



AN ASSESSMENT OF STUDENTS' ENVIRONMENTAL  
ATTITUDES AND BEHAVIORS AND THE EFFECTIVENESS  
OF THEIR SCHOOL RECYCLING PROGRAMS.

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## **DEDICATION**

This thesis is dedicated to my wonderful parents, William and Elizabeth Mrema, who have raised me to be the person I am today. You have been with me and encouraged me every step of the way, through good and bad times. Thank you for all the love, guidance, and support that you have given me throughout the years, helping me to succeed and instilling in me the confidence that I am capable of doing anything I put my mind to. Thank you for everything.

I love you!

## **ACKNOWLEDGEMENTS**

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Lastly, I would like to thank my mother for all the resources she provided and the endless effort she put in when I needed it.

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## **1. ABSTRACT**

Recycling over many years has become of great importance to our society, and especially the environment. It has become an important means of reducing the increasing amounts of waste being sent to landfills each year. Adults, youth and even children can all play a part in contributing to creating a healthier and clean environment. With this in mind, and the fact that Halifax is recognised as having one of the most progressive recycling programs in Canada, the principal objective of this project was to assess student attitudes and behaviour towards recycling in the attempt of increasing recycling participation in the schools. The significance of this project was that we need to start encouraging good habits and behaviours among the youth, to teach them to be good stewards of our environment so as to create a more sustainable environment in the future and for the future generations. The research and analysis of this project was obtained through the use of questionnaires to gather the relevant information from the students. In addition, observations and interviews were also undertaken.

Knowledge about recycling and knowing what materials are recyclable was found to be the main factor that influences recycling participation as well as location and instructions on the recycling bins.

## **2. INTRODUCTION**

Most of the world's garbage is sent to landfills, dumps or municipal incinerators. But with more and more people producing more and more waste, landfills are filling up faster than we can find new sites for them (Environment Canada, 2003). In Canada, as is the case in many other industrialized nations, our high rates of consumption and past decades of environmental ignorance, have resulted in an over-reliance on landfills to dispose of our waste (Lockwood *et al.*, 2004). Furthermore, in some jurisdictions, sending too much waste to landfills without effective management is not the best solution to the waste management problems. Landfills themselves have been known to create new types of waste, such as a toxic liquid called leachate, formed from decomposing garbage reacting with moisture in the landfill. Discarding products and wastes that were once resources is also considered wasteful as these resources are no longer easily accessible for reuse, manufacturing, and recycling. Of all the waste management practices and methods available, reducing the rate and quantity of waste generated should be our primary objective (Lockwood *et al.*, 2004).

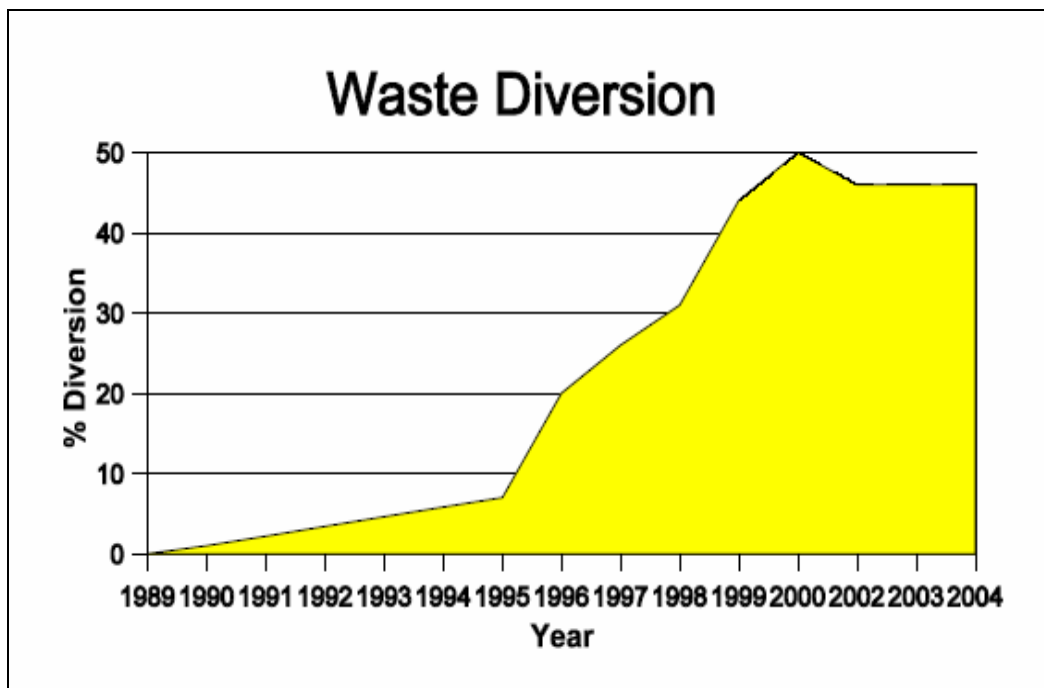
Recovery and recycling are two of the most effective methods used to reduce wastes. According to Environment Canada (2003) a really effective and manageable program must incorporate the 4Rs: *Reduce, Reuse, Recycle and Recover*. Recycling allows us to reduce the amount of natural resources that we extract and prevents the discard of resources into landfills. It reduces our Ecological Footprint and helps Canada meet its Kyoto Protocol commitments. However, recycling requires waste products to be transported, broken down, and reformed. These processes consume resources such as fossil fuels, electricity, and water. Despite these shortcomings however, recycling has proven to be a more efficient use of resources than burning and burying (Rogers, 2005: 158).

Recycling should be everybody's concern, from children to adults, rich or poor. It is therefore crucial and important to start educating the young ones about the importance and benefits of recycling and encourage them to care for the environment by participating in recycling. It is believed that through education, current and future waste generators will respect and conserve natural resources by making informed waste prevention choices (Integrated Waste Management Board, 2007). It is important to enable children and youth to see the need of them taking part in the recycling programs and contributing in helping their surroundings reduce waste and decrease demand on existing and mostly filled landfills. If no action is taken early enough as the young ones grow, such filled landfills may create many other environmental hazards and increase the environmental pollution and degradation, all of which may in turn affect climate change or further depletion of the ozone layer.

In addition to discarding potentially valuable resources, methane emissions from landfills account for 2.9 per cent of Canada's total greenhouse gas emissions and by the year 2010, that figure is expected to be 19 per cent higher (David Suzuki Foundation, 2007). Other problems with landfills include the release of leachate and generally the fact that dumping garbage into landfills is a waste of resources that could be recycled and/or reused. In November 2007, HRM set a new limit of six bags/containers for curbside collection (down from 10 bags) as a step forward to encouraging people to recycle more and reaching their diversion goal of 60% as set in 1996 (Halifax Regional Municipality, 2007). In early 1970s, there were over 100 dumps operating in Halifax Regional Municipality (HRM), most of which used open burning as a means of disposal. In 1996 however, only 20 open burning sites were in operation. On April 1 of this same year, open burning was banned and all sites were shut down (Nova Scotia Environment and Labour, 2004). During this year, Nova Scotia was forced to deal with its garbage problem. Faced with the prospect of their landfills reaching capacity and with few new options available,



the provincial government adopted a hard-line approach to waste disposal. It banned many common dry recyclable items from landfills. These included newsprint, cardboard, tires, compostable organic materials, and food containers made of steel, tin, or glass (News in Review, 2000). To further protect the environment the province required all new landfills to use plastic and soil liner systems to collect and treat the leachate to ensure that it does not pollute ground water. By 2004, there were only 18 disposal sites left in Nova Scotia and the HRM site had already met the new landfill requirements. In 2002, Nova Scotia had diverted 46% of their waste from landfills and incinerators. Though this diversion rate had fallen from the 50% rate in 2000 (Figure 1), Nova Scotia still remains a leader in recycling and improvements are constantly still being made. Amount of space in landfills saved from this diversion of waste is known to be equivalent to 9 average sized landfills (Nova Scotia Environment and Labour, 2004). Below is a diagram showing waste diversion in Nova Scotia between 1989 and 2004 (Figure 1).



**Figure 1:**  
Percentage of waste diverted in Nova Scotia between 1989 and 2004.  
*Source: Nova Scotia Environment and Labour, 2004*

As you can see, there have been increases in the amount of waste diverted in Nova Scotia every since the 1980s. But it was only until the mid-1990s when the province began developing and expanding their waste management strategies that the percentage of waste diverted increased rapidly.

Currently, recycling programs have been implemented in various locations within Halifax and other areas as well. However, millions of tonnes of wastes are still going into the landfills each year and this has brought about questions of the effectiveness of these programs. Recycling is voluntary, so municipalities must make every effort to educate, share information and create awareness to individuals about the importance and benefits of recycling, both in the short-term and long-term, for them as well as the societies they live in and the world at large. They equally need to create incentive mechanisms to induce positive change in behaviour so as to participate and begin to recycle their waste or reduce their production. Increasing the amount of waste diverted from landfills every year will create great benefits for the environment in the long-run. The purpose of this research is to find out how effective recycling programs are in schools and increase awareness of the importance and effective ways of recycling. This project will therefore focus on the analysis of recycling programs in private schools in the Halifax Metro Area and determine whether there are individual, family, and societal factors that affect recycling attitudes and behaviour. In the long-term, it is hoped that this will reduce the amount of waste being produced and sent to landfills, which in turn will reduce the amount toxic substances being released from landfills to the atmosphere affecting the climate and human health, thus resulting into a cleaner and more sustainable environment. To be able to achieve this, we need to educate the students on the benefits and importance of recycling and ways they can take part and contribute to reducing the amount of waste generated.

According to Doug McKenzie, author of *Fostering Sustainable Behaviour*, there are three explanations for people not engaging in an activity:

- People do not know about the activity or its benefits.
- People who know about the activity may perceive that there are significant barriers associated with engaging in it.
- While people may feel that there no significant barriers to carrying out the activity, they may perceive that it is easier and more beneficial to continue with their present behaviour, such as putting recyclables in the garbage.

This is why education is crucial in the attempt to overcome these barriers to recycling by increasing the students' knowledge about how to carry out the activity, making it more convenient for them to do the activity and providing more information about the activity so that the students can see the benefits of recycling and increase their participation.

### **2.1 Research Questions**

What recycling methods or programs exist in schools around the Halifax Metro Area?  
How effective are the recycling programs in these schools? What factors affect recycling behaviours and attitudes amongst children and youths in the schools?

The primary objective of this research was to analyze the effectiveness of the recycling program implemented in the schools. However, in order to come up with an accurate analysis and assessment, the following objectives were considered:

1. Assessed the factors that may affect recycling behaviours and attitudes amongst school children, such as age, gender, peer pressure and grade level to mention but a few.
2. Assessed whether the recycling facilities were being utilized effectively.

3. Determined the amount of knowledge and awareness children possess about how to recycle.
4. Provided recommendations on how to improve on the current recycling programs in place in the schools in order to increase the number of children who recycle effectively.

I hypothesized that age will have an effect on recycling behaviour in the sense that the older the student, the more knowledgeable and aware they are about recycling. Gender will have an effect on the children's knowledge and awareness of recycling where there will be greater pro-environmental attitudes and knowledge amongst girls than boys. I also hypothesized that proper signage was critical to recycling success among youth.

The results obtained in this thesis are significant because they will allow a deeper understanding of the reasons why some students do not fully participate in the current recycling programs in place in the schools. The results will further provide new information for the design of a more effective recycling program that can be implemented in the schools that will hopefully see an increased recycling participation amongst the students. Furthermore, the research may also provide a foundation for other students who are willing to take the research further, for example in comparing recycling participation in private schools versus public schools. Also, the finding may help other schools in the area establish a more efficient recycling program in their own schools. Additionally, the results would not only help us understand why some students recycle and others don't, but it would also help in the reduction of waste generated in the schools.

This project was limited only to three private schools in the Halifax Peninsula and Halifax South. Schools in the City of Dartmouth, Town of Bedford or the former County of Halifax were not included. Furthermore, only students in grades 8 and 11 were considered in the project study.

### **3. LITERATURE REVIEW**

Sustainable development relies on fundamental shifts in the attitudes held by individual citizens towards the environment, and their use of natural resources (Barr, 2006). In order to achieve sustainable development, humans need to find a way to co-exist with the environment and reduce the pressures we are currently inflicting on our natural resources. Modern industrial societies rely heavily upon non-renewable energy and materials, such as fossil fuels and mineral ores. We are draining the Earth's "capital" instead of living off the "interest" and this is why recycling should be integrated into the daily cultural and socioeconomic character of society (Cherif, 1995).

In order to limit the amount of waste being sent to landfills, we need to use less material and recover more. In October 2007, the garbage beneath the rolling hills of the old Sackville landfill in Nova Scotia, which was shut down at the end of 1996, is now producing enough methane gas to provide electricity to 2,000 area homes continuously for the next 15 years. Although this may be beneficial to the area homes, several problems can arise as a result of the methane gas. There is some possibility that the landfill gas will travel underground, accumulate in enclosed structures and ignite on both landfill property and private property (U.S. EPA, 2006). However, the biggest health and environmental concern would be the release of landfill gas into the atmosphere, contributing to global warming. Furthermore, over the course of its 20-year life, the Sackville landfill was the dumping ground for more than four million tons of un-separated garbage (Moar, 2007). Problems at the landfill caused odour problems that were so serious that more than 20 homes had to be purchased by the City so residents could relocate.

Landfills are the main destination for Canadian solid waste sent for disposal by a wide margin, approximately 90-95%. In 1998 alone, nearly 21 million tons of waste was disposed of in 767 publicly and/or privately operated landfills. In the same year, close to 9 million tons of

waste was diverted from disposal through recycling, composting or reuse programs (Crittenden, 2002).

We need to continue to encourage people to recycle. In order to do this, we need to educate the population about the benefits of recycling and how recycling is actually done. Students should learn that our landfills are mostly composed of phone books, magazines, and other recyclable materials, which is indicative of how, at our present level of practice, we neglect proper recycling techniques (Rathje, 1991). Kids hold the future in their hands and the better educated they are about the effects of good resource management on our fragile bio-systems like land, water, and air, the better able they will be to make environmental decisions as adults and protect the world around us (Simpson *et al.*, 2002). Additionally, environmental attitudes of young people appear to be crucial as they ultimately play a direct role in providing knowledge based solutions to incoming environmental problems (Bradly *et. al*, 1999). Furthermore, school environmental program, although addressed to students can also influence upon the environmental knowledge, attitude and behavior of adults (parents, teachers and local community members) through the process of intergenerational influence (Evans *et al.*, 1996). Another study also showed that the environmental knowledge of the students can improve the knowledge of their parents (Malgorzata Grodzinska *et al.*, 2003). According to the parents reports, the majority of students (70%) had discussed the program with their parents, and just over one third of them (34%) had made suggestion to their parents regarding the ways in which they could improve their waste management practices at home. A study by Heslop 1981 showed that knowledge seems to have a strong positive relationship with attitudes towards environmental protection and conservation (Heslop *et al.*, 1981 cited in Moscoso, 2001). Furthermore, people who have knowledge on environmental issues and/or knowledge on how to take actions on those issues are more likely to engage in environmentally acceptable behavior than those who do not possess this

knowledge. Another study done by Clay indicated that recycling behavior is relatively stable in different settings and increasing recycling in one setting would correspond to an increase in other settings. In his research he was comparing university students who recycled at home and at the University, and showed that those who did not recycle at home also chose not to recycle in the University.

It has been suggested that environmental education is critical and is most effective on younger children who do not have well-established habits (Smith *et al.*, 1997). Recycling can reach a level of collective consciousness only if we begin at the fundamental level - teaching our schoolchildren that it is an essential and natural mechanism that has created and sustained life on Earth (Cherif, 1995). This can be further supported by many studies that have been carried out on children and their knowledge about environmental issues that have proven that education is a key ingredient to improving this knowledge and increasing awareness about the environment and what can be done to make it more sustainable.

A recent study carried out at Illinois State University examined students' attitudes and behaviours toward residence hall recycling. An important finding was that students who participated in recycling efforts prior to college were more likely to participate in the residence hall recycling program (Navarro, 2002). This shows the importance of encouraging good environmental habits into students when they are still young so they can continue with this pro-environmental attitude as they grow up. My research aims at finding out how much knowledge school children have about how to recycle and provide recommendations on improving their knowledge so that they are able to implement this knowledge in their daily lives and teach others to do the same.

Another study carried out in the city of Cincinnati tried to analyze the impacts of two versions of a paper recycling education program on the knowledge, attitudes, and behaviours of

third to sixth graders. This study showed that there was greater knowledge and pro-recycling behaviour and attitudes after the recycling program was administered, and that a more hands-on experience during the program such as a visit to a landfill caused more pro-recycling attitudes and behaviours changes compared to a simple classroom presentation. Furthermore, the study observed differences in grade level with 5<sup>th</sup> and 6<sup>th</sup> graders having greater knowledge about recycling than 3<sup>rd</sup> and 4<sup>th</sup> graders (Smith *et al.*, 1997). This study links with what I expect to conclude in my results, such that the higher the grade level, the more environmental knowledge and awareness the students will have and the more these students will know how to recycle.

However another study carried out in the US in 1998 opposes this finding and my hypothesis by concluding that their study found no significant grade level differences among students on their environmental attitudes and recycling behaviour (Zelenzy, 1998).

Another study which I expect my own research to support was carried out in the US in 1998. This study examined students' environmental attitudes and behaviours and the stability of those attitudes and behaviours after the implementation of a school recycling program. One of the results from this study was that there were significant gender differences in the students, where girls reported significantly stronger environmental attitudes and behaviour than boys on most environmental measures (Zelenzy, 1998). This study is consistent with a research done Aldrich in 2000. This study examined gender differences in environmental attitudes and behaviours in primary and secondary school children. The study found that compared to boys, girls reported significantly stronger pro-environmental and greater participation in pro-environmental behaviours (Aldrich *et al.*, 2000).

A research study done by Clay showed that the relationship between peer recycling and recycling activity are very strong. Furthermore results showed that over 60% of those students recycling who frequently recycle have friends who frequently recycle as well (Clay, 2005). An



article found in the New York Times a couple of years ago stated that the crux of the recycling problem is two-fold: First, there is a fundamental lack of public education concerning exactly what can and what can't be recycled (Mehrfar, 1993). The second problem is that there are not enough recycling receptacles around so people end up throwing their recyclables in the trash bin instead of the recycling bin. Many of the studies done in schools about recycling knowledge, attitudes, and behaviours in students concluded that education is very important in increasing awareness about the importance of recycling with specific emphasis for students to have hands-on experience as this is considered very beneficial.

Environmental attitudes are fundamentally important, widely discussed, frequently measured, and poorly understood (Heberlein, n.d.). Research into recycling has usually taken two basic approaches: personal and situational. Research taking a personal approach attempts to identify who recycles. What are the characteristics of individuals that cause them to recycle? Research taking a situational approach has attempted to identify when people recycle. What conditions facilitate recycling, and what type of interventions can increase recycling? (Schultz, 1995) Schultz further goes and states that research investigating the type of person who recycles is broken down into four classes: environmental attitudes, knowledge about recycling, demographic variables, and personality variables. This study will focus on some aspects within three of these classes, namely environmental attitudes, knowledge about recycling, demographic variables.

## **4. METHODS**

The following methods of data collection were selected in order to fulfill the objectives of the research. First, the objective was to assess whether the recycling facilities were being used properly in the school campuses and this was achieved through observation of several recycling bins within the schools. The other objectives were to find out how much the students know about recycling and how to recycle and to assess some of the factors that may affect recycling behaviour. This information was collected through the use of questionnaires. With all research, there exist limitations and delimitations. Limitations are factors that cannot be controlled by the researcher whereas delimitations are restrictions that the researcher deliberately imposes on the study to narrow the scope. The first limitation of the study was that in some of the schools, the principals were too busy or away during the time I carried out the research so some of the interview questions were done with the school secretary. Another important limitation is the student's degree of honesty when filling out the questionnaire. In this case, some students would answer the questions on the basis of what they think is the right as opposed to what they actually do. A delimitation of the study was that only schools in the Halifax Metro Area were included due to the time barrier for completion of the study, and only students in grades 8 and 11 participated and completed the questionnaires.

### **4.1 Sampling Method**

Before sampling could take place, a sampling frame of all private schools in the metro area had to be obtained as this would indicate what type of sampling method would be appropriate for this research. In total, there are six private schools in the Halifax Metro Area. A random sampling method was used where I put all the school names in a hat and I randomly picked out three.

#### 4.2 Questionnaires for Students

A self-administered questionnaire was distributed to students in grades 8 and 11. A questionnaire was the most appropriate means of collecting the data because it was a good way to amass a lot of data quickly and ensure respondent anonymity. Furthermore, questionnaires are inexpensive and the structured questions make for easy data coding and compilation (Palys, 2003: 153). Both open-ended and structured questions were used in the questionnaire. Since the participants were young, it was important to take this factor into account when formulating the questions as it was my responsibility to present the information in a way that could be easily interpreted and understood (Davis, 2005). Keeping this in mind, I chose to include more structured questions in the questionnaire than open-ended questions to ensure that the students completed the questionnaires and it was not tiresome for them.

#### 4.3 Interview with Principals

Face-to-face interviews were conducted with the school principals, though for one of the schools, the school secretary was interviewed due to unavailability of the principal. The goal of these interviews was to obtain some general information about the school and the curriculum and find out whether the curriculum included any subjects that taught the students about environmental issues and in particular, about recycling and how to recycle. Face-to-face interviews are known to have high rates of participations (80-90%). Also, these interviews can enhance the quality of data gathered and they ensure that the appropriate person completes the interview, any confusion about particular questions is clarified, and encourage verbally stingy respondents to embellish further (Palys, 2003: 159). However, care has to be taken so that the interviewees are not unduly influenced to respond in one way or another.

#### 4.4 Observations

Audits of the bins were conducted in the school hallways as well as the classrooms and any other location where bins were present. The significance of these audits was to find out how well the students were using the recycling facilities in their schools and see if there were inconsistencies between what they said could be recycled and what they were actually recycling.

#### 4.5 Summary of Procedure

1. Designed a questionnaire for the students that included appropriate questions that would answer the research questions and enable me to reach the research objectives.
2. Conducted a pilot study of the questionnaire to receive feedback from the participants on what they thought needed to be changed.
3. Edited the original draft of the questionnaire based on the feedback I received from the pilot test to create a final draft (See Appendix D).
4. Designed interview questions for the school principals (See Appendix E).
5. Designed consent letters for principals and teachers (See Appendix B-C).
6. Used a random sampling method discussed earlier in this section to choose the schools that will be involved in the research. These include:
  - Armbrae Academy
  - Sacred Heart School of Halifax
  - Shambhala School
7. Applied for ethics approval from Dalhousie University (See Appendix A).
8. Began contacting schools from the first week of November 2007.
  - All questionnaires were completed by January 2008.
9. Analysis of the data from the questionnaires was completed in February 2008.
10. All interviews with principals and observations were completed by March 2008.

## **5. DATA PRESENTATION AND ANALYSIS**

### **5.1 DATA PRESENTATION:**

#### **5.1.1. Questionnaires:**

The student questionnaire composed of 15 questions (Appendix E) was distributed to all students in grades 8 and 11 in 3 private schools in the Halifax Metro area. A total of 136 questionnaires were received; 41 filled out by male students and 95 filled out by female students.

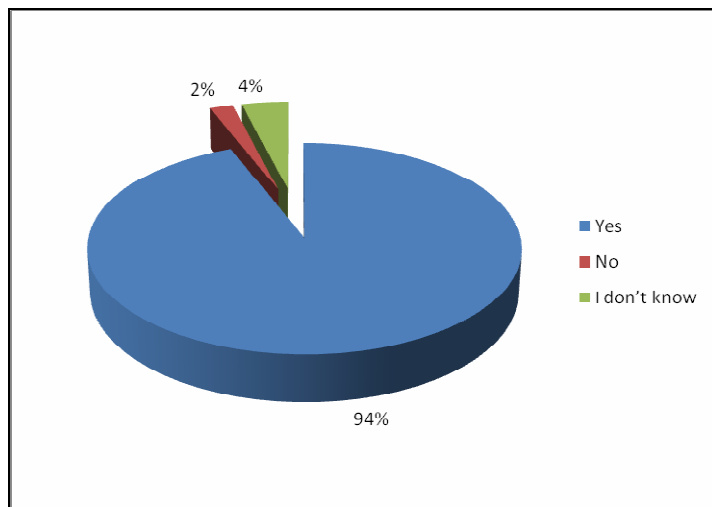
Table 1 summarizes this data including the number of participants from each school (Table 1).

<b>School</b>	<b>Grade</b>	<b>Gender</b>	<b>Age</b>	<b># of Students</b>	<b>Total</b>	<b>Grand Total</b>	
Armbrae Academy	Grade 8	Male Female	11-13	10 12	22	Male N = 41 (30%)	
	Grade 11	Male Female	14-16	7 11	18		
Sacred Heart School	Grade 8	Male Female	11-13	13 31	44		Female N = 95 (70%)
	Grade 11	Male Female	14-16	0 30	30		
Shambhala School	Grade 8	Male Female	11-13	7 8	15		
	Grade 11	Male Female	14-16	4 3	7		

**Table 1:**

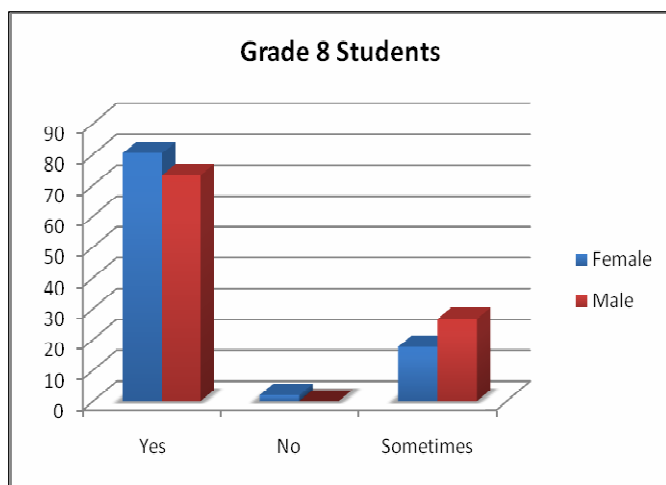
Total number of participants from each school by gender.

Differences in attitude and knowledge on recycling were also analyzed by using independent t-tests to test for significance of the results. Results from the questionnaires demonstrated that most students had been educated about the importance of recycling; with ninety four percent of the students said yes, two percent said no, and four percent said they did not know (Figure 2).

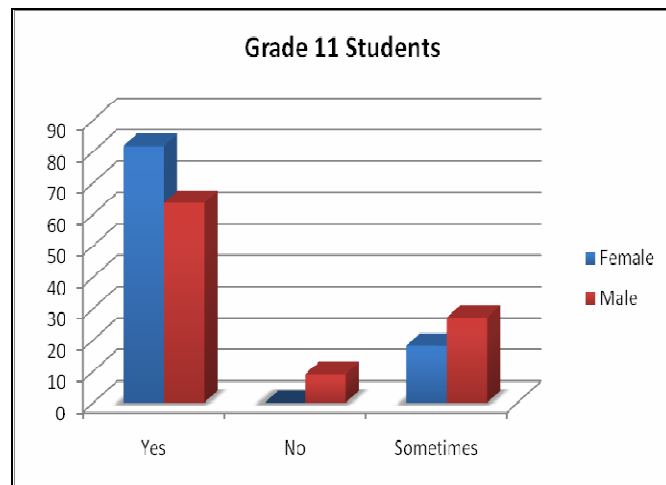


**Figure 2:**  
Students' responses on the question: "Have you been educated about the importance of recycling?"

All students responded that they were aware that their school had recycling bins. However, when asked whether they personally use the recycling bins, results showed that there are more girls than boys in both grades who use the recycling bins (80% and 73% respectively in grade 8 and 82% and 64% respectively in grade 11). Statistical calculations of t-tests showed that these differences are not statistically significant ( $p = 0.35$ ). More males in both grades indicated that they sometimes use the recycling bins than females (Figure 3(a)-(b)).



**(a)**

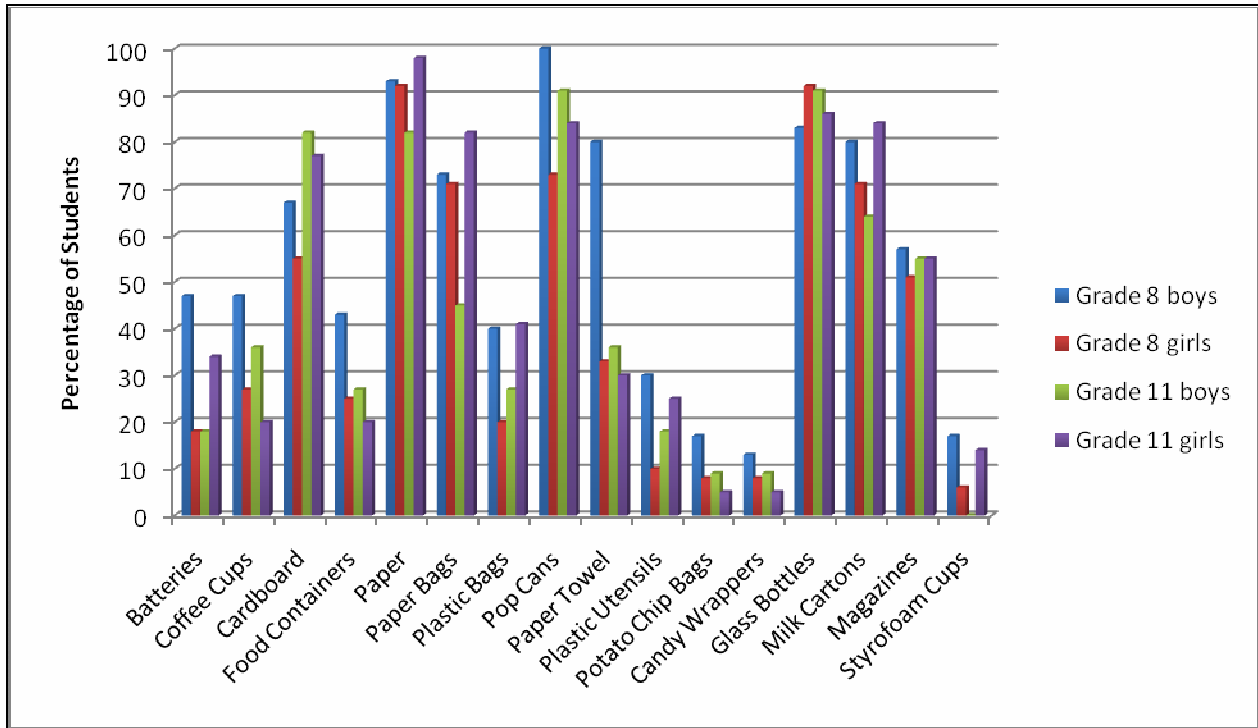


**(b)**

**Figure 3:**

Students' response by grade to the question: "Do you personally use the recycling bins?"

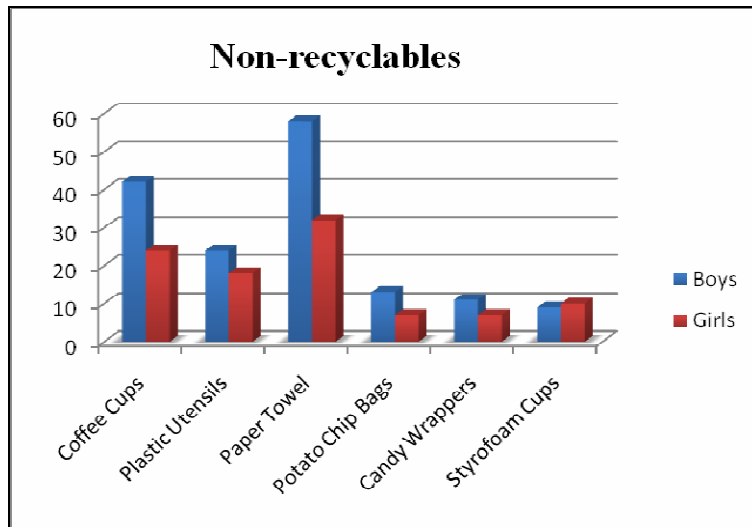
Students were also asked to tick all the items that they know can be recycled. Figures 4 below shows the responses for grade 8 boys and girls and grade 11 boys and girls.



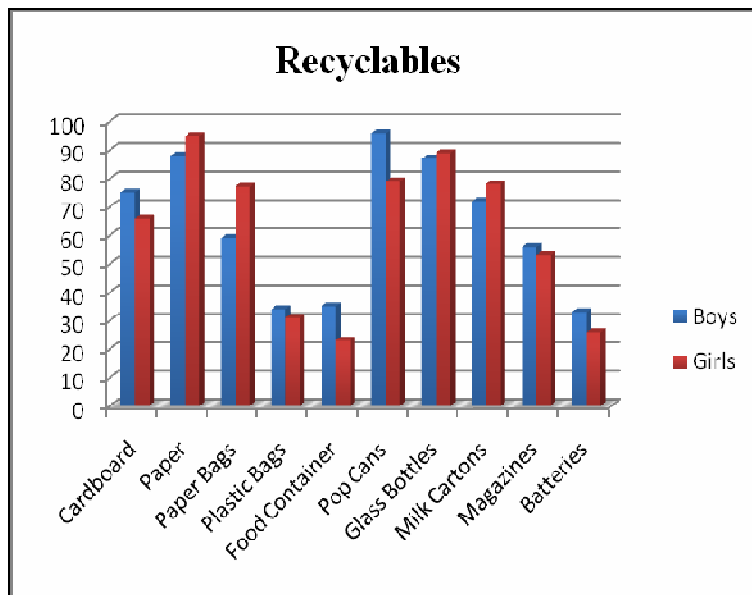
**Figure 4:**

Students' response by grade and gender to the question: "Please tick the item(s) that you know can be recycled."

Figure 5 below summarizes the response of the students who thought that non-recyclables were recyclable. Results show that more boys indicated that non-recyclables were recyclable showing that girls are more aware about what can and cannot be recycled. Figure 6 summarizes the responses of the students who identified correctly what materials can be recycled.



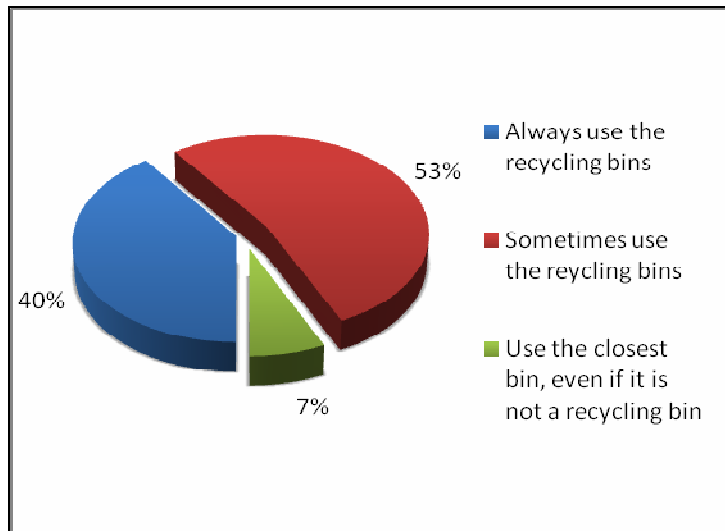
**Figure 5:**  
Percentage of students who indicated that non-recyclable items were recyclable.



**Figure 6:**  
Percentage of students who indicated correctly that recyclable items were recyclable.

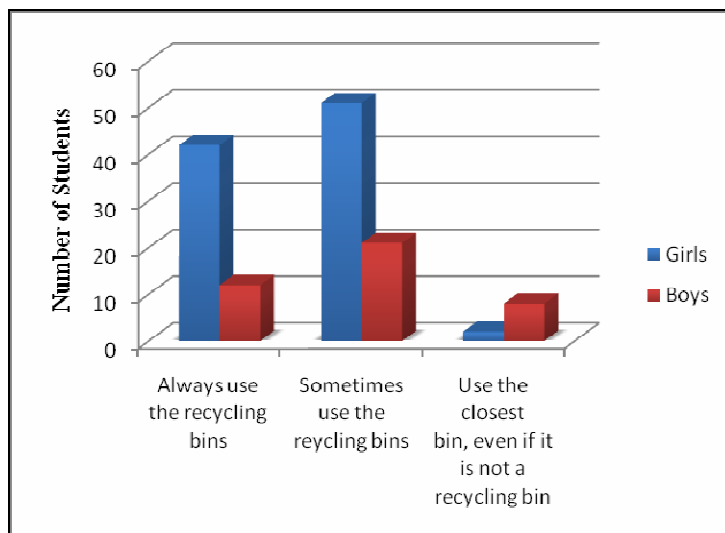
When students were asked to indicate what they do with garbage that can be recycled, 40% stated that they always use the recycling bins, 53% stated that they sometimes use the recycling bins, and 7% said they use the closest bin, even if it is not a recycling bin (Figure 7).





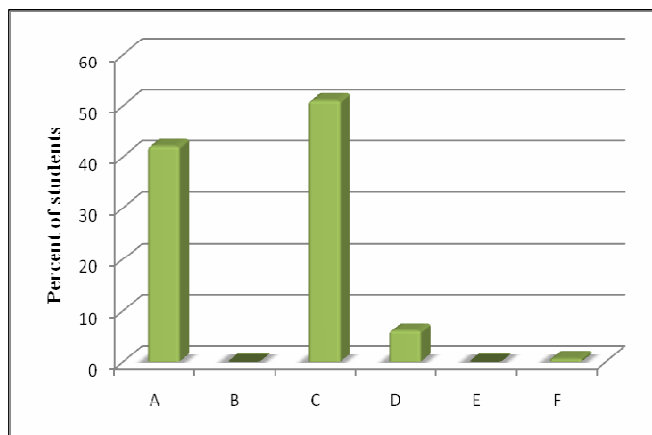
**Figure 7:**  
Students' response to the question regarding their use of recycling bins.

The following table separates the above responses between the two genders. Results show that there is a greater percentage of girls who either always use the recycling bins or sometimes use the recycling bins than boys. Also, there are more boys than girls who use the closest bin to throw their garbage even though it is not a recycling bin (Figure 8).



**Figure 8:**  
Students' response by gender indicating what they do with garbage that can be recycled.

The students responded to several reasons why they did not always use the recycling bins at the school. Among these, a large proportion of the students indicated the reason to be the fact that the recycling bins were too far away and that they did not always know what garbage could be recycled (Figure 9). This shows that there is a possible willingness to recycle however, a lack of knowledge is a possible limiting factor, suggesting that more education and better signage would be helpful.

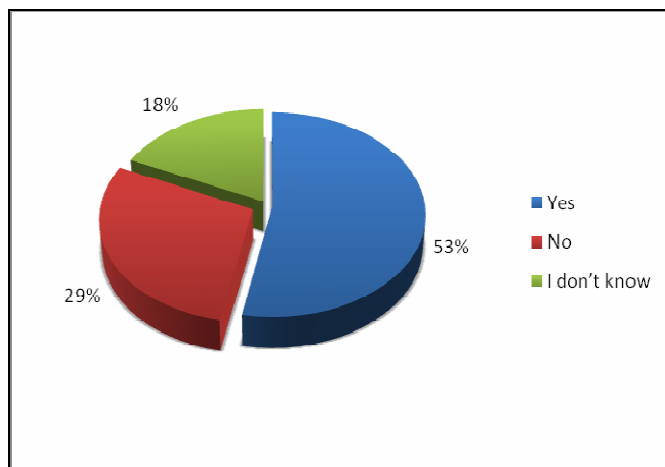


**Legend:**

- A – The recycling bins are too far away
- B – My friends do not recycle so I don't either
- C – I don't always know what garbage can be recycled
- D – I just cannot be bothered to recycle
- E – I do not know why we should be recycling
- F – I have not learnt about why we should recycle or use recycling bins thus it does not bother me.

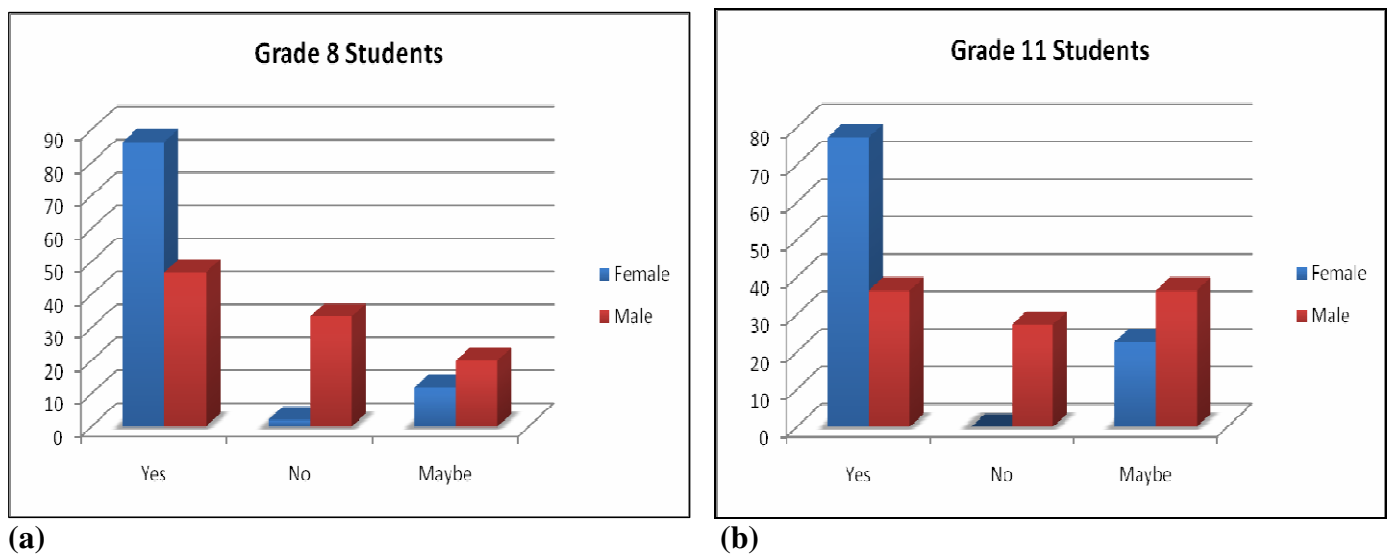
**Figure 9:** Students' response to the question: "What might cause you **not** to use the recycling bins?"

Furthermore, when the students were asked if they thought that the instructions on the recycling bins in their school was clear and easy to understand. 53% of the students responded yes, 29% said no, and 18% indicated that they did not know (Figure 10).



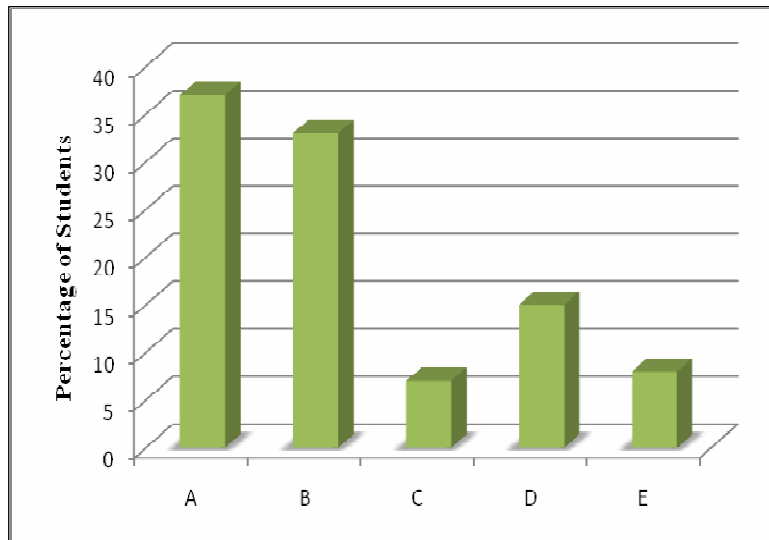
**Figure 10:** Students’ responses to the question: “Do you think the instructions on the recycling bins of what to recycle are clear and easy to understand?”

For those who do not know how to recycle properly, when asked whether they would like to learn, there were more females than males in both grades who indicated they would like to learn. A much larger percentage of males than females responded that they did not want to learn how to recycle. This suggests that females are more willing to learn about environmental issues than males (Figure 11 (a)-(b)).



**Figure 11:** Student response by grade to the question: “If you don’t know how to recycle properly, would you like to learn?”

Many of the students indicated that better instructions of the bins would make them recycle more. More bins around school and more knowledge about recycling would also make them recycle more. There were also a few students (7%) who stated that they will recycle more if their friends also recycled (Figure 12).

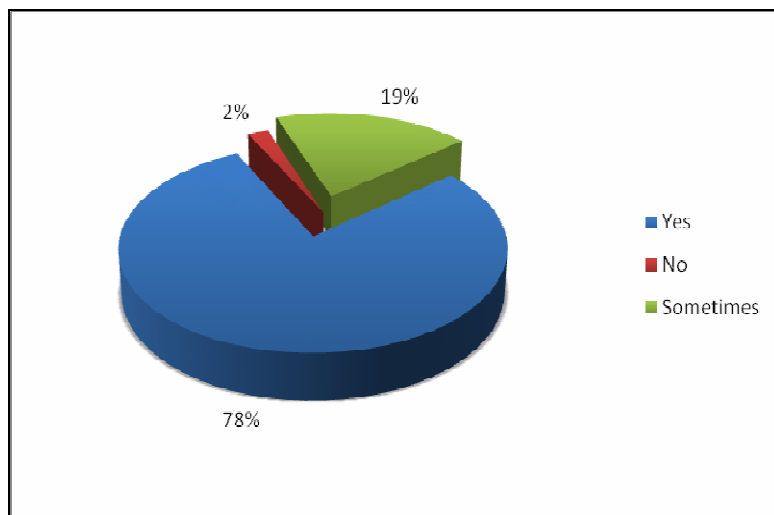


**Legend**

- A – Better instructions on the bins
- B – If there are more bins around school
- C – If more of my friends recycled
- D – If I knew more about how to recycle
- E – Nothing, I don't care about recycling.

**Figure 12:**  
Students' responses to the question: "What would make you recycle more?"

Finally, a great number of students said that they did recycle at home, with 78% stating they do and only 2% stating they do not. A common reason given for recycling at home was that their parents made them to do and that they did not have a choice (Figure 13).



**Figure 13:**  
Students' responses to the question: "Do you recycle at home?"

### **5.1.2.Interviews:**

The main interview questions which were crucial for this study were whether the school curriculum contained any subjects that taught the students about environmental issues. In addition, I wanted to know whether there were specific topics about recycling and how to recycle and what can and cannot be recycled and why should the children participate in recycling. None of the schools had a subject that solely taught the students about environmental issues; however, there were subjects like Global History, Global Geography, Physical Science, and Social Studies that included various topics on what is going on in the world and the effects of human actions on the environment. The school teachers ensure that the students and staff are aware of the recycling facilities by instructing them informally. It is not compulsory for the students to recycle however, according to the principals, many students feel obliged to do so.

In Armbrae School for example, each class has a monitor for the day that makes sure their peers recycle and follow other school operations. A few years ago they had also organised a field trip to the waste management facility in HRM where the students observed the operations and learnt a lot of information about recycling and composting. In Sacred Heart School of Halifax, there is an environmental committee in the school. Also the students have been participating in a high school provincial competition called Enviro-thon every year. They have had on occasion speakers from Sierra Club and the Ecology Action Centre coming in to talk to the students about environmental issues. Furthermore, during school events, the school avoids using Styrofoam cups and instead give students re-usable plastic cups for their refreshments. Also, they give students water in jugs instead of handing out water bottles. In Shambhala School, they have a Board Environmental Committee that ensures use of the recycling facilities by getting students to participate and carry out waste and energy audits in the school.

### **5.1.3.Observations**

#### **Bin Audit:**

All the schools had a garbage bin in each classroom. As for the recycling bins, some schools had a paper recycling bin and a plastic and glass bottles recycling bin in each class and others only had a paper recycling bin (Appendix F). Though the bins were very well labelled, there were still some recyclable materials found in the garbage bins. In areas of the school where there were no recycling bins like the hallways, the garbage bins contained a large amount of recyclable materials. Most of the schools had a central recycling facility mainly in the hallway such as Shambhala School. At this location, there was a large garbage bin, a paper recycling bin, and a recycling bin for plastic and glass bottles. In Armbrae School, there was only a large recycling bin for paper in the hallway. Each classroom however, had a recycling bin for paper and containers, as well as a garbage and compost bin. Overall, the recycling bins showed that the students were recycling reasonably well though there is clearly room for improvement. In Sacred Heart School of Halifax, there was a garbage bin and a recycling bin for bottles and cans in the hallways. Each classroom had a garbage bin and a paper recycling bin.

## **6. ANALYSIS & DISCUSSION**

The objectives of this project were to assess whether the recycling facilities were being utilized in the proper manner and what factors affect the use of these facilities in students. I was looking for any differences in recycling knowledge and attitudes between 8<sup>th</sup> and 11<sup>th</sup> graders, as well as between male and female participants in the same grades. I wanted to further explore how much students know about recycling and how aware they are of what can and cannot be recycled.

Results from the questionnaires shows that students are generally aware of the importance of recycling, many of whom said that they learnt from school or both school and at home. Others also stated that they learnt from other locations such as summer camps, scouts, presentations, and posters. Results also revealed that more girls recycle than boys in both grades 8 and 11. This finding is not consistent with a study done by Clay where the results from his study on recycling behaviour in university students found that male students were more likely to recycle than females both at home and at the university (Clay, 2005). Additionally, on average more boys than girls reported either not using the recycling bins at all or just sometimes using them. Previous work that has been done in this area for example research done by Lynette Zeleny on assessing student's environmental attitudes and behaviours also supports this finding of girls having stronger environmental attitudes than boys. Many theories have been used to explain gender differences in environmentalism. The most widely used theory is based on gender roles and socialization. Females are socialized to be more expressive, compassionate, nurturing, and helpful in care-giving roles, whereas men are more independent and competitive (Aldrich *et al.*, 2000). Therefore, because more females compared to males are socialized to value the need of others, women exhibit more helping behaviours (Aldrich *et al.*, 2000). Furthermore, my findings indicate that boys in grade 8 recycle more than the boys in grade 11 and the same goes for the

girls. This finding indicates that students in the lower grade level generally recycle more than those in the higher grade level.

Those frequently recycling will participate on a regular basis and will have much better diversion rates of waste from landfills. Obviously, the number of people who participate in recycling is crucial to achieving good diversion rates but how well they do so and how effectively they participate is also an important parameter (Thomas, 2001). All the students were generally aware of which basic materials were recyclable. These are the materials that they readily use and recycle on their school campus, such as paper, milk cartons, pop cans, and bottles. These are the categories that returned the highest response rates. Schultz *et al.* (1995) identifies the five most commonly recycled materials as being newspaper, glass, aluminium (cans), plastics and cardboard/paper, in that order (cited in Clay, 2005). Somehow consistent with my research, glass and aluminium cans were among the mostly recycled materials as identified by the students, though paper is recycled more than glass. This difference in the order of recyclable items in the two studies may be due to the fact that many of the young would not readily recycle newspaper and would more likely recycle paper instead. Other recyclables that produced lower response rates were food containers, magazines, and plastic bags. Results indicated that overall there was a greater proportion of boys than girls who indicated that non-recyclables were actually recyclable; the highest responses being coffee cups and paper towels. For the recyclables items, there was an equally high response from both girls and boys for stating correctly the recyclable items.

Once again, there were more girls than boys who indicated that when they have garbage that can be recycled, they either always recycle or sometimes use the recycling bins. A much greater proportion of boys indicated that they simply use the closest receptacle even though it may not be a recycling bin. There were a greater proportion of both girls and boys who stated



that they sometimes use the recycling bins than those who responded that they always use the bins. The two main reasons indicated by the students for the non-utilization of the recycling bins are that the bins were too far away and also they did not always know what garbage can and cannot be recycled. Research has shown that increasing the ease of recycling is one of the most effective methods of increasing participation (Chung, 1996 cited in Clay, 2005). So reducing these barriers to recycling in the schools should be a priority if we hope to see more students recycling. Interestingly, although many students said that the recycling bins had clear and understandable instructions on them, a large percentage of the students still responded that better instructions on the bins will make them recycle more as well as having more bins around the school. More girls than boys in both grades responded that they would like to learn more about recycling. Less than 5% of the girls said they would not like to learn whereas about 25% of the boys said the same. Girls seem to present greater pro-environmental attitudes than boys in both grades and students in the lower grade level present greater pro-environmental attitudes than those in the higher level. Previous research done by Arcury (cited in Zelenzy) reported that age and pro-environmental attitude were inversely related. This research however was done on adults only and not children. Nonetheless, consistent with this research, my study found that younger students (those in grades 8) seem to present more concern for the environment than the older students (those in grades 11).

Most of the recycling facilities in the schools are very simple and straight forward such that they have a bin for paper, plastic and glass bottles, and garbage. The lack of complexity is important as it may lead to an increase in recycling participation. The fact that the students are encouraged to recycle a small number of recyclables can be very beneficial. A study by the European Recovery and Recycling Association (ERRA) into recycling scheme effectiveness found that by targeting smaller numbers of significant recyclables diversion rates were increased

and costs were substantially reduced (Thomas cited in Clay, 2005). Hornik and Cherian (1995) stress the importance of educating students on the importance and availability of recycling, and how to recycle effectively. This could mean that those students who said that they sometimes recycle will start recycling more frequently due to the availability of more information, and could also encourage those who don't recycle at all to begin recycling. As we are dealing with young students, this recycling information needs to be clear and concise.

## **7. CONCLUSION & RECOMMENDATIONS**

Although a lot of effort has been made to divert solid waste from landfills in HRM, much work still remains to be done. While the introduction of bins as part of the recycling programs in schools is a step forward, it will not be effective if we do not change the attitudes and behaviours of the students and raise their awareness towards the importance of recycling waste. This study has provided some reasons for the lack of full recycling participation on the students' part and it is hoped that these results will provide some insight into the improvement of current recycling programs in schools.

It is clear that recycling attitudes and behaviours are affected by various factors and in order to increase recycling participation amongst the students, these factors need to be overcome. Generally, the students demonstrate concern for the environment and are aware about the importance of recycling; however, there is need to apply the knowledge of waste recycling into effective and affirmative action. The most productive way of increasing recycling participation would be to stress the environmental benefits of recycling. Students need to know why they should be recycling, why is it crucial for them to partake in this certain activity. We are all aware that telling children not to do something without giving them a reason why they should not be doing it might not change their attitudes and behaviour because children would not know the

consequences of their actions. In order for children to learn and stop doing what were told not to do, there is a need to educate them on reasons why it is not good for them to do those actions. The situation is similar for the recycling of waste in schools. Just telling the students to recycle or just placing recycling bins in schools without providing them with simple information on the use of the bins, the importance of recycling, and the benefits it brings to the environment and to themselves will not encourage them to recycle. This information can be easily communicated through cartoons, comics, posters and flyers around the school as well as through leisure or competitive games. I felt that not all the schools had proper signage on the recycling bins. For example, the recycling bins in the classroom had no signage on them, but the bins either had a different color or were a different size. Most schools also had posters on their boards about waste reduction and benefits of recycling, but none explained to the students what materials were recyclable. See appendix F for the different recycling facilities available in the schools (Appendix F).

A large proportion of the students indicated that there is a lack of proper signage on the recycling bins and this is something that needs to be improved. It is important to have clear and concise instructions on the recycling bins in order to increase recycling participation. Furthermore, I would recommend that each location that has a garbage bin should also have a recycling bin. Many students stated that the recycling bins were too far away resulting to a few using the closest bin even though it wasn't a recycling bin to throw away their garbage. If the students can take time to walk to the garbage bin and throw away their garbage (even if it is recyclable), placing a recycling bin next to a garbage bin increases the chance that they will use the recycling bin. The reality is that we want things to be as easy as possible.

Furthermore, social influences can greatly affect recycling. In this regard, schools could select volunteers to actively promote recycling behaviour amongst their peers. Studies have

shown that hands-on experience can greatly improve and increase knowledge. In order for the students to effectively learn and continue to apply this knowledge, the lessons provided should be as fun and exciting as possible to maintain students' interest. For example, schools could have an environment day with a focus or theme on recycling, where they may have various activities that teach and raise awareness to the students about environmental issues and recycling. Schools could also organise games on recycling where students are given several materials that are recyclable and non-recyclable and students could compete in separating the materials. Such fun and games could include presents and awards as an incentive to induce students to recycle. These activities are engaging, fun, and could increase students' knowledge on what materials are recyclable. To greatly achieve positive reaction from the students through increased recycling, staff members and other school employees need to get involved to encourage the students to recycle and applaud them when they do it right and correct them when they make mistakes.

Recycling attitudes and behaviours are a multifaceted combination of several factors and recycling programs must attempt to take all these factors into account. It must be understood that education is a crucial element in the attempt to increasing recycling participation and educators must educate the students and promote collaborative efforts with students to achieve a more sustainable environment now and in the future.

**APPENDICES**  
**Appendix A**

*Ethics Form:*

Revised January 1, 2005

**ENVIRONMENTAL PROGRAMMES  
FACULTY OF SCIENCE  
DALHOUSIE UNIVERSITY**

**APPLICATION FOR ETHICS REVIEW OF RESEARCH INVOLVING HUMAN PARTICIPANTS  
UNDERGRADUATE THESES AND IN NON-THESIS COURSE PROJECTS**

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**GENERAL INFORMATION**

1. **Title of Project:**  
*Analyzing the Effectiveness of Recycling Programs in Junior High and High Schools in the Halifax Metro Area.*
  2. **Faculty Supervisor(s)**  
*Raymond Côté*
  3. **Student Investigator(s)**  
*Karen Mbema*
  4. **Level of Project:**  
Non-thesis Course Project [] Undergraduate [  ] Graduate Specify course and number: ENVS 4901/49
  5.
    - a. **Indicate the anticipated commencement date for this project:** November 2008.
    - b. **Indicate the anticipated completion date for this project:** April 14, 2008.
- |   |                      |                                |
|---|----------------------|--------------------------------|
| <b>Department</b>                                   | <b>Ext:</b>          | <b>e-mail:</b>                 |
| <i>School of Resource and Environmental Studies</i> |                      | <i>rcote@dal.ca</i>            |
| <b>Department</b>                                   | <b>e-mail:</b>       | <b>Local Telephone Number:</b> |
| <i>Environmental Programmes</i>                     | <i>kmrema@dal.ca</i> | <i>(902) 466-6692</i>          |

## SUMMARY OF PROPOSED RESEARCH

### 1. Purpose and Rationale for Proposed Research

Briefly describe the purpose (objectives) and rationale of the proposed project and include any hypothesis(es)/research questions to be investigated.

The research questions in this project are how effective are recycling programs in junior high and high schools in the Halifax Metro Area? And what factors affect recycling behaviour and attitudes amongst children. The objectives are to assess whether the recycling bins are being utilised in the proper manner by the students. Also determine how much knowledge children possess about recycling and whether factors such as age, gender or school type affect recycling behaviour and attitudes.

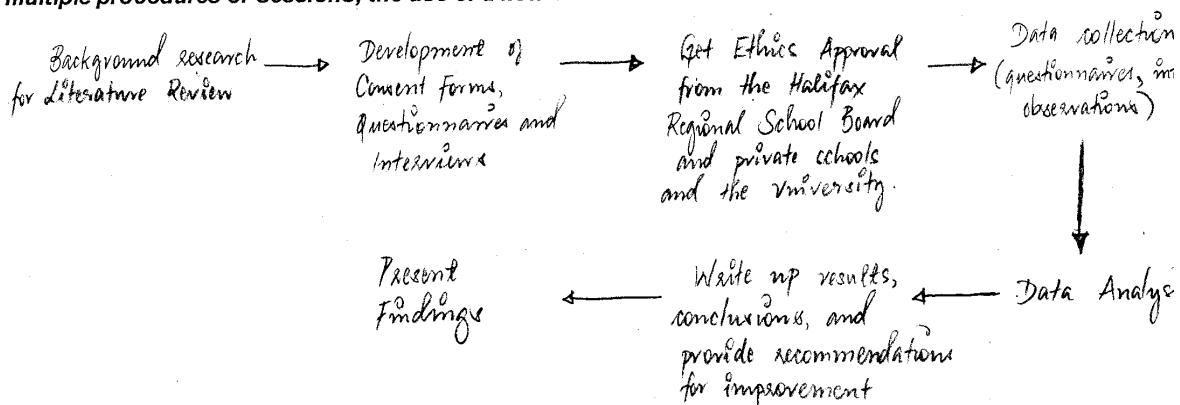
The rationale of this project is to increase efficiency of recycling programs and to educate the students on how to recycle properly so as to reduce the amount of waste going into landfills and create a cleaner environment.

### 2. Methodology/Procedures

#### a. Which of the following procedures will be used? Provide a copy of all materials to be used in this study.

- Survey(s) or questionnaire(s) (mail-back)
- Survey(s) or questionnaire(s) (in person)
- Computer-administered task(s) or survey(s)
- Interview(s) (in person)
- Interview(s) (by telephone)
- Focus group(s)
- Audio taping
- Videotaping
- Analysis of secondary data (no involvement with human participants)
- Unobtrusive observations
- Other, specify \_\_\_\_\_

#### b. Provide a brief, sequential description of the procedures to be used in this study. For studies involving multiple procedures or sessions, the use of a flow chart is recommended.



### 3. Participants Involved in the Study

#### a. Indicate who will be recruited as potential participants in this study.

- Dalhousie Participants:  Undergraduate students  
 Graduate students  
 Faculty and/or staff
- Non-Dal Participants:  Children  
 Adolescents  
 Adults  
 Seniors  
 Persons in Institutional Settings (e.g. Nursing Homes, Correctional Facilities)
- Other (specify) \_\_\_\_\_

#### b. Describe the potential participants in this study including group affiliation, gender, age range and any other special characteristics. If only one gender is to be recruited, provide a justification for this.

- Junior High and High School students in grades 8 and 11 both male and female will be asked to complete the questionnaires.
- A short interview will be conducted with school principals.

#### c. How many participants are expected to be involved in this study? ~ 500

### 4. Recruitment Process and Study Location

#### a. From what source(s) will the potential participants be recruited?

- Dalhousie University undergraduate and/or graduate classes  
 Other Dalhousie sources (specify) \_\_\_\_\_  
 Local School Boards  
 Halifax Community  
 Agencies  
 Businesses, Industries, Professions  
 Health care settings, nursing homes, correctional facilities, etc.  
 Other, specify (e.g. mailing lists) \_\_\_\_\_

#### b. Identify who will recruit potential participants and describe the recruitment process.

Provide a copy of any materials to be used for recruitment (e.g. posters(s), flyers, advertisement(s), letter(s), telephone and other verbal scripts).

*I, the only investigator will administer the questionnaires to the students. Student's parents will be asked to sign consent forms for their child to participate. Students will be briefly explained about the project and questionnaire before it is administered for them to complete in the presence of me and their class teacher.*

## 5. Compensation of Participants

Will participants receive compensation (financial or otherwise) for participation? Yes [ ] No [✓]  
If Yes, provide details:

## 6. Feedback to Participants

**Briefly describe the plans for provision of feedback and attach a copy of the feedback letter to be used.** Wherever possible, written feedback should be provided to study participants including a statement of appreciation, details about the purpose and predictions of the study, contact information for the researchers, and the ethics review and clearance statement.

Note: When available, a copy of an executive summary of the study outcomes also should be provided to participants.

N/A

*All included in the information letters.*



## POTENTIAL BENEFITS FROM THE STUDY

1. Identify and describe any known or anticipated direct benefits to the participants from their involvement in the project.

*Students will be more aware of how to recycle properly and the benefits from doing so, such as providing a healthier environment.*

2. Identify and describe any known or anticipated benefits to society from this study.

*Students may incorporate lessons learned at school to their every-day life at home and may encourage others to recycle as well. Schools may also incorporate environmental education on recycling into their curriculum to further promote awareness.*

## POTENTIAL RISKS TO PARTICIPANTS FROM THE STUDY

1. For each procedure used in this study, provide a description of any known or anticipated risks/stressors to the participants. Consider physiological, psychological, emotional, social, economic, legal, etc. risks/stressors

No known or anticipated risks

Explain why no risks are anticipated: *Completion of questionnaires is voluntary and responses are kept confidential. No names of students are used.*

Minimal risk

Description of risks:

Greater than minimal risk

Description of risks:

2. Describe the procedures or safeguards in place to protect the physical and psychological health of the participants in light of the risks/stresses identified in Question 1.

*N/A*

## INFORMED CONSENT PROCESS

Refer to: <http://pre.ethics.gc.ca/english/policystatement/section2.cfm>

**1. What process will be used to inform the potential participants about the study details and to obtain their consent for participation?**

- Information letter with written consent form; provide a copy
- Information letter with verbal consent; provide a copy
- Information/cover letter; provide a copy
- Other (specify) Verbal Agreement. However consent forms will be sent to parents, principals and teachers for their approval.

**2. If written consent cannot be obtained from the potential participants, provide a justification.**

*Information with written consent forms will be sent to the parents of the participants. Due to the fact that the participants are young, it is best to give a brief verbal description of project and request their permission verbally for a more effective communication.*

### ANONYMITY OF PARTICIPANTS AND CONFIDENTIALITY OF DATA

**1. Explain the procedures to be used to ensure anonymity of participants and confidentiality of data both during the research and in the release of the findings.**

*No names will be collected from the questionnaire. All findings will be kept in a portfolio at all times. The project findings will be presented anonymously.*

**2. Describe the procedures for securing written records, questionnaires, video/audio tapes and electronic data, etc.**

*All data will be safely kept by me alone and only I will view them for my data analysis. Data transferred to an electronic source will be kept on a personal computer and account. All data collected will be shredded upon completion of the project.*

**3. Indicate how long the data will be securely stored, the storage location, and the method to be used for final disposition of the data.**

- Paper Records
  - Confidential shredding after \_\_\_\_\_ years
  - Data will be retained indefinitely in a secure location
  - Data will be retained until completion of specific course.

- Audio/Video Recordings
  - Erasing of audio/video tapes after \_\_\_\_\_ years
  - Data will be retained indefinitely in a secure location
  - Data will be retained until completion of specific course.

- Electronic Data
  - Erasing of electronic data after \_\_\_\_\_ years
  - Data will be retained indefinitely in a secure location
  - Data will be retained until completion of specific course.

- Other \_\_\_\_\_  
(Provide details on type, retention period and final disposition, if applicable)

Specify storage location: ENVS 4901/4902 Portfolio/personal computer.



## **Appendix B**

### *Principal consent letter:*

Dear Principal,

My name is Karen Mrema and currently a fourth year undergraduate student at Dalhousie University. I am currently conducting a research for my undergraduate honours thesis this year under the supervision of Professor Raymond Cote from the School of Resource and Environmental Studies at Dalhousie University. My thesis will be analyzing the effectiveness of recycling programs in Junior High and High Schools in the Halifax Metro Area, as well as assessing factors that may affect recycling behaviour and attitudes in children today. The goal of this project is to improve the efficiency of recycling programs in schools and increase awareness of effective means of recycling in children. I anticipate that the results will increase my understanding of how effective recycling programs are in schools. I also expect that this research will also equip all of us with the knowledge how much children today know about recycling.

I am, therefore, writing this letter to request your support and permission to carry out my research at your school. With your permission, I would like to give out questionnaires to students in grades 8 and 11 which should take approximately 15 minutes. All responses will be kept highly confidential in a safe location and all questionnaire forms will be shredded upon completion of my project. I also hope that I will be able to take a few minutes of your time to ask you some general questions. I also wish to let you know that this study has received ethics approval from the Department of Environmental Programmes at Dalhousie University.

I thank you in advance for your time and I hope you will give me permission to carry out my research at your school. If you have any further questions at any time please do not hesitate to contact me or Professor Cote at:

Email: [kmrema@dal.ca](mailto:kmrema@dal.ca) or Raymond Cote: [rcote@dal.ca](mailto:rcote@dal.ca)  
Tel: (902) 446-6692 Tel: (902) 494-1358

Please sign the attached consent to confirm your approval and return to me as soon as possible.

Sincerely,

Karen Mrema

---

### **Informed Consent**

School Name: \_\_\_\_\_

I have carefully read the above information and I agree/do not agree (circle the option that applies) for this school and the students to take part in the study.

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

**Appendix C**

*Teacher Consent Letter:*

Dear Teacher,

My name is Karen Mrema and currently a fourth year undergraduate student at Dalhousie University. I am currently conducting a research for my undergraduate honours thesis this year under the supervision of Professor Raymond Cote from the School of Resource and Environmental Studies at Dalhousie University. My thesis will be analyzing the effectiveness of recycling programs in Junior High and High Schools in the Halifax Metro Area, as well as assessing factors that may affect recycling behaviour and attitudes in children today. The goal of this project is to improve the efficiency of recycling programs in schools and increase awareness of effective means of recycling in children.

I am, therefore, writing this letter to request your permission to use approximately 15 minutes at the end of your class to give your students questionnaires to fill out under your supervision, provided it is convenient for both you and the students. I have already received signed consent forms from the principal.

I also wish to let you know that this study has received ethics approval from the Department of Environmental Programmes at Dalhousie University.

I thank you in advance for your time and I hope you will be able to spare a few minutes of your class time to assist me in my research. If you have any further questions at any time please do not hesitate to contact me or Professor Cote at:

Email: [kmrema@dal.ca](mailto:kmrema@dal.ca) or Raymond Cote: [rcote@dal.ca](mailto:rcote@dal.ca)  
Tel: (902) 446-6692 Tel: (902) 494-1358

Please sign the attached consent to confirm your approval and return to me as soon as possible.

Sincerely,

Karen Mrema

-----  
**Informed Consent**

Name: \_\_\_\_\_ Class: \_\_\_\_\_

I have carefully read the above information and I fully agree to assist in this research study.

\_\_\_\_\_  
Signed

\_\_\_\_\_  
Date

**Appendix D**

*Student Questionnaire:*

Name of School: \_\_\_\_\_

Grade: \_\_\_\_\_

**Please answer the following questions as honestly and accurately as possible.**

1.) What is your age?

\_\_\_ 7 or younger

\_\_\_ 8-10

\_\_\_ 11-13

\_\_\_ 14-16

\_\_\_ 17 or older

2.) What is your gender?

\_\_\_ Male      \_\_\_ Female

3a) Have you been educated about the importance of recycling?

\_\_\_ Yes                      \_\_\_ No                      \_\_\_ I don't know

b.) **If yes**, where did you learn about the importance of recycling?

\_\_\_ Home                      \_\_\_ School                      \_\_\_ Elsewhere, please state where \_\_\_\_\_

c.) **If no/I don't know**, would you like to know about recycling? If so, why?

\_\_\_ Yes, because \_\_\_\_\_

\_\_\_ No

4.) Do you know if your school has any recycling bins?

\_\_\_ Yes                      \_\_\_ No                      \_\_\_ I don't know

5.) If the school has recycling bins, do you personally use them?

\_\_\_ Yes                      \_\_\_ No                      \_\_\_ Sometimes

**a.) If no, say why not** \_\_\_\_\_

6.) How well would you say you know or understand why the school uses recycling bins on a scale of 0 to 5? (**0 - very well to 5 - very poor**) (Please circle).

0      1      2      3      4      5

7.) Please tick the item(s) that you **know** can be recycled.

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Batteries       | <input type="checkbox"/> Plastic bags     | <input type="checkbox"/> Glass bottles  |
| <input type="checkbox"/> Coffee cups     | <input type="checkbox"/> Pop cans         | <input type="checkbox"/> Milk cartons   |
| <input type="checkbox"/> Cardboard       | <input type="checkbox"/> Paper towels     | <input type="checkbox"/> Magazines      |
| <input type="checkbox"/> Food containers | <input type="checkbox"/> Plastic utensils | <input type="checkbox"/> Styrofoam cups |
| <input type="checkbox"/> Paper           | <input type="checkbox"/> Potato chip bags |   |
| <input type="checkbox"/> Paper bags      | <input type="checkbox"/> Candy wrappers   |   |

8.) If you have garbage that can be recycled, you:

- always use the recycling bins  
 sometimes use the recycling bins  
 use the closest bin, even if it is not a recycling bin.

9.) What might cause you **not** to use the recycling bins? (You can tick more than one answer, if it applies).

- the recycling bins are too far away  
 my friends do not recycle so I don't either  
 I don't always know what garbage can be recycled  
 I just cannot be bothered to recycle  
 I do not know why we should be recycling  
 I have not learnt about why we should recycle or use recycling bins thus it doesn't bother me.

10.) If you don't know how to recycle properly, would you like to learn?

- Yes       No       Maybe

11.) Do you think the number of recycling bins in your school

- should be increased so more people can recycle?  
 is enough and should stay the same?  
 should be reduced? Please explain why

---

12. Do you think the locations of the recycling bins are

- good enough and should stay where they are?  
 poor and should be moved? Please state to where \_\_\_\_\_

13.) Do you think the instructions on the recycling bins of what to recycle are clear and easy to understand?

- Yes       No       I don't know

14.) What would make you recycle more? (Check all that apply)

- better instructions on the bins
- if there are more bins around school
- if more of my friends recycled
- if I knew more about how to recycle
- nothing, I don't care about recycling

15a.) Do you recycle at home?

- Yes                       No                       Sometimes

**b.) If yes, why? (Tick all that apply)**

- Because I do so in school
- My parents taught me how to recycle
- I have to recycle at home, I have no choice.
- Other, please state \_\_\_\_\_



## **Appendix E**

### *Interview Questions*

- 1.) Roughly how large/big is this school?
- 2a.) How many students are there in total?
  - b.) How many girls? How many boys?
3. Does the school curriculum include any subjects that teach the children about environmental issues? What are these subjects, if any?
- 4a.) Does the school curriculum include lesson(s) about recycling, including why is it important, if it is, how to recycle and what can and cannot be recycled and why should the children participate in recycling?
  - b.) Which specific subject teaches them about recycling, if one exists?
  - c.) If not, how does the school ensure that the children are knowledgeable about recycling and participate in it?
  - d.) If no such subject or programme exists, does the school intend to introduce education on environmental issues including recycling in its curriculum in the near future?
  - e.) Can copy (ies) of such curriculum be shared with me to review and comment for my Project?
- 5.) Does the school have a policy on increasing children's awareness about the environment through education? What does that policy, if one exists, state? Can it be shared?
- 6a.) If recycling facilities or bins exist in the school, it is compulsory or not for the children and school society to use them?
  - b.) If so, what happens when they are not used in the proper manner? Are there any educative or other punishments or reprimand given to the children for not using recycling bins or any such facility?

**Appendix F**

**Armbrae Academy**



Bins available in the classrooms at Armbrae Academy.

**Sacred Heart School of Halifax**



Bins available in the classrooms at Sacred Heart School of Halifax.

**Shambhala School**



Bins available in the classrooms at Shambhala School.

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