

Ecological Awareness among 3rd Grade Students of Primary School

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Abstract

Presented research aimed to determine the extent to which third-grade students in two Slovene regions have ecological awareness. Ecological awareness is a competence that empowers individuals with knowledge of the environment, the relationship between humans and nature, and the ability to recognise and solve environmental problems. The research focuses on whom the students think is the biggest polluter, whether they talk about this issue at school, how they take care of a clean environment at school and home, and what kind of packaging they use for transporting food from the store. The study involved 200 students from all elementary schools in the region. A descriptive and non-experimental empirical method of pedagogical research was used in the study. Results showed that students are good at identifying the biggest polluters. They are most aware of the concern for a clean environment and behave environmentally consciously. They collect garbage separately, save a lot of electricity and water, and often learn about this topic at school.

Keywords

Ecology, Ecological Awareness, Preservation, Environment

1. Introduction

Ecological awareness is a competency that equips individuals with knowledge about the environment, the relationship between humans and nature, and the ability to recognise and solve environmental problems. In researching people's ecological awareness, researchers try to get a global picture of the situation, focusing mainly on the sources of pollution, waste management, and current ecological awareness and competence (Tarman, 1994). Thus, pollution is a con-

temporary problem due to human behaviour and lifestyle. People are endangering the ecological system, and therefore ourselves, through intensive agriculture, excessive use of personal transportation, industrial facilities, and improper use of nature's resources (Costa-Pau, 1995). Another significant environmental problem arises from the enormous amounts of waste people produce through their actions, improper use, and waste separation. Precisely because of improper waste separation, certain amounts of waste cannot be recycled, resulting in the accumulation of waste in illegal landfills (Asimov, 1996; Scott, 1997). Some wastes can be recycled in simple ways, such as organic wastes that can be recycled using the composting process. However, this is only the case for some other types of waste. Recently, there have been major problems with the recycling of product packaging, the use of which is steadily increasing (Seymour & Girardet, 1991). One simplest and most efficient way to manage waste is to collect it separately. However, this requires effort from everyone involved, and the importance of involving as many people as possible must be stressed. Each of us can contribute to protecting and preserving the environment (Fefer, 2007).

Humans do not have an innate instinct to interact appropriately with nature. Therefore, it is necessary to teach both children and adults ecological awareness and proper interaction with nature. Thus, environmental education is essential to promote ecological awareness in individuals (Požarnik, 1999). To raise ecological awareness, each person must understand the limits of natural resources. We should be aware that people's lives depend on nature's resources and use nature responsibly to pass on a healthy environment to younger generations (Grmič, 1994; Marpa, 2020). Therefore, environmental education is necessary for both learning and teaching. Teaching students to be responsible stewards of nature is essential for preserving its potential. Environmental education aims to increase students' knowledge of their environment and raise their awareness of environmental issues so that they can actively participate in finding and implementing solutions to environmental problems. One of the goals is also to inform citizens and motivate them to participate willingly in the management and sustainable use of the environment (Marpa, 2020).

Marques and Xavier (2020) stated that environmental education is of utmost importance nowadays, especially in the younger years. Here it is emphasized that the school provides a favorable environment for promoting development that uses awareness and responsible behaviour concerning environmental problems. However, ecological education and attitudes towards the environment differ from culture to culture. Kimaryo (2011) conducted an extensive study entitled Integrating Environmental Education into Primary Education in Tanzania. She found that teachers believe environmental education should be included in primary education for two reasons. First, it develops knowledge, skills, and relationships among students, and second, it significantly impacts students becoming role models for the broader society with their conscious and responsible behaviour.

Considering developing students' ecological awareness we planned research to

focus on whom the students think is the biggest polluter, whether they talk about this issue at school, how they take care of a clean environment at school and home, and what kind of packaging they use for transporting food from the store.

Some authors in Slovenia have already conducted research that was basis for planning our research. Zalar (2016) found that young people in the region of Kočevje are very well informed about waste separation and recycling, drinking water and electricity saving. Geršak (2012) found in her research that elementary school students are very aware of how to save water but somewhat less aware of how to save electricity. Džambić (2014) studied teachers' concern for a clean environment and found that quite a few think that they should use fewer cars, pay more attention to clean nature, and warn each other about how to protect the environment.

2. Methodology

2.1. Purpose of the Study

We planned and conducted an empirical study based on the above theoretical findings. The focus was to find out what students think pollutes the environment the most, in what ways they care about maintaining a clean natural environment, and whether there are differences by gender, elementary school, place of residence, and school involvement in the Eco school program.

2.2. The Basic Research Method

The study was based on a descriptive and non-experimental method of empirical research. It is typical for the descriptive research method of empirical pedagogical research to teach by describing facts, relationships, and processes without sample explanation. Quantitative non-experimental empirical research is one of the most widespread empirical researches in the pedagogical field (Štemberger, 2020).

2.3. Sample

We included a non-random sample of students from Obsotelje and Kozjansko attending the third grade of the elementary school in the year 2020. We sent 207 questionnaires to the schools meant for all 3rd-grade students. After the end of data collection, we had 200 completed questionnaires in the database. The sample is representative of regions Obsotelje and Kozjansko, but is not representative of the country. Students' participation in the study was completely anonymous. The questionnaires were completed in groups under the guidance of the classroom teacher. We obtained the necessary consent from parents and school administrators beforehand and informed them of the purpose of the study. We also sent the class teachers a guide for guiding students in completing the questionnaires.

2.4. Data Collection

After an extensive review of the literature and curricula for primary education,

we adapted a questionnaire from Korošec (2011). The questionnaire contains 21 questions, four basic questions about gender, place of residence, elementary school, and school participation in the Eco school program. Regarding the research questions, we were primarily interested in whether there were differences between the independent variables of gender, elementary school, place of residence, and school involvement in the Eco school program.

2.5. Data Analysis

The data obtained from the questionnaire were analyzed using the SPSS statistics program. Data was processed at the descriptive and inferential statistics levels. In the analysis, we used the SPSS program and procedures for frequency distribution, basic descriptive statistics, nonparametric tests (χ^2 test) for the analysis of frequencies of non-numeric variables, and Kullback's $2\hat{I}$ test (when the conditions for using the χ^2 test were not met, the independence hypothesis was made). We presented the data in the form of frequencies and percentages in tables.

3. Results with Interpretation

Results are presented in four sections:

- Student responses about the biggest polluters,
- Concern for a clean environment at school and home,
- Packaging chosen for transporting food from the store and
- Frequency of discussion about the polluted environment at school.

We were also interested in whether there were differences based on students' gender, the elementary school they attend, where they live, and the school's participation in the Eco school program.

3.1. Students' Responses about Who Are the Biggest Polluters of the Environment

Figure 1 shows that students believe factories are the biggest polluter (47.5%), while tourism is the most minor (2.0%). Students' responses were also compared between the fixed variables, and we found statistically significant differences according to gender ($\chi^2 = 12.002$; $p = 0.035$). The most considerable discrepancy occurs in the response waste, which was chosen by girls to a greater extent than by boys, while boys chose the response People to a greater extent than girls. There were also differences in the answer Agriculture, which none of the girls chose, while some boys believe that agriculture is the biggest polluter of the environment. Our results differ from the Report on the environment in the Republic of Slovenia 2009, in which the Ministry of the Environment and Spatial Planning of the Republic of Slovenia puts transport, especially roads, in the first place. The main reasons for the high increase in final energy consumption in transportation are the sharp increase in motorization of the population (ownership of passenger cars), the increase in kilometres driven per passenger car and

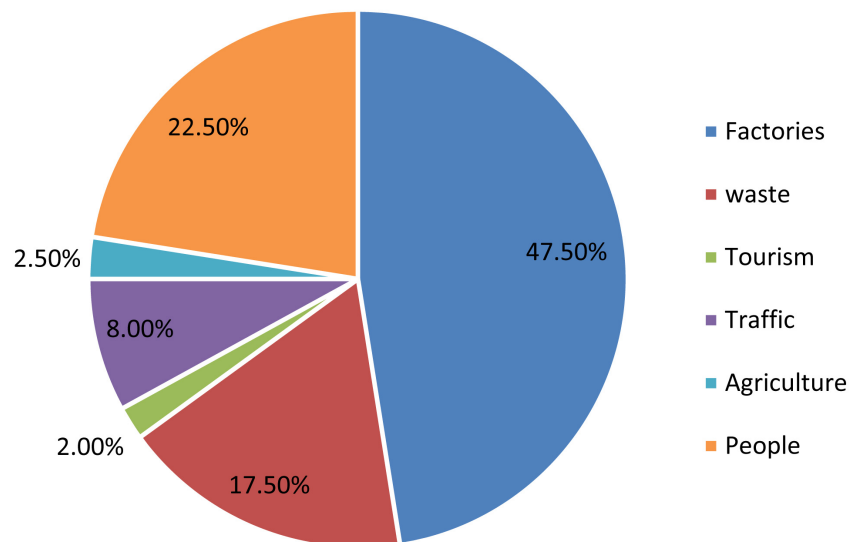


Figure 1. Structural percentage (f%) of students' answers about environmental pollutants.

the increase in transit traffic *Ministrstvo za okolje in prostor* (2009).

3.2. Concern for a Clean Environment at School and Home

Table 1 shows that students pay the most attention to waste separation at school (91.0%) and at home (95.5%). At school, collecting waste paper and saving water are followed. Similarly, students choose saving water and electricity at home as another essential measure to protect the environment. The most significant difference was found in taking care of flower beds and collecting old clothes, which is much more common at home than at school. Regarding maintaining a clean school environment, some statistically significant differences were found, depending on the school's participation in the Eco school program ($\chi^2 = 16.276$; $p = 0.039$). It was found that students from "Eco-schools" care more about maintaining a clean nature. We assume that they are encouraged to do so by the Eco school program goals that schools must achieve to participate in the program. Regarding caring for a clean environment at home, there were statistically significant differences according to gender ($\chi^2 = 14.105$; $p = 0.049$). Girls were found to try to maintain a clean environment to a slightly greater extent and in different ways. The latter can be supported by the findings of *Ljubica Marjanovič Umek and Maja Zupančič* (2009), who found in their book *Developmental Psychology* that girls are generally more responsible and caring (among other things). In the article *Healthy School* (2008) authors also encourage waste separation and reuse, believing that this reduces the amount of unnecessary waste. Reuse allows waste to be used multiple times rather than just once, meaning fewer new products need to be purchased and consequently, less waste is produced. Schools are encouraged to create waste reduction programs. They also emphasize the importance of recycling water for watering plants and reusing food waste to make compost (*EPA, 2008*).

Table 1. Number (f) and structural percentage (f%) of students' answers about their concern for clean environment.

Answers	At home		At school	
	Yes	No	Yes	No
	f	f	f	f
	f%	f%	f%	f%
We separate waste.	191 95.5%	9 4.5%	182 91.0%	18 9.0%
We collect old batteries.	84 42.0%	116 58.0%	124 62.0%	76 38.0%
We collect waste cartridges.	58 29.0%	142 71.0%	143 71.5%	57 28.5%
We collect old paper.	119 59.5%	81 40.5%	181 90.5%	19 9.5%
When we are not using the water, we close it.	189 94.5%	11 5.5%	180 90.0%	20 10.0%
We turn off the lights when we don't need them.	185 92.5%	15 7.5%	177 88.5%	23 11.5%
We take care of flower beds and birds.	134 67.0%	66 33.0%	59 29.5%	141 70.5%
We collect old clothes.	103 51.5%	97 48.5%	33 16.5%	167 83.5%

3.3. Packaging Chosen for Transporting Food from the Store

Table 2 shows that students or their parents often use a cloth shopping bag to take home the items they buy from the store (38.5%). It is very encouraging that parents rarely (5.5%) buy a new plastic bag. The results of our study also showed statistically significant differences between individual responses according to students' place of residence ($\chi^2 = 29.354$; $p = 0.003$). Those living in a house (37.5%), apartment block (60.0%), or apartment building (52.6%) chose a canvas bag as the most commonly used packaging, while those living on a farm chose a cardboard box (51.2%). The latter was true for those living in a house or apartment block elsewhere. *Korošec (2011)* asked students a similar question in her research on the environmental awareness of elementary school students in the Savinjska-Šaleška region and came up with similar results. Pupils from this region also frequently chose the answer cloth bag (34.0%), but in contrast to our results, the answer to use a new plastic bag (15.8%) appeared very frequently.

3.4. Frequency of Discussion about the Polluted Environment at School

As shown in **Figure 2**, in the third grade of elementary schools, the most frequent topic of discussion (69.5%) is the polluted environment, i.e. at least once a

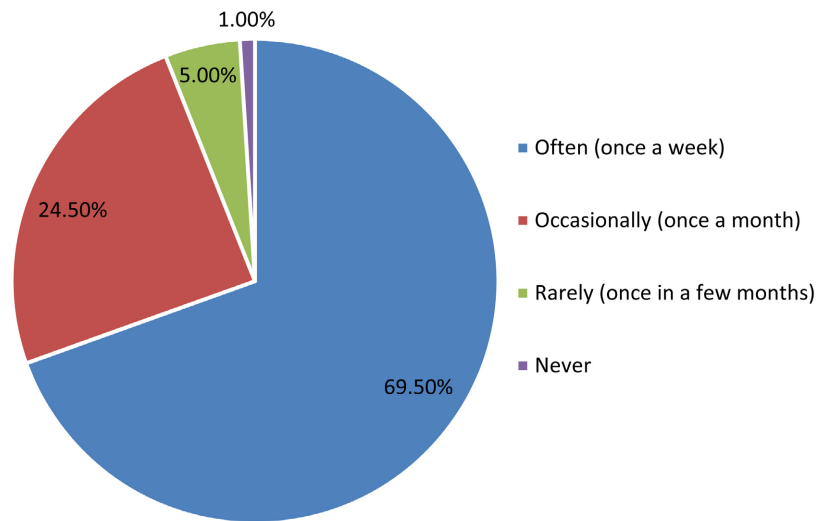


Figure 2. Structural percentage (f%) of times the polluted environment and concern for a clean environment are discussed in school.

Table 2. Number (f) and structural percentage (f%) of students' answers about their concern for clean environment.

Packaging chosen for transporting food from the store	f	f%
We take a used plastic bag to the store.	36	18.0%
We use a basket.	17	8.5%
We always buy new plastic bags.	11	5.5%
We use a cloth shopping bag.	77	38.5%
We use a cardboard box that we buy at the store.	59	29.5%
Total	200	100%

week, and only 1.0% of the students surveyed said they never discuss this topic at school. Analyzing the responses, we found that there were statistically significant differences depending on the elementary school ($\chi^2 = 106,924$; $p < 0.000$) and school involvement in the Eco school program ($\chi^2 = 26,233$; $p < 0.000$) exists. All surveyed students from Hruševac Šentjur elementary school report frequent conversations about the polluted environment (100%). In contrast, in Kozje elementary school, all but one student reported occasional (53.3%) or infrequent (33.3%) conversations about this type of issue. Student respondents from schools not participating in the Eco school program were more likely to select the answer “often” (82.0%) than students from schools participating in the Eco school program (50.0%). This is interesting considering that when we reviewed the Ekošola program (Ekošola, b.d.), we found that for school to be included in this program, one has to achieve quite a lot of goals with an ecological theme, which is also related to the larger number of hours that teachers dedicate to teaching this content. We believe that the percentage of schools participating in the Eco school program could be higher. This means that Eco-Schools teachers and stu-

dents would discuss ecological issues more frequently and integrate them into other subjects.

As we indicated in the introduction, it is necessary to start educating children in the direction of caring and responsible use of the environment, nature and its resources as early as elementary school. Marpa (2020) found in his research that most teachers include environmental education in their teaching program weekly, some monthly, and only a few days. This means that there are no clear guidelines on the number of hours or even how to integrate this type of topic that would be helpful for teachers. The methods most commonly used by teachers are lectures, and some use other activities such as hands-on outdoor learning, field trips that promote tree planting, recycling, and greening schoolyards. The latter activities have proven to be the most effective in imparting this knowledge and instilling a responsible approach to nature. In line with all the above, the study suggested developing teaching materials and training teachers to teach environmental education and integrating it into different subject areas. It would be helpful to introduce the latter into the educational process elsewhere, including Slovenia.

4. Conclusion

In summary, the results show that third graders in the Obsotelj and Kozjansko regions care for the environment mainly by separating waste and saving water and electricity. We also note that students and their parents should pay more attention to using more sustainable packaging to transport their food from the store. The results show that under half are using sustainable packaging, such as cloth bags or baskets that can be reused and does not produce additional waste. On the other hand, a significant percentage of students and parents still use non-reusable packaging such as cardboard boxes or plastic bags and throw them away after use. Consequently, they keep producing unnecessary waste. According to the results, just over two-thirds of schools deal with environmental issues weekly. This is a quite realistic result, but at the same time, we believe that the topic should be addressed and discussed more often. We recommend that teachers should be educated and trained to acquire methods to incorporate this content into all subject areas, thus increasing the number of hours devoted to discussing environmental issues. Recently, the environment and the value of nature have been increasingly forgotten due to fast-paced and anthropocentric lifestyles. However, there is a growing need to educate citizens to act appropriately and environmentally conscious as soon as possible, automatically and unconsciously. By providing sufficient quality information and best practices, students become aware of the need to protect nature and maintain a clean environment. Consequently, students become independent and competent individuals who responsibly use and manage nature. In addition, their actions serve as role models and incentives for others to act in the same or at least similar ways. Among other content, students should be informed about the sources that pol-

lute the environment the most. In this study, we found that students believe that the most significant source of pollution is factories. However, only a few students chose transportation and agriculture, which are also significant contributors to pollution. It would be advisable to enter into the curriculum information about alternative transportation and agriculture, which are less polluting, and how they can help reduce this type of pollution. Students should be exposed to environmental issues in different ways and various subjects as much as possible.

We must consider that obtained results represent the opinions of a specific Slovene region 3rd-grade student. However, research can give us guidance and direction for broader research. In the future, we plan to upgrade the research with a representative sample of Slovene 3rd-grade students.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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