



Food waste education in European and North American public institutions

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1.0 SUMMARY

While food waste is one of the biggest global issues, some countries do not provide any environmental education for their students. As a result, younger generations are unaware of food waste and methods that are used to decrease the percentage of waste. Only 35% of students from North American countries (Canada, the United States) and Europe (Italy, Germany, Spain, Ukraine) have an environmental class offered in their school. Having a correct and planned education is one of the keys to stopping global warming and other environmentally related issues as food waste is one of their biggest causes.

2.0 INTRODUCTION

While food waste is one of the biggest global issues, some countries do not provide any environmental education for students. As a result, younger generations are unaware of food waste and methods used to decrease the percentage of waste. Since January 1, 2024: 37,034,300 tons of food was wasted, resulting in 1,222,070,334 tons of CO₂ being released into the atmosphere (as of January 11, 2024). The total amount of food waste increases each year by 49%. In 2022 the world wasted 1.3 billion tons which is 40% more than in 2021 (931 million tons). In 2023 over 2.5 billion tons of food were wasted, which is equivalent to the total amount of food wasted in both 2021 and 2022. If the percentage of food waste increases each year by 40%, over 7 billion tons of food will be wasted in 2030, resulting in 232,344,000,000 tons of CO₂ being released into the atmosphere that same year.

Today, schools main environmental focus is educating students about climate change and global warming, while food waste is one of the biggest causes of these environmental issues. Educating younger generations about food waste will help them develop environmentally friendly habits and knowledge of being aware of nature. Only 35% of students grades 8 to 12 have had an educational class about food waste while having an average 4 to 15 classes in the school year.

3.0 PURPOSE

Research what level of education different countries provide for their students in the environmental field. Analyze students' knowledge about food waste and their ability to correctly identify methods of reducing food waste in households.

4.0 RESULTS

4.1 Europe (Italy, Germany, Spain, Ukraine)

To collect information about European education, students from Italy, Germany, Spain and Ukraine were asked to fill out the questions. The results of the survey illustrate that 83.3% of the students from above included countries have a strong knowledge about food waste, they were able to identify the issue and include different method to reduce waste in their households. Students did not have a problem with writing a definition of food waste while having no education about it in public institutions. An average number of courses students in Europe take

per school year is 8 to 9. However, no environmental classes are offered to students in grades 8-12; according to results of the survey 0% of students from Italy, Germany, Spain and Ukraine have environmental class in their school. At the same time, students have had a one time class about plastic, air and water pollution, as well as 14% of students have had a class about ocean acidification and 40% of students have been offered a class about deforestation (these classes include: a one time class about the environmental issue, a unit about environmental issue in another class).

4.2 North America (Canada, United States)

Students from Canada and the United States were asked to answer questions about food waste to collect information about North America education. The results were opposite to results in European countries, as 100% of students' schools offer environmental classes and/or courses. Students from Canada and the United States were able to easily identify food waste. Even though countries of North America produce 20% more food waste than other countries, they provide environmental education to their students resulting in younger generations being knowledgeable and responsible about reducing food waste at a young age.

According to *Arizona State University* (Food Waste Reduction Efforts and Strategies at Schools: A Literature Review) one of the ways to reduce food waste in the world is to provide correct and planned education to students.

4.3 Comparison of Europe and North America

The average amount of food waste in countries of North America is 50 million tons compared to European countries with an average of 11 million tons; resulting in European countries wasting 78% of North American countries' waste.

Research showed that 35% of all students have environmental classes in their schools when the average number of classes one student has per school year is 4-15 refer to (figure 3). From the results provided through the survey, countries of North America are countries with the best environmental education in public institutions. Students from Canada and the United States were able to identify what food waste is and efficient methods that can be used to reduce the amount of waste in households. Even though Europe does not provide any public classes about the environment, 83.3% of students have heard about food waste and can define the issue correctly.

The general results show that 78.6% of all students in grades 8-12 have heard about the "food waste" issue, and ± 67% of these students know how to reduce food waste in their household (figure 2)(figure 4). 85% of all students had an educational class about global warming and climate change throughout their secondary education. Also, classes about water and plastic pollution were offered to 71% of students. Other environmental topics that students had a strong knowledge about included: deforestation 50%, air pollution 50%, ocean acidification and sea rise level 28.6%.

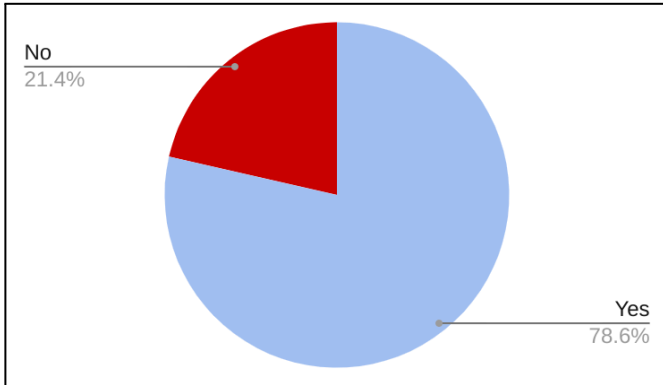


Figure 2
The percentage of students knowing what food waste is.
“Can you define what food waste is?”

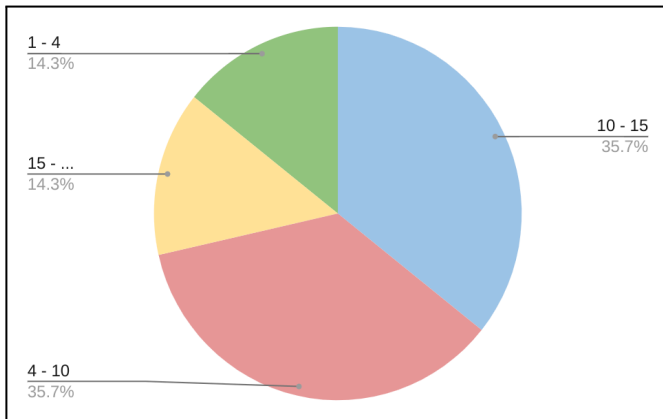


Figure 3
Number of classes students have in one school year.
“How many classes do you have in one school year?”

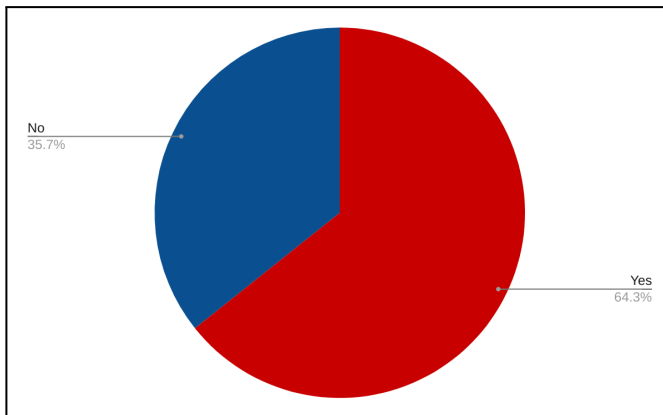


Figure 4
Students knowledge about reducing food waste
“Do you know how to reduce food waste?”

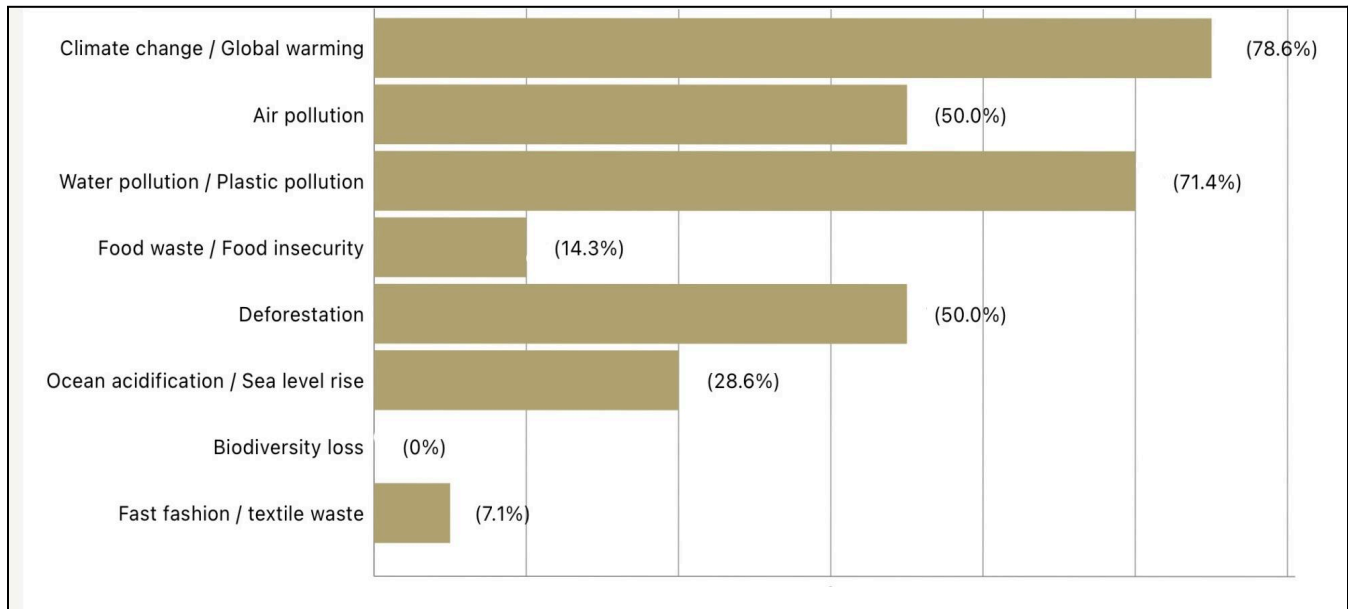


Figure 5
Topics/units students had class about

5.0 METHODS

5.1 Survey

A survey was used to collect all required information for the research. The survey included 7 multiple choice questions and 3 short answer questions. Multiple choice questions were used to analyze the background of students, they were focused on collecting information about environmental classes that public institutions provide for grade 8-12. Short answer questions asked to define food waste and methods that can be used to reduce food waste in households. Survey did not ask for any personal information (sharing names was an option in the survey).

5.2 Data Statistics and Analysis

All information was collected and processed before being used in the paper. Information was divided into two categories: Europe and North America and then calculated together.

6.0 Conclusion

Education in European countries (Italy, Germany, Spain, Ukraine) mainly focuses on global warming and global change, while other environmental issues are not taught in institutions. Having one class about a specific issue (food waste) will not provide students with enough knowledge of how to help the environment. Each year food waste increases by 40% in the world while students are not offered any environmental science classes and/or courses. On the other hand, 100% of students in the United States and Canada have environmental science in their school. The research shows that students from North American countries have more knowledge about food waste as they can identify more methods to prevent food waste in their households, while most students from countries in Europe were able to only identify food waste. Having

correct environmental education will help younger generations be aware of problems that surround them, making it easier to decrease the percentage of food waste.

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