

The potential for education programmes to create awareness about climate change among youth: a study of climate change knowledge in small towns in Poland

Abstract

A critical component of climate change mitigation policy is to develop a sense of responsibility for climate change in children and young people. This study assesses the level of awareness among young people in small towns regarding climate change. The study also explores whether local climate change programmes involve urban communities in educational activities related to climate change and if these programmes have a real impact on the climate change awareness of young people. The research reports on a survey questionnaire of 195 young people in three types of secondary schools in the small town of Staszów, Poland. Findings suggest that there is no correlation between the type of school and the level of climate change awareness. Additionally, the study found that young people have a high level of awareness regarding local environmental activities.

Keywords

Climate change • social activities • small town • Staszów • chi-square test • correspondence analysis

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Received: 3 June 2024

Accepted: 12 November 2024

Introduction

Current urbanization trends and pro-climatic activities

According to a report by the World Meteorological Organization (WMO 2024), climate change is increasing at a fast pace. The consequences of these changes will strongly impact future generations, particularly the current youth. According to the European Commission, 2030 is the furthest predictable date for prognosis. Therefore, it is crucial to provide climate education to young people who will be at the beginning of their working life in 2030 and will have a significant impact on shaping potential changes (Węgiel et al. 2024).

According to data from the European Commission (Schiavina et al. 2023), 6.8 billion people, which accounts for 87% of the world's population, resided in urban areas in 2020. This includes 3.4 billion individuals, or 43% of the population, who lived in small towns and suburbs of large cities. In Europe, 244.3 million people, or 32.7% of the population, lived in small towns and suburbs, while in Poland, 11.33 million people, or 29.5% of Poles, lived in such areas. Notably, in Europe, large cities had only 13% more inhabitants in 2020 than small cities and suburbs with a similar density structure. In Poland, the difference is even lower, amounting to only 3.5%.

Awareness of the need to introduce changes in energy production, waste management and water management is gradually increasing in Polish society (CEBOS 2021). The increase in understanding of climate action is related to top-down socio-political activities. For example, EU programmes support activities to counteract climate change at the municipal and household levels. These programmes finance innovations that use renewable energy sources and individual solutions in water and sewage management. Awareness changes are supported by

legal and economic factors. Additionally, growing awareness is shaped by social patterns. This trend is particularly noticeable among younger Poles who are more conscious of the need to preserve resources for future generations (Wawer et al. 2022).

Future urbanization trends and the promise of small cities to address the effects of climate change

Global trends suggest a continued increase in urban populations. This significant increase in urbanization is due to the growing number of large, medium and small cities in Poland. As of 1 January 2024, there were 1,013 cities in Poland. Nearly 80% of the population resides in small towns, the majority of which have fewer than 20,000 inhabitants. Furthermore, over 60% of city residents live in towns with fewer than 10,000 inhabitants (Statistics Poland 2023).

Contemporary aspirations in the field of urban transformation, such as the trend of fifteen-minute cities or other initiatives aimed at improving quality of life, accessibility and social relations, present new opportunities for small cities (Ciesielski & Wójtowicz-Wróbel 2019). Due to their relatively small area¹ (Statistics Poland 2021), excellent pedestrian accessibility (Lamprecht 2020) and the close proximity of open areas, small towns have greater potential than large centres to be self-sufficient (Bański 2021; Sosnowski 2022). Small towns have a higher potential to become cities that are resistant to the effects of climate change (Hume et al. 2021; Ljubenović et al. 2020). Therefore, it is timely to conduct research on the level of awareness among the inhabitants of these centres regarding the need to take adaptive actions in relation to climate change.

¹According to Central Statistical Office data from 2021, the average area of a city with a population of less than 20,000 is 1,452.05 hectares (Statistics Poland 2023).

Contemporary actions to counteract climate change through targeted activities in small towns and their surroundings are crucial. Increasing climate awareness among young people in small cities is an investment in the future and a long-term strategy for addressing the negative effects of climate change.

Generational changes

Changes in societal awareness concerning key social issues are often linked to generational changes, occurring approximately every 20 to 25 years with the replacement of generational cohorts (Bitterman & Hess 2020; Hysa 2016). Consequently, it is possible to introduce new approaches to shaping climate education and outreach over intervals of more than twenty years. However, the dynamics of changes in awareness over a broader time perspective are under discussion. In recent centuries, periods of social change have spanned well over two decades, so they have had relatively little impact on changing people's lives. Today, we can observe dynamic social changes at a faster pace. In recent decades, these changes have rapidly accelerated and have had an impact on supra-individual activities (Szymański 2021). Therefore, transformation, broadly understood as a change in the population's awareness of various issues, does not occur in a vacuum and is, as Anna Karnat-Napieracz writes, strongly related to the impact of various external stimuli (Karnat-Napieracz 2009). One of these types of stimuli is climate change, the effects of which are increasingly visible around us (Aslanova 2018). Adapting societies to climate change requires more than just current and immediate solutions. Shaping climate attitudes and increasing climate awareness in future generations is crucial. Therefore, programmes supporting the ecological balance must effectively target younger generations – not only generations currently making decisions about priorities around the world.

To effectively implement actions aimed at counteracting climate change on a long-term basis, it is necessary to raise awareness among the younger generations.

Characteristics of the Staszów Municipality

Staszów is an example of a small Polish town that is not significantly influenced by a large city. It is a local centre for the surrounding rural communities in terms of administration, services and education. There are three types of secondary schools providing education at various levels. Due to this, Staszów was selected as the research site (Ciepiela et al. 2019).

The Staszów municipality is an urban–rural community located in the Świętokrzyskie Voivodeship in Staszów Poviát. In June 2023, the population of the municipality was 24,550 people but this has steadily decreased in recent years² (Statistics Poland 2023). The Staszów municipality is also characterized by a lower total per capita income than other municipalities of this type in the voivodeship and poviát.

The Central Statistical Office collects and analyses data on municipalities' expenditures, which are then classified by 'section'. This data shows that Staszów has allocated a larger portion of its total expenses to 'Section 900 – Municipal Management and Environmental Protection' compared to other similar communes in the voivodeship and the poviát, despite experiencing a population loss in the last five years. Section 900 expenditures include categories such as '90001 for wastewater management and water protection' and '90005 for air and climate protection' (Statistics Poland 2023). Staszów's expenditure over the last five years exceeded the average for urban–rural communes in the

voivodeship and poviát in section 90001. However, expenses for section 90005 appeared for the first time in the Staszów commune budget in 2021. In both 2021 and 2022, the expenses were 17 times lower than the voivodeship average and 38 times lower than the poviát average.

As District Examination Commission (2023) reports for 2022, the municipality had two high schools, attended by 622 students combined, two vocational schools with 269 students combined and two technical schools with 1,197 students combined. In the 2022–2023 academic year, 1,202 students from outside Staszów attended secondary schools in the town, while 161 students from Staszów chose to attend schools outside the municipality. In the Staszów municipality, the net enrolment rate³ in high schools is 58.9% (the average in urban–rural municipalities is 42.1%), in vocational schools it is 25.0% (the average is 18.4%) and in technical schools it is 91.0% (the average is 56.6%). The exam pass rates are used to determine the general level of youth education. In this municipality in 2023, the pass rate of the secondary school examination was 88.0% (in the voivodeship 93.1%), and for both parts combined of the vocational examination, it was 69.5% (in the voivodeship 71.6%).

Methods

The objective of this study was to assess the awareness level and access to education in the field of climate change activities among school-aged youth (15–19 years old) in the Staszów municipality. A similar research method using chi-square testing was employed in past research (Skeiryte et al. 2022), which concerned a slightly different approach. The study compared the perception of climate change, levels of responsibility and differences in pro-climate activities among EU countries and generations. However, it did not consider the size of cities or the type of schools attended by the young people. The study found that high awareness of climate change does not necessarily translate into action among young people. It was observed that young people do not see themselves as responsible for taking climate action; rather, they assign this responsibility to the economic sector, government and climate activists. In reference to 2020, other researchers obtained similar results (Wu et al. 2020). Nevertheless, a denial of climate change would be considered an extreme attitude (Oriowska 2020). Additionally, research by Tarkowski R. and Luboń shows that adults with lower levels of education have lower ecological awareness (Tarkowski et al. 2014). Against this background, the study examined the climate change awareness of young residents in small towns in Poland across various types of schools. The results suggest that research conducted on a general scale may not be reflective of the attitudes of young people in small towns.

The methodology used included desk research to provide background information, followed by a survey questionnaire administered to students in grades I–III across three different types of secondary schools. The questionnaire consisted mostly of closed questions on a simplified five-point Likert scale where 1 indicated 'strongly agree' and 5 indicated 'strongly disagree'. One of the questions allowed for multiple answers (Figure 1, question 2). The chi-square test of independence was used to compare responses on the Likert scale for gender and selected types of schools. Statistical significance in differences in respondents' answers by gender was tested using the chi-square test. Additionally, correspondence analysis was employed as a descriptive and exploratory technique to observe the co-occurrence of responses between selected questions representing groups of issues. The survey questionnaire included basic demographic information

²The emigration of residents is linked to the shortage of job opportunities, particularly for highly skilled professionals. Many young people attend academic centres such as Warsaw, Cracow or even Kielce, and often find employment there. The high unemployment rate and the closure of larger workplaces in the municipality exacerbate this problem.

³The ratio of young people aged 15–18 attending general secondary schools to the total number of people aged 15–18. The enrolment rate is higher than 100% when students commute from outside the studied territorial unit.

Table 1. The survey included questions about respondents' exposure to information on climate change and sustainability

Education on adaptation to climate change (general knowledge)	1. I have been exposed to information about cities adapting to climate change
	2. If you have been exposed to information about the adaptation of cities to climate change, please indicate in which form (multiple choice: school, TV, Internet, social networks – FB, Instagram, etc. – educational programmes, other).
	3. I have been exposed to information about education and information programmes related to climate issues (eco-municipality, biodiversity, smog, water management, waste management).
Accessibility to education on adapting to climate change in a specific town (city)	4. I have been exposed to information about climate change adaptation programmes and projects in my hometown (city).
	5. I have been exposed to information about the "Clean Air Programme" in my hometown.
Climate change awareness, understood as the overall human impact on the environment	6. The impacts of climate change diminish the quality of life in urban areas (e.g. thermal comfort).
	7. In my hometown, I can see the effects of climate change (heatwaves, droughts, heavy rain, air pollution).
	8. Residents can significantly reduce the effects of climate change through actions such as waste segregation, water retention and the use of renewable energy sources.

Source: own elaboration

(gender and age) for survey respondents, and questions about respondents' exposure to information about climate change and sustainability (see Table 1).

Results

In Poland, there are three main types of secondary schools: high school (general secondary school), technical schools and vocational schools. The study covered 195 students from a secondary school, a technical secondary school and a first-cycle vocational school.⁴ Responses were provided by 100 men, 88 women and 7 people who defined their gender as non-binary. Figure 1 presents graphical summaries of responses to individual questions (the data is given in percentages).

Analysing the statistical significance of differences in respondents' answers by gender (the 'non-binary' gender was not included due to the small sample size), the chi-square test revealed statistically significant differences in only two questions:

- The impacts of climate change diminish the quality of life in urban areas (e.g. thermal comfort).
- In my hometown, I can see the effects of climate change (heatwaves, droughts, heavy rain, air pollution).

However, only the Pearson chi-square test confirmed the hypothesis regarding the effects of climate change, while the N-W chi-square test rejected it.

Tables 2 and 3⁵ suggest that a greater share of women responded with 'I strongly agree' or 'I agree', while a greater share of men disagreed or strongly disagreed with both questions: 'Climate change has an impact on the comfort of living in cities (e.g. thermal comfort)' and 'In my hometown, I can see the effects of climate change (heatwaves, droughts, heavy rains, air pollution).'

To analyse the survey results further, we examined the statistical significance of the differences in responses based on the type of school the respondent attended. The difference was statistically significant for the following questions:

⁴The research was conducted at the S.Staszic School Complex (technical school and vocational school) and the S. Wyszyński High School in Staszów.

⁵The colour red indicates the gender for which there was a higher proportion of responses.

Table 2. The share of individual answers for the question 'Climate change has an impact on the comfort of living in cities (e.g. thermal comfort)' was compared by gender

No.	Female (%)	Male (%)
1	26.1	18.0
2	23.9	22.0
3	19.3	18.0
4	17.0	20.0
5	13.6	22.0

Source: own elaboration

Table 3. Responses compared by gender for the question 'In my hometown, I can see the effects of climate change (heatwaves, droughts, heavy rains, air pollution).'

No.	Female (%)	Male (%)
1	23.9	19.0
2	44.3	25.0
3	22.7	21.0
4	8.0	22.0
5	1.1	13.0

Source: own elaboration

- I have been exposed to information about the adaptation of cities to climate change.
- I have been exposed to information about education and information programmes related to climate issues (eco-municipality, biodiversity, smog, water management, waste management).



Figure 1 Distribution of respondents' answers by gender. Source: own elaboration, 2024.

Table 4. Comparison of individual response shares by school type for the question 'I have been exposed to information about cities adapting to climate change'

	Vocational schools	High schools	Technical schools
1	6.5	13.8	9.1
2	12.8	22.0	30.8
3	61.3	31.2	20.0
4	12.9	19.3	21.8
5	6.5	13.7	18.1

Source: own elaboration

Table 5. Comparison of individual response shares by school type for the question 'I have been exposed to information about education and information programmes related to climate issues'

	Vocational schools	High schools	Technical schools
1	38.7	21.1	12.7
2	25.8	46.8	30.9
3	22.6	12.8	23.6
4	3.2	14.7	14.5
5	9.7	4.6	18.2

Source: own elaboration

Table 6. Comparison of individual response shares by school type for the question 'I have been exposed to information about climate change adaptation programmes and projects in my hometown (city).'

	Vocational schools	High schools	Technical schools
1	19.4	10.1	12.7
2	25.8	27.5	21.8
3	38.7	16.5	16.4
4	6.5	38.5	21.8
5	9.7	7.3	27.3

Source: own elaboration

Explanation of the symbols used

19.4	The largest value in the row (the highest share of responses in the compared schools)
38.7	Largest value in the column (highest share of responses by school type)

- I have been exposed to information about climate change adaptation programmes and projects in my hometown (city).
- The impacts of climate change diminish the quality of life in urban areas.
- In my hometown, I can see the effects of climate change (heatwaves, droughts, heavy rain, air pollution).
- Residents can significantly reduce the effects of climate change through actions such as waste segregation, water retention and the use of renewable energy sources.

Table 7. Comparison of individual response shares by school type for the question 'The impacts of climate change diminish the quality of life in urban areas'

	Vocational schools	High schools	Technical schools
1	22.6	38.5	27.3
2	38.7	34.9	27.3
3	19.4	16.5	27.3
4	9.7	8.3	5.5
5	9.7	0.9	12.7

Source: own elaboration

Table 8. Comparison of individual response shares by school type for the question 'In my hometown, I can see the effects of climate change (heatwaves, droughts, heavy rains, air pollution).'

	Vocational schools	High schools	Technical schools
1	19.4	23.9	18.2
2	19.4	41.3	23.6
3	12.9	20.2	29.1
4	25.8	11.0	21.8
5	22.6	3.7	7.3

Source: own elaboration

Table 9. Comparison of individual response shares by school type for the question 'Residents can significantly reduce the effects of climate change through actions such as waste segregation, water retention, and the use of renewable energy sources.'

	Vocational schools	High schools	Technical schools
1	38.7	59.6	40.0
2	35.5	28.4	30.9
3	16.1	5.5	14.5
4	3.2	5.5	5.5
5	6.5	0.9	9.1

Source: own elaboration

The distribution of responses by school type is presented below for questions that showed statistically significant differences based on school type.

The chi-square test was used to examine agreement, as it is most often used to test the independence of two qualitative variables. Upon analysing the responses (refer to tables 4–9), it is challenging to identify a clear pattern for similar or more in-depth questions. Only in the first two questions, listed in tables 4 and 5, is the response 'I agree' dominant in technical schools.

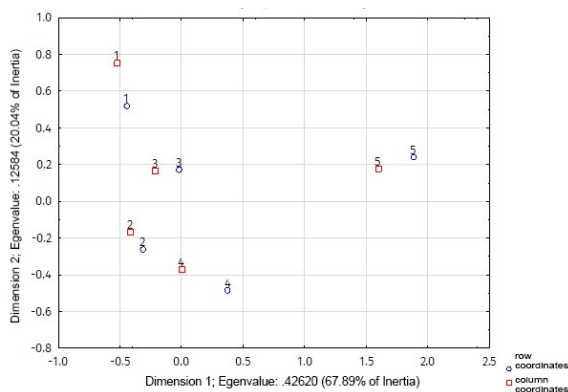


Figure 2. Summary of responses to questions 3 and 4
Source: own elaboration

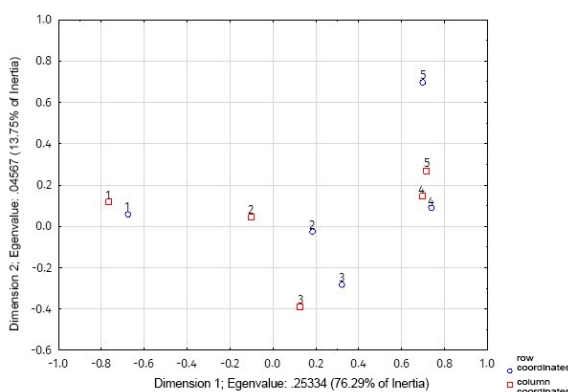


Figure 3. Summary of responses to questions 6 and 7
Source: own elaboration

For questions 1 to 3 regarding knowledge about climate change and related programmes, there was a convergence of extreme answers. For example, when comparing questions 1 and 3, respondents either strongly agreed or strongly disagreed with both.

The responses overlapped for questions 3 'I have been exposed to information about education and information programmes related to climate issues (eco-municipality, biodiversity, smog, water management, waste management)' and 4 'I have been exposed to information about climate change adaptation programmes and projects in my hometown (city)' (see Figure 2).

Respondents who were very strongly and decisively exposed to educational programmes (Figure 2) also perceive climate change very clearly and distinctly. Furthermore, responses exhibit similar patterns regarding the impact of climate change on quality of life and perception of climate change (see Figure 3). It is worth mentioning that youths who have clearly noticed the effects of climate change in their city also strongly agreed that residents can have an influence on reducing the effects of climate change.

Discussion and Conclusions

In scientific discourse, the prevailing opinion is that the level of climate awareness in Polish society is low (Bokwa et al. 2022) and knowledge in this area among young people is incomplete. However, it should be noted that young people are more likely than older people to declare a lack of knowledge on this topic. In view of these observations, the research presented in this article was carried out in the 15–19 age group. This made it possible to confirm the assumptions made. The research investigated the development of climate awareness among young people in small towns, considering different types of schools. Such research has not been carried out before. Our analysis of survey responses produces the following conclusions:

- Although young people claim to be aware of educational programmes on climate change, this does not necessarily translate into knowledge about how to implement climate change strategies and practices in their own towns.
- Survey results suggest that there are distinct attitudes about the impact of climate change. Accordingly, it can be concluded that young people observe the effects of climate change in their places of residence and recognize the important role of city residents in reducing its effects.
- There are discernible patterns in the responses to individual survey questions based on the type of school attended by respondents. However, these patterns do not form a cohesive image of the level of climate change awareness or its absence. Additionally, there is no correlation between the type of school and the level of climate awareness.
- In each group of questions, young people tend to express extreme attitudes (either strongly agreeing or disagreeing) – more frequently than moderate attitudes – concerning their knowledge about climate change concerns.
- Respondents are more aware of the necessity for climate protection activities on a local scale than on a geographically larger scale.

The research reported in this article confirms the need to programmatically expand educational activities that increase awareness of climate change. The extreme attitudes of young people, combined with the lack of a coherent picture of the level of awareness regarding the need to act on climate change, clearly suggest the need for both further research and the development of comprehensive educational programmes to expand and enhance young people's knowledge about climate protection concerns.

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