diverse expectations. Over half of the students (50.28%) hoped to learn actionable strategies to prevent pollution and foster a cleaner environment. A smaller portion anticipated gaining insights into the prevalence of plastic waste (9.5%) or learning more about recycling and reuse (2%). Some students (12.29%) expected a combination of these outcomes, while others had no specific expectations (7.26%) or held unclear ideas (8.38%). These findings suggest that students approached the activity with an openness to learning, though many lacked a concrete understanding of what the experience might entail (Schultz et al.,2013). Before the cleanup, the majority of students (37.9%) anticipated that contributing to a cleaner environment, whether in their school, community, or city, would be the most rewarding aspect. Others (18.9%) believed the combination of helping the environment and having fun with peers would stand out, while 17.32% expected the collaborative aspect alone to be the highlight. A smaller group looked forward to the satisfaction of doing something good (12.29%), and a few hoped to learn more about waste and recycling (2.79%) or to help animals and other species (1.68%). These findings highlight a mixture of altruistic motivations and social enjoyment, common in youth environmental activities (Steg & Vlek, 2009).

In contrast, teachers exhibited more focused and structured expectations. A majority (71.43%) aimed to gain a deeper understanding of the extent and types of plastic waste, as well as the harmful effects associated with it. The remaining teachers (28.57%) were interested in learning about waste management strategies and the specific types and quantities of garbage found. This difference indicates that teachers, likely influenced by their role as educators, approached the activity with clear objectives related to environmental education and management practices (Li et al., 2016). Additionally, teachers anticipated a more structured set of rewards. A portion (42.86%) expected that contributing to a cleaner environment and community would be the highlight. Additionally, 28.57% believed that watching students take on social responsibility and advocate for reducing plastic use would be particularly meaningful. A smaller group (14.29%) hoped for increased student awareness of issues such as plastic waste and waste management. These expectations reflect teachers' focus on the educational and developmental outcomes of the activity (Tilbury, 1995).

Lessons Learned After the Cleanup

Following the cleanup, students and teachers both reported valuable takeaways, though their insights reflected their respective roles and experiences. Among students, the most common reflection (21.15%) was an appreciation for the necessity and benefits of cleanup efforts. Nearly as many students (20.19%) expressed surprise at the volume of garbage in seemingly clean areas, while 18.27% were struck by the sheer amount of waste collected. Others learned about the importance of reducing plastic use and recycling (12.5%) or the impact of human behaviour on pollution (4%). However, a small percentage of students (6.73%) felt they did not learn much or had no clear takeaways. These findings underscore the program's effectiveness in fostering environmental awareness among students, even if some struggled to articulate specific lessons (Jambeck et al., 2015). Over half (53.85%) shared that the most rewarding part was cleaning up and contributing to a cleaner environment. Many (31.73%) valued the opportunity to have fun and walk with friends, emphasizing the social and enjoyable aspects of the activity. Others appreciated unexpected moments, such as finding interesting items, sorting waste, or working in shaded areas (8.65%). A small percentage (4.8%) either had no specific response or were unsure about what stood out. These reflections suggest that hands-on activities can enhance environmental awareness while fostering a sense of community and personal fulfillment (Chawla & Cushing, 2007).

For teachers, the lessons learned were similarly impactful but more oriented toward practical and systemic solutions. Nearly half (44.44%) reported gaining insights into the extent of littering and effective prevention strategies, reflecting a commitment to environmental stewardship. A substantial portion (22.22%) learned about recycling, reuse, and alternatives to plastic, highlighting a focus on sustainable practices. Another 22.22% noted a deeper understanding of the circular economy, the life cycle of plastic, and the surprising presence of waste in seemingly clean spaces. A smaller group (11.11%) observed increased environmental consciousness among students and the community, suggesting that the activity not only educated but also inspired collective action (Eriksen et al., 2018). Teachers, on the other hand, highlighted both the students' engagement and the environmental impact. Half of the teachers found that the most rewarding part was seeing students excited and actively involved in taking collective action. This shared sense of purpose and teamwork among students was evidently inspiring. Another 50% valued the tangible outcomes of raising awareness, making a difference, and contributing to a cleaner environment. These responses indicate that teachers view cleanup activities as effective tools for fostering environmental stewardship and promoting experiential learning (Monroe et al., 2017).

While both students and teachers highlighted the importance of cleanup activities in addressing environmental issues, their perspectives diverged in key areas. Students' reflections were often more immediate and personal, focusing on the surprising volume of waste and the direct benefits of cleanup efforts. Teachers, on the other hand, tended to emphasize broader implications, such as systemic waste management strategies and the principles of the circular economy. This difference likely stems from the teachers' role as facilitators of learning and their greater familiarity with environmental concepts (Schultz et al., 2013; Eriksen et al., 2018). Another difference lies between expectations and outcomes. Both groups valued the environmental and social aspects of the cleanup, though students often highlighted immediate rewards such as fun, while teachers focused on long-term educational and behavioural outcomes. This difference reflects their roles, with students primarily participating in the program, while teachers serve as facilitators and observers of the learning process (Tilbury, 1995; Monroe et al., 2017). Another key difference lies in the expectations versus reflections. While teachers' anticipations closely aligned with their post-activity reflections, students frequently reported unanticipated lessons and enjoyable moments, such as discovering surprising items or the unexpected satisfaction of sorting waste (Li et al., 2016). This finding underscores the potential for experiential learning activities, such as the CEAP, to provide unexpected and meaningful insights for participants (Chawla & Cushing, 2007).

The fulfillment of the CEAP proved to be a meaningful educational experience for both students and teachers. Students gained a visceral understanding of environmental issues, while teachers deepened their knowledge of waste management and sustainability practices. These complementary outcomes highlight the value of experiential learning in fostering environmental awareness and action across different age groups and roles (Jambeck et al., 2015; Schultz et al., 2013).

Surprising Findings During the Cleanup

For students, the amount of garbage encountered was the most surprising aspect, with 32.69% identifying this as their primary observation. Others (25.96%) were surprised by the lack of plastic or garbage in certain areas, reflecting variability in waste distribution. A smaller group (14.42%) noted surprise at the prevalence of specific waste items, such as cigarette butts or pieces of plastic. Some students (7.69%) were struck by unexpected discoveries, such as usable items or animal-related waste, while others reflected on human behaviour toward littering and recycling practices (3.85%). These findings align with studies indicating that hands-on environmental activities can enhance awareness of localized environmental challenges (Chawla & Cushing, 2007).

Teachers shared similar reactions, with 55.56% being most surprised by the amount and composition of garbage, particularly the prevalence of cigarette butts and large plastics. This aligns with research suggesting that direct engagement with environmental issues can deepen understanding of waste dynamics (Monroe et al., 2017). Conversely, a third of teachers (33.33%) expressed surprise at not finding much garbage in some cleanup locations, challenging their assumptions about local litter levels. A smaller group (11.11%) was pleasantly surprised by the sense of community impact and the positive environmental changes achieved, reflecting the social benefits of collective action (Tilbury, 1995). While both students and teachers were surprised by the scale and specifics of waste encountered, teachers' reflections often emphasized broader patterns and educational takeaways. Students, on the other hand, continued to focus on immediate observations and personal engagement.

After completing the cleanup, students were motivated to take a variety of meaningful actions. The largest group (28.85%) expressed a desire to participate in more cleanup activities, suggesting a sustained interest in direct environmental action. Others (20.19%) felt inspired to combine cleanups with reusing and recycling initiatives and finding alternatives to plastic items. A smaller group (6.73%) emphasized reusing and recycling alone, while 8.65% were motivated to reduce littering and take better care of the environment. A few students (3.85%) aimed to minimize their reliance on plastic by choosing products with less plastic content. These responses highlight the potential of cleanup activities to encourage pro-environmental behaviours in youth (Steg & Vlek, 2009).

For teachers, the cleanup experience also served as a catalyst for change. A majority (62.50%) felt inspired to adopt sustainable practices, such as recycling, reusing, reducing single-use plastics, and selecting plastic alternatives. This shift reflects a deepened personal commitment to environmental responsibility. Additionally, 25% of teachers were motivated to organize more cleanup events, likely driven by the positive outcomes and engagement observed during the activity. A smaller percentage (12.50%) expressed enthusiasm for pursuing both additional cleanups and sustainable practices, demonstrating a holistic approach to environmental stewardship. These findings suggest that cleanup activities can influence educators to integrate sustainability into both their personal lives and professional practices (Chawla & Cushing, 2007).

The actions inspired by the cleanup also varied. Students predominantly emphasized continued participation in cleanups and individual efforts to reduce waste, reflecting their direct engagement with the activity. Teachers, however, were more likely to adopt sustainable practices and plan future events, highlighting their role as environmental advocates. These differences underscore the complementary nature of student and teacher contributions to environmental education and action (Monroe et al., 2017).

Although the CEAP by Mind Your Plastic has successfully encouraged both students and teachers to participate in more cleanup activities, it is crucial to recognize that these are short-term solutions. Therefore, programs like this should be equipped with resources to demonstrate the importance of long-term actions aimed at preventing plastic waste from entering the environment in the first place. Studies highlight that while cleanups raise awareness and foster engagement, they fail to address systemic issues such as excessive plastic production and inadequate waste management infrastructure (Borrelle et al., 2017). Furthermore, the financial costs of conducting cleanups on a global scale are substantial, and the reliance on fossil fuel-powered equipment during these events contributes to greenhouse gas emissions, exacerbating climate change (Jambeck et al., 2015). Educating participants about these interconnected issues and advocating for upstream solutions, such as reducing plastic production and eliminating plastic waste at the source, can create more sustainable impacts.

The CEAP successfully engaged students and teachers in meaningful environmental action, fostering awareness, motivation, and behavioural change. Students gained insight into waste issues and expressed a desire for continued involvement, while teachers deepened their understanding of sustainability and were inspired to lead further initiatives. Together, these perspectives illustrate the power of experiential learning to promote environmental stewardship across different roles and age groups.

CONCLUSION

The 2024 CEAP by Mind Your Plastic has proven to be a highly effective initiative for engaging students and teachers in meaningful environmental action. Through hands-on activities such as the classroom cleanup, the program fostered awareness and understanding of plastic pollution, its environmental impacts, and the need for sustainable waste management practices. Both students and teachers demonstrated notable shifts in knowledge, attitudes, and behaviours, with students becoming more aware of the scale of plastic waste and teachers gaining deeper insights into waste management strategies and the principles of the circular economy.

Students expressed diverse motivations, ranging from social enjoyment to a desire to contribute to a cleaner environment. Many reflected on the surprising volume and types of waste encountered during the cleanup. These immediate, tangible experiences fostered a sustained interest in environmental action, with students expressing a desire to participate in future cleanups and adopt sustainable practices such as recycling and reusing. Teachers, in contrast, displayed a more structured understanding of the issue, emphasizing the importance of systemic change and long-term solutions to prevent plastic waste.

The differences in expectations and reflections between students and teachers highlight the value of experiential learning. Students benefit from direct, hands-on activities that shape their immediate actions and behaviours, while teachers use their understanding to inspire broader, long-term environmental responsibility. The unexpected discoveries made during the cleanup activities provided both groups with new insights, reinforcing the importance of direct engagement with environmental challenges.

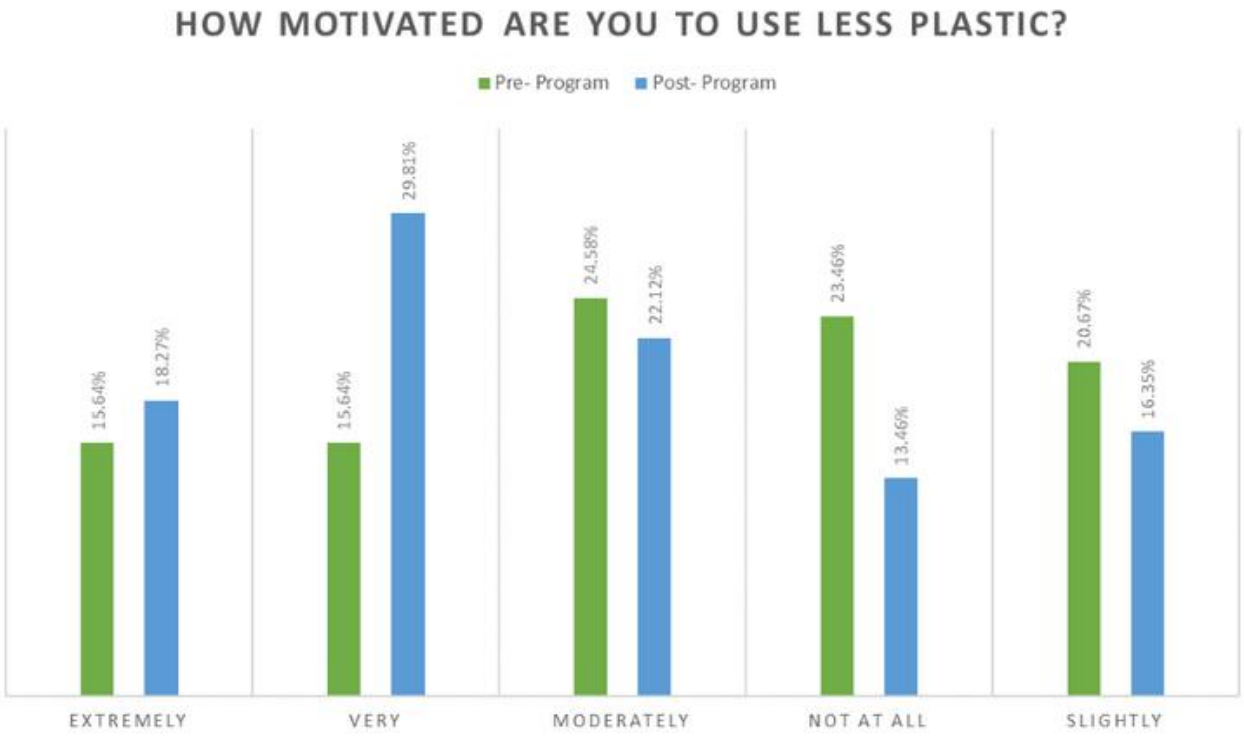
While the CEAP successfully motivated both groups to take action and engage in cleanup activities, it is important to acknowledge that cleanups alone cannot address the root causes of plastic pollution. The program highlighted the need for upstream solutions, such as reducing plastic production and improving waste management systems, to create lasting, systemic change. Moving forward, the CEAP should continue to emphasize the importance of long-term prevention strategies alongside fostering hands-on engagement, inspiring sustainable change at both the individual and societal levels.

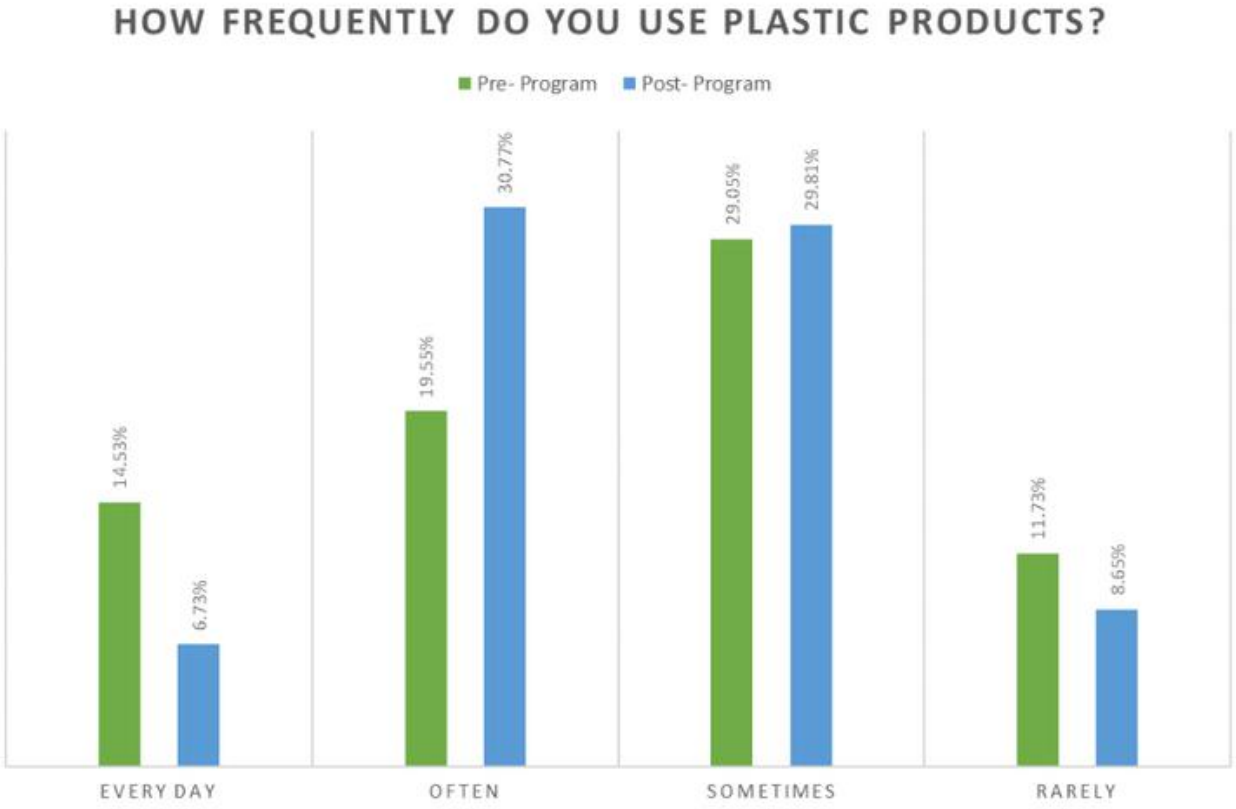
Ultimately, the program's success in promoting environmental stewardship demonstrates the power of experiential learning in shaping attitudes and behaviours toward sustainability. The lessons learned by both students and teachers underscore the importance of continued education and action in the fight against plastic pollution, ensuring that future generations are equipped with the knowledge and motivation to build a more sustainable world.

APPENDIX

USE OF PLASTIC PRODUCTS

Students





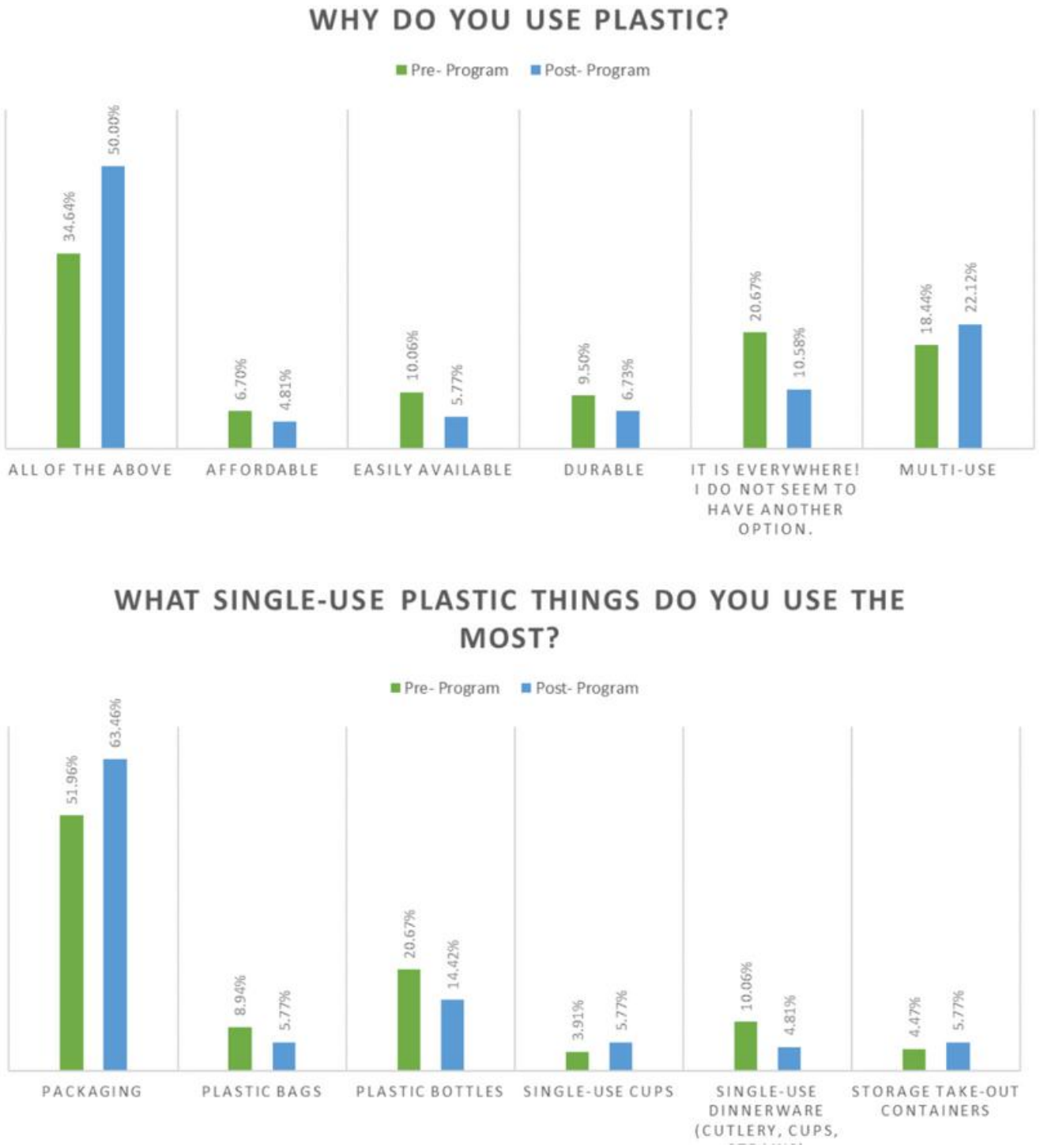
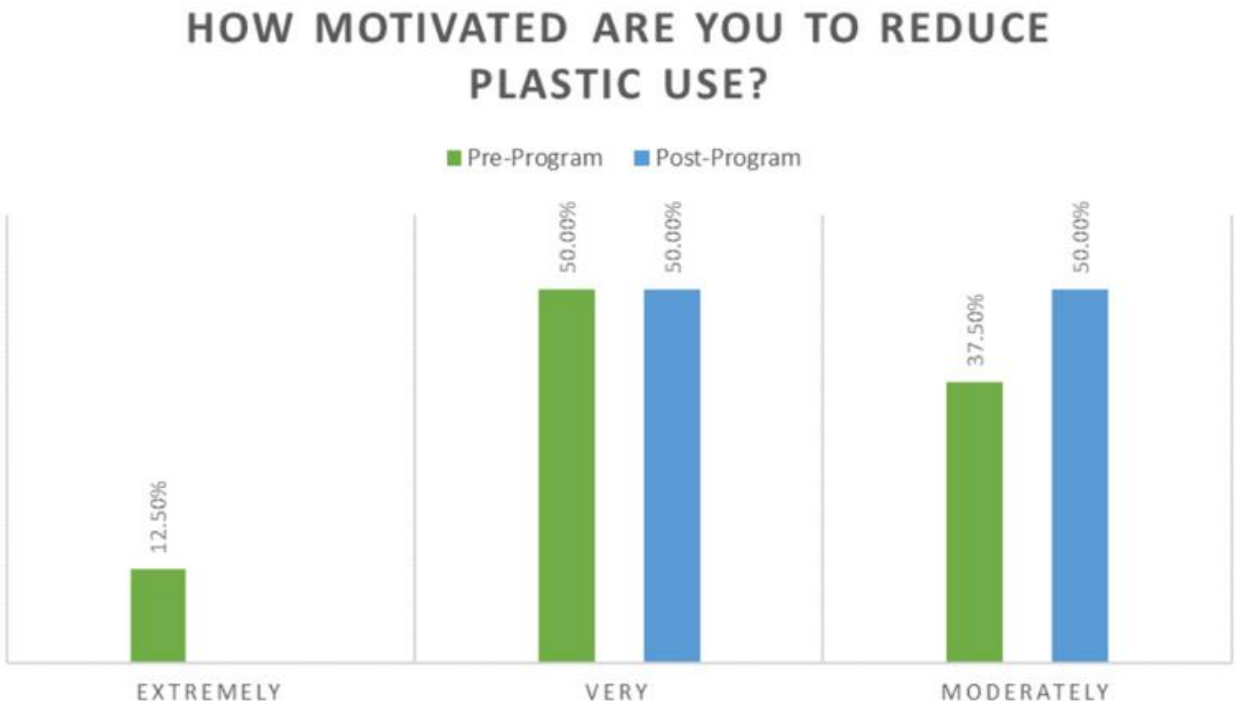
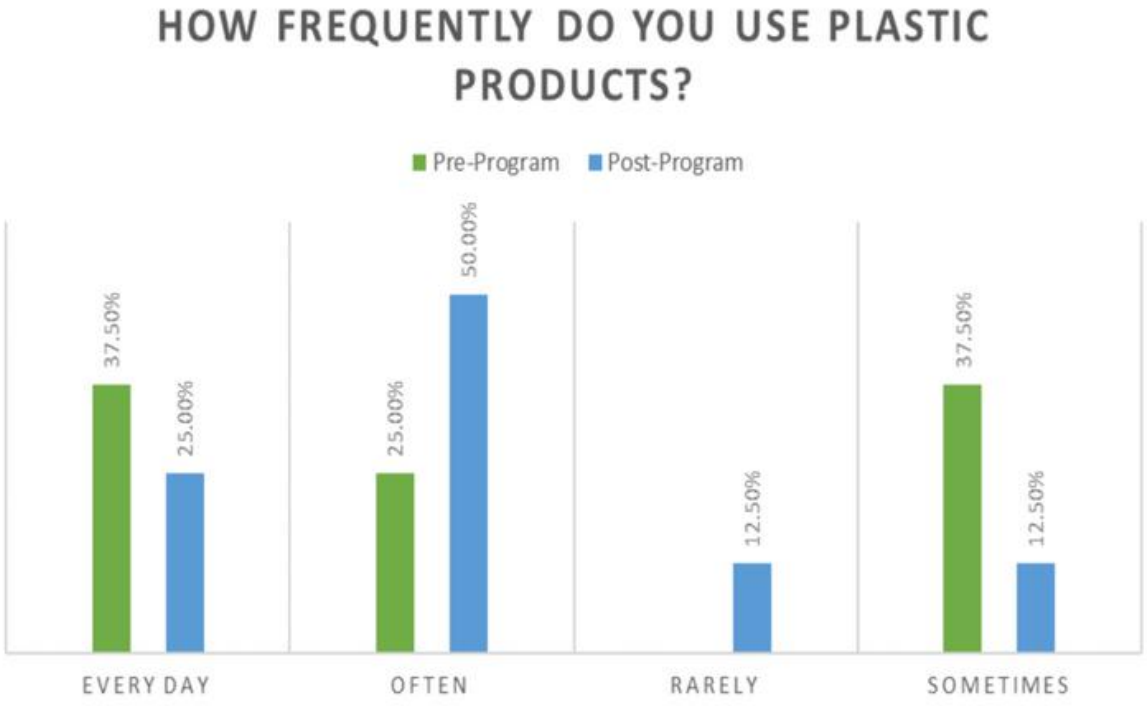


FIGURE 5. Students' Responses on the topic of Use of Plastic Products.


CIRCULAR ECONOMY AMBASSADOR PROGRAM

Teachers


HOW MOTIVATED ARE YOU TO REDUCE PLASTIC USE?
Pre-Program
Post-Program
12.50%
50.00%
50.00%
37.50%
50.00%
EXTREMELY
VERY
MODERATELY


HOW FREQUENTLY DO YOU USE PLASTIC PRODUCTS?
Pre-Program
Post-Program
37.50%
25.00%
25.00%
50.00%
12.50%
37.50%
12.50%
EVERY DAY
OFTEN
RARELY
SOMETIMES

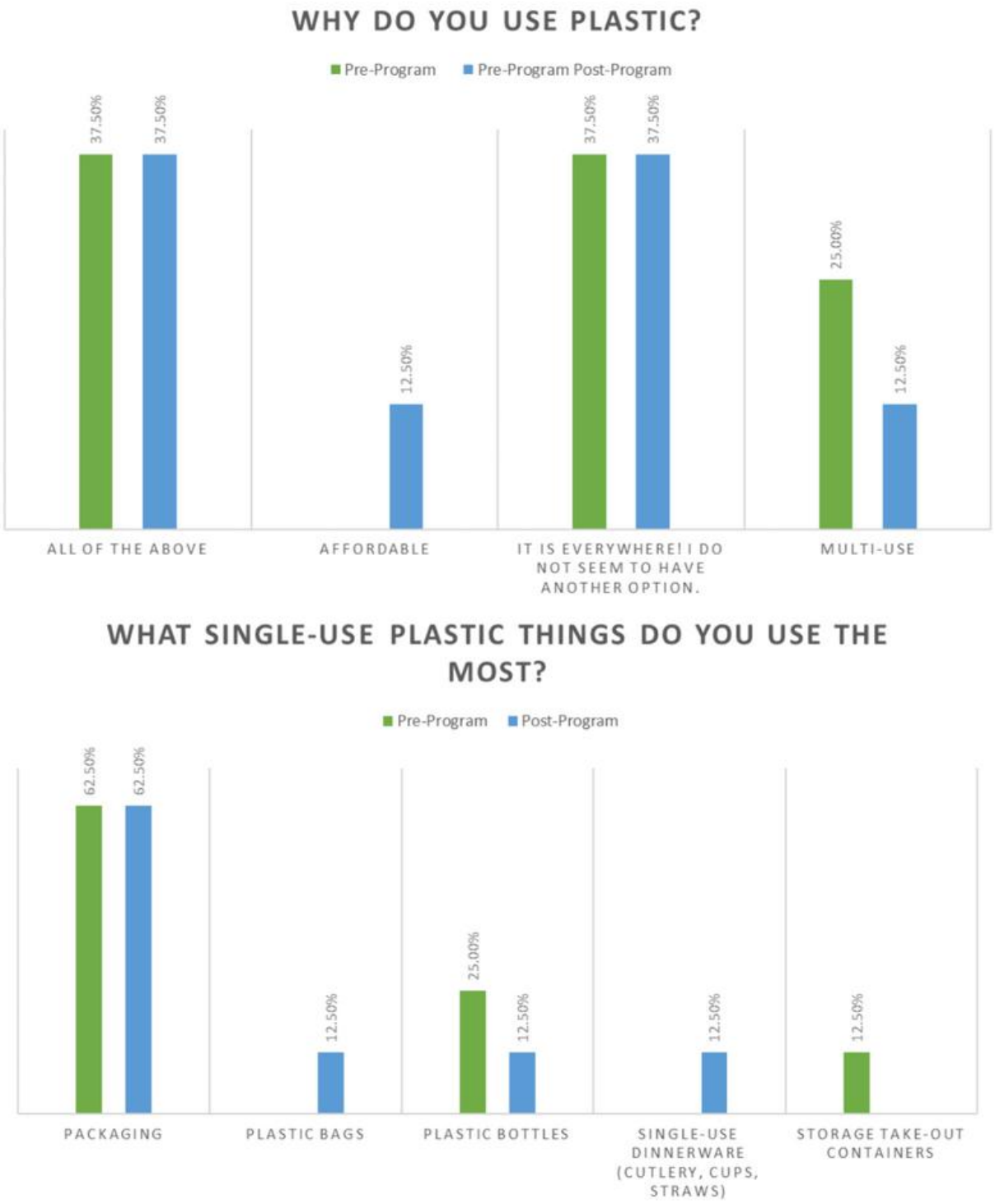
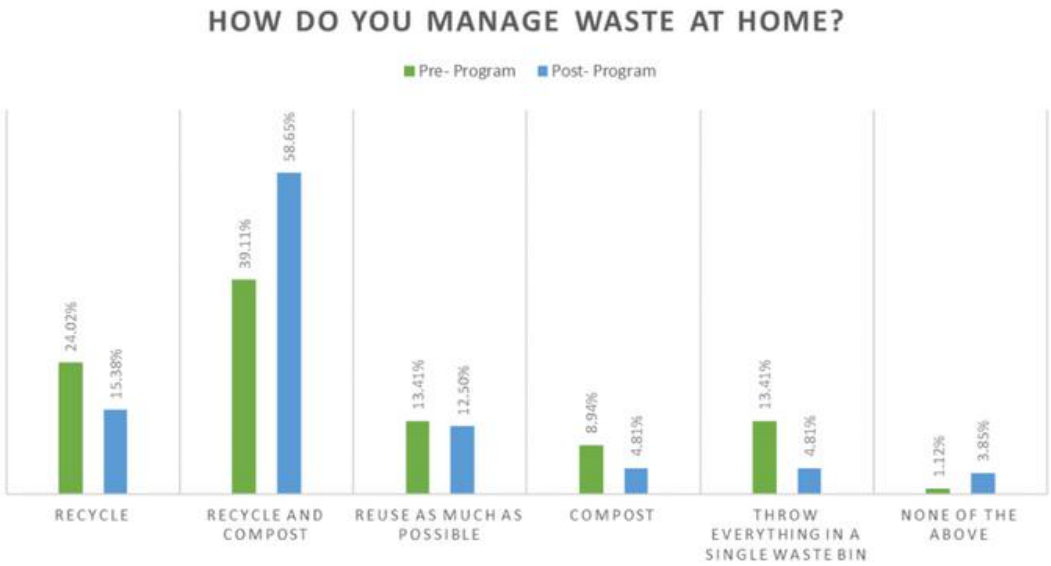
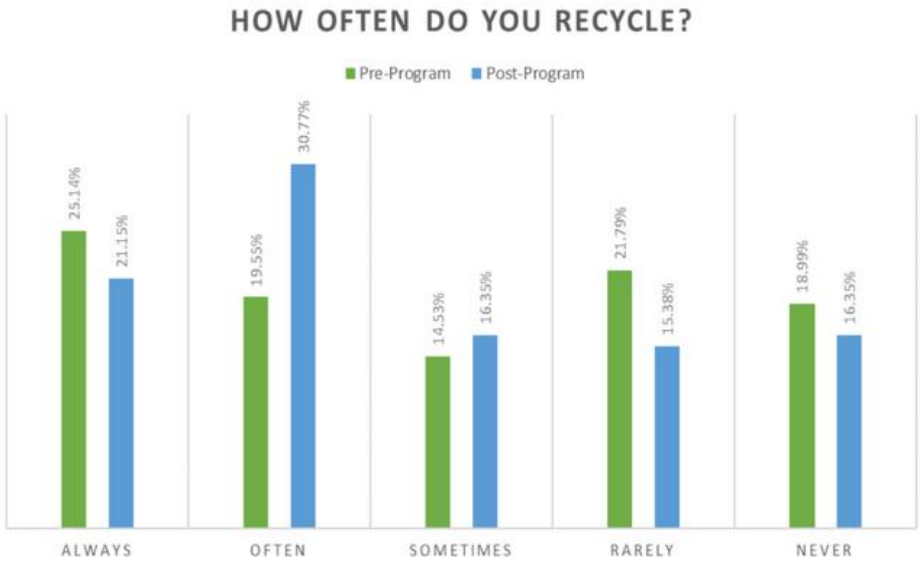


FIGURE 6. Teachers' Responses on the topic of Use of Plastic Products.

PLASTIC WASTE MANAGEMENT

Students





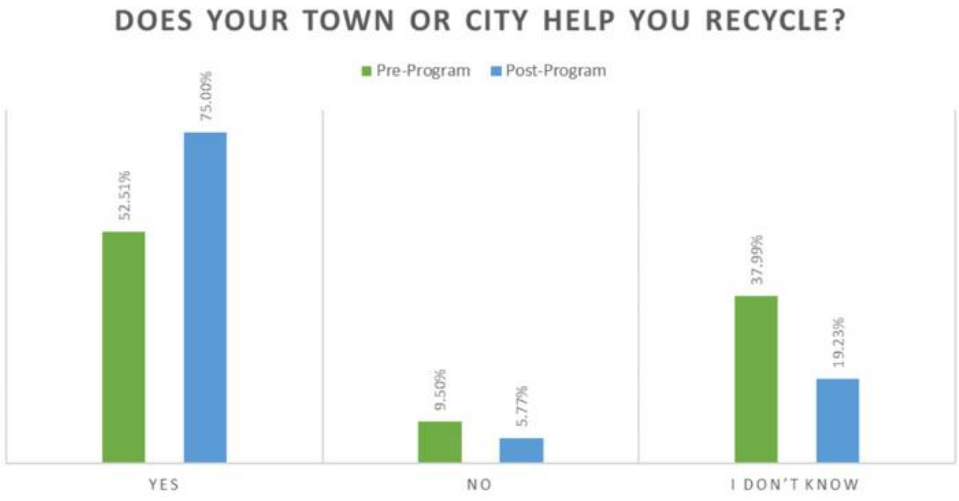


FIGURE 7. Students' Responses on the topic of Waste Management.

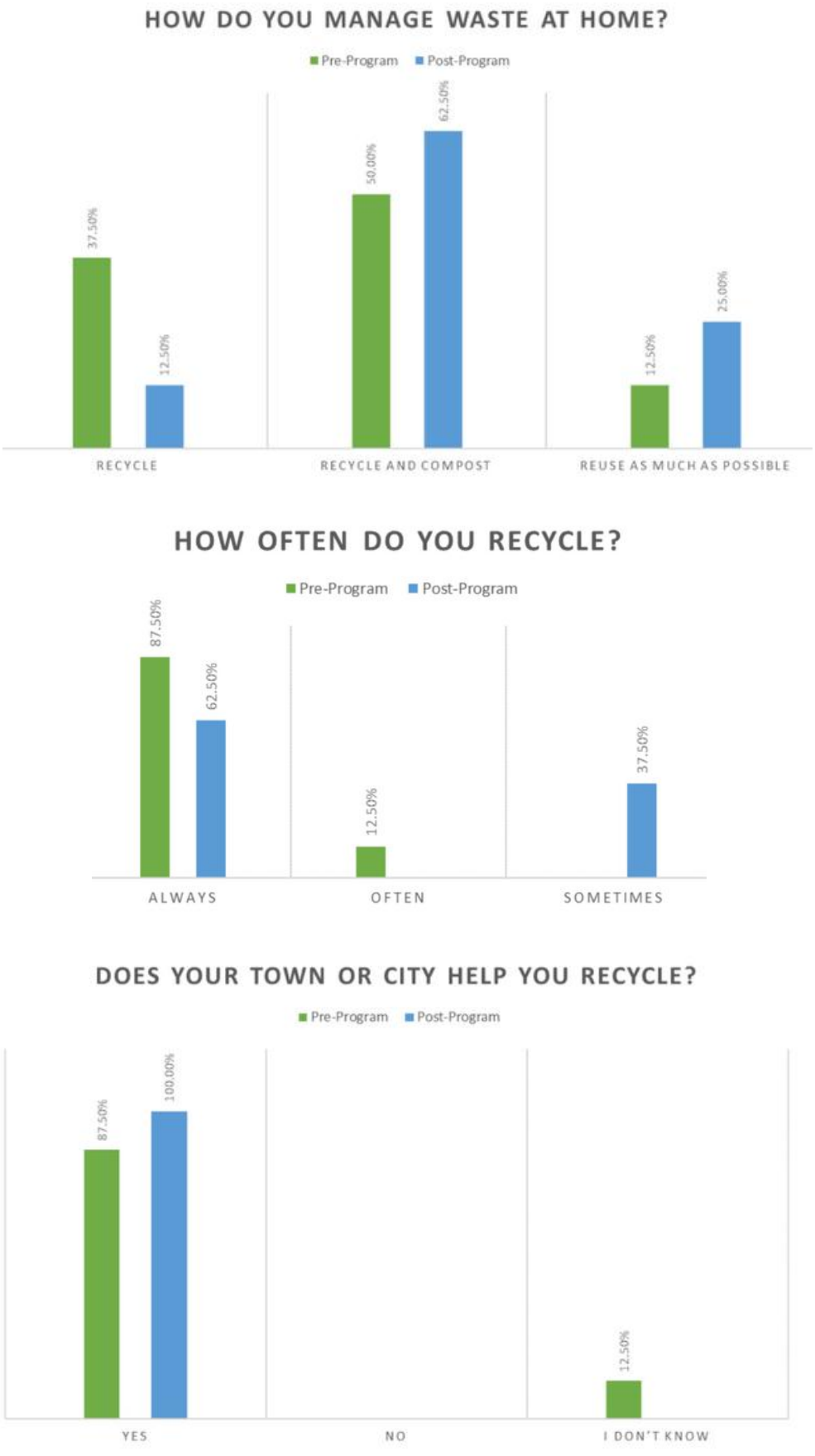
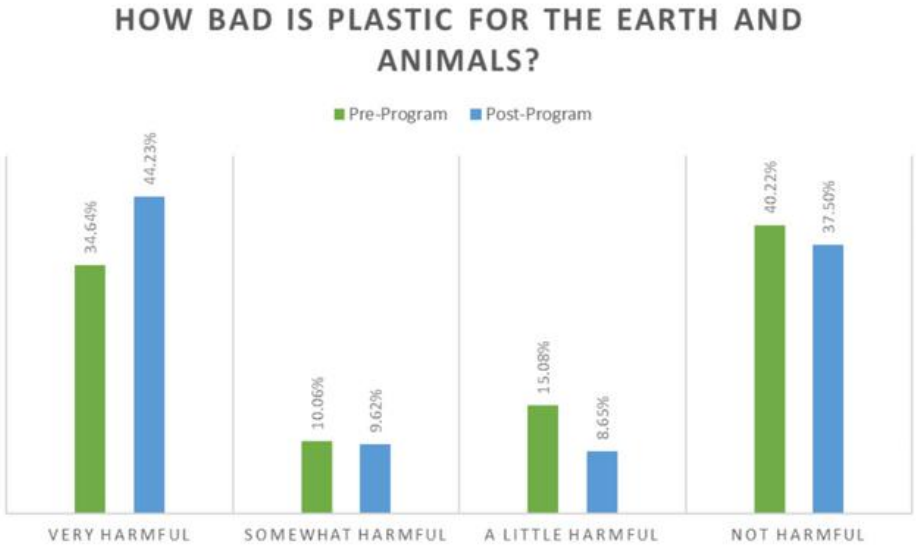
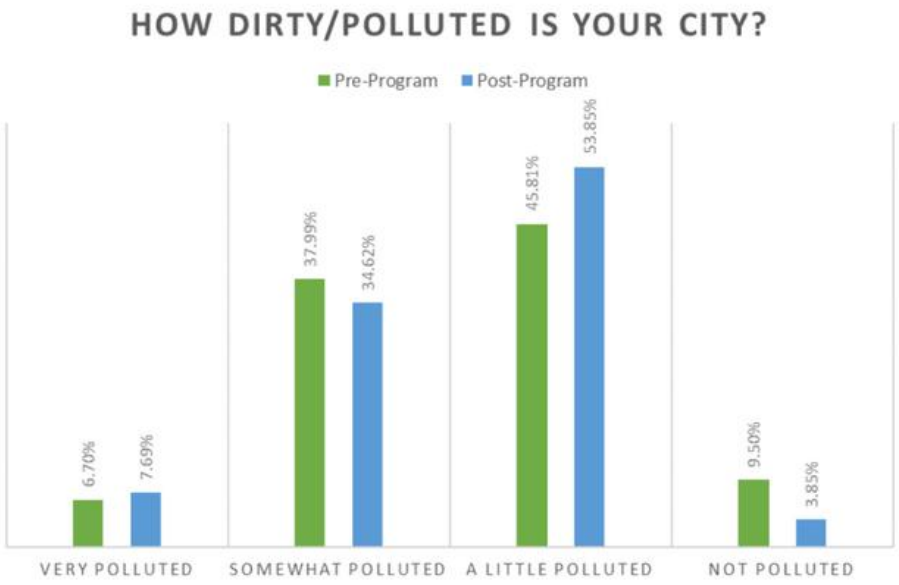


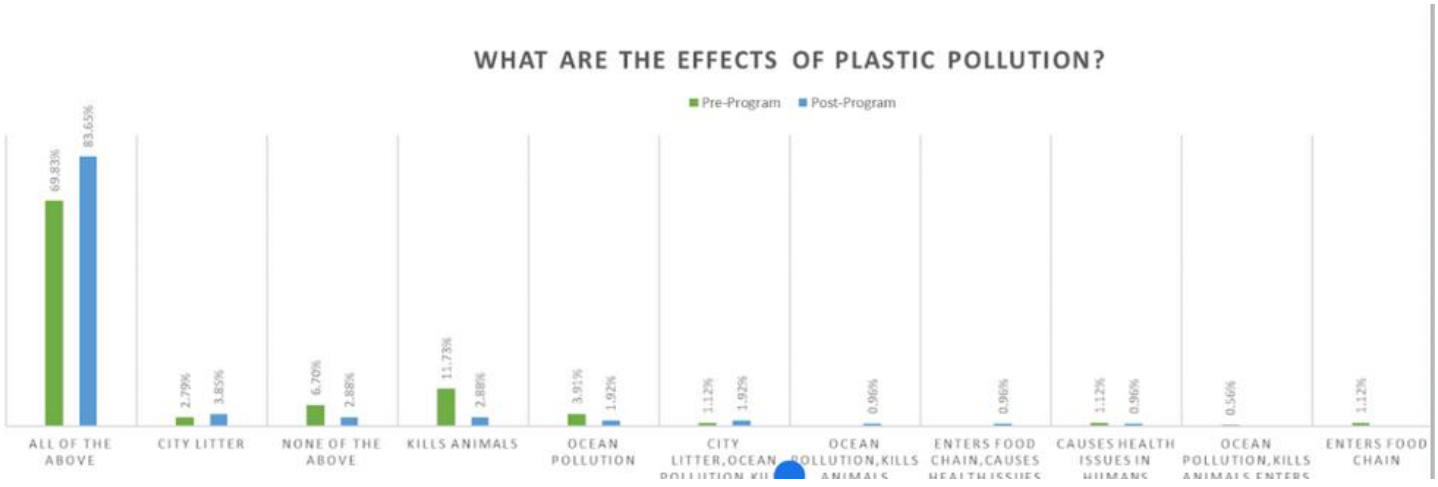
FIGURE 8. Teachers' Responses on the topic of Waste Management.

PLASTIC POLLUTION AWARENESS

Students







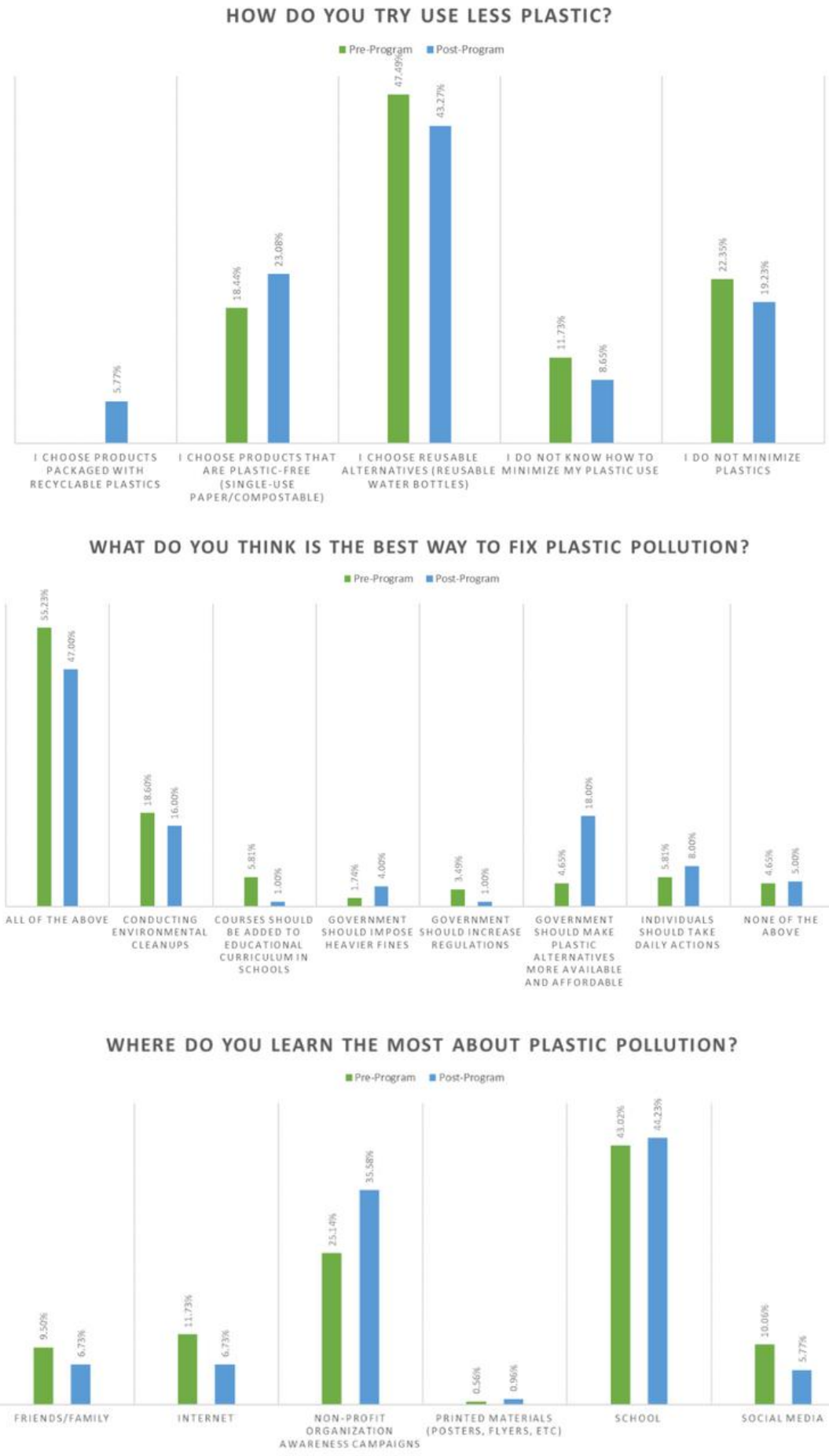
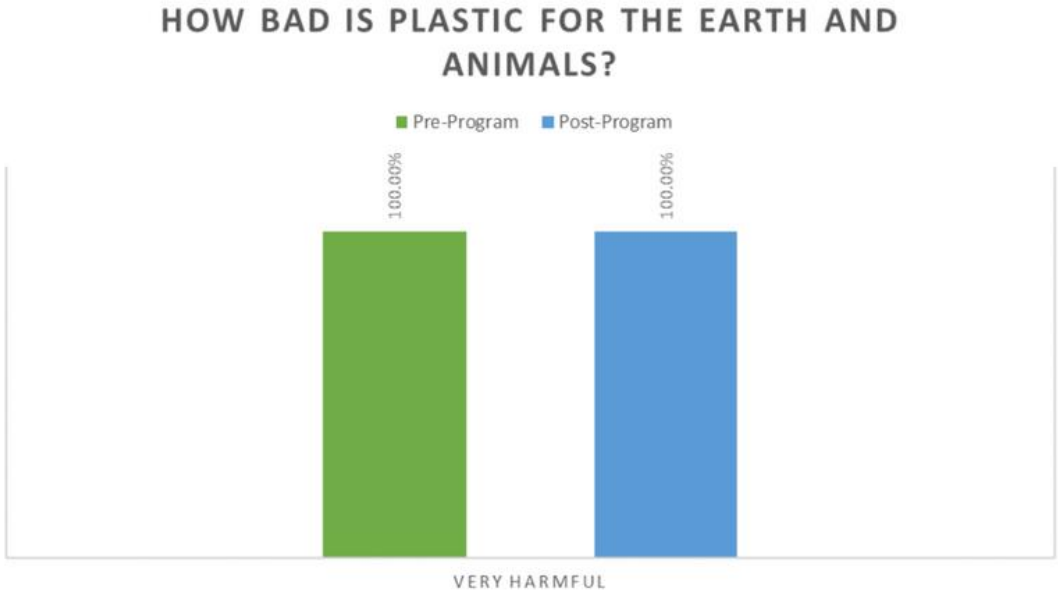
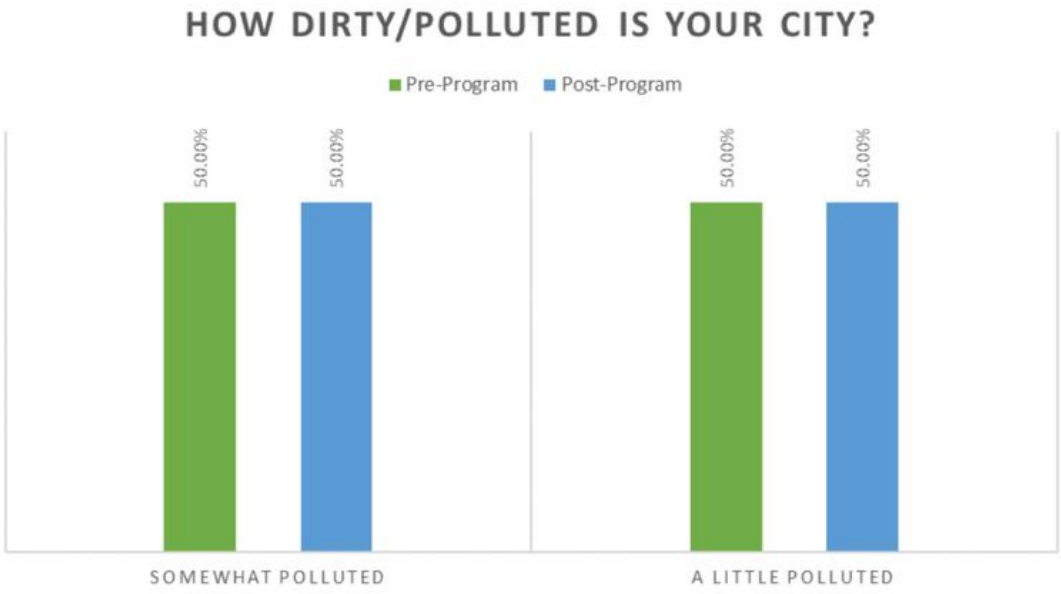
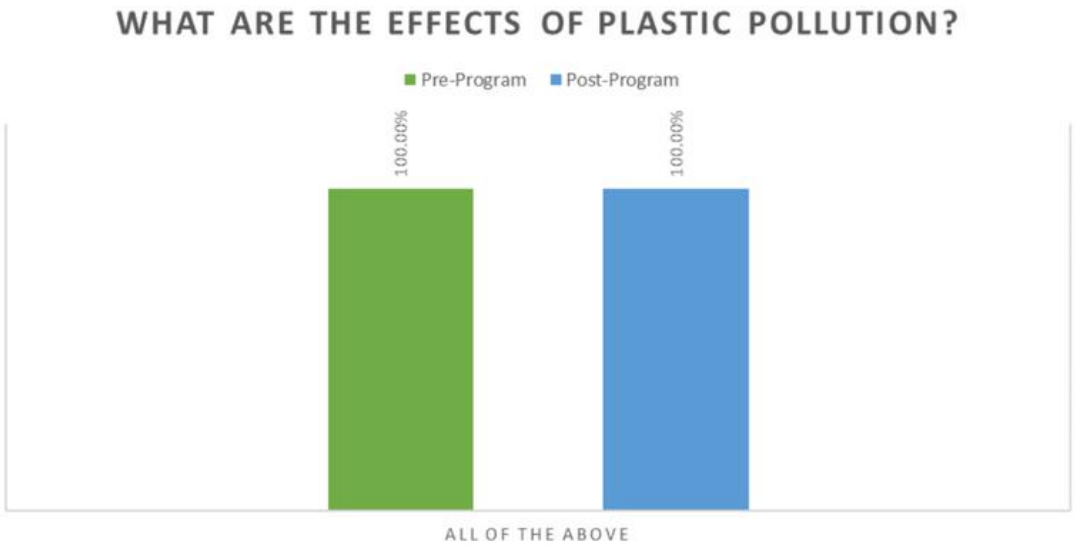
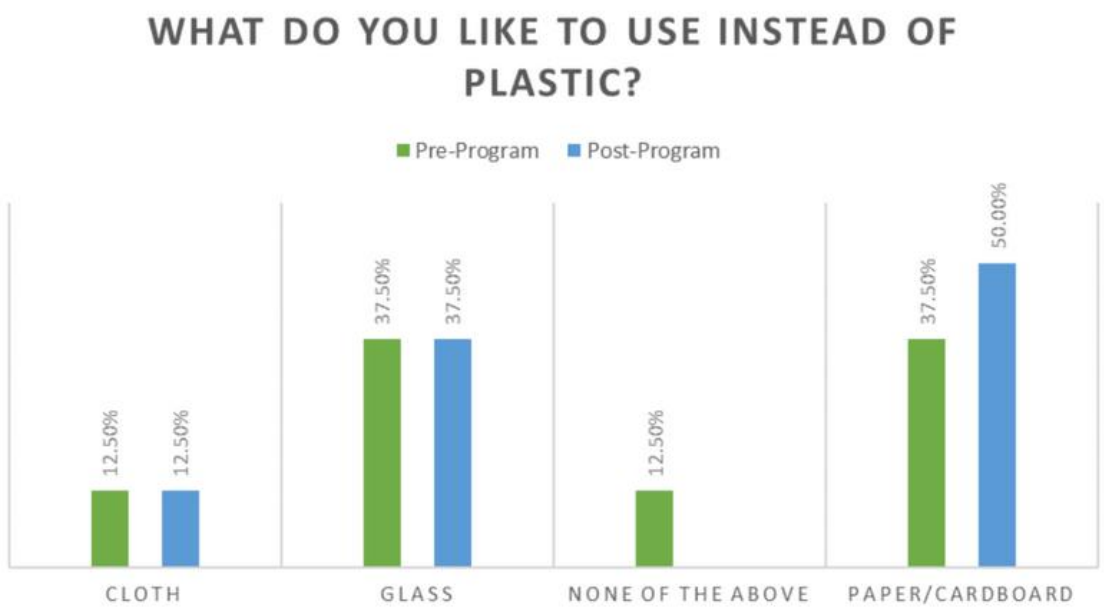


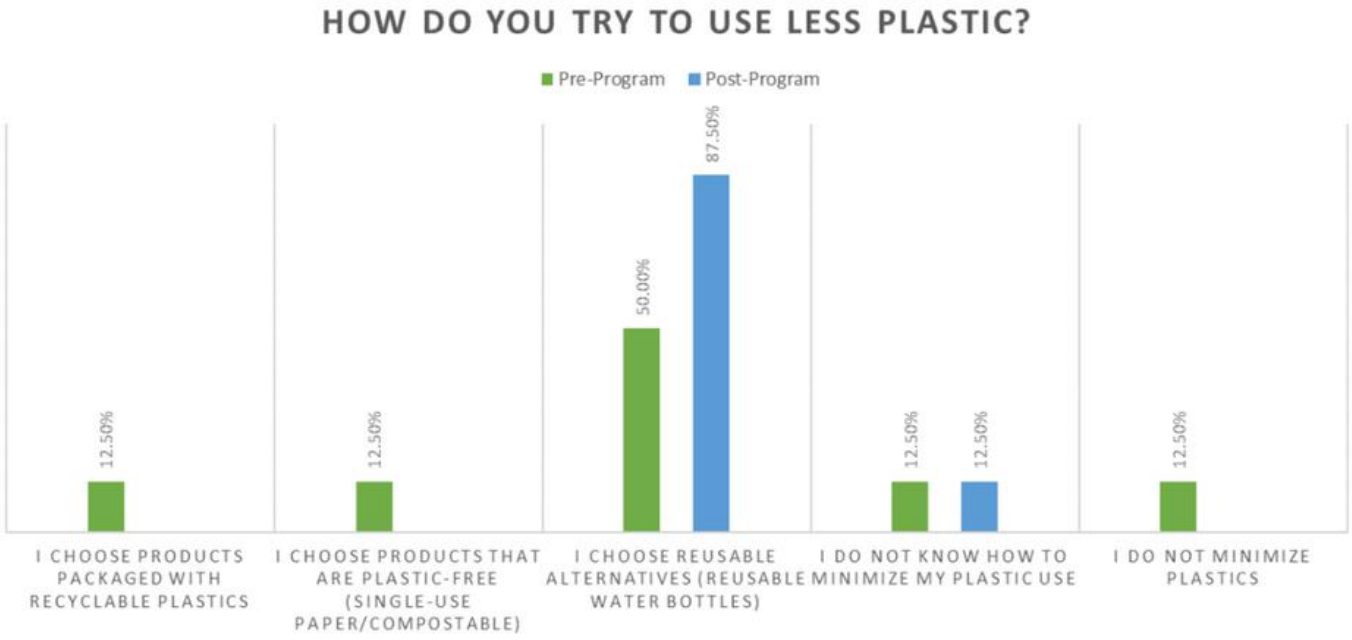
FIGURE 9. Students' Responses on the topic of Plastic Pollution Awareness.


HOW BAD IS PLASTIC FOR THE EARTH AND ANIMALS?
Pre-Program
Post-Program
100.00%
100.00%
VERY HARMFUL


HOW DIRTY/POLLUTED IS YOUR CITY?
Pre-Program
Post-Program
50.00%
50.00%
50.00%
50.00%
SOMEWHAT POLLUTED
A LITTLE POLLUTED


WHAT ARE THE EFFECTS OF PLASTIC POLLUTION?
Pre-Program
Post-Program
100.00%
100.00%
ALL OF THE ABOVE


WHAT DO YOU LIKE TO USE INSTEAD OF PLASTIC?
Pre-Program
Post-Program
12.50%
12.50%
37.50%
37.50%
12.50%
37.50%
50.00%
CLOTH
GLASS
NONE OF THE ABOVE
PAPER/CARDBOARD


HOW DO YOU TRY TO USE LESS PLASTIC?
Pre-Program
Post-Program
12.50%
12.50%
50.00%
87.50%
12.50%
12.50%
12.50%
I CHOOSE PRODUCTS PACKAGED WITH RECYCLABLE PLASTICS
I CHOOSE PRODUCTS THAT ARE PLASTIC-FREE (SINGLE-USE PAPER/COMPOSTABLE)
I CHOOSE REUSABLE ALTERNATIVES (REUSABLE WATER BOTTLES)
I DO NOT KNOW HOW TO MINIMIZE MY PLASTIC USE
I DO NOT MINIMIZE PLASTICS

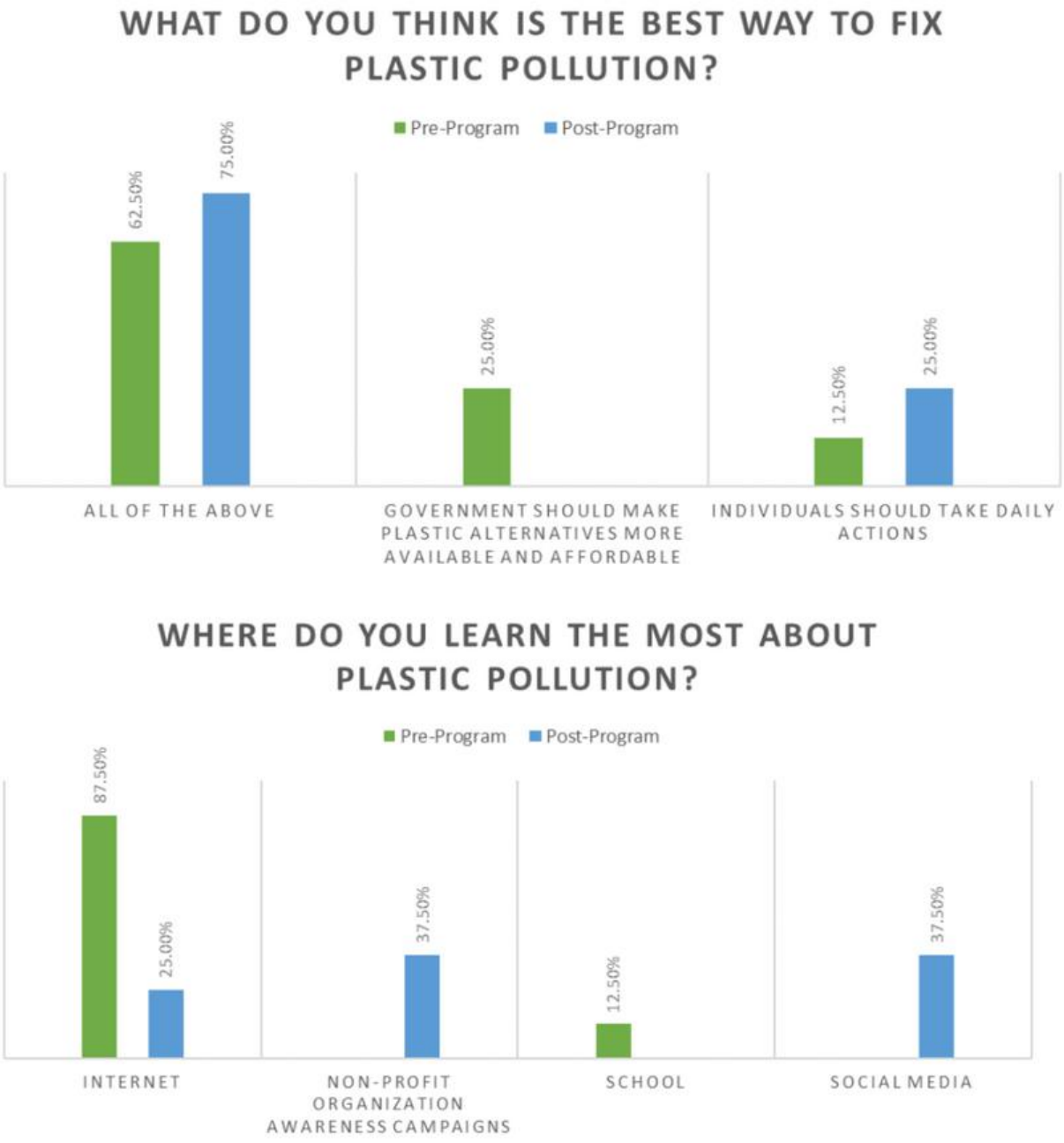
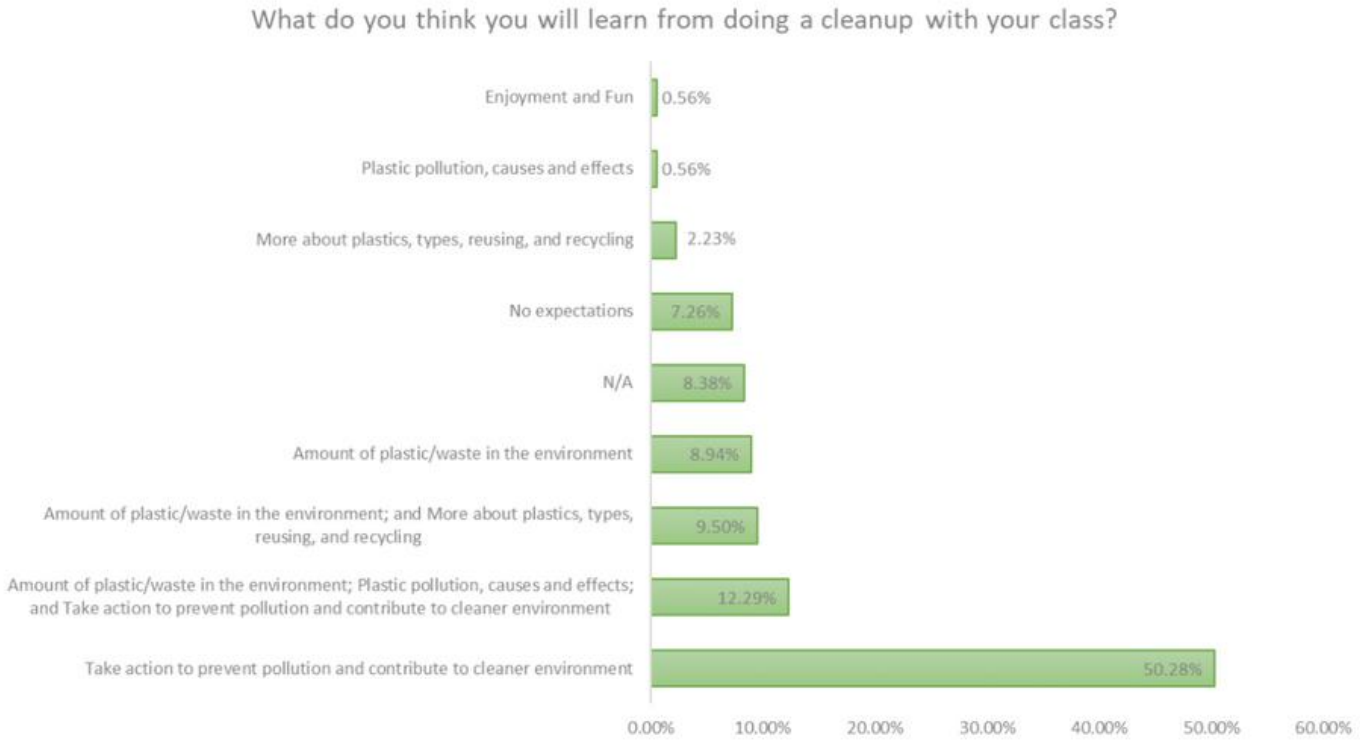
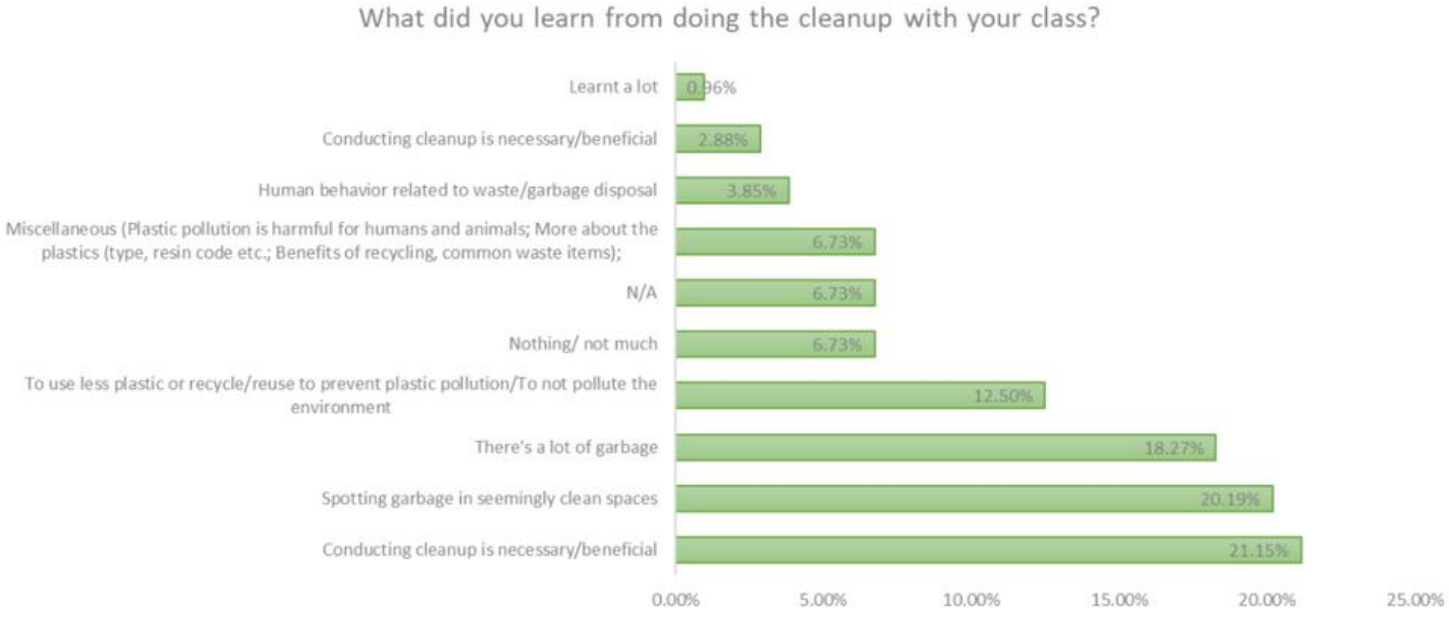


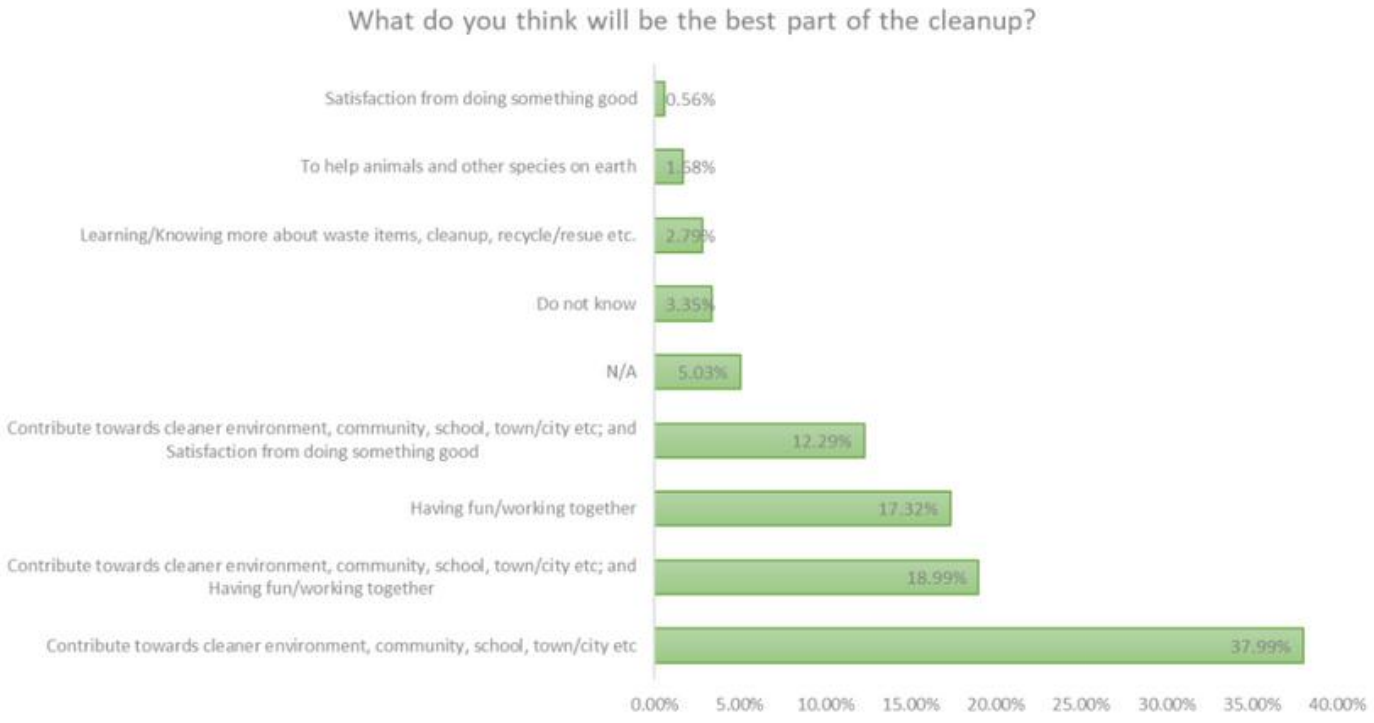
FIGURE 10. Teachers' Responses on the topic of Plastic Pollution Awareness.

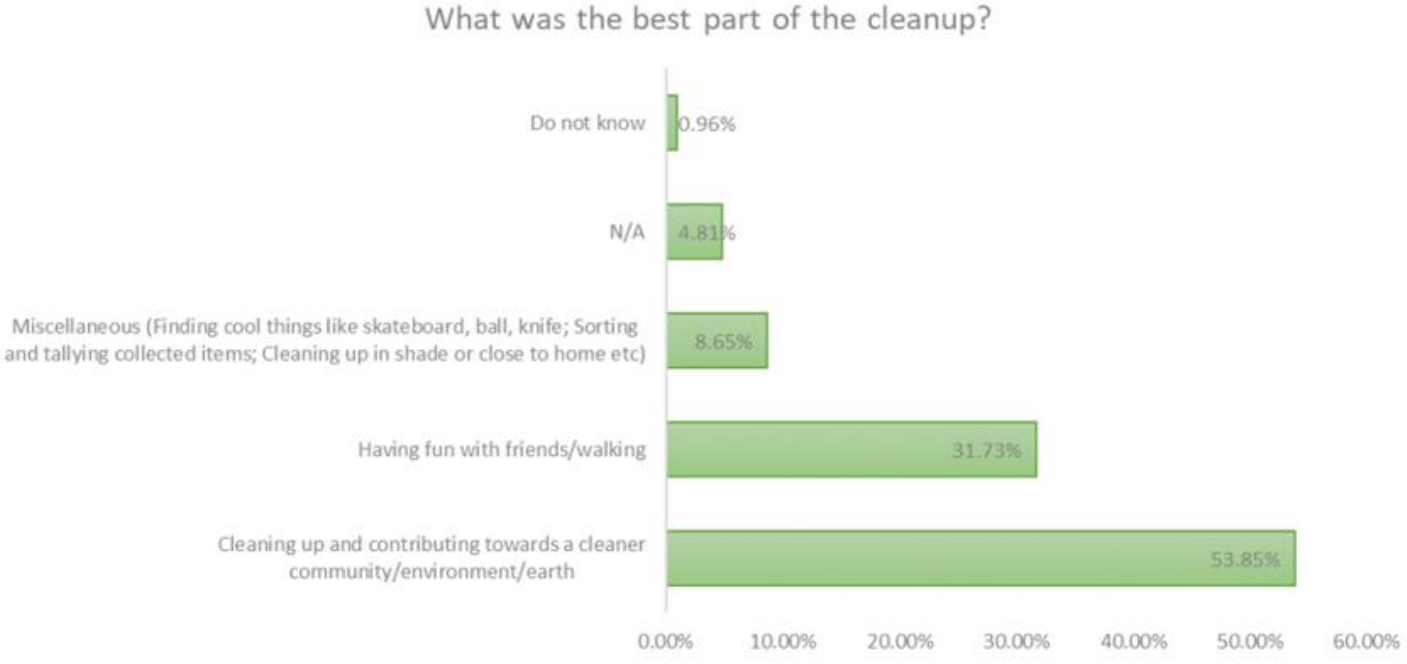
OPEN QUESTIONS

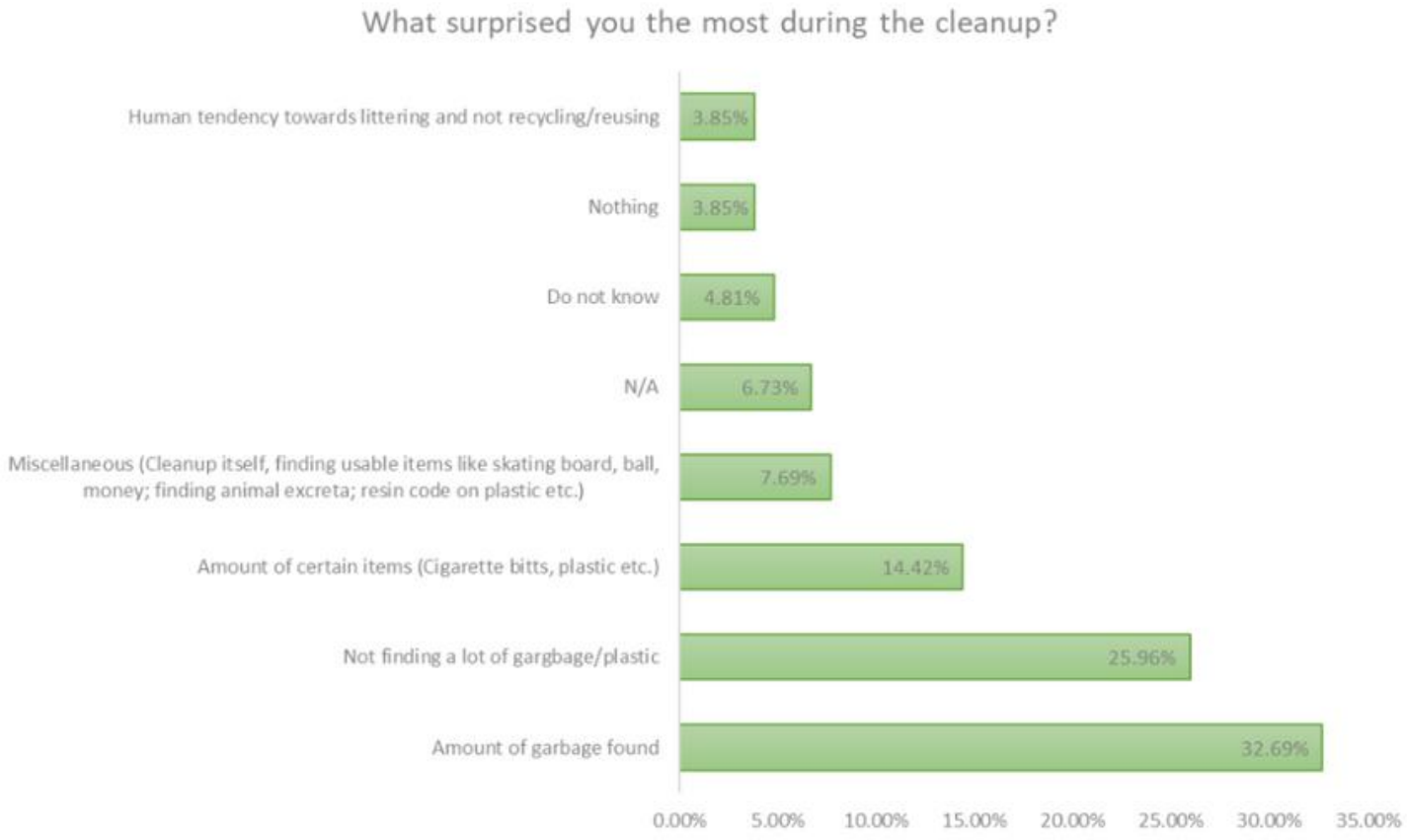
Students






What do you think will be the best part of the cleanup?
Satisfaction from doing something good
0.56%
To help animals and other species on earth
1.68%
Learning/Knowing more about waste items, cleanup, recycle/resue etc.
2.79%
Do not know
3.35%
N/A
5.03%
Contribute towards cleaner environment, community, school, town/city etc; and Satisfaction from doing something good
12.29%
Having fun/working together
17.32%
Contribute towards cleaner environment, community, school, town/city etc; and Having fun/working together
18.99%
Contribute towards cleaner environment, community, school, town/city etc
37.99%
0.00% 5.00% 10.00% 15.00% 20.00% 25.00% 30.00% 35.00% 40.00%


What was the best part of the cleanup?
Do not know
0.96%
N/A
4.81%
Miscellaneous (Finding cool things like skateboard, ball, knife; Sorting and tallying collected items; Cleaning up in shade or close to home etc)
8.65%
Having fun with friends/walking
31.73%
Cleaning up and contributing towards a cleaner community/environment/earth
53.85%
0.00% 10.00% 20.00% 30.00% 40.00% 50.00% 60.00%



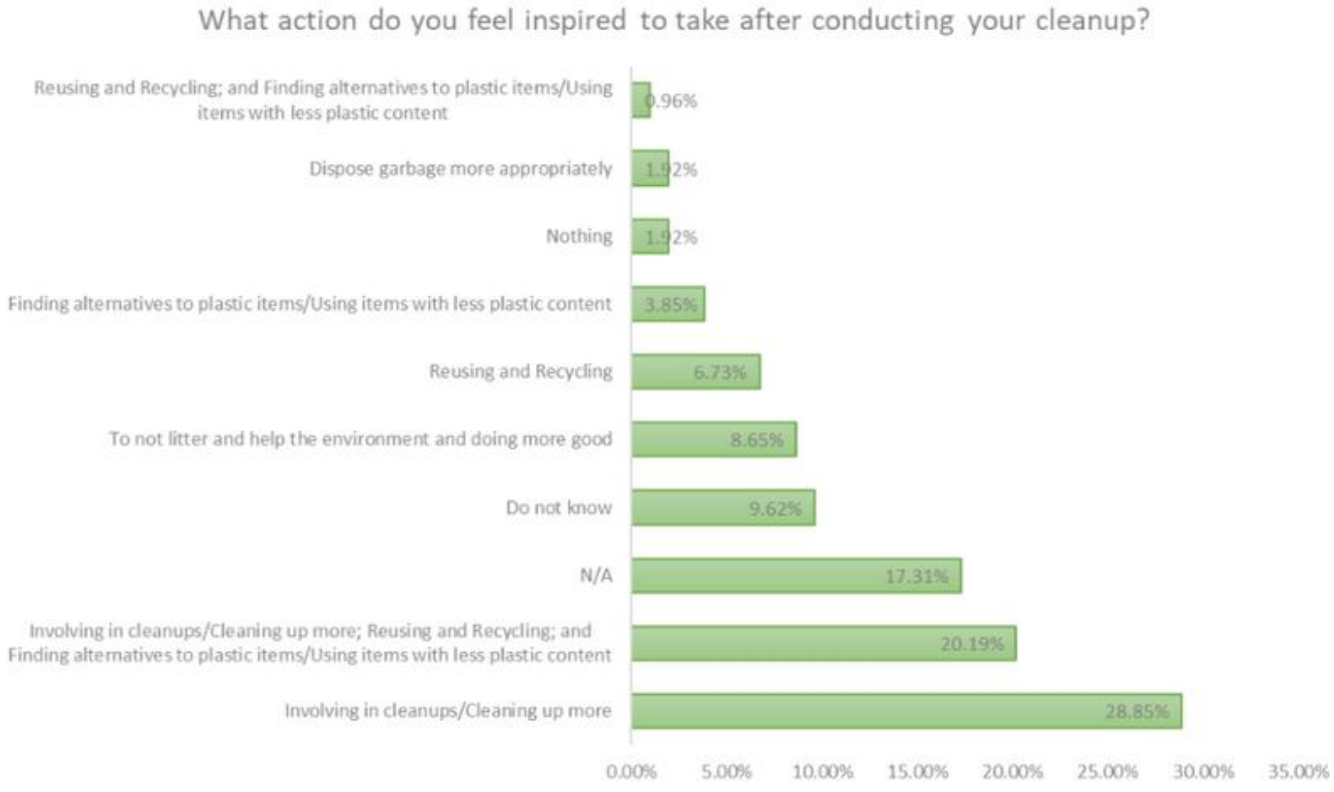
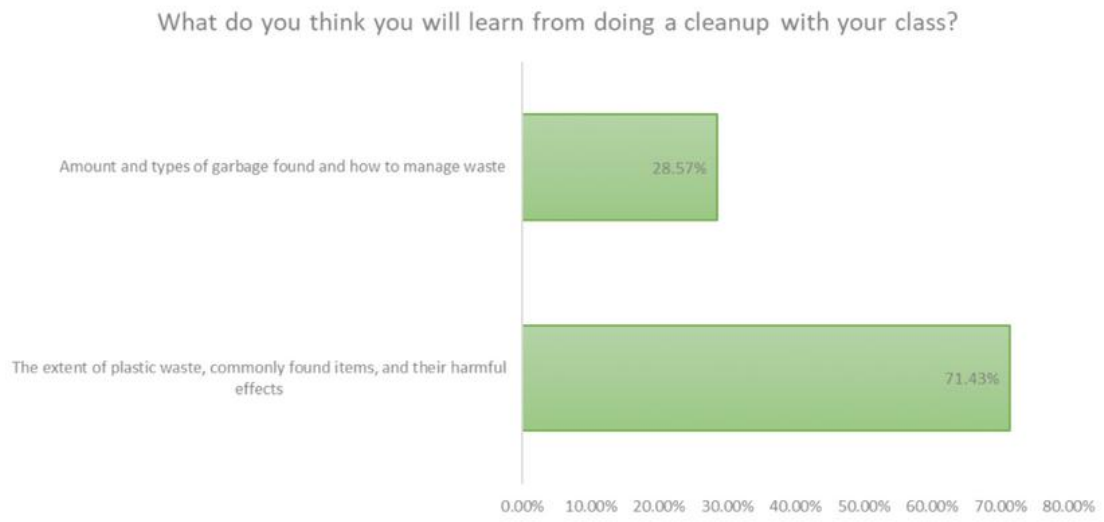
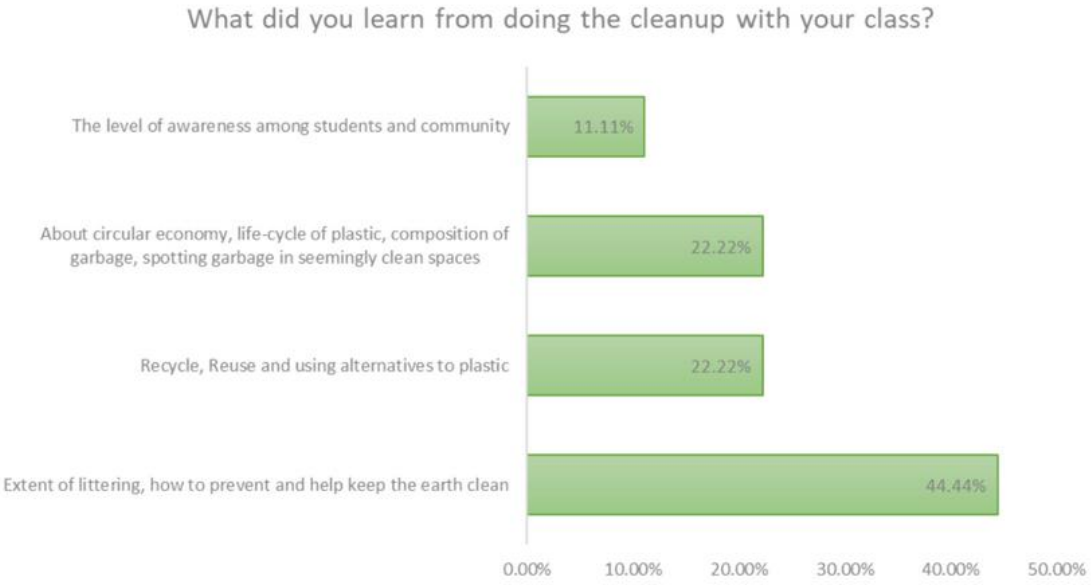
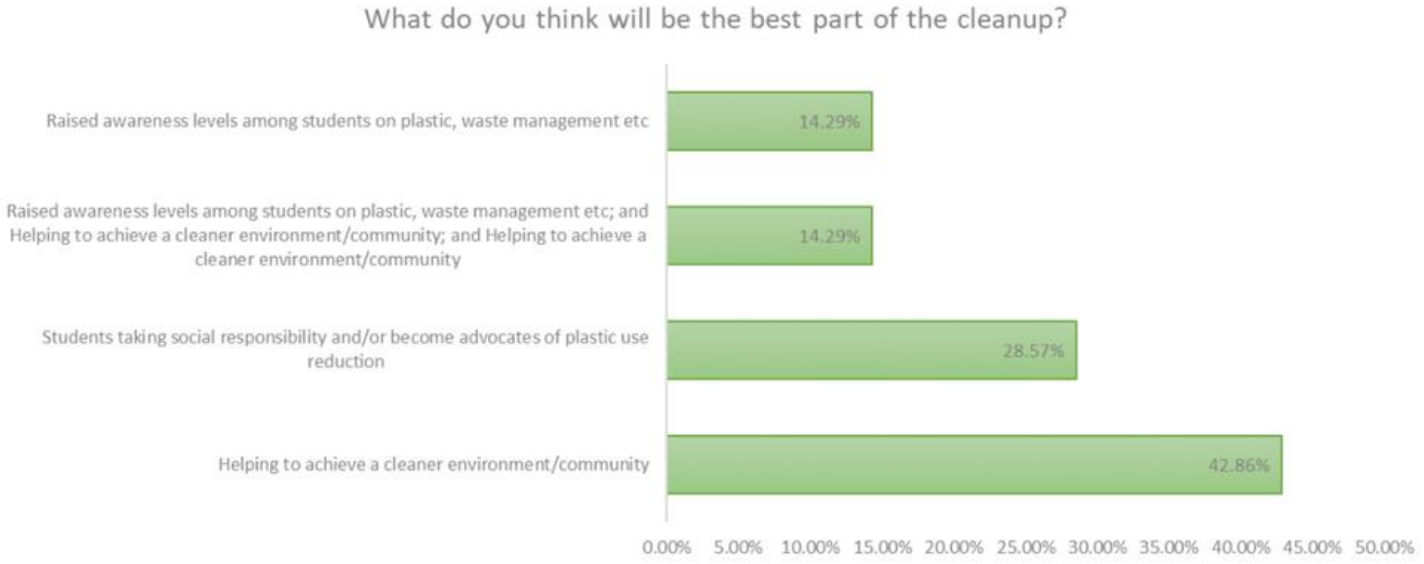
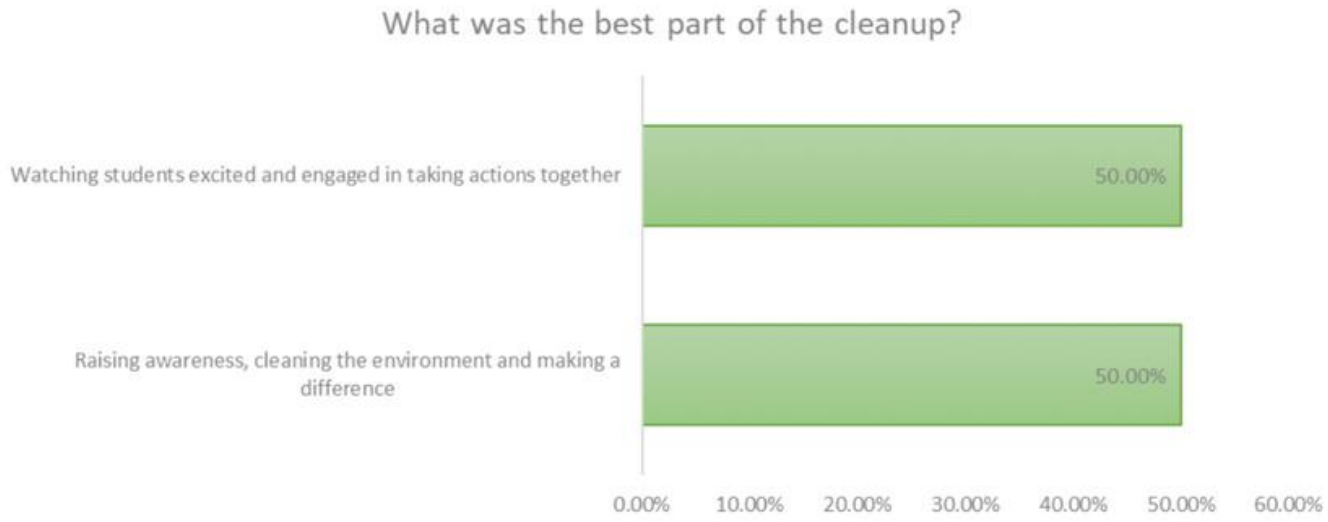


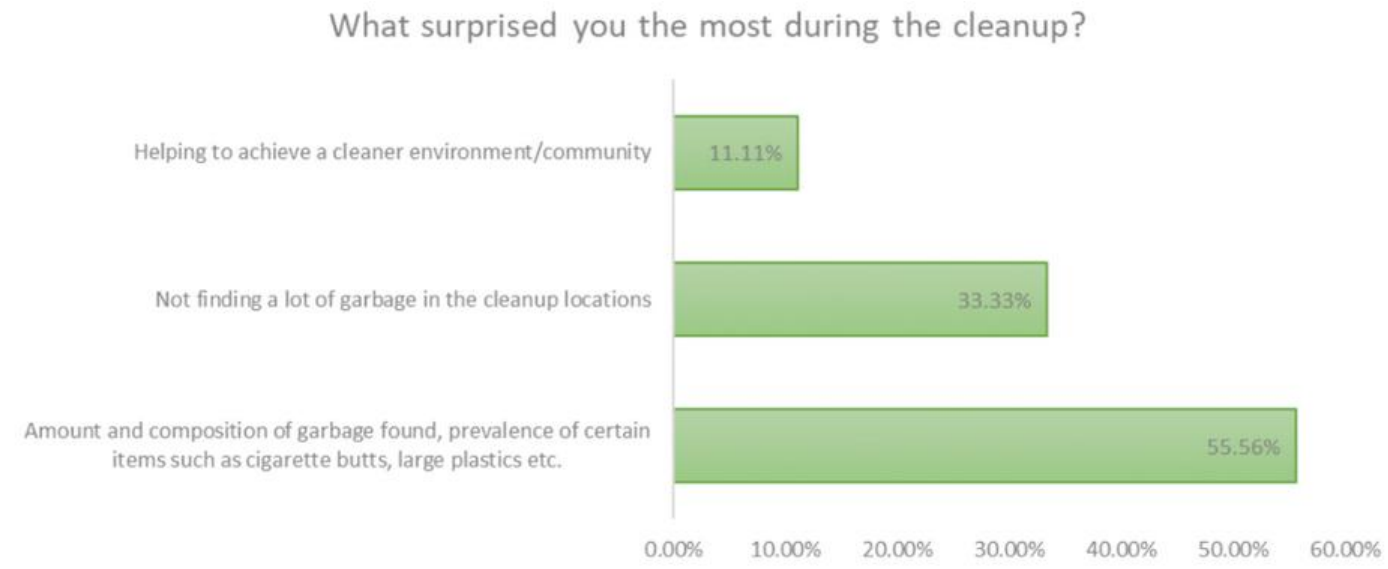
FIGURE 11. Students' Responses to open questions.


What do you think you will learn from doing a cleanup with your class?
Amount and types of garbage found and how to manage waste
28.57%
The extent of plastic waste, commonly found items, and their harmful effects
71.43%
0.00% 10.00% 20.00% 30.00% 40.00% 50.00% 60.00% 70.00% 80.00%


What did you learn from doing the cleanup with your class?
The level of awareness among students and community
11.11%
About circular economy, life-cycle of plastic, composition of garbage, spotting garbage in seemingly clean spaces
22.22%
Recycle, Reuse and using alternatives to plastic
22.22%
Extent of littering, how to prevent and help keep the earth clean
44.44%
0.00% 10.00% 20.00% 30.00% 40.00% 50.00%


What do you think will be the best part of the cleanup?
Raised awareness levels among students on plastic, waste management etc
14.29%
Raised awareness levels among students on plastic, waste management etc; and Helping to achieve a cleaner environment/community; and Helping to achieve a cleaner environment/community
14.29%
Students taking social responsibility and/or become advocates of plastic use reduction
28.57%
Helping to achieve a cleaner environment/community
42.86%
0.00% 5.00% 10.00% 15.00% 20.00% 25.00% 30.00% 35.00% 40.00% 45.00% 50.00%





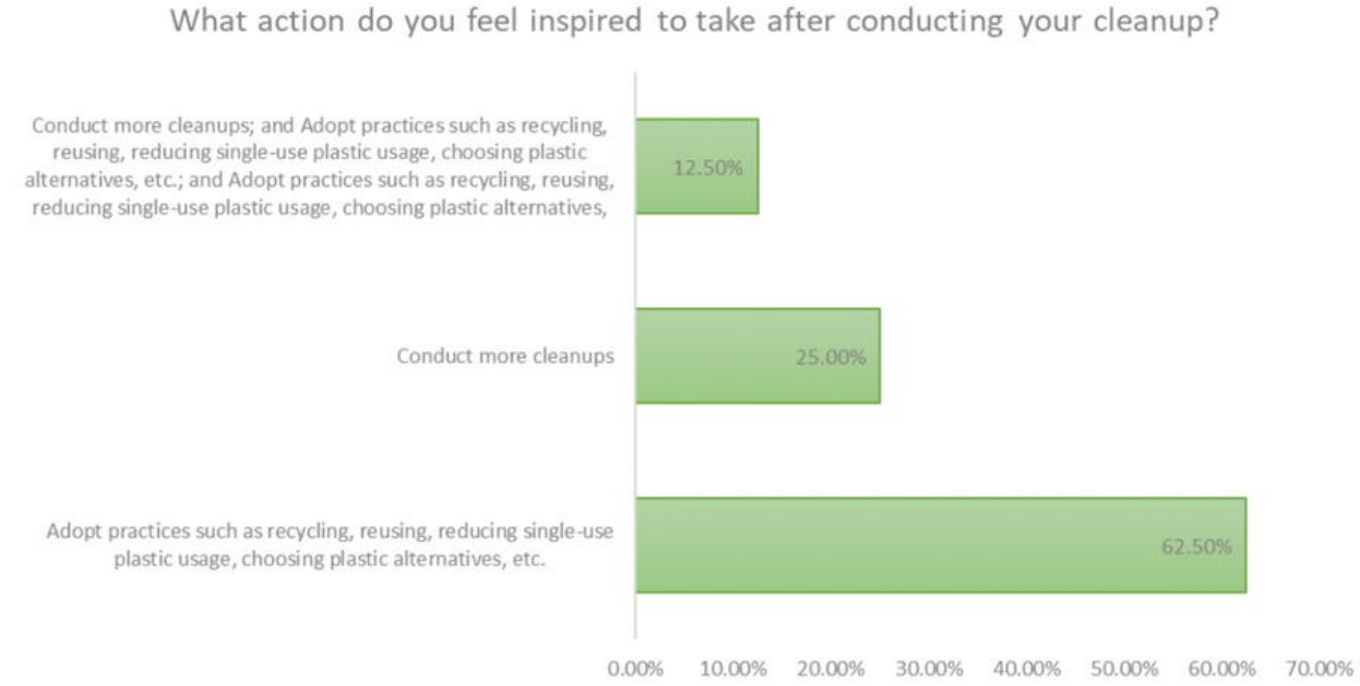


FIGURE 12. Teachers' Responses to open questions.

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