



Investigating the Impact of Environmental Education on Improving the Environmental Awareness of Elementary School Students

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Abstract: Environmental education programs not only broaden children's knowledge but also enhance their environmental awareness. This research aims to determine the extent to which environmental education improves the environmental awareness of elementary school students. In addition to reviewing existing studies, this research employs a questionnaire method to gather data. It also examines the effectiveness of using questionnaires to evaluate children's environmental awareness. The findings indicate that the efforts of environmentalists and school environmental education instructors positively influence children. Students demonstrate a strong connection to nature, their local geography, and the environment. They also gain substantial, accurate information about the environment and its unique characteristics. However, assessing the level of environmental awareness among children solely based on school education programs is challenging. Comparing schools with and without environmental education programs could provide more meaningful insights. This study investigates the impact of environmental education on enhancing primary school students' environmental awareness through the use of questionnaires. The results reveal that regular exposure to nature, combined with educational programs, positively affects children's understanding of and commitment to nature conservation.

Keywords: *Environment; nature; awareness of the environment; education of children; Environmental questionnaire*

1. Introduction

Environmental education plays an important role in the formation of children's attitude and behavior towards the environment. By integrating environmental education into the primary school curriculum, we can raise a generation that is more aware and committed to environmental protection. This article examines the effect of environmental education on improving the environmental awareness of primary school students. This research is divided into three sub-fields of environmental behavior, environmental attitude and environmental knowledge. Using four different methods, the aim is to find out to what extent the environmental awareness of primary school children is improving. This research focuses on quantitative research and questionnaires. The purpose of this research is to find out whether environmental education in schools improves students' environmental awareness or not. Research questions were pre-set for this evaluation. The main questions are:



To what extent can the environmental awareness of elementary children be increased by environmental education?

To what extent is the questionnaire suitable for evaluating the environmental awareness of primary school children?

Detailed results of each questionnaire question are described and supported by clear diagrams. Discussion The questions raised at the beginning have been answered with the results explained in the research literature. In addition, environmental awareness, environmental knowledge and environmental attitudes are interpreted. In addition, a perspective of the next course of studies for further research is provided. In the final conclusion, the research questions are raised again and answered.

1.2 Criteria

When evaluating this research, seven criteria were defined. These criteria were included and integrated in the questionnaire. These criteria are as follows.

1.3 Protection of natural processes in the environment:

This factor emphasizes teaching students about the importance of maintaining natural cycles and processes such as the water cycle, nutrient cycle, and energy flow. Understanding these processes helps students understand how ecosystems work and the importance of preserving them.

1.4 Trees and plants:

Education about trees and plants focuses on their role in the environment, including producing oxygen, sequestering carbon, and providing habitat for wildlife. Students learn about the importance of biodiversity and the need to protect plant life to maintain ecological balance.

1.5 Specific environmental features:

This includes teaching students about unique environmental features in their local area or globally, such as wetlands, coral reefs, or forests. Understanding these characteristics helps students understand the diversity of ecosystems and the specific challenges they face.

1.6 Regional knowledge:

Regional knowledge involves educating students about specific environmental issues and natural resources in their region. This localized approach makes environmental education more relevant and practical and encourages students to participate in conservation efforts in their community.



1.7 National and social attitude:

This factor deals with broader social and cultural attitudes towards the environment. This includes educating students about national policies, social movements, and cultural practices that affect environmental protection. Understanding these attitudes helps students see the bigger picture and the collective effort needed to protect the environment.

1.8 Dealing with nature:

It includes practical training on how to interact responsibly with nature. This includes activities such as recycling, waste reduction, water conservation and wildlife protection. Hands-on experiences help students develop a personal connection with nature and understand their role in preserving it.

1.9 Personal importance:

Personal significance focuses on helping students understand how environmental issues affect them. This could include discussions about how pollution affects health, the benefits of clean air and water, and the importance of sustainable living. When students see the direct impact on their lives, they are more likely to take environmental issues seriously and act accordingly.

The overall goal of these factors is to create a comprehensive understanding of the environment among primary school students and to raise a generation that is more aware and active in protecting the environment. In this research, the students were trained for several years by the environmentalists of the region. With the help of the school, an attempt was made to make students more aware of the environment and the region. This included learning about national parks, plants and animals, and nature conservation. This research is divided into three sub-areas. These include environmental behavior, environmental attitudes, and environmental knowledge. The purpose of this work is to find out whether children become more aware of the environment and its natural processes and appreciate nature conservation activities. This research is focused on the sub-field of quantitative research and questionnaire.

Environmental Knowledge → Environmental Awareness → Environmental Behavior

In the contemporary world, the relationship between environmental knowledge, awareness and behavior is very important to promote sustainable practices and reduce environmental degradation. This paper examines how environmental knowledge leads to environmental awareness, which in turn influences environmental behavior and ultimately leads to pro-environmental action.

2 Environmental knowledge

Environmental knowledge refers to the understanding and information that people have about environmental issues, ecosystems, and the impact of human activities on the natural world.



This knowledge can be acquired through formal education, media, personal experiences, and scientific research. It covers a wide range of topics, including climate change, pollution, biodiversity, and sustainable practices. Acquiring environmental knowledge is a fundamental step in the journey towards environmental care. It equips people with the necessary tools to understand the complexities of environmental issues and the connections within ecosystems. For example, understanding the causes and consequences of climate change can encourage people to reduce their carbon footprint.

2.1 Environmental awareness

Environmental awareness is knowing and understanding environmental issues along with feeling concern and responsibility towards the environment. It is an emotional and cognitive response to environmental knowledge. When people become aware of the environmental challenges facing the planet, they are more likely to feel a sense of urgency and desire to take action. Awareness can be raised through various means, such as educational campaigns, documentaries, social programs and personal experiences with nature. For example, observing the effects of pollution in the local community can significantly increase awareness and concern about environmental issues.

2.2 Environmental behavior

Environmental behavior refers to actions and practices that people adopt to reduce their impact on the environment. These behaviors can range from simple everyday habits, such as recycling and water conservation, to major lifestyle changes, such as adopting renewable energy sources and supporting sustainable products. The transition from awareness to behavior is influenced by several factors, including personal values, social norms, and perceived efficacy. When people believe that their actions can make a difference, they are more likely to engage in environmentally friendly behaviors. Additionally, social support and infrastructure, such as accessible recycling programs and public transportation, play an important role in facilitating these behaviors.

2.3 Environmental action

Environmental action is the pinnacle of knowledge, awareness and behavior. This includes proactive efforts to address larger-scale environmental issues, such as participating in environmental advocacy, advocating for policy changes, and participating in community initiatives. Environmental actions often stem from a deep commitment to preserving the planet for future generations. For example, people who are aware of the harmful effects of plastic pollution and its impact on marine life may participate in beach cleanups or support policies that reduce plastic use. These actions not only help to save the environment but also encourage others to join the cause.



Progressing from environmental knowledge to environmental awareness, and ultimately to environmental behavior and action, is a critical path to fostering a sustainable future. By educating people about environmental issues, raising awareness and encouraging preventive behaviors, we can collectively work towards reducing environmental challenges and preserving the planet for future generations. Each step in this development is interconnected and necessary to create a culture of environmental care and responsibility.

3 Method

The survey tool used was a questionnaire, which will be explained in the following. Data collection and sample description are also discussed in more detail. Finally, the evaluation method of SPSS and Excel is described.

Scientific research can be divided into qualitative and quantitative research designs. To answer the previously mentioned questions, a quantitative data collection method, a written survey, has been used. This questionnaire is used to record attitudes, opinions and positions on topics or issues.

In experimental research, questionnaire is one of the most important methods of collecting quantitative data. It is the most widely used method to obtain information due to its wide and economical application. It is primarily used to record attitudes, opinions and positions on issues and topics. A standardized questionnaire is a common measurement tool that provides the characteristics and current information of the subjects. A written survey means presenting written questions that the subjects answer independently. It is especially suitable for examining large and homogeneous groups in a relatively short time. The questionnaire can be done both on paper and as an online survey. The use of questionnaires is becoming more popular due to the ease of implementation and easy dissemination through the Internet. This allows for quick comparison of information from different people.

The questionnaire of this research was made independently and compiled with knowledge. This survey was used in schools. This questionnaire was presented by the respective teachers and completed by the students. The parents of the students have already been informed about this and expressed their consent. At first, all students were assigned a code. The following information was also obtained: name, gender, school level, educational level and assessment of interest in nature.

Due to the age difference between the participants, two questionnaires were created, a simplified questionnaire for first year elementary students (first, second, third grade) and a slightly more complex questionnaire for second year students (i.e. fourth to sixth grade). This questionnaire was created with Word. Seven criteria were used to evaluate schools as the basis of this research.



Both open and closed response formats were used for the study. There are no alternative answers to open-ended questions. The answers are formulated by the respondents themselves. The questions again take more time for both test takers and assessors. Open questions can be found in the following areas: national parks, knowledge of the region and in some cases personal significance and dealing with nature. These questions were collected and analyzed using Microsoft Excel. Closed questions are types of questions that have predefined categories as answer options to be marked. All the possible answers have been specified by the designers of the questionnaire. Based on this, students are required to choose one of the possible answers. The advantage of these questions is that they are very affordable to evaluate. In the forest criteria questionnaire, there are process protection, individual importance, dealing with nature and attitude that children should mark the correct answer. These do not require further coding. After asking students' opinions, attitudes, and values, the questionnaire includes so-called theoretical questions. The questionnaire also has scales as response options. In the first-grade questionnaire, students have the option to choose one of three emoticons. The questionnaire for second-year students includes verbal grading scales (does not apply/uses a little/uses to some extent/uses to some extent) in which students must choose an answer option.

3.1 Data collection

In order to answer the research questions, questionnaires were distributed among the selected classes in partner schools. The studied students are from the first grade to the sixth grade. Therefore, the age of the investigated children is between 7 and 13 years. This questionnaire was delivered by teachers in May 1403. Each school offered at least one class. A total of 91 children were contacted and interviewed.

3.2 Evaluation of questionnaires

The statistical analysis of the questionnaires was largely done using the SPSS program. Excel was also used for open response formats.

4 Results

4.1 Personal variables in students

The following variable mainly refers to the personal characteristics of students.

Table 1: Personal variables of students

Personal Variables of Students		
Name	Value Tags	Level
Execution Number	1,2,3,...	Execution Number
Section	= 1First Period Of Elementary School	Nominal



	= 2Second Period Of Elementary School	
Gender	= 1Female = 2Male	Nominal
Year Of Birth	2011-2017	Nominal
Evaluation Of Interest In Nature	=1Very Interested In Nature = 2Moderate Interest In Nature = 3Little Or Not At All	Analogical
School	1 = District 1 Of Greater Tehran 2 = District 2 Of Greater Tehran 3 = District 3 Of Greater Tehran	Ordinal
Class	= 1First Period Of Elementary School = 2Second Period Of Elementary School	Nominal

4.2 The variable related to regional knowledge

The following variable deals with variables related to nature.

Table 2: Variable related to students' regional knowledge

Variable Related to Students' Regional Knowledge		
Name	Value Tags	Level
Nature	▪Everything ▪Animals ▪Trees ▪Smell/Fresh Air ▪Flower	Nominal



	<ul style="list-style-type: none">▪Forest▪Silence▪Mountain	
Importance In Life	<ul style="list-style-type: none">▪Everything▪Family▪Friends▪Toys▪Animals▪Nature▪Health/Safety▪Forest/Water▪Electronic Devices	Nominal
The Frequency of Spending Time In Nature	<p>= 0No</p> <p>7-1</p>	Metric
Do <ul style="list-style-type: none">▪ Friends▪Siblings,▪Parents Are Your Partners in Nature Tourism	<p>1 = yes,</p> <p>2= no,</p>	Nominal
Nature Protection	<ul style="list-style-type: none">•Garbage/Plastic Collection/Disposal/Separation/Recycling•Tree Protection/Planting•Turn Off The Light/•Water While Brushing•Cleaning The Environment•Cycling	Nominal



	<p>Avoid Throwing Garbage</p> <ul style="list-style-type: none">•Reduction Of Plastic Consumption•Driving Less•Protect/Help Nature	
<p>Natural Knowledge</p> <ul style="list-style-type: none">▪Teacher▪FriendParents,▪Trainers▪Your Own Observations▪TV Programs	<p>1 = yes, 2= no,</p>	<p>Nominal</p>

4.3 The variable related to students' free time

The following variable deals with children's free time and places of their free time.

Table 3: Variable related to leisure time

Variable related to leisure time		
Name	Value Tags	Level
<p>Leisure activities</p> <ul style="list-style-type: none">▪Out in nature▪Computer/mobile phone▪Television▪Play with friends▪Take a walk	<p>1 =often 2=Rare 3 = Never</p>	<p>Ordinal</p>
<p>Leisure stay</p> <ul style="list-style-type: none">▪In my room▪In the garden▪In front of the computer	<p>1 = often 2=Rare 3=Never</p>	<p>Ordinal</p>



<ul style="list-style-type: none">▪In front of the TV▪In the forest▪On the playground▪Different location		
different place	<ul style="list-style-type: none">▪Swimming pool▪Animals (zoo, pets, horse stables)▪With friends▪At home▪By the water (pond, lake)▪Climbing▪Park▪During the break▪Grandparent's house▪Nature▪On the cycling routeSports field (football)	nominal
Membership in forums	1 = yes, 2= no,	nominal
which one	<ul style="list-style-type: none">▪Football club▪Karate▪Tennis▪Music▪Nature lovers▪Climbing clubSports club	nominal



4.4 A variable related to natural processes in the environment

The variable related to natural processes in the environment deals with the statements of animals, trees and forests.

Table 4: Variable related to natural processes in the environment

A variable related to natural processes in the environment		
Level	Value Tags	Name
city	1 = yes, 2= no, 3 = I don't know	Ordinal
garbage disposal		
Insects		
Birds		
the desert		
Nature protection		
Not to smoke		
Pastures and ranchers		
The importance of wood and dead trees		
cutting down trees		

4.5 Presentation of results

In the following, the results and also the interpretation that was done by evaluating the questionnaires are presented.

Questionnaire results

A total of 91 children answered the questionnaire. The questions were classified into several categories. The results are discussed below.

Personal results

A total of 91 children were interviewed in the elementary school district. These people include 41 (45%) females and 50 (55%) males. The year of birth of children in elementary school is between 2011 and 2017. In addition, teachers were previously asked about their assessment of primary school children's interest in nature. The evaluation done beforehand is divided almost equally in all three areas. This means that 33 students (36.26%) are very interested in nature,



32 (36.16%) are relatively interested in nature, and 26 (28.57%) are little or not at all interested in nature.

Results related to the protection of natural processes in the environment

The first part of the questionnaire explicitly deals with the protection of natural processes in the environment. First, the subjects were asked what they thought about the protection of natural processes in the environment. Several answers were possible here. A total of 30 different answers were given and summarized. In 38 (23.6%), animals (insects, birds and snails) were mostly mentioned by children. In addition, forest was recorded with 28 trees (17.4%) and water sources, rivers, lakes and waterfalls with 25 (15.5%).

Students were also asked whether they had thought about nature since attending environmental education classes. 80 children (87.91%) said that they often think about nature. 8 children (8.79%) rarely think about nature and 2 children (2.20%) never think about nature. Another question was raised in this regard. Since the implementation of the program, 61 subjects (67.03%) said that they often talked with their families about their nature trips. 23 (25.27%) rarely answered and 6 (6.59%) never answered. Both questions were not answered once (1.10%).

When asked about environmental protection, the most mentioned items were animal protection and bird care with 35 (43.8%), followed by nature protection with 24 (30%). 5 people (6.3%) answered that people do nothing about it. 8 people (8.79%) said something wrong or did not answer. Children were also asked what they can do in the environment and what they should not do. A total of 28 different answers were given. Children mentioned walking in general 30 times (16.4%). Observing animals was mentioned by students 29 times (15.8 percent), followed by playing with 21 (11.5 %) answers.

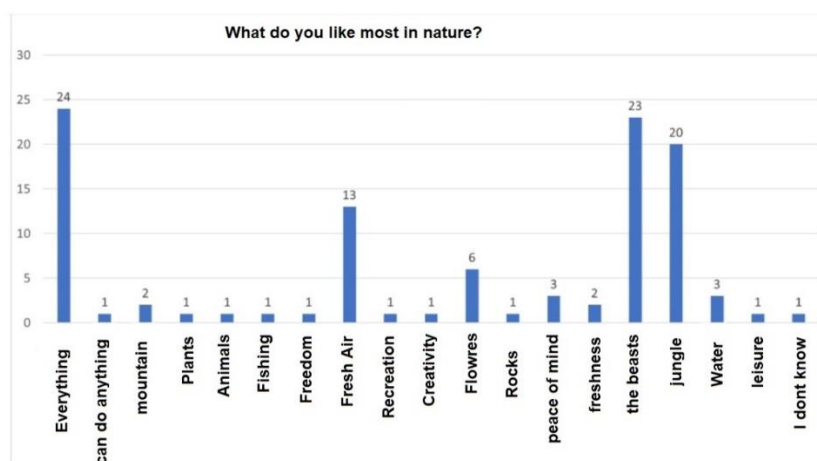
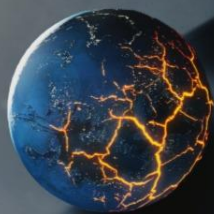


Figure 1: What do you like most in nature?



24 students (22.6%) like everything about nature. Animals were given as the answer 23 times (21.7%). Forest with trees was mentioned 20 times (18.9 percent) and fresh air 13 times (12.3 percent). What was particularly exciting were the responses (0.9%) that nature has the ability to recreate. 41 people (56.94%) said that they spend time in nature every day of the week. 7 people (9.72%) spend 5 days, 6 people (8.33%) 4 or 2 times a week, and 5 people (6.94%) spend 6 or 2 times a week outside the home. Only 2 people (2.78%) stated that they never spend time in nature.

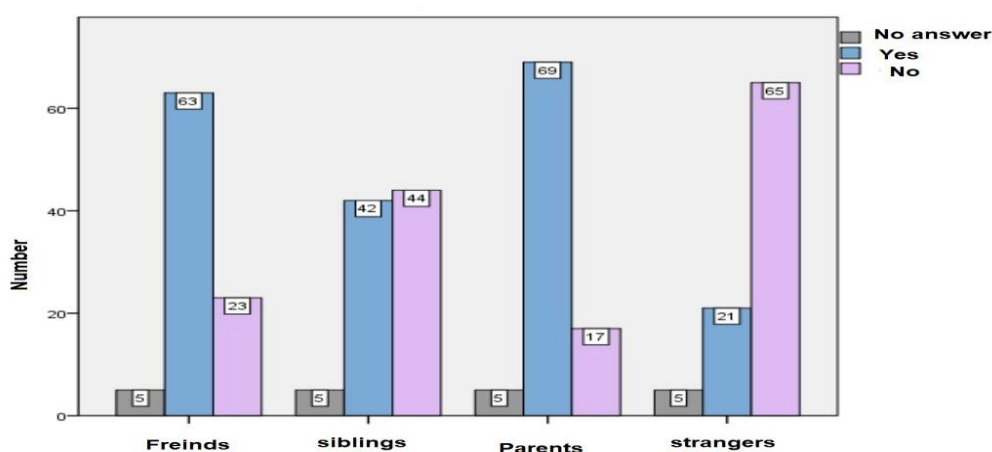


Figure 2: Companion in nature

69 children (75.8%) reported spending time in nature with their parents. 63 (69.2%) children reported their friends. Regarding siblings, 42 people (46.2%) said "yes" and 44 people (48.4%) said "no". 65 people (71.4%) of the surveyed people said that they do not spend time in nature.

Of the 91 children surveyed, 80 (87.9%) said that they often spend their free time outside in nature, 72 (79.1%) said that they often play outside with friends, and 54 (59.3%) said that They often go for a walk. In the electronics domain, elementary school-aged children rarely reported playing with computers/cell phones (56.1%/51%) or watching television (69.2%/63%).

A very similar result can be seen with leisure stays. Accordingly, 79 children (86.8%) said that they spend most of their time in the garden, followed by 57 children (62.6%) in the forest. It is relatively rare for children to spend time with 58 (63.7%) in front of the TV, 52 (57.1%) in front of the computer, or 55 (60.4%) in the room. 46 (50.5%) spend most of their time in the playground and 38 (41.8%) rarely go to the playground. Students were also asked about other places to spend their free time. A total of 17 different answers were given. Staying with animals was mentioned more with 8 answers (13.33%) and friends with 7 answers (11.67%). The mountain was mentioned by 5 children (8.33%) and staying in the forest by 2 children (3.33%). When asked about the importance of life, most children answered with family (73.80.2%), friends (59.64.8%), and animals (49.53.8%). Only 1 child (1.1%) reported electronic devices



such as computers, cell phones, or game consoles. Toys were also mentioned only 3 times (3.3%) by the respondents. Regarding school affiliation, the answers were almost balanced. 44 children (48.35%) stated that they do not belong to any association. 6 people (6.59%) did not answer this question. The football club was mentioned the most with 11 times (30.6%).

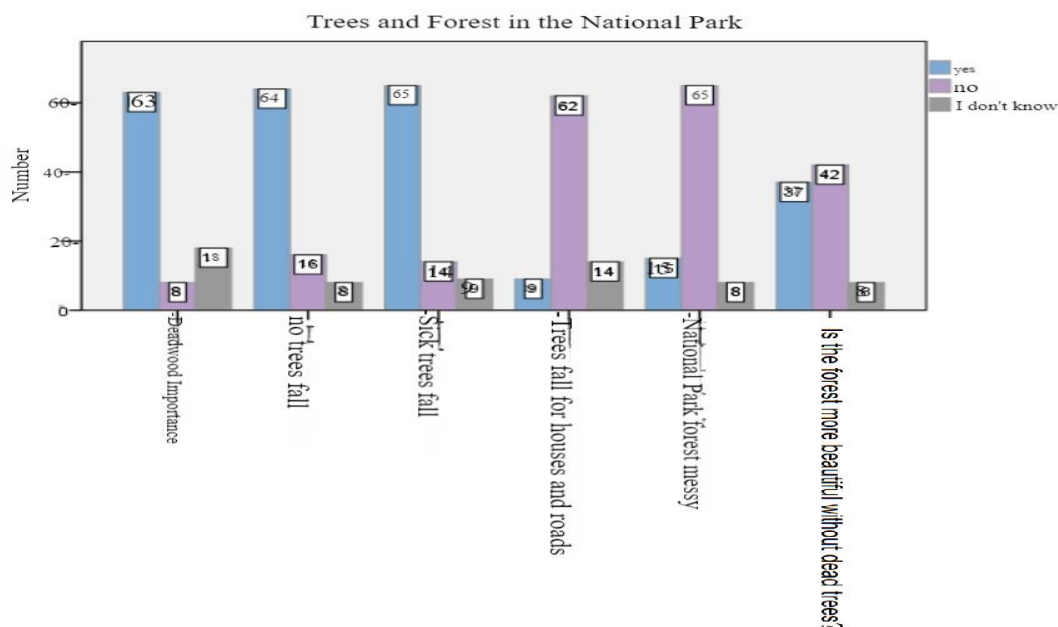


Figure 3: Trees and forest in the environment

63 children (69.2%) think dead wood is important for nature. Almost the same number of 64 people (70.3%) think that no tree should be cut in the forest. 65 people (71.4%) also believe that only diseased trees should be cut. 62 people (68.1%) of the respondents think that trees should not be cut to build houses and roads. When the students were asked if the forest is more beautiful when there are no (dead) trees on the ground, 37 (40.6%) chose "yes" and 42 (46.2%) "no". 76 people (83.5%) of the respondents believe that nature should be left alone for wild nature to emerge.

5 Discussion

In the following, the research questions will be answered by comparing and linking the presented results with the theoretical part. As it is clear from the research title, the topic of this article is related to children's environmental awareness. The first goal is to find out to what extent children's environmental awareness is promoted through education. The second question deals with the research method. Here, the goal is to know how suitable this questionnaire is for evaluating children's environmental awareness.



The goals of environmental education programs are children's understanding of nature, culture and environment. In order to address this question in more detail, the domains of the multidimensional concept have been divided and compared with the theory section and similar studies. The field of environmental knowledge is divided into questions related to regional knowledge and related to environmental education programs. Surveys showed that out of 91 children, only 24 children (26.37%) were able to gain an adequate understanding of the protection of natural processes in the environment. The majority of children were also able to name at least three endangered animals. Students also gave different answers about mountain huts, tree species, mountains and other special features.

If you look at these results, you can see that the students have good factual knowledge, although many subjects come from elementary school science books. As mentioned earlier, the environmental attitude deals with the opinion and internal relationship of a subject. In particular, this is true of children's norms, values, and emotions. This issue was determined in the questionnaire using questions about the importance of life, ideas about nature conservation, and general attitudes toward animals and forests in the national park. From the total of 91 children examined, 73 (80.2%) called family, 59 (64.8%) friends and 49 (53.8%) animals very important in their lives.

Also, 80 people (94.1%) think that animals and plants like them have the right to live. Meanwhile, 79 children (86.8 percent) said that animals and plants have equal rights with humans. It's just that when it comes to cockroaches, they are very uncertain, and therefore opinions vary greatly. The majority of children also consider dead wood to be important to nature when it comes to trees and forests. About the same number believe that no trees or only diseased trees should be cut in the forest. As can be read in the theory section, dead wood provides important habitats for animals and lichens. It also serves as a source of food and protection against falling rocks and avalanches.

Under environmental behavior, children's actual behavior in nature, waste segregation, deforestation, membership and leisure time behavior were investigated. Children were also asked about their free time. Social and mental conditions also contribute a lot to environmental behaviors. If you look at the answers of elementary school students about spending time in nature, you will notice that they spend a lot of time in nature. 80 people (87.9%) said that they often spend their free time outside in nature, 72 people (79.1%) said that they often play outside with friends, and 54 people (59.3%) said that they often go for walks. they go According to these children; the priority of leisure activities is playing with friends in nature even more than playing with mobile phones. Accordingly, 79 children (86.8%) say that they spend most of their time in the garden, followed by 57 children (62.6%) who prefer the forest and nature outside the city. Play together outdoors with your friends. If you compare children's leisure activities with the studies mentioned earlier, the children surveyed are more likely to spend



more time in nature and playing outside with friends than in front of a computer/cell phone or television. This result is also reflected in leisure stays. The people surveyed rarely use electronic devices, be it computers, mobile phones or game consoles. It can be seen that students have a lot of connection with nature. Here, too, the majority of children stated that they would rather be in the garden, villa or forest than in front of the television. Only 8 children (30.8%) said that they often play with their mobile phones. However, this also reflects the proximity to nature and the location of the school. It will be very interesting to compare classes in which environmental education programs are not conducted with classes in which environmental education programs are conducted.

In order to protect nature, most of the primary school students surveyed (51.5%) pointed to the correct disposal, collection, separation and recycling of waste.

It also mentions saving energy and water as environmental behavior. What is notable in the student survey is that children only mentioned turning off the lights and water while brushing their teeth twice (2.1%). Only one child (1%) mentioned avoiding meat as a way to protect nature. Shockingly, most children only mention the proper disposal, segregation and recycling of waste as an idea to preserve nature. Among the majority of respondents (38.7%) again mentioned the collection, disposal, separation and recycling of waste and plastic. Fortunately, some students gave other examples, such as building a channel for spawning frogs, reducing air traffic, and using electric and hydrogen cars were among the interesting ideas of the children. No children here belong to nature, mountain or national park associations. If you look at the overall results of the students surveyed, you can see that the immediate variety as well as the discovery and research about nature lead to the children's positive relationship with nature. Experiences of walking in nature in combination with an educational concept have a positive effect on children's environmental awareness. It aims to help the next generation understand nature and the environment.

To what extent is the questionnaire suitable for evaluating the environmental awareness of primary school children?

This question is intended to determine whether a questionnaire is appropriate for assessing children's environmental awareness. Here again the focus is on the concept of multidimensionality. As mentioned earlier, environmental knowledge is the easiest to measure. A questionnaire is suitable for this. In this questionnaire, environmental knowledge was determined using two test and descriptive questions. It was particularly noticeable that descriptive questions, especially on regional knowledge, sometimes caused difficulty for the children. They found it difficult to answer questions such as what they do not like about the environmental education program and what is the purpose of environmental education. Answering descriptive questions was relatively easier for students of the second year of elementary school. Considering the high age, the criticisms were somewhat more constructive



than the first-year students. However, there were also some descriptive questions here that were less answered. Regarding environmental behavior, only general questions can be asked, for example about waste segregation, avoidance of waste generation and deforestation. Of course, these answers are only immediate reactions and do not confirm the actual general behavior of children. However, insight into environmental behavior can be gained through a few descriptive and test questions. As mentioned, environmental attitudes refer to children's attitudes, norms, and values. The main questions were ticking questions related to environmental education and its specific features.

It is believed that the questionnaire is very useful for obtaining information from a large number of children and, as a result, getting an overview of opinions, attitudes and positions on issues and topics. However, the questionnaire and the results are very suitable for comparing children's responses over several years, and it is suggested that other researchers use this method over several years.

5.1 A long-term study perspective

In the following years, the children's results can be compared with each other in order to better address the research question raised at the beginning. Here are some ideas and suggestions to help us optimize the study for years to come. With the help of a questionnaire, you can easily question and examine the environmental and real information of children. However, in order to explicitly address the research question and find out whether environmental education programs improve students' environmental awareness, it would be interesting to compare the results with another class or school that is not involved in the project. to do with the help of coaches and teachers, preliminary conclusions can be drawn and impressions can be recorded. In addition, children's ideas and wishes can be included for future projects. For further investigations using questionnaires, it will be useful to mention that evaluation of open-ended questions requires a lot of time. This is especially evident in school questionnaires. It is necessary to estimate how many resources are available for evaluation or whether it is useful to limit the possible responses. It is also important to mention that some elementary school students were affected by descriptive questions and therefore many of them were not filled. The simplification of open-ended questions should be reconsidered here.

5.2 Conclusion

To what extent does environmental education increase elementary children's environmental awareness?

Frequent exposure to nature combined with educational programs positively contributes to children's understanding of nature and nature conservation. Looking at the results, it can be seen that students are aware of nature and environment. In addition, students spend a lot of time in nature. Children are also much more interested in natural areas than electronic devices.



The results cannot accurately determine whether children's environmental awareness improves explicitly as a result of environmental education programs. It would be interesting to conduct this survey with students of other classes or schools where environmental education is not carried out for direct comparison. In general, it can be said that the work of environmental education in schools has positive effects, because environmental education with diverse and positive experiences of nature helps children to gain an important basis for a positive attitude towards the environment and nature. . Also, the results show that students are strongly involved in environmental education and establish their connection with nature. As this is a long-term study and the survey was conducted for the first time using a questionnaire, it is unfortunately not possible to compare the results and therefore only preliminary insights are possible. More meaningful results will certainly emerge in the next few years.

To what extent is the questionnaire suitable for evaluating the environmental awareness of primary school children?

As already mentioned, a questionnaire is suitable for searching for environmental knowledge, regional knowledge and opinions about the national park. Descriptive questions are good for getting more information from children. However, younger students are sometimes overwhelmed by these items and need a lot of time to fill them out. Evaluation is also very time-consuming. Therefore, it is important to carefully consider the usefulness of descriptive questions and the time resources available for subsequent surveys.

References

- [1] Giancola, M., Pino, M. C., Zacheo, C., Sannino, M., & D'Amico, S. (2024). The Intergenerational Transmission of Pro-Environmental Behaviours: The Role of Moral Judgment in Primary School-Age Children. *Social Sciences*, 13(6), 318.
- [2] Che, W., & Yang, C. (2024). Human awareness and behavior on the driving of sustainable city environment. *Sustainable Cities and Society*, 105604.
- [3] Che, W., & Yang, C. (2024). Human awareness and behavior on the driving of sustainable city environment. *Sustainable Cities and Society*, 105604.
- [4] Wang, Z., & Li, W. (2024). The Mechanism of Adolescent Environmental Passion Influencing Parent Pro-Environmental Behavior. *Journal of Environmental Psychology*, 102342.
- [5] Amin, S., Utaya, S., Bachri, S., Sumarmi, S., & Susilo, S. (2020). Effect of problem based learning on critical thinking skill and enviromental attitude. *Journal for the Education of Gifted Young Scientists*, 8(2), 743-755.
- [6] Biasutti, M., & Frate, S. (2017). A validity and reliability study of the attitudes toward sustainable development scale. *Environmental Education Research*, 23(2), 214-230.



- [7] Ghazvini, S. A. M., Timothy, D. J., & Sarmento, J. (2020). Environmental concerns and attitudes of tourists towards national park uses and services. *Journal of Outdoor Recreation and Tourism*, 31, 100296.
- [8] Mullenbach, L. E., Andrejewski, R. G., & Mowen, A. J. (2019). Connecting children to nature through residential outdoor environmental education. *Environmental Education Research*, 25(3), 365-374.
- [9] Nazarenko, A. V., & Kolesnik, A. I. (2018). Raising Environmental Awareness of Future Teachers. *International Journal of Instruction*, 11(3), 63-76.
- [10] Lopez-Odar, D., Alvarez-Risco, A., Vara-Horna, A., Chafloque-Cespedes, R., & Sekar, M. C. (2020). Validity and reliability of the questionnaire that evaluates factors associated with perceived environmental behavior and perceived ecological purchasing behavior in Peruvian consumers. *Social Responsibility Journal*, 16(3), 403-417.
- [11] Sánchez-Llorens, S., Agulló-Torres, A., Del Campo-Gomis, F. J., & Martinez-Poveda, A. (2019). Environmental consciousness differences between primary and secondary school students. *Journal of Cleaner Production*, 227, 712-723.
- [12] Kuvac, M., & Koc, I. (2019). The effect of problem-based learning on the environmental attitudes of preservice science teachers. *Educational Studies*, 45(1), 72-94.
- [13] Zárate Rueda, R., Beltrán Villamizar, Y. I., & Becerra Ardila, L. E. (2023). A Retrospective Approach to Pro-Environmental Behavior from Environmental Education: An Alternative from Sustainable Development. *Sustainability*, 15(6), 5291.
- [14] Zhao, X., Wang, J., Wang, M., Li, X., Gao, X., & Huang, C. (2021). A new model for assessing the impact of environmental psychology, e-learning, learning style and school design on the behavior of elementary students. *Kybernetes*, 50(2), 512-527.
- [15] Whitburn, J., Abrahamse, W., & Linklater, W. (2023). Do environmental education fieldtrips strengthen children's connection to nature and promote environmental behaviour or wellbeing?. *Current Research in Ecological and Social Psychology*, 5, 100163.
- [16] Genc, M., & Akilli, M. (2016). Modeling the relationships between subdimensions of environmental literacy. *Applied Environmental Education & Communication*, 15(1), 58-74.
- [17] Barter, C., Batool, F., Charles, J., Devaney, J., Farrelly, N., Hayes, D., ... & Stanley, N. (2024). Conducting large-scale mixed-method research on harm and abuse prevention with children under 12: Learning from a UK feasibility study. *Children & Society*, 38(1), 79-96.