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Climate Education in Kindergarten

(pp. 435–453)

Abstract

Climate change is one of the biggest challenges of our times, as it affects the way societies and economies around the world operate: from dangerous weather anomalies, through a drop in crop production, to an escalation of international conflicts. Moreover, the consequences of climate change pose a risk to many areas of life. Therefore, actions ought to be taken to limit it. For these actions to be effective, climate change education must start as early as kindergarten. The subject of the research presented in the article is the implementation of climate education in kindergartens in the Masovian Voivodeship, Poland. The objective of the study is to determine the level of knowledge among six-year-old children about climate, climate change, the related risks, actions that can be taken to prevent climate change, and whether and how the children's teachers cover topics related to climate change. The study consisted of diagnosing children's knowledge about climate and climate change and verifying preschool teachers' class register records and monthly work plans regarding climate change education. The analysis regarding children's awareness of climate and climate change demonstrates that they could not support their knowledge with concrete examples. It indicates a superficial environmental education targeted at the adoption of positive attitudes towards nature among children. The study reveals that despite some preschool

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teachers introducing climate education to their classes, in the majority of classrooms, climate-related issues are rarely discussed. The research demonstrates that preschool teachers are unaware of the fact that the present generation of preschool children will have an impact on the future of our planet. Therefore, it should be recommended that teachers promote the principles of sustainable development and foster an awareness of the effect of human activity on our environment and climate change.

Keywords: climate education, kindergarten, six-year-old child, teacher

Introduction

Climate change is the most crucial issue the world faces. It has an impact on all of humankind and the survival of our civilization. This is because climate change affects the way societies and economies around the world operate: from dangerous weather anomalies, through a drop in crop production, to an escalation of international conflicts. The consequences of climate change also pose a grave danger to the energy sector (damage to energy lines as a result of hurricanes and intense storms or a lack of cooling water for power plants), agriculture (decreased plant production due to the changeability of precipitation and frequent droughts), and transport (destruction of road infrastructure and vehicles because of temperature extremes or increased risk of accidents due to rapidly changing weather). Therefore, it is worth taking action to limit these consequences and introducing the issue very early on – in kindergarten – since our preschool-aged children will soon grow up to become adults implementing the principles of sustainable resource management in their own lives.

Climate change education for preschool children

The aim of climate change education for preschool-aged children is to help them understand climate change and show them that their

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actions and lifestyles make them accountable for the future of our planet. If preschoolers adopt environmentally friendly lifestyles, they will become teachers themselves, able to educate their parents. Thus, knowledge about climate change and its impact on the environment and humankind must be disseminated clearly and comprehensibly and children should be taught how to prevent climate change through everyday actions.

Good, effective climate change education for preschool children ought to be interdisciplinary: the topics must be selected at various levels of education and seen from different angles. All materials should be presented as a series of regular classes and as a years-long series of classes in preschools, starting at the age of 3 and continuing until the age of 6. The educational process should include experiences, discussions, trips, and tasks which combine various methods and offer the children a wide range of advantages. During the process, children ought to come in contact with nature (e.g., the learning through nature method), make observations and do scientific research, conduct critical analysis, discuss and reflect, cooperate, take responsibility, and learn autonomously (i.e., Roger Hart's Ladder of Participation [Hart, 2008]).

When implementing climate change education in kindergarten, the emphasis should be placed on existing, tested teaching methods and techniques based on a child-centered approach that allow the pupils to develop critical thinking and analytical skills (e.g., philosophical inquiry and systemic thinking development). Moreover, theoretical teaching should be supplemented by everyday practical application (Schwartz, 2012).

Method

The objective of the research was to determine the knowledge about climate and climate change among six-year-old children attending kindergartens within the city of Warsaw (Ursus district). Six hundred and nineteen children (309 girls and 310 boys) participated in the study, including 301 children (149 girls and 152 boys) from the city and 318 from the countryside (160 girls and 158 boys). All children participating in the study

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had the consent of their parents to do so. In addition, 60 teachers from 28 urban and 32 rural kindergartens took part in the research.

The research problem was formulated as the following question: What is the level of knowledge of six-year-olds about climate and climate change?

The following sub-problems detailed the main research problem:

1. Do preschool-aged children understand the term "climate"?
2. Do six-year-olds know the risks related to climate change?
3. Do preschool-aged children know how to take care of the climate?
4. What climate change-related didactic content is taught by preschool teachers?

In search of an answer to the main research problem, it was theoretically assumed that the climate-related knowledge of six-year-olds was substantial.

The following detailed hypotheses were adopted when justifying the choice of the research problem and in preparation for the research:

1. Preschool-aged children have a good understanding of the term "climate."
2. Six-year-olds know the risks related to climate change.
3. Preschool-aged children know how to take care of the climate.
4. Preschool teachers teach suitably selected climate change material.

The method used in the study was a diagnostic survey carried out with techniques such as a questionnaire and document analysis. The questionnaire was designed by the author and addressed to the study population. It was composed of six closed-ended questions which the children were to answer with either "yes," "no," or "I don't know." Additionally, in the case of four questions, the children were asked to justify their answers.

The analysis also covered documents: preschool activity registers and monthly work plans. In total, 60 class registers and 60 work plans were analyzed. The analysis covered a 6-month period (September 2021 to February 2022).

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Results

The first stage of the research was aimed at determining whether children had ever come across the term "climate." The results are presented in Table 1.

Table 1. Children's answers to the question of whether they had heard of the term "climate," by sex and place of residence

Environment	Number of children									
	Girls				Boys				Total	
	Yes		No		Yes		No			
	N	%	N	%	N	%	N	%	N	%
City	97	15.7	52	8.4	117	18.9	35	5.6	301	48.6
Countryside	97	15.7	63	10.2	95	15.3	63	10.2	318	51.4
Total	194	31.4	115	18.6	212	34.2	98	15.8	619	100

The data presented in Table 1 demonstrate that children who had come across the term "climate" constituted 65.6% of all the children, including 34.2% of the boys and 31.4% of the girls. The largest group amongst them were boys from the city (18.9%). The next largest groups were girls, both from the city and the countryside (15.7% each), and boys from the countryside (15.3%).

Subsequently, the children were asked if they knew what climate was. The results show that 62.8% of all children declared that they did, including 29.2% of the boys and 33.6% of the girls. The largest group amongst them were boys from the city (19.6%). The next largest groups were girls from the city (15.7%), boys from the countryside (14.2%), and girls from the countryside (13.5%). Here, it ought to be emphasized that 2.8% of the children claiming to be familiar with the term declared that they had never come across the term.

Next, the children who declared that they knew the term "climate" were asked to define it. The answers are presented in Table 2.

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Table 2. Children's understanding of the term "climate," by sex and place of residence

Children's answers	Number of children									
	City				Countryside				Total	
	Girls		Boys		Girls		Boys			
	N	%	N	%	N	%	N	%	N	%
Our environment, what we are surrounded by, nature	16	4.1	12	3.1	0	0	8	2.1	36	9.3
Weather conditions: rain, snow, sun, wind, ice, hail, clouds	9	2.3	15	3.9	11	2.8	16	4.1	51	13.1
Getting colder and warmer outside, depending on the location on the earth	12	3.1	25	6.4	5	1.3	11	2.8	53	13.6
Temperature, various temperatures around the world	5	1.3	4	1.0	5	1.3	10	2.6	24	6.2
Presence of the seasons of the year	11	2.8	14	3.6	10	2.6	9	2.3	44	11.3
Weather, changes in the weather around the world	33	8.4	46	11.8	35	9.0	31	8.0	145	37.2
Air	21	5.4	10	2.6	23	5.9	11	2.8	65	16.7
No answer	16	4.1	17	4.4	12	3.1	20	5.1	65	16.7

The responses provided in Table 2 show that the largest group of children (37.2%) understood climate as the weather and weather changes around the world. The second largest group (16.7%) believed that climate is air. The third group (13.6%) consists of children who understood climate as "getting colder and warmer outside, depending on the location on the earth." Somewhat fewer children (13.1%) reckoned that climate is made up of weather conditions such as rain, snow, sun, wind, ice, hail, and clouds. An even smaller group (9.3%) thought that climate is our environment, what we are surrounded by, or nature. The smallest group (6.2%) represents children who claimed that climate is temperature or various temperatures around the world. Climate as the weather or changes in the weather around the world was selected by the largest group of girls

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from the city (8.4%) girls from the countryside (9.0%), boys from the city (11.8%), and boys from the countryside (8.0%). The second largest group of girls from the city (5.4%) and from the countryside (5.9%) described climate as air. The second largest group of the boys from the city, in turn, understood climate as getting colder and warmer outside, depending on the location on the earth (6.4%), while the second largest group of boys from the countryside understood climate as weather conditions (4.1%). The data do not add up to 100% because the children were able to submit several options. We should emphasize here that among the children who had claimed to know what climate was, 16.7% failed to answer what climate was. The highest percentage in that group belonged to boys from the countryside (5.1%), followed by boys from the city (4.4%) and girls from the city (4.1%); the lowest percentage was for girls from the countryside (3.1%).

Next, the children were asked if climate was necessary. Most children (58.5%) said that climate was needed, including 28.9% girls (15.8% from the city and 13.1% from the countryside) and 29.5% boys (16.6% from the city and 12.9% from the countryside). The second largest group (35.7%) were children who did not know whether climate was needed. Amongst them were 18.3% girls (7.0% from the city and 11.3% from the countryside) and 17.6% boys (6.6% from the city and 11.0% from the countryside). The smallest group (9.7%) believed that climate was not needed. The group comprised 2.8% girls (1.3% from the city and 1.5% from the countryside) and 2.9% boys (1.3% from the city and 1.6% from the countryside).

The children who claimed that climate was needed were then asked what it was needed for. The results are presented in Table 3.

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Table 3. Children's answers to the question of what climate is needed for, by sex and place of residence

Children's answers	Number of children									
	City				Countryside				Total	
	Girls		Boys		Girls		Boys			
	N	%	N	%	N	%	N	%	N	%
To live, for people, animals, plants, nature development	50	13.8	45	12.4	39	10.8	33	9.1	167	46.1
No answer	48	13.3	58	16.0	42	11.6	47	13.0	195	53.9
Total	98	27.1	103	28.4	81	22.4	80	22.1	362	100

Table 3 shows that the majority of children who said that climate was needed could not address the question of why it was needed (53.9%), including 24.9% girls (15.8% from the city and 13.3% from the countryside) and 29.0% boys (16.0% from the city and 13.0% from the countryside). A minority (46.1%) claimed that climate was needed to live, for people, animals, plants, and nature development. This answer was provided by 24.6% girls (13.8% from the city and 10.8% from the countryside) and 21.5% boys (12.4% from the city and 9.1% from the countryside).

Subsequently, the children were asked if they had ever heard of climate change. About half of the respondents (49.3%) had heard about climate change, including 23.6% girls (11.8% from the city and 10.8% from the countryside) and 25.7% boys (13.6% from the city and 12.1% from the countryside). The other half (50.7%) had not heard about climate change. Amongst them were 26.3% girls (12.2% from the city and 141% from the countryside) and 24.4% boys (11.0% from the city and 13.4% from the countryside).

Those children who provided a positive answer to the previous question were asked to list some examples of climate change. The results are presented in Table 4.

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Table 4. Children's knowledge of examples of climate change, by sex and place of residence

Children's answers	Number of children									
	City				Countryside				Total	
	Girls		Boys		Girls		Boys			
	N	%	N	%	N	%	N	%	N	%
Storms, hailstorms, hurricanes, tornadoes	5	1.6	3	1.0	0	0	4	1.3	12	3.9
no seasonal changes, real winter, or snow; warm in the wintertime	14	4.6	11	3.6	15	4.8	19	6.2	59	19.2
Changeable weather, alternating hot and cold	8	2.6	8	2.6	8	2.6	6	2.0	30	9.8
Fires, e.g. in Australia	4	1.3	7	2.3	3	1.0	7	2.3	21	6.9
Melting glaciers	5	1.6	5	1.6	3	1.0	2	0.6	15	4.8
Floods	3	1.0	7	2.3	2	0.6	4	1.3	16	5.2
Droughts, dry fields	7	2.3	11	3.6	4	1.3	3	1	25	8.2
Global warming	16	5.2	17	5.6	17	5.6	22	7.2	72	23.6
No answer	34	11.2	40	13.1	26	8.5	28	9.2	128	42.0

Table 4 demonstrates that despite the fact that 49.3% of the children had heard about climate change, 42.0% could not give any specific examples of it, including 11.2% girls from the city, 8.5% girls from the countryside, 13.1% boys from the city, and 9.2% boys from the countryside. Of all the children who listed examples of climate change, the largest group (23.6%) were those who mentioned global warming. Changes were specified by 5.2% girls from the city, 5.6% girls from the countryside, 5.6% boys from the city, and 7.2% boys from the countryside. The second most often listed change was the disappearance of the seasons, real winter, and snow, as well as warm winters (19.2%). The third most popular climate change example was changeable weather, alternating hot and cold, followed by droughts and dry fields (8.2%), fires, such as in Australia (6.9%), floods (5.2%), melting glaciers (4.8%), and storms, hailstorms, hurricanes, and

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tornadoes (3.9%). The results do not add up to 100% because the children were able to list several examples of climate change.

Then, the children were asked if one needed to take care of the climate and what should be done to prevent climate change. To this question, 62.8% of the children provided an affirmative answer: 30.4% girls (17.4% from the city and 13.0% from the countryside) and 32.4% boys (18.7% from the city and 13.7% from the countryside). Only 4.4% of the children said that one did not need to take care of the climate or prevent climate change, including 2.1% girls (1.1% from the city and 1.0% from the countryside) and 2.3% boys (1.5% from the city and 0.8% from the countryside). On the contrary, 32.8%, including 17.5% girls (5.5% from the city and 12.0% from the countryside) and 15.3% boys (4.4% from the city and 10.9% from the countryside), said they did not know the answer.

The children who answered "yes" to the previous question were asked how the climate should be taken care of and how climate change could be prevented. The results obtained are presented in Table 5.

Table 5. Children's answers to the question of how climate should be taken care of and how climate change could be prevented, by sex and place of residence

Children's answers	Number of children									
	City				Countryside				Total	
	Girls		Boys		Girls		Boys			
	N	%	N	%	N	%	N	%	N	%
Take care of plants, animals, and bees	9	2.3	18	4.6	4	1.0	5	1.3	36	9.2
Construct fewer factories	0	0	1	0.2	0	0	3	0.8	4	1.0
Save water	7	1.8	7	1.8	9	2.3	11	2.8	34	8.7
Clean up forests and collect waste	9	2.3	1	0.2	4	1.0	6	1.5	20	5.0
Do not pollute the environment; do not throw litter to rivers, lakes, and seas; do not dump waste in forests	16	4.1	28	7.2	20	5.1	26	6.7	90	23.1

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Use paper and fabric bags	5	1.3	2	0.5	4	1.0	2	0.5	13	3.3
Do not burn waste or plastic in stoves or fires	12	3.1	24	6.1	3	0.8	5	1.3	44	11.3
Limit car and motor use, ride the bike more often	17	4.4	7	1.8	6	1.5	11	2.8	41	10.5
Save energy	14	3.6	4	1.0	11	2.8	7	1.8	36	9.2
Sort and separate waste	17	4.4	22	5.6	14	3.6	15	3.9	68	17.5
Do not cut down trees, plant more bushes and trees	5	1.3	10	2.6	7	1.8	11	2.8	33	8.5
Do not smoke cigarettes	1	0.2	3	0.9	1	0.2	0	0	5	1.3
Buy a new boiler, use lignite for heating, use solar energy	2	0.5	2	0.5	3	0.8	3	0.8	10	2.6
Play with wooden toys	0	0	0	0	1	0.2	0	0	1	0.2
No answer	67	17.2	57	14.7	48	12.3	44	11.3	216	55.5

Table 5 demonstrates that more than half (55.5%) of the children who confirmed that the climate needs our care and attention and that we have to prevent climate change had no response to the question of how to do so. Amongst them, there were 29.5% girls (17.2% from the city and 12.3% from the countryside) and 26.0% boys (14.7% from the city and 11.3% from the countryside). The next largest group (23.1%) said that in order to take care of the climate and prevent climate change, one should not pollute the environment, throw litter into rivers, lakes, and seas, or dump waste in forests. This answer was given by 9.2% girls (4.1% from the city and 5.1% from the countryside) and 13.9% boys (7.2% from the city and 6.7% from the countryside). Next, 17.5% children found waste sorting to be the correct method, including 8.0% girls (4.4% from the city and 3.6% from the countryside) and 9.5% boys (5.6% from the city and 3.9% from the countryside). The next largest group, 11.3%, including 3.9% girls (3.1% from the city and 0.8% from the countryside) and 7.4% boys (6.1% from the city and 1.3% from the countryside), said that to take care of the climate or prevent climate change, one should not burn trash or plastic in boilers or fires. Another 10.5% of the children believed that reducing car and motorcycle use

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and increasing bicycle use could help, including 5.9% girls (4.4% from the city and 1.5% from the countryside) and 4.6% boys (1.8% from the city and 2.8% from the countryside). In addition, some children pointed out that one ought to take care of plants, animals, and bees (9.2%), save energy (9.2%), save water (8.7%), not cut down trees or plant more bushes and trees (8.5%), clean up forests and collect waste (5.0%), use paper and fabric bags (3.3%), buy a new boiler, use lignite for heating, or use solar energy (2.6%), not smoke cigarettes (1.3%), construct fewer factories (1.0%), and play with wooden toys (0.2%). The results do not add up to 100% because children provided more than one answer.

Similarly, the children who answered that there is no need to take care of the climate or prevent climate change were asked why. The results are presented in Table 6.

Table 6. Children's answers to the question of why one does not need to take care of the climate or prevent climate change, by sex and place of residence

Children's answers	Number of children									
	City				Countryside				Total	
	Girls		Boys		Girls		Boys			
	N	%	N	%	N	%	N	%	N	%
It can take care of itself	1	3.7	3	11.1	0	0	0	0	4	14.8
One cannot control the weather	0	0	1	3.7	0	0	0	0	1	3.7
Climate is a work of nature and one does not need to be taken care of	0	0	1	3.7	0	0	0	0	1	3.7
It is unnecessary	1	3.7	0	0	0	0	0	0	1	3.7
The weather changes on its own	1	3.7	3	11.1	0	0	0	0	4	14.8
It is impossible to take care of the climate	3	11.1	5	18.5	0	0	0	0	8	29.6
There are too many factories	0	0	0	0	1	3.7	0	0	1	3.7

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We are incapable of doing anything	0	0	0	0	0	0	1	3.7	1	3.7
No answer	2	7.4	4	14.8	7	25.9	3	11.1	16	59.2

Table 6 reveals that 59.2% of the children who said that the climate does not need care and climate change does not require prevention failed to explain why. Amongst them, there were 33.3% girls (7.4% from the city and 25.9% from the countryside) and 25.9% boys (14.8% from the city and 11.1% from the countryside). Another 29.6% of the children, of which 11.1% were girls (only from the city) and 18.5% boys (also only from the city), claimed that the climate does not need care and climate change does not require prevention because it is impossible to do so. The next largest group of children – 14.8% (3.7% girls and 11.1% boys, only from the city) – reckoned that the weather changes on its own. The same percentage of children, 14.8% (3.7% girls and 11.1% boys, from the city), said that the climate takes care of itself. Individual children (3.7%) held that the climate and climate change did not need attention because the weather could not be controlled, climate was a work of nature and did not need any care, there were too many factories, or we are incapable of doing anything. The data do not add up to 100% because the children were able to provide several answers each.

The final question addressed to the study group was intended to determine whether the children's preschool teachers discussed climate and climate change with them. About half (50.3%) of the children said that their preschool teachers had discussed the climate and climate change with them. This answer was provided by 24.5% girls (12.0% from the city and 12.5% from the countryside) and 25.8% boys (14.5% from the city and 11.3% from the countryside).

Next, the number of teachers implementing climate change education was established in an analysis of the class registers and work plans of 60 teachers. The data demonstrate that climate change education issues were raised by 65% of the respondents' teachers, including 35.0% in urban kindergartens and 30% in rural kindergartens.

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The following stage of the research was to determine how many climate change topics were introduced by the respondents' teachers. All the data is presented in Table 7.

Table 7. Number of climate change education topics covered by teachers, by place of residence

Number of topics	Number of teachers					
	City		Countryside		Total	
	N	%	N	%	N	%
1	5	12.8	4	10.2	9	23.0
2	6	15.4	4	10.2	10	25.6
3	3	7.7	2	5.1	5	12.8
4	2	5.1	6	15.4	8	20.5
5	2	5.1	1	2.6	3	7.7
6	0	0	1	2.6	1	2.6
8	1	2.6	0	0	1	2.6
10	1	2.6	0	0	1	2.6
19	1	2.6	0	0	1	2.6
Total	21	53.9	18	46.1	39	100

The data collected in the course of the research and presented in Table 7 show that most teachers (25.6%) introduced two climate change education topics over the six-month study period (15.4% teachers from the city and 10.2% teachers from the countryside). The second largest group (23%) were teachers who covered one topic (12.8% from the city and 10.2% from the countryside). The third group (20.5%) covered four topics (5.1% from the city and 15.4% from the countryside). The next group (12.8%) were teachers who covered three topics (7.7% from the city and 5.1% from the countryside), and teachers (7.7%) who introduced five topics (5.1% in the city and 2.6% in the countryside). Individual teachers (2.6%) covered six topics (1 teacher in the countryside) and 8, 10, and 19 topics (one teacher in the city each). Both rural and urban areas were

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dominated by teachers who covered two climate-related topics within the study period (15.4% and 25.6%, respectively).

The last stage of the research was to gain insight into the type of climate change education topics introduced by the teachers. The results are presented in Table 8.

Table 8. Climate change education topics covered by the teachers, by place of residence

Topic	Number of teachers					
	City		Countryside		Total	
	N	%	N	%	N	%
Clean air around us	5	12.8	5	12.8	10	25.6
Forests – the Earth's lungs	3	7.7	1	2.6	4	10.3
Motor fashion – advantages and disadvantages of motor industry development	2	5.1	0	0	2	5.1
Waste sorting	12	30.8	9	23.0	21	53.8
Water as a source of life, water saving, water and climate change	12	30.8	4	10.2	16	41.0
Energy saving and the climate	6	15.4	3	7.7	9	23.1
The fundamentals of the climate every child knows about	5	12.8	3	7.7	8	20.5
Climate and climate change	6	15.4	9	23.0	15	38.4
The weather and consequences of its change	10	25.6	2	5.1	12	30.7
Ecology – we take care of our plant, Little Ecologist Program, We have Ecology's phone number, The Code of the Little Ecologist	19	48.7	11	28.2	30	76.9
Solar energy – solar panels and photovoltaic installations	0	0	1	2.6	1	2.6

Table 8 indicates that the largest group of teachers (76.9%, including 48.7% from the city and 28.2% from the countryside) covered ecology-related topics: Ecology – we take care of our plant, Little Ecologist

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Program, We have Ecology's phone number, and the Code of the Little Ecologist. The next largest groups, representing 53.8% (including 30.8% from the city and 23.0% from the countryside) of teachers and covering waste sorting, and 41.0% of teachers (30.8% in the city and 10.2% in the countryside) introducing water as a source of life, water saving, and water and climate change. This was followed by 38.4% of teachers (15.4% in the city and 23.0% in the countryside) pursuing topics related to climate and climate change, 30.7% of teachers (25.6% in the city and 5.1% in the countryside) teaching the weather and consequences of its change, 25.6% of teachers (12.8% in the city and 12.8% in the countryside) covering clean air around us, and finally 23.1% of teachers (15.4% in the city and 7.7% in the countryside) teaching energy saving and the climate. In addition, the teachers participating in the research covered the following topics: the fundamentals of climate every child knows about (20.5% of the respondents – 12.8% in the city and 7.7% in the countryside), Forests – the Earth's lungs (10.3% – 7.7% in the city and 2.6% in the countryside), motor fashion – advantages and disadvantages of motor industry development (5.1% – only teachers in the city), and solar energy – solar panels and photovoltaic installations (2.6% – only teachers in the countryside). The largest group of teachers from both the city and the countryside (48.7% and 28.2%, respectively) were those who pursued ecology-related subjects: ecology – we take care of our plant, Little Ecologist Program, We have Ecology's phone number, and the Code of the Little Ecologist.

Conclusions

The research presented above is consistent with the general and wide-ranging discussion about climate change education. The major goal of the study was to assess the implementation of climate change education in selected kindergartens. It consisted of diagnosing children's knowledge about climate and climate change and verifying preschool teachers' class register records and monthly work plans regarding climate change education.

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The study revealed that despite the preschool teachers who do cover climate education in their classes, in the majority of classrooms, climate-related issues rarely appear. It is thus fair to say that the awareness of sustainable development among these teachers is not satisfactory. This could be the result of a widespread consensus that preschool age is too early to introduce climate education. Nonetheless, numerous examples of good practices in the literature on the subject do not support this suggestion.

The analysis of the children's awareness of the climate and climate change demonstrated that even though most children have heard of the issues, they cannot support their knowledge with concrete examples. Their insight indicates, at most, a superficial environmental education targeted at helping them adopt positive attitudes towards nature. Environmental awareness-raising and teaching about climate change are two entirely different things, to which waste sorting is only indirectly related. This shows that climate change education in kindergartens is not conducted in a satisfying manner.

These shortcomings can be ascribed to a lack of preschool teacher training with respect to climate education. The foundations of higher education are set by the National Qualifications Framework issued by the Ministry of Science and Higher Education, comprised of guidelines pertaining to curricula in individual fields of study at higher education institutions. However, in addition to the Framework, every university has full autonomy with respect to developing individual curricula. The term "sustainable development" and related issues can be identified mainly in the areas of natural sciences, agriculture, forestry, and veterinary sciences. As far as higher education institutions training future teachers are concerned, only the social competencies to be achieved are clearly outlined. The issue of sustainable development in the teacher training has been treated cursorily, mostly through the idea of lifelong and independent learning. The National Qualifications Framework does not require future teachers to be familiar with the idea of sustainable development or to understand the issues at the interface between the environment, the economy, and society. The most promoted values are, above all, respect for the environment and cultural tolerance.

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Moreover, in accordance with the Core Curriculum for Preschool Education, children should acquire multiple cognitive, physical, and social skills. What is striking is the absence of natural sciences topics, especially in comparison with the emphasis on the family and national (Polish) material. There are two exceptions, though. As part of a child's emotional development, they should develop a sensitivity towards and sympathy with animals, be aware of the fact that animals can feel, and show them kindness and concern. In addition, children should be able to use terms related to natural phenomena, such as rainbows, rain, storms, leaves falling, seasonal bird migration, blossoming, or water freezing; terms related to the life of animals, plants, people in the environment; and the use of natural goods, such as mushrooms, fruits, and herbs. At the same time, a child should see the emotional value of the environment as a source of aesthetic satisfaction. In other words, if a child can comprehend that nature exists, they must admire it and be delighted rather than concerned about its fate. When the Ministry of National Education developed the core curriculum, it established the skills which children were to acquire. Teachers find it difficult to meet the objectives of the curriculum due to its immensity. As a result, topics related to climate and climate change are often omitted.

The research demonstrates that preschool teachers are not aware of the fact that the present generation of preschool children will have an impact on the future of our planet and that their decisions in the future will shape the behavior of producers which impact ecology and CO_2 emissions. The lack of sustainable development education among preschool teachers and of an obligation to introduce climate change education in their classes leads to poor environmental awareness among children and insufficient foundations of ecology in the nation's youth. Therefore, it is recommended that teachers promote the principles of sustainable development and foster an awareness of the effect of human activity on our environment and climate change. Close contact with nature, establishing a relationship with it, or finding favorite spots in forests may have a lasting impact on environmental protection in the future and may develop environmentally friendly attitudes.

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References

Currie, J., & Deschênes, O. (2016). Children and climate change. *The Future of Children*, *26*(1), 3–9. https://doi.org/10.1353/foc.2015.0000

Ginsburg, J. L., & Audley, S. (2020). "You don't wanna teach little kids about climate change": Beliefs and barriers to sustainability education in early childhood. *International Journal of Early Childhood Environmental Education*, *7*(3), 42.

Hart, R. A. (2008). Stepping back from "The Ladder": Reflections on a model of participatory work with children. In A. Reid, B. B. Jensen, J. Nikel, & V. Simovska (Eds.), *Participation and learning: Perspectives on education and the environment, health and sustainability* (pp. 19–31). Springer.

Schwartz, S. H. (2012). An overview of the Schwartz theory of basic values. *Online Readings in Psychology and Culture*, *2*(1), 1–20. https://doi.org/10.9707/2307-0919.1116

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