

Development of Students' Civic and Ecological Competences

Analytical report

Introduction

The analysis is part of the activities of the *Eco-Civic Awareness* (ECA) Erasmus+ project (2023-1-BG01-KA220-SCH-000160813). It presents the results of a study of the competences of students from age 7 to age 11 in terms of *Civic competences (Part A)* and *Ecological competences (Part B)*. The students are from the four partner countries in the project - Bulgaria, Latvia, Portugal and Turkey.

The aim of the analysis is to compare the students' responses before and after participating in the training activities from the *Civic and Environmental Education* (CEE) training course developed under the ECA project, in order to establish the headway in students' development and the extent to which the indicators previously set for the project have been achieved.

A total of 760 students participated in the study in the initial stage of the project and 1070 students in the final phase - after the trainings have been conducted. The distribution of the number of participants by country is visible in the table below.

Table 1. Number of participants per partner country

Project partner country	Number of students who responded to the questionnaire at the beginning of the project	Number of students who responded to the questionnaire at the end of the project
Bulgaria	259	245
Latvia	104	200
Portugal	224	226
Turkey	173	399
Total:	760	1070

Procedure for collecting data for the implementation of project indicators

The data were collected through a specially developed questionnaire researching both civic and environmental competences of students, and consistent with the project's goals and indicators. Respondents filled in one questionnaire before the CEE training course activities, and another

questionnaire with the same questions – after the trainings. Questionnaires were available in students' mother tongues:

Bulgaria: [pre-training](#); [after training](#)

Latvia: [pre-training](#); [after training](#)

Portugal: [pre-training](#); [after training](#)

Turkey: [pre-training](#); [after training](#)

Part A – Civic competences

The results of student achievements in the four countries are presented in separate parts of the analysis. The analysis does not aim to compare data between participating students, nor to present them in a generalized form, as this is not the task of the project and does not take into account the specifics of the cultural and educational context.

Methodology of analysis of project indicators

The *Civic competences questionnaire* contains a total of 14 questions. The questions are of a closed type (multiple-choice); the student chooses the answer that corresponds to his/her opinion. The main questions are aimed at revealing students' knowledge, skills and attitudes about human rights, values, awareness of their own identity, behavior of respect for the differences of others and expression of an active civic position. The questions are tailored to the age of the students and present in an accessible and understandable way practical situations close to children's experience. Three of the questions contain demographic information - about age, gender and country in which the participants live.

The content of the questions strictly corresponds **to the indicators** set in the project:

- % of students who indicate that they know what children's rights and human rights are.

Target – 50% increase;

- % of students who indicate with their answers that they respect and honor the rights of other people. Target – 30% increase;

- % of students who indicate that they are aware of the characteristics of their identity and feel valued in the class community. Target – 70% increase;

- % of students who indicate with their answers that they consider their classmates to be valuable members of the community (class). Target – 50% increase;

- % of students who indicate with their answers that they know how to actively participate and contribute to school/class life. Target – 50% increase.

All ethical principles and requirements for such research were observed. The students filled out the questionnaires voluntarily, anonymously, in the usual learning environment of their school and classroom, having received information about the project and the objectives of the questionnaire and having expressed their consent to participate.

The increase in the values of achievement of the indicators was calculated as the difference between the percentage of correct answers to the questions after the training and the percentage of correct answers before the training. Based on the comparison of the answers before and after the training, conclusions are drawn about the achievement of the indicator.

Rating scale for achieving indicators

To ensure correct interpretation of the results, the growth in each indicator is assessed on the following 5-point scale:

- **0 - 20% – Basic level of students' competence:** the results of the indicator show the beginning of the formation of knowledge, skills and attitudes.
- **21 - 40% – Level in development:** the results of the indicator show a positive trend of change and development.
- **41 - 60% – Stable level:** the results of the indicator show sustainable (stable) development.
- **61 - 80% – High level:** the results of the indicator show high development.
- **81 - 100% – Excellent level:** the results of the indicator show the highest development.

This scale allows us to see the real progress in implementing the indicator. The aim of the analysis is to deal with extreme statements such as “achieved” and “not achieved” indicators, but to show to what extent something has been achieved and what is the measured change in the students' civic competences.

Analysis of achievement of indicators based on student data in Bulgaria

The number of students surveyed before the training was 259, and after the training – 245. The age distribution of the students before the training was as follows:

- 7 years old – 2.7%

- 8 years old – 18.2%
- 9 years old – 60.5%
- 10 years old – 17.8%
- 11 years old – 0.8%

The age distribution of the group of students who completed the questionnaire after the training shows some changes:

- 7 years old – 10.2%
- 8 years old – 36.9%
- 9 years old – 60.5%
- 10 years old – 44.7%
- 11 years old – 8.2%%

Before the training, the group of nine-year-old students prevailed (60.5%), while after the training the distribution was equalized between nine and ten-year-olds (36.9% and 44.7%). This means that the sample is concentrated in the initial stage of primary education (third and fourth grades), where cognitive development allows the acquisition of basic concepts of human rights and interpersonal relationships. The transition to a higher age group after the training suggests a natural development of abstract thinking and a more mature understanding of moral categories (honest/unhonest; fair, right/wrong).

From the point of view of gender distribution, the sample is balanced and does not show differences that would significantly affect the results. Before the training, boys were 59.3%, and girls–40.7%. After the training, almost complete equalization was observed–girls51.6%, boys48.4%. This balancing is important because it reduces the risk of gender bias in the interpretation of results and ensures equality in the study of attitudes towards rights and respect.

Results by indicators

Indicator 1: knowledge of children's rights and human rights

The CEE training activities conducted with the students had led to a clear increase in understanding of children's rights. After the training, students have a clear knowledge of their rights. Awareness of rights has increased significantly. Before the training, only 50% of the students stated that they knew their rights, while after the training this share reached 83.2% (Fig. 1). At the same time, the answers "I don't know what my rights are" have significantly decreased.

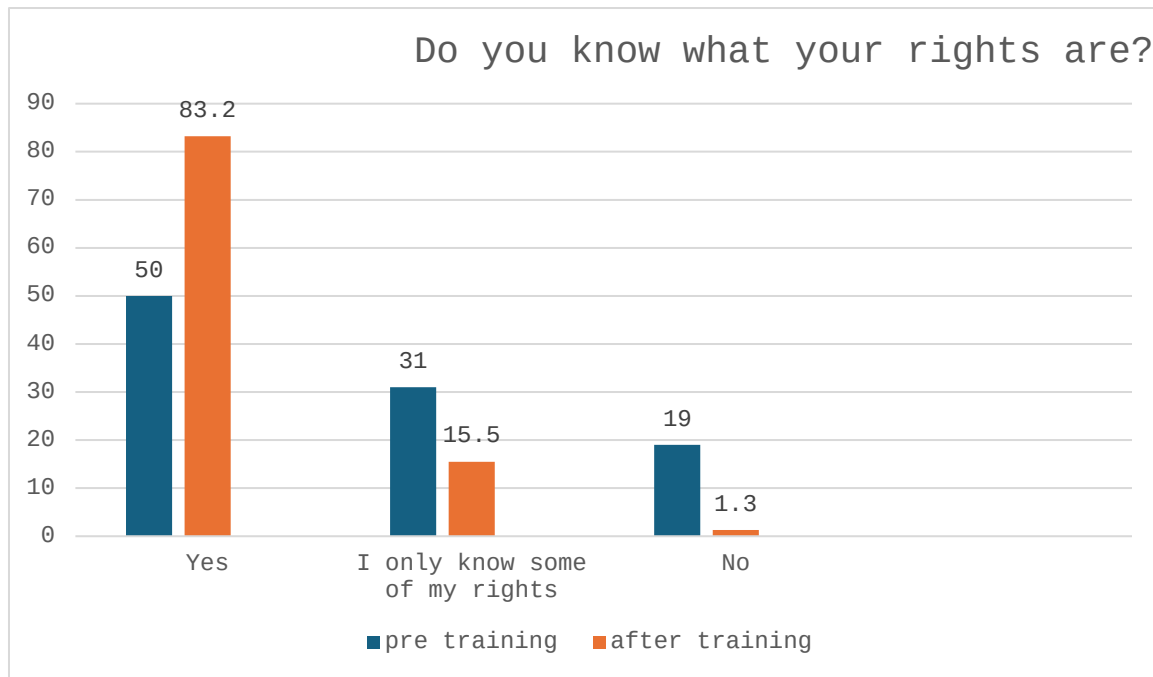


Fig. 1. Knowledge of one's own rights – comparison before and after training

Students are better able to recognize their rights and distinguish them from other situations in everyday life. The statements “I have the right to express my opinion without offending other people” and “Every child has the right to personal space” show an increase from 38.4% to 72.1% (Fig. 2 and Fig. 3).

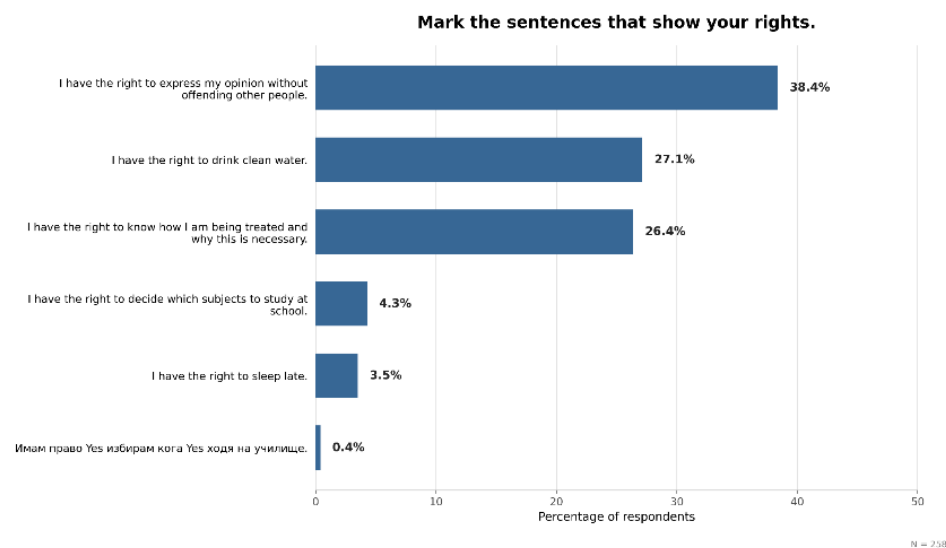


Fig.2. Mark the sentences that show your rights – answers before the training

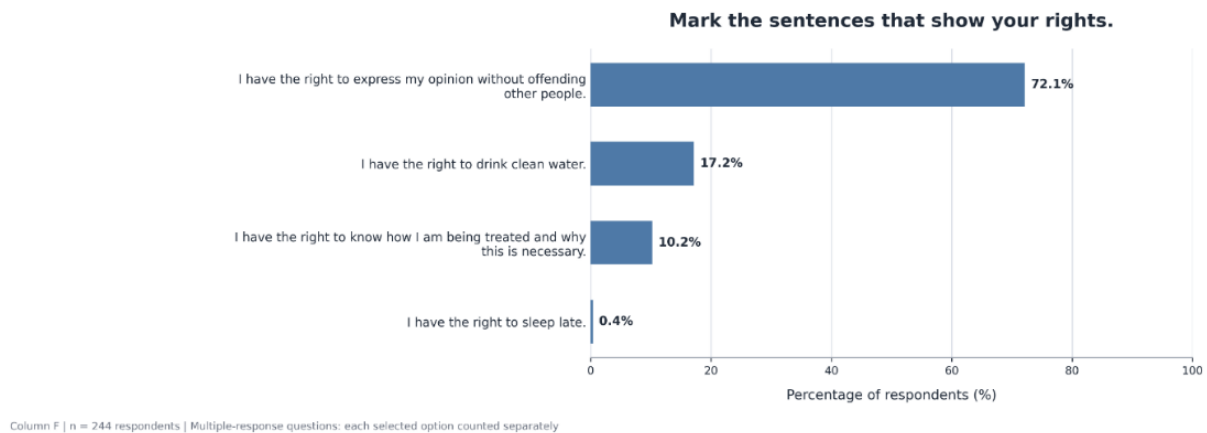


Fig. 3. Responses after the training

The understanding of the right to express one's opinion has shown a high rate of improvement. These data indicate the **formation of a stable level of knowledge about one's own rights**. Students begin to recognize their rights not as abstract concepts, but as concrete social and moral principles. This is a key learning outcome that shows a transition from an intuitive to a conscious understanding of children's rights.

Indicator 2. Respect for others

To examine the level of awareness of respect for others, students are offered a case study task: “What would you do if one of your classmates suggested something that you disagree with?” The results show a change after the project activities (Fig. 4). The proportion of those who will remain silent and not react when they disagree decreases, and the percentage of students who are ready to discuss and defend their opinion increases.

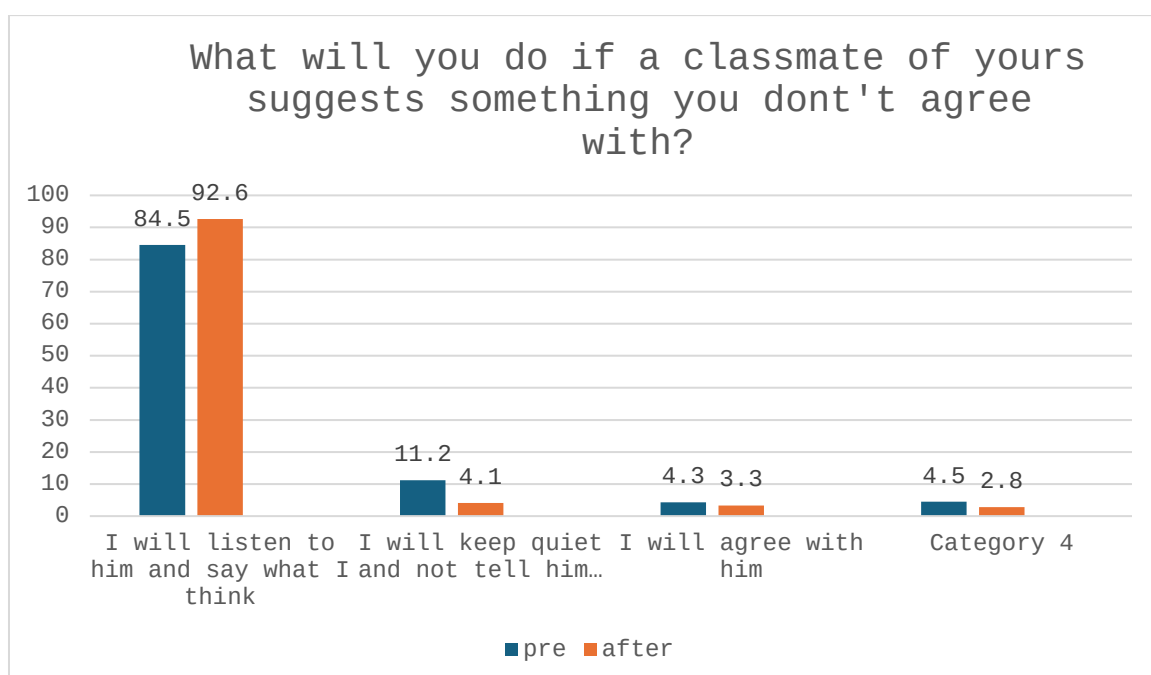


Fig. 4. Comparison before and after training – respect for different opinions

This is a clear sign of **the development of empathy and dialogicity** – students begin to perceive difference as a value, not a threat. The indicator reaches a high level of achievement because it shows the sustainable formation of respectful behavior.

Indicator 3. Identity characteristics and self-worth

The progress in the awareness of one's own identity and the understanding of the value of knowing oneself and accepting oneself as one is examined through a practical situation. It involves students projecting their attitude towards the characters in the picture situation. The results before and after the test are shown in Fig. 5.

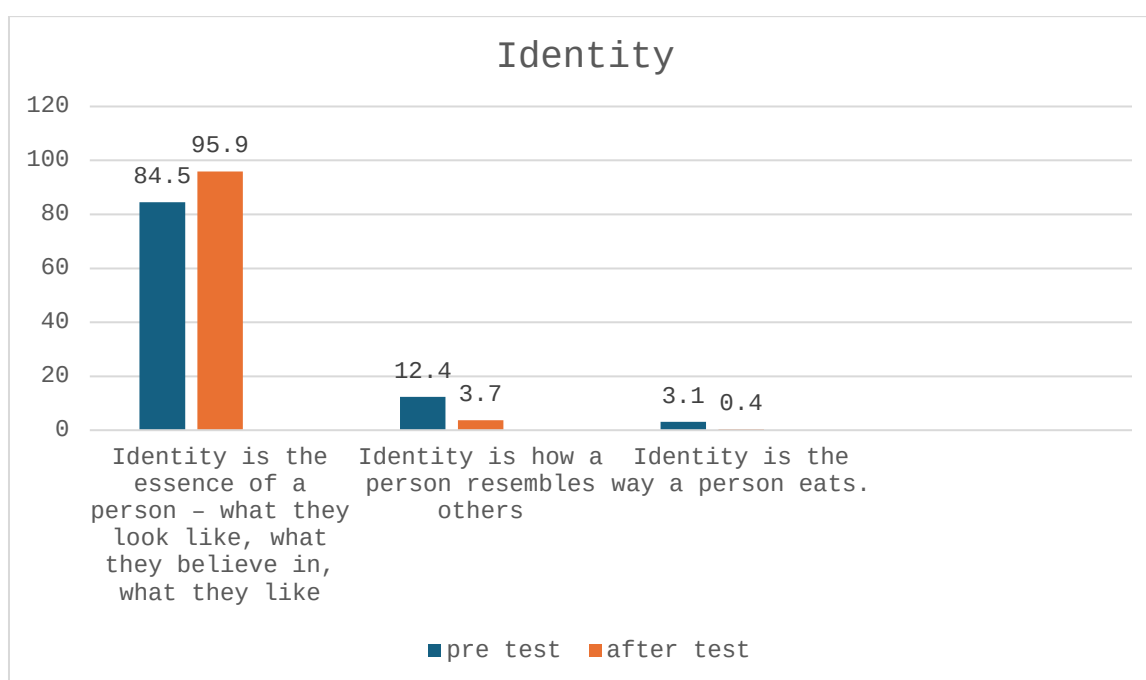


Fig. 5. Practical situation – identity – before and after training

There is a visible increase in the students' belief that identity is related to the perception of oneself and the inner world, and is not determined by clothes, appearance, etc. Before the training, 84.5% of the students defined identity as "the essence of a person - how he looks, what he believes in, what he likes". After the training, this share reached 95.9%. This shows a **developing level of achievement of the indicator** - students realize that identity is an internal characteristic, not an external similarity. The answers show the children's ability to recognize differences as part of human individuality.

Indicator 4. Students as valuable members of the community

The indicator is manifested through the children's subjective assessment of how valuable their classmates are to their learning and progress in school, how differences of opinion can move the school class forward, and the contribution of each to the atmosphere in the group. After the

training in the project, students demonstrate a high increase in the responses that their classmates are valuable as members of the community (Fig. 6).

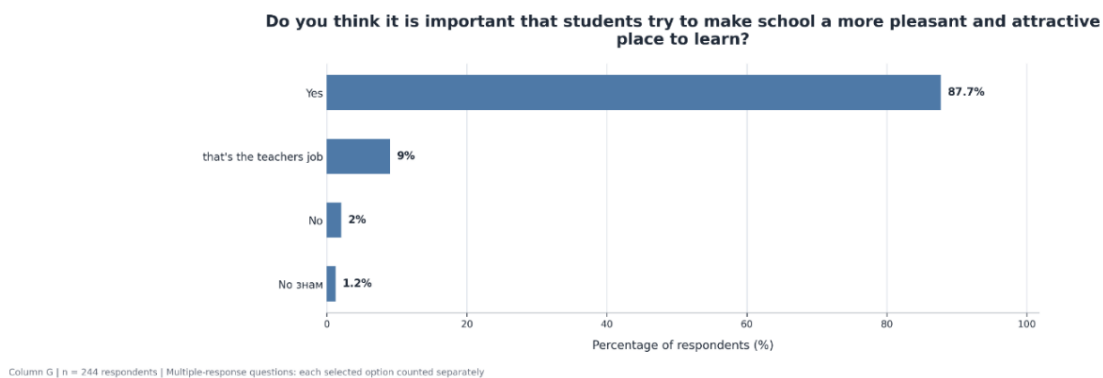


Fig. 6. Value of classmates for collaborative learning

Indicator 5. Active participation in the life of the school community

Active participation of students in school life is a key component of the development of a democratic culture and a sense of belonging to the community. The diagram in Fig. 7 shows a clearly expressed positive dynamic in the readiness of students to offer ideas to their teachers and to participate in decision-making processes.

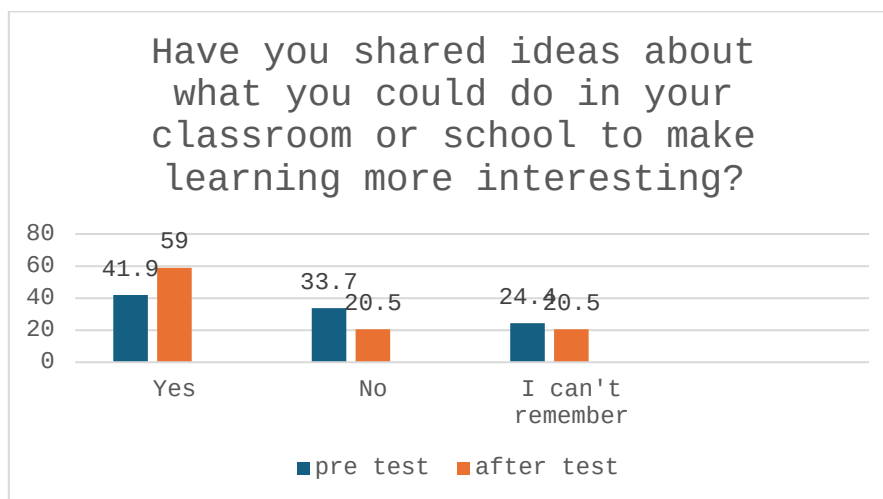


Fig. 7. Students active involvement - comparison before and after training

Before the training, a significant proportion of students stated that **they had not suggested ideas** or **do not remember doing so**, which indicates a low level of confidence and limited participation in the school environment. However, after the training, the proportion of students who actively suggested something to their teachers increased significantly. This indicates **the development of initiative, independence and a sense of significance**.

This change is particularly important because active participation is an indicator that reflects not only individual motivation, but also the quality of the relationships between students and teachers. The increased willingness to participate after the training shows that students:

- feel that their voice matters;
- perceive school as a space in which they can have an impact;
- develop communication and collaboration skills;
- build confidence to express ideas and suggestions.

On this basis, Indicator 5 reaches a **developing to a stable level of achievement**, demonstrating a real change in students' behavior and attitudes.

Interpretation of results

The data from the study in Bulgaria show a clear and consistent improvement across all indicators (Table 2 and Fig. 8).

Table 2. Summary of results by indicators

Indicator	True answers pretest	True answers after test	Increase (%)	Rating scale
1. Knowledge about children's rights	50.0%	83.2%	33.2%	Level in development
2. Respect for others	84.5%	92.6%	8.1%	Basic level
3. Identity	84.5%	95.9%	11.4%	Basic level
4. Value of classmates	24.4%	59.0%	34.6%	Level in development
5. Active participation	25%	60%	35%	Stable level

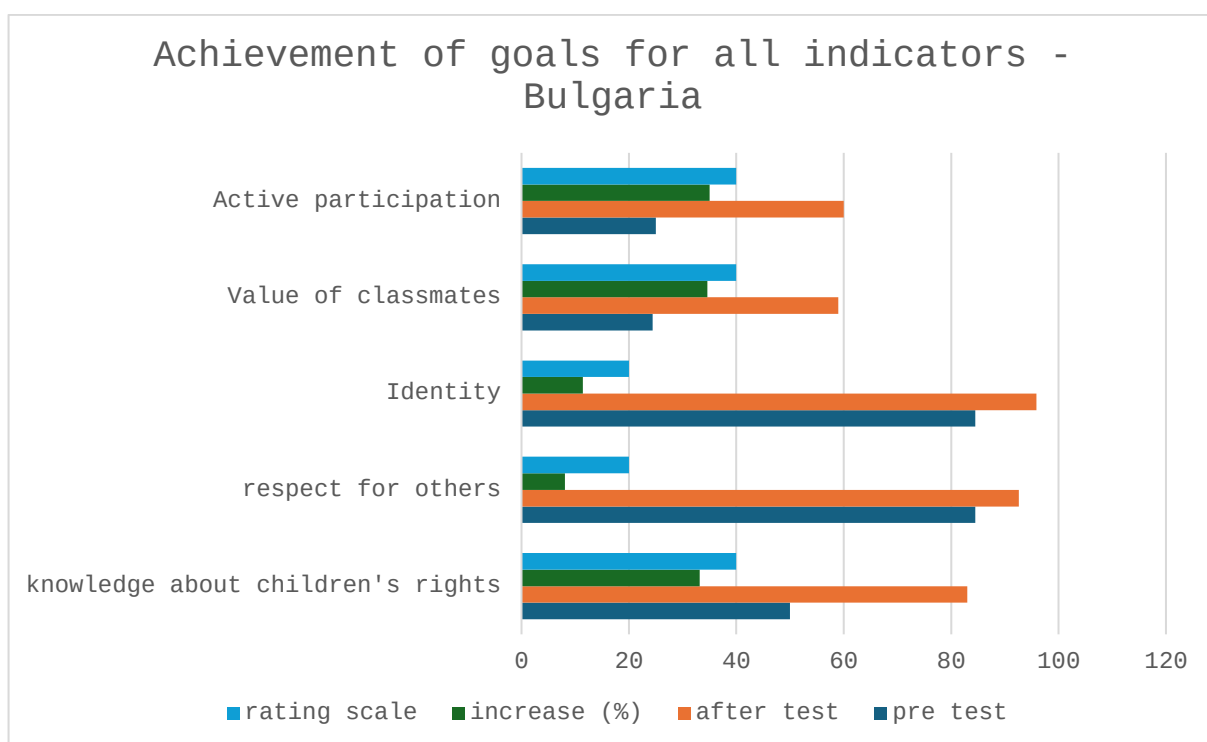


Fig. 8. Results by indicators before and after the CEE training course implementation

Although the indicator goals were not fully achieved, the training had a strong positive effect on:

- empathy
- respect
- sensitivity to injustice
- understanding of identity
- attitude towards classmates
- readiness for active participation

The strongest improvement is observed in ethical reactions and attitudes towards classmates. Students show 100% positive reactions in situations of disagreement and injustice. Significant increase in understanding of identity. There is a strong development of empathy and respect. Confidence in the abilities of classmates has increased. Students declare a clear willingness to actively participate in the school community.

Based on the data from the study conducted in Bulgaria, it can be concluded that the training has led to a significant improvement in the knowledge, attitudes and skills of students. Although the goals have not been fully achieved, the effect is clear, consistent and pedagogically significant.

Achievement of indicators based on data for students in Turkey

The surveyed students who filled out the questionnaire before the training were 173, and after the training – 399. Their distribution by age is shown in Fig. 9.

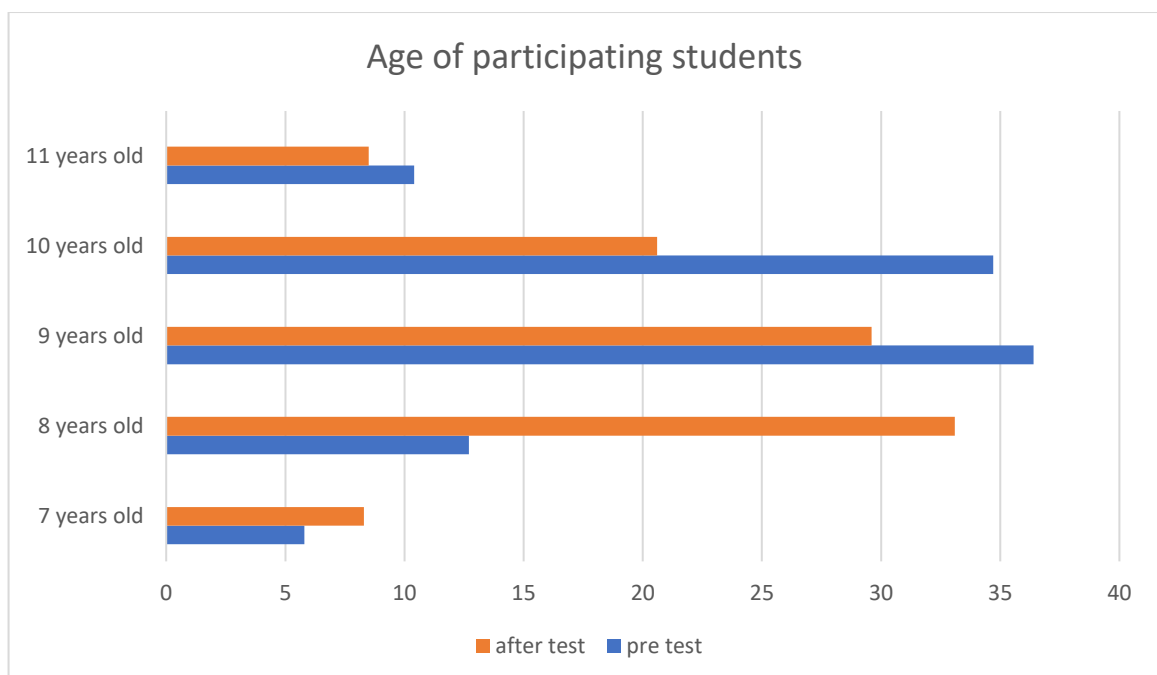


Fig. 9. Age of students – group from Turkey

Before the training, students aged 9–10 predominated, which indicates a concentrated group in the middle of the primary stage. After the training, the distribution remained in the same age range, but with a distinct increase in the number of eight-year-old students. This ensures good comparability between the two measurements and allows for reliable interpretation of changes in the indicators. The stable presence of students between 8 and 11 years old corresponds to a stage in which skills for dialogue, empathy and awareness of rights are developed.

By gender – girls predominate in both stages of the study. The group after the training included twice as many students and the group of girls increased accordingly – 60.9% were girls and 39.1% were boys in the second completion of the test. It is possible that gender influences the interpretation of the indicators, especially those related to empathy, dialogicity and social sensitivity, where girls traditionally show higher values, but this was not the subject of a special study in the project.

Results by indicators

Indicator 1: knowledge of children's rights and human rights

In the answers before the project training, the students declared that they knew their rights (Fig. 10). At the same time, in the answers to the questions, there were formulations such as *“I only know some of my rights”*, as well as partial or inaccurate representations of rights (e.g. inclusion of *“I have the right to sleep until late”*).

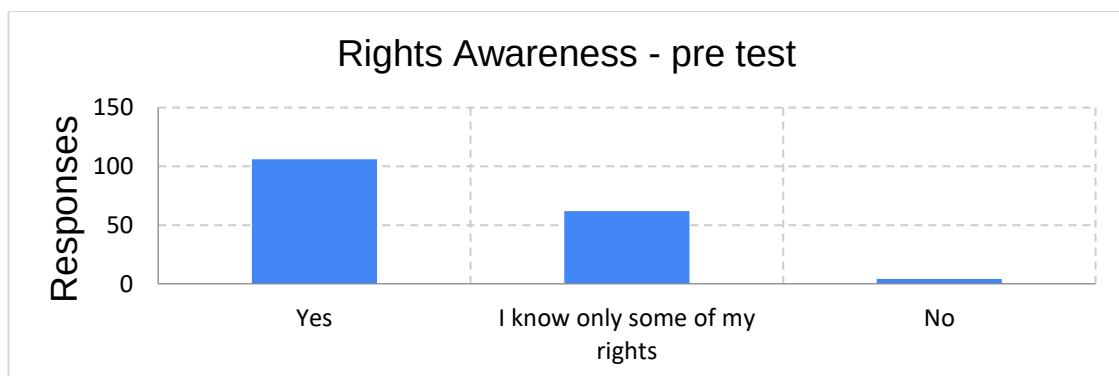


Fig. 10. Knowing your rights before training activities

After the training, a significant number of students differentiated their rights and understood them in depth (Fig. 11). They consistently indicated *“I have the right to drink clean water”*, *“I have the right to express my ideas without offending others”*, *“I have the right to know how I am being treated and why it is necessary”*.



Fig. 11. Differentiated understanding of children's rights after training activities

There is a clear **progression from partial to more complete awareness of rights**. Students begin to distinguish between real rights and desires or privileges. The indicator reaches a **developing to stable level** of achievement. High values for 'Drink clean water' and 'Express ideas respectfully' indicate awareness of specific rights, while low values for 'Sleep until late' indicate a distinction between right and desire.

Indicator 2. Respect for others

When asked about disagreement with a classmate's opinion, before the training, answers such as *"I will argue with them and insist that they agree with me"* and *"I will stay quiet and not tell them that I disagree"*, which shows a vacillation between confrontation and passivity.

After the training, the dominant response is *"I will listen to them and say what I think"*, which expresses dialogicity and respect for different opinions.

There is an increase in readiness for dialogue and *respectful listening*. Students move away from extreme reactions (argument at all costs or silence) towards balanced behavior. The indicator reaches a **high level** of achievement.

Indicator 3. Identity characteristics and self-worth

Before training, the answer *"Identity is how a person resembles others"* is found, which shows an external and superficial understanding of identity. It is mainly associated with external features (Fig. 11).

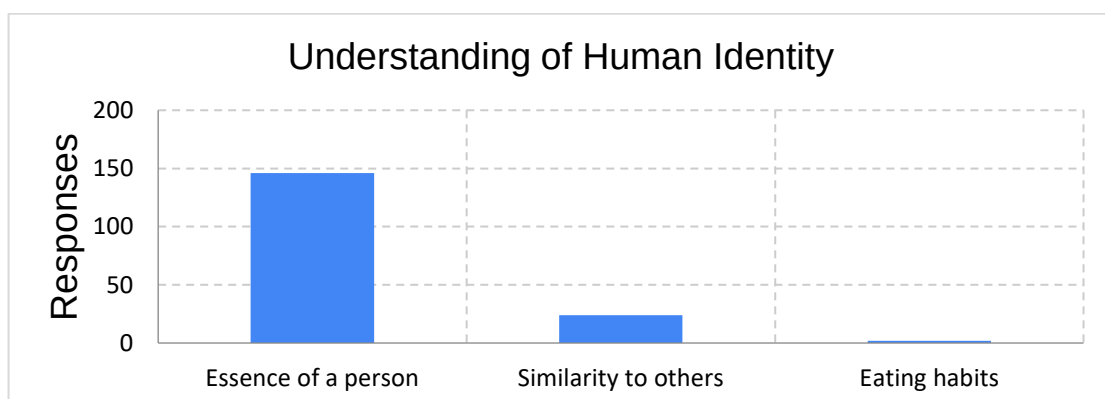


Fig. 11. Identity perception before training

After the training, almost all students choose the formulation “*Identity is the essence of a person — what they look like, what they believe in, and what they like*” (Fig. 12).

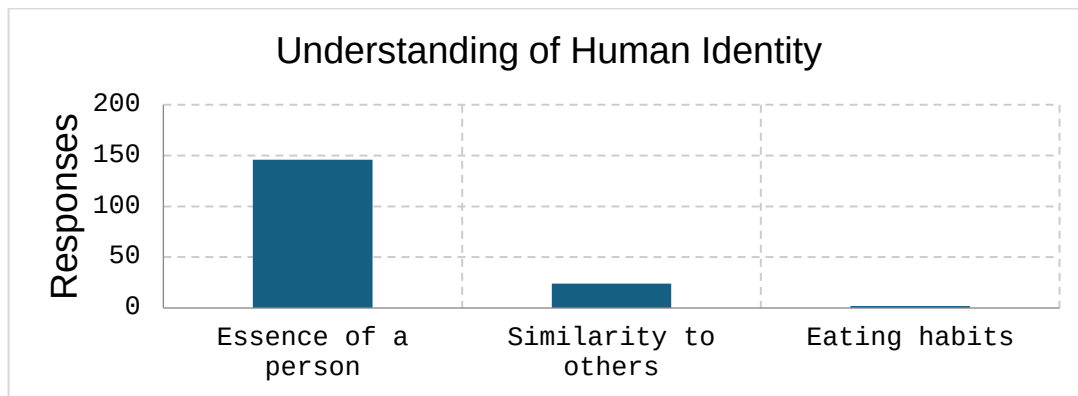


Fig. 12. Identity perception after training

There is a **shift from external resemblance to internal essence** as a criterion for identity. Students realize that identity includes beliefs, values, and preferences – i.e. it has internal features of the personality, and is not so much related to clothes and appearance.

The indicator reaches **stable to high level** of performance.

Indicator 4. Students as valuable members of the community

The indicator manifests itself in two dimensions:

1) Social sensitivity and empathy

The student understands the reaction to suffering or injustice, whether it is towards a classmate, a child or another person. In his behavior, he can choose how to react when he meets someone who is isolated.

2) Classmates as a value

The questionnaire puts students in a situation to assess how it is good to act when there is a new child in the class and he is still unknown (case „Anna“). Before the training, answers such as „*I don't know this child; it would be better not to get involved*“ are found, which shows distancing and uncertainty of the position.

After the training, answers such as „*I would treat Anna well even if others bully her*“, „*I would tell the students to stop making fun of Anna*“, „*I would tell the teacher*“ prevail (Fig. 13).

The essence of the indicator is to show how the student assesses the moral attitude within the group – does he notice the value of respect, support and solidarity. The situation provokes an internal dialogue in the students in order to answer the question: “How do I react when someone is isolated?”

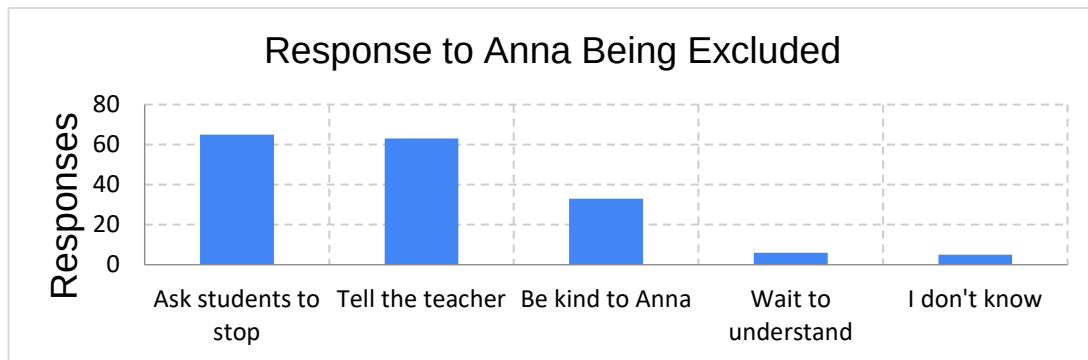


Fig. 13. The value of the other – responses after the training

The results after the second completion of the questionnaire show a **strong increase in the manifestations of empathy and readiness to protect** a classmate. Students perceive classmates as a value and a common responsibility. The even distribution between “Ask students to stop” and ‘Tell the teacher” indicates active protection and trust in institutional support. The indicator reaches a high level of achievement.

Indicator 5. Active participation in the life of the school community

When asked about participation in school life before the training, the answer "This is the teachers' job" was often found, as well as "I don't know" and "I don't remember", which indicates low confidence and passivity. After the training, when the questionnaire was filled out again, the number of such answers decreased and the categoricalness of the choice of statements that students can influence school life through their activity increased (Fig. 14).

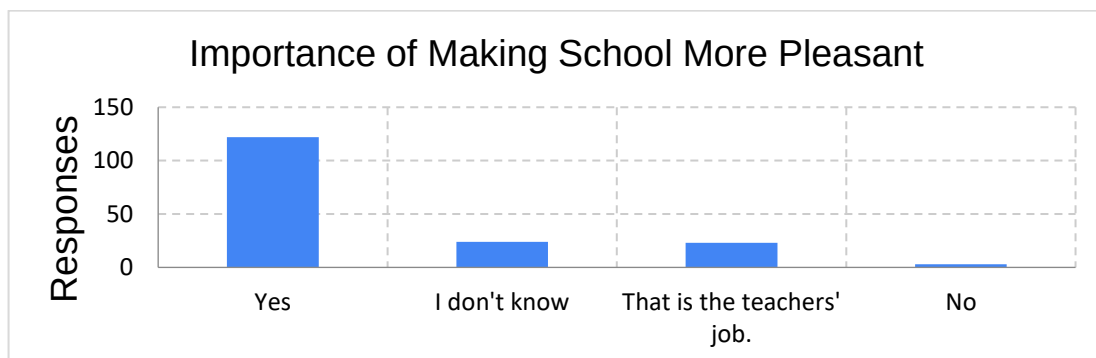


Fig. 14. Confidence in the significance of one's own activity at school – post-test results
After the training, significantly more students answered “Yes” to questions related to participation and showed willingness to engage in discussion and improvement of the school environment (Fig. 17).

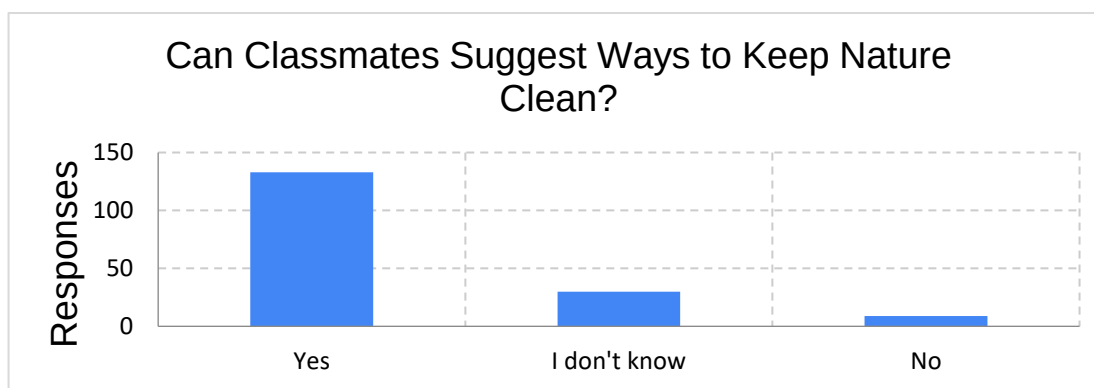


Fig. 17. Students' activ involvement – answers after the test

There is a **transition from a passive to a more active attitude** towards school life. Students begin to perceive themselves as participants, not just observers.

The indicator indicates a transition **from level in development to a stable level**.

Interpretation of results

The data from the study with students in Turkey show a clear and consistent improvement in all indicators (Table 3):

- Knowledge of children's and human rights: from partial to a more structured and realistic understanding.
- Respect for others: from confrontation/passivity to dialogue and listening.
- Identity: from external similarity to internal essence.
- Value of classmates: from less interest and distancing to active protection and support.
- Active participation: change in perspective - from "it's the teachers' job" to shared responsibility.

Table 3. Summary results by indicators - Turkey

Indicator	True answers pretest	True answers after test	Increase (%)	Rating scale
1. Knowledge about children's rights	45%	75%	30%	Stable level
2. Respect for others	70%	90%	20%	Level in development
3. Identity	60%	85%	25%	Level in development
4. Value of classmates	50%	85%	35%	Stable level
5. Active participation	40%	70%	30%	Stable level

The strongest improvement was observed in **ethical reactions and attitudes towards classmates**, as well as in **understanding of identity** (Fig. 18).

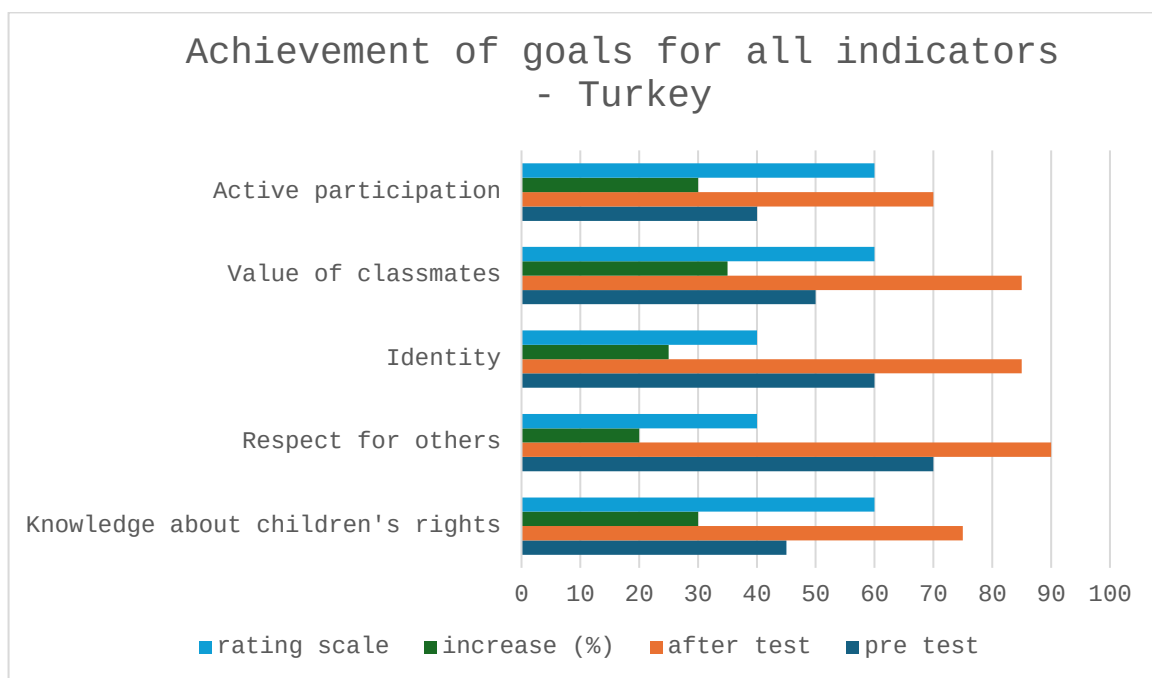


Fig. 18. Change in indicators for the group of students from Turkey

The data from the completed questionnaires show:

- Clear development of empathy and readiness to protect classmates;
- Strong affirmation of dialogical behavior in case of disagreement;
- Improved understanding of rights as concrete, not abstract concepts;
- Awareness of identity as an internal characteristic;
- Increased readiness to participate in school life.

Based on the results of the students from Turkey, it can be concluded that the project achieved a **significant improvement** in the knowledge, attitudes and skills of students about children's rights, respect, identity, the value of classmates and active participation. Although the indicators were not fully achieved, the **effect is consistent, distinct and pedagogically significant**.

Achievement of indicators based on student data from Portugal

The progress survey questionnaire was completed by 224 students from Portugal before the project training and by 226 students after the training.

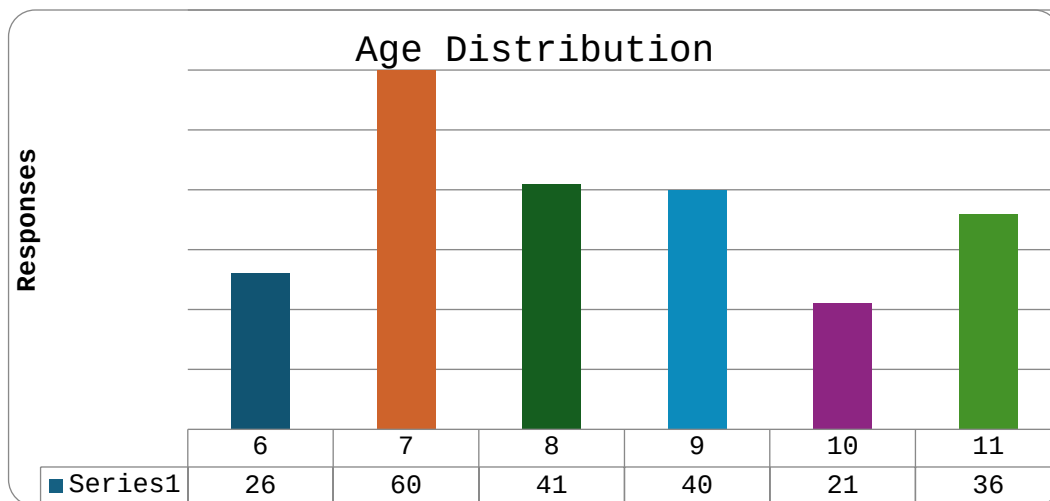


Fig. 19. Distribution of students by age before training

Before the training, **students aged 7–9** predominated (Fig. 19), and after the training, **students aged 8–11** (Fig. 20), which indicates a natural development of cognitive abilities and it can be expected that older students will cope better with topics about civic behavior.

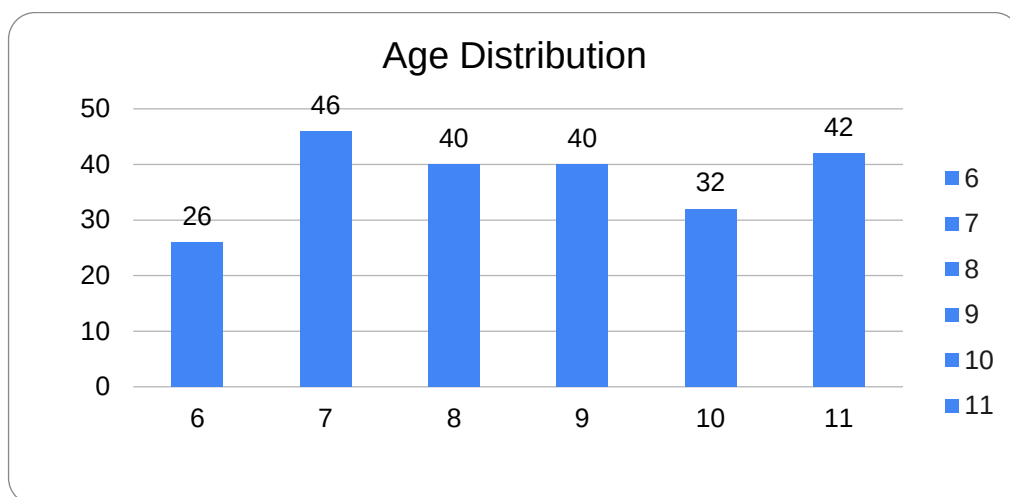


Fig. 20. Distribution of students by age after the training

The distribution of students by gender in both groups is relatively even: before the training: boys – 59.8%, girls – 40.2%, and after the training - boys – 55.3%, girls – 44.7%.

Results by indicators

Indicator 1: knowledge of children's rights and human rights

Before the training, only 9.4% of students stated that they knew their rights, while after the training this share reached 99.6% (Fig. 21 and Fig. 22).

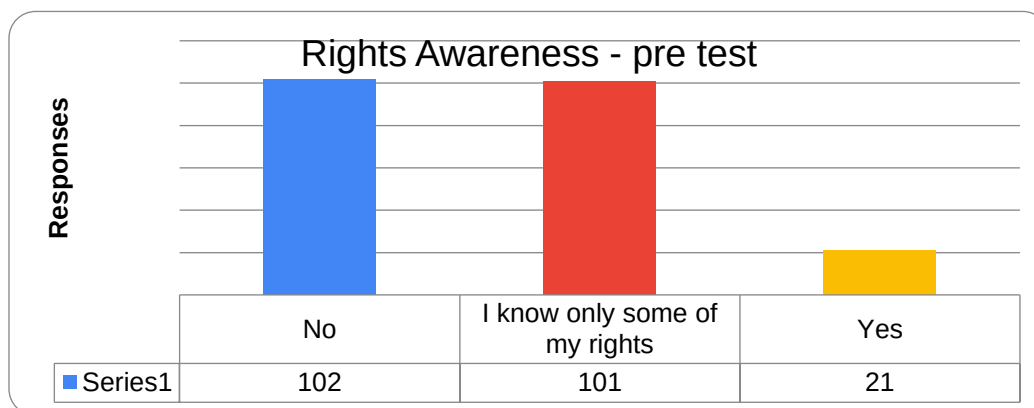


Fig. 21. Knowing your rights – before training

Students begin to distinguish between real rights (“right to clean water,” “right to express ideas respectfully”) and desires (“to sleep late”).

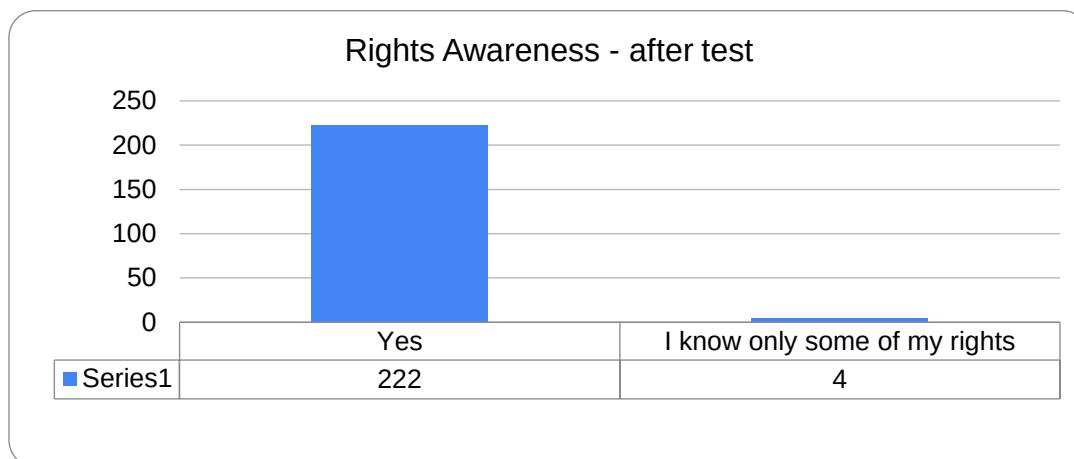


Fig. 22. Knowing your rights – after training

The results of this indicator show impressive growth and an excellent level achieved on the assessment scale – the indicator is fully achieved.

Before the training, students overwhelmingly chose desires instead of rights (“Sleep until late”, “Choose school lessons”) and clearly did not know the essence of children’s rights. After the training, almost all of them indicated real rights (“Drink clean water”, “Express ideas respectfully”). This shows not only a quantitative but also a qualitative change in knowledge.

Indicator 2. Respect for others

Before the training, 15.2% of students stated that they would listen to a classmate with a different opinion, while after the training this percentage reached 99.1%.

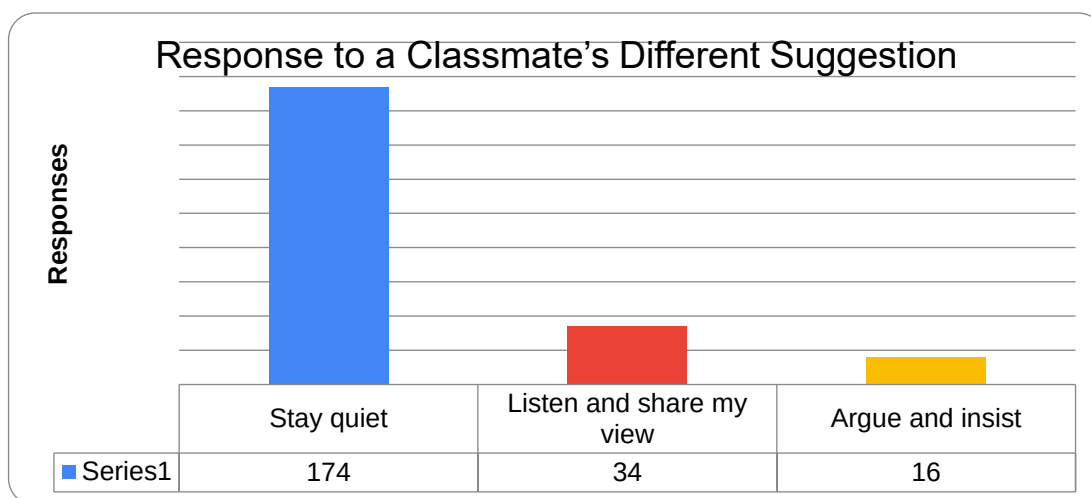


Fig. 23. Respect for a different point of view – before training

After the second completion of the questionnaire, a transition was observed from answers expressing a passive position ("Stay quiet") to activity and dialogicity ("Listen and share my view").

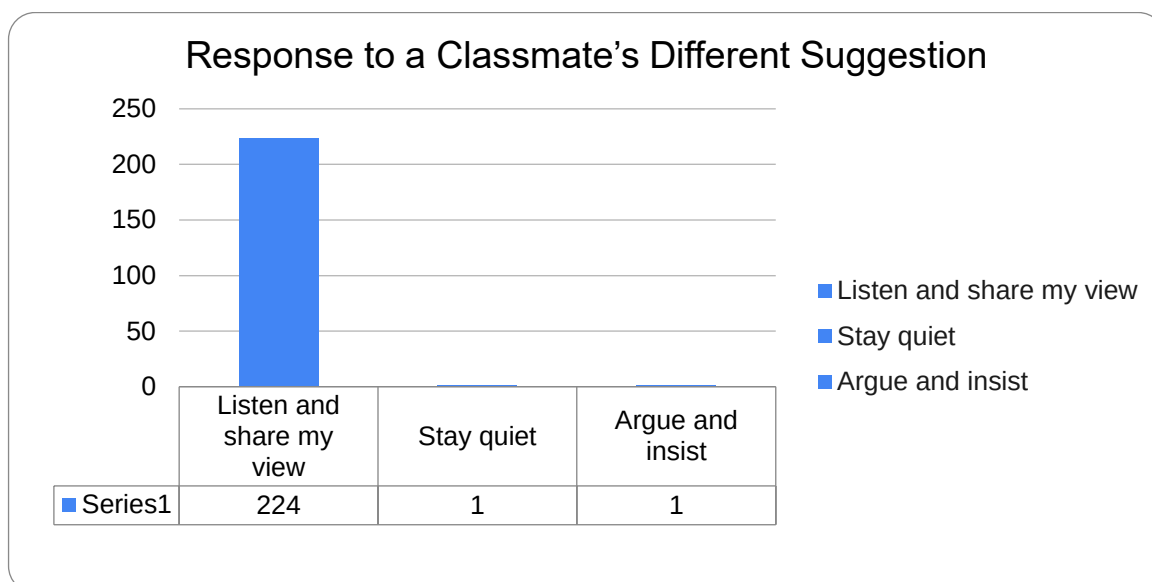


Fig. 24. Respect for a different point of view – after training

The indicator of respect for others has achieved significant growth and an excellent level of implementation according to the assessment scale (81–100%). Students demonstrate an active position in relation to other cases related to respect for individuality – in cases of unfair treatment, imposition of punishments, restriction of personal freedom. A high level of formation of moral sensitivity is noted.

Indicator 3. Identity characteristics and self-worth

Before the training, 12.1% of students defined identity as the "essence of a person", and after the training - **96.9%**.

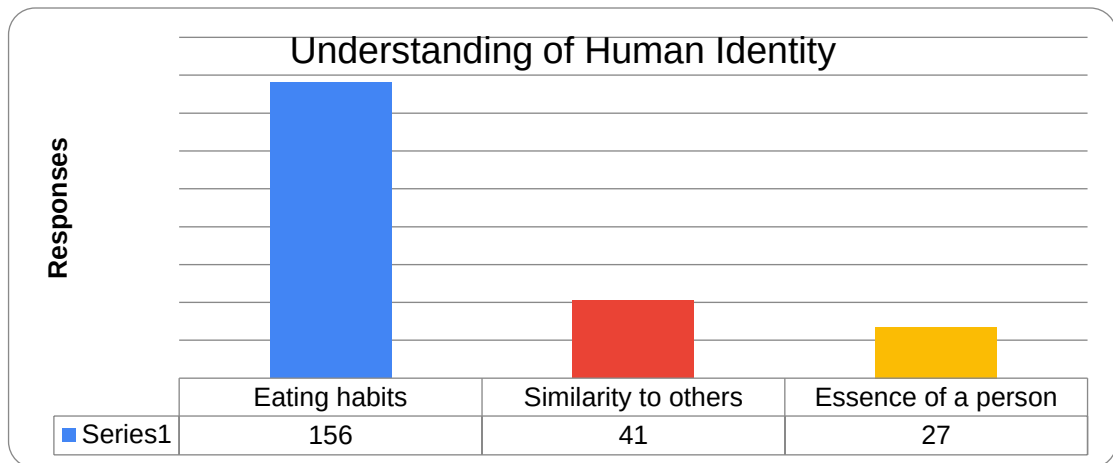


Fig. 25. Understanding of identity before training

Thanks to the CEE training course activities, students realize that identity is an internal characteristic, not an external resemblance (Fig. 26).

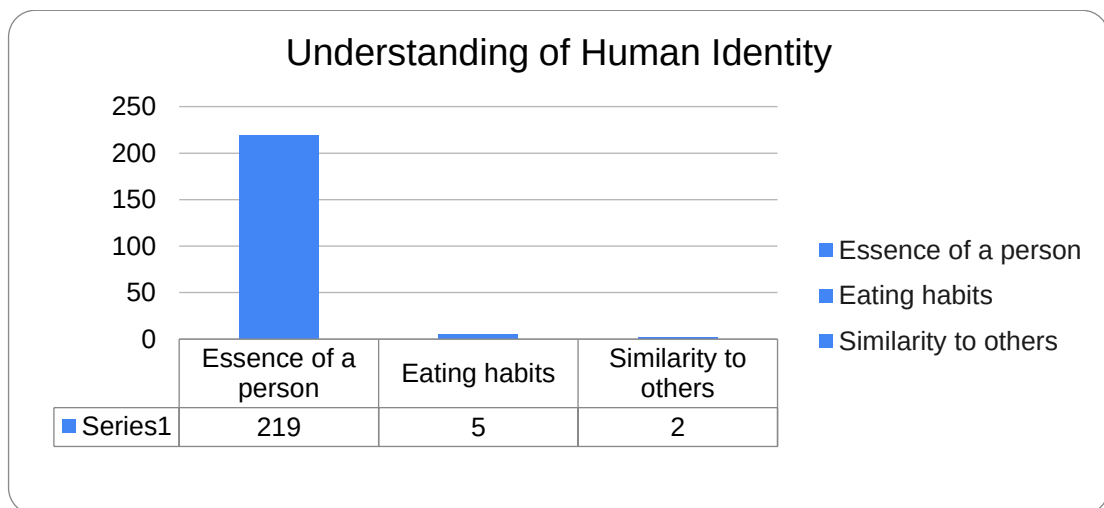


Fig. 26. Understanding of identity – after training

Before the training 70% of students associated identity with "Eating habits". After the training, 96% associated it with "Essence of a person". The results show data on transformation at the cognitive level.

The indicator was achieved to the maximum extent and at an **excellent level** according to the evaluation scale (81-100%).

Indicator 4. Students as valuable members of the community

Before the training, only 8% of students actively defended a classmate ("Be kind to Ana", "Tell the teacher"), while after the training, **92.9%** chose responses showing empathy and solidarity ("Ask students to stop").

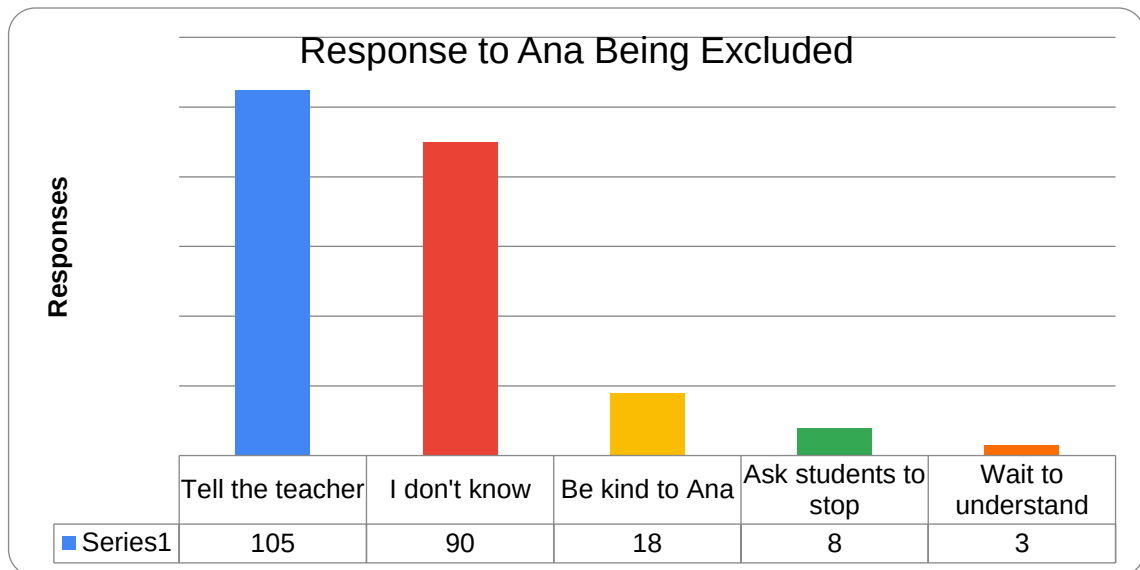


Fig. 27. Responses to a picture case study before CEE training course activities

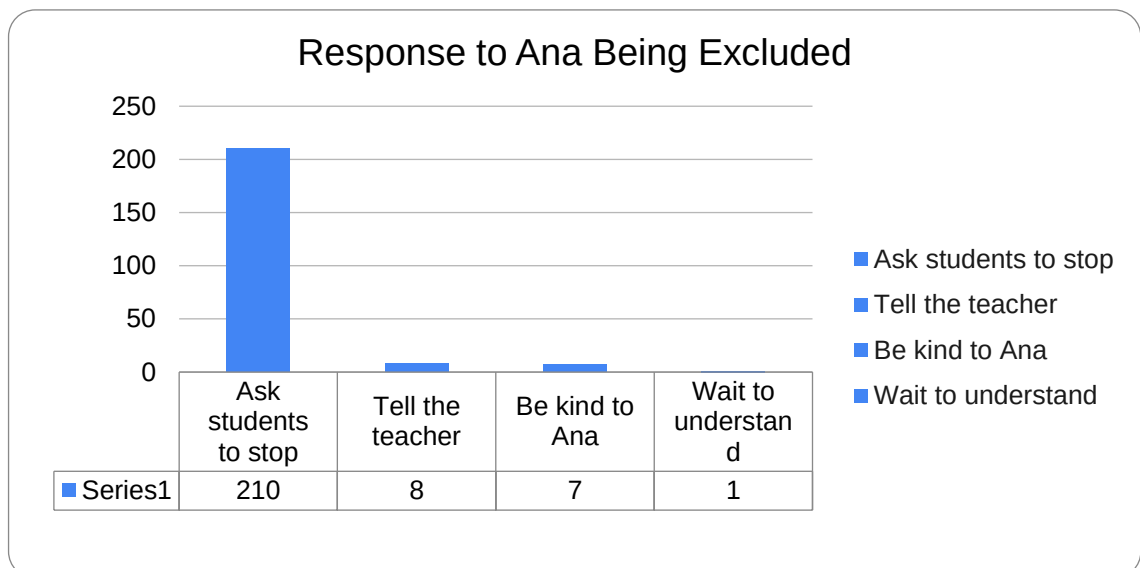


Fig. 28. Responses to a picture case study after CEE training course activities

Before the training, students rely on the teacher to resolve conflict situations (“Tell the teacher” – 46.9%), and after the training they take a personal position (“Ask students to stop” – 92.9%).

The implementation of the indicator shows an **increase of 89%**, which is an **excellent level** of achievement.

Indicator 5. Active participation in the life of the school community

Before the training, 48.2% of students believed that they could offer ideas for improving the school, and after the training – **99.1%** (Fig. 29).

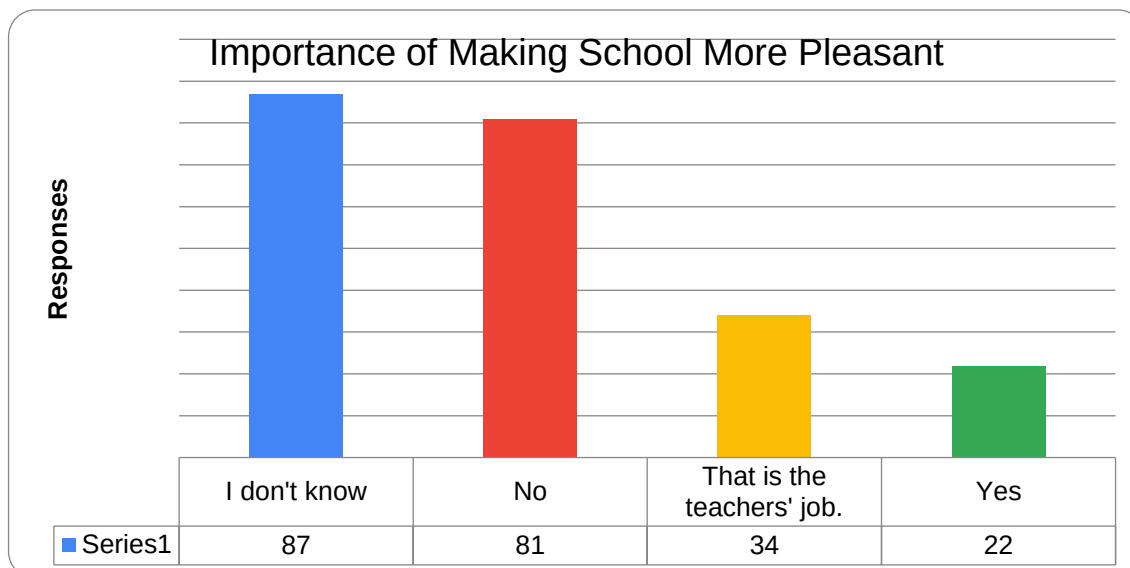


Fig. 29. Readiness for active participation in the school community – before training

After the project training, students began to perceive school as a shared responsibility, not just as “teachers’ work” (Fig. 30).

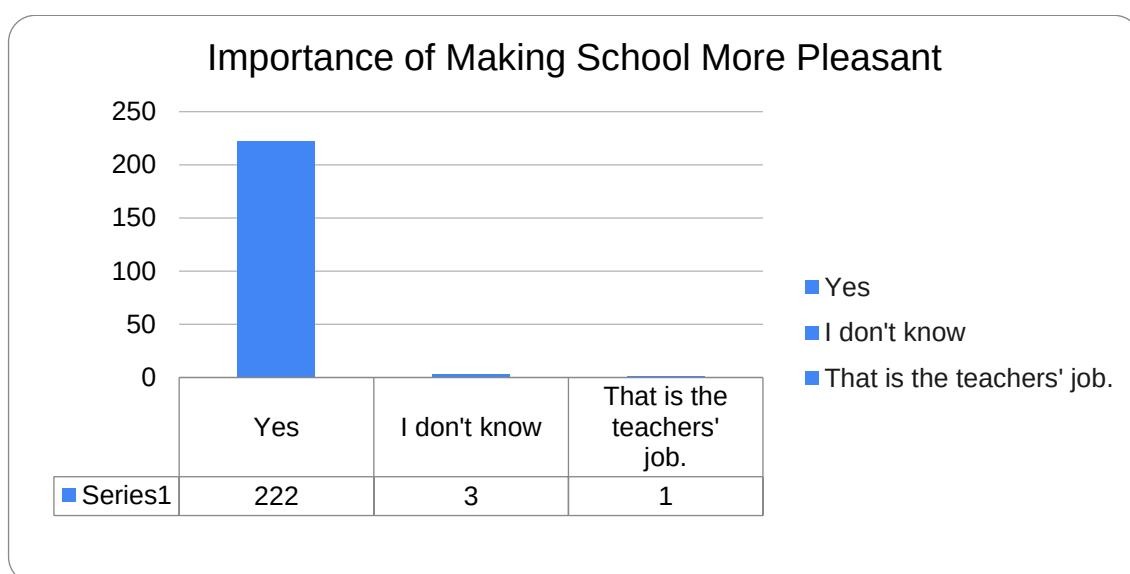


Fig. 30. Readiness for active participation in community life – after training

The active attitude at school is also manifested as engagement with important topics such as nature conservation, inclusion in school initiatives. Students choose to get involved in environmental activities and show concern for the environment around them.

The indicator is fulfilled at a high level (61 – 80%) and an increase of 50.9%.

Interpretation of results

The data from the study in Portugal show extremely high values for all indicators (Table 4).

Table 4. Summary results by indicators - Portugal

Indicator	True answers pretest	True answers after test	Increase (%)	Rating scale
1. Knowledge about children's rights	9,4%	99,6%	90,2%	excellent level
2. Respect for others	15,2%	99,1%	83,9%	excellent level
3. Identity	12,1%	96,9%	84,8%	excellent level
4. Value of classmates	8%	92,9%	84,9%	excellent level
5. Active participation	48,2%	99,1%	50,9%	high level

The study among the group of students from Portugal shows **progress in achieving the indicators to the highest degree**. The data show that the training led to **significant improvement** in the knowledge, attitudes and skills of the students and high achievements in all indicators (Fig. 31).

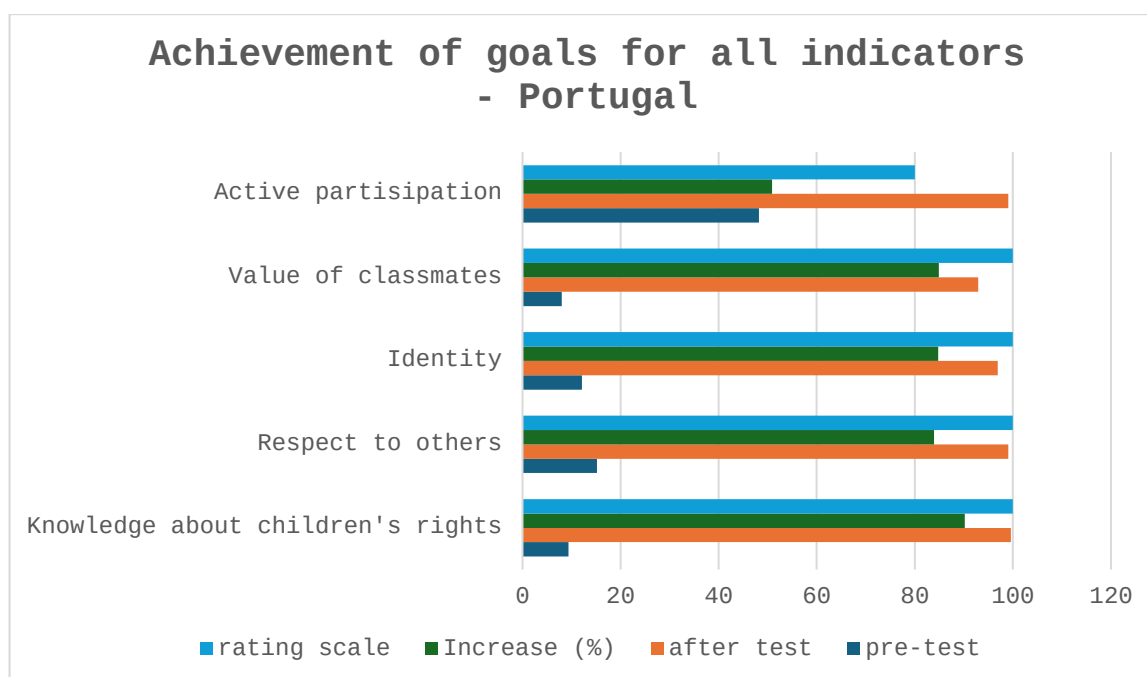


Fig. 31. Summary of the achievement of indicators

The increase in the level of competence of students refers to:

- full awareness of rights and obligations;
- development of empathy and respect;
- clear understanding of identity as the inner essence of the personality;
- a strong sense of belonging to the school community and active participation in its everyday life;
- active citizenship and sensitivity to the moral dimensions of behavior (just/unjust).

The strongest improvement is observed in moral choices and understanding of identity, which indicates an improvement in moral and social development.

Achievement of indicators based on student data from Latvia

Before the training, the questionnaire was filled in by 104 students from Latvia. All of them were 11 years old. The group was homogeneous in terms of age. Girls predominated by gender – 75.7%, and boys were 42.3%. When the questionnaire was filled out for the second time, at the end of the project, there were a total of 200 students, of different ages (Fig. 32) – from 7 to 11 years old, with the largest number of 11-year-olds (82). The distribution by gender was relatively even: 51% girls, 47% boys and 2% who indicated “other” in the question to determine their gender.

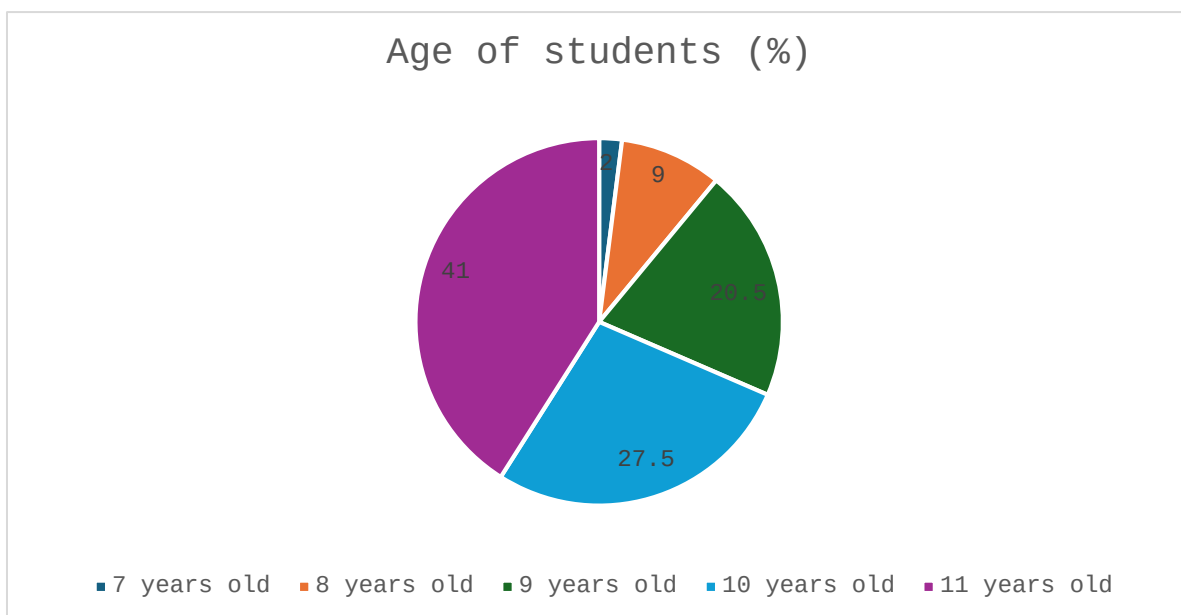


Fig. 32. Age of students who completed the questionnaire at the end of the project

Results by indicators

Indicator 1: knowledge of children's rights and human rights

The students have a general idea of children's rights and human rights. They express the opinion that when someone is forced to do hard work, it is not right. Some of them understand that their rights can be restricted through punishment. In general, this idea is quite common before the project activities. After conducting the training with the children's rights resources, the students name human rights more specifically and connect them with certain practical situations of respect or non-respect of rights. When filling out the questionnaire again, an increase in the number of students who categorically state that they know what their rights are (Fig. 33). The relative share of students who know only some of their rights both before and after the test is small and also decreases after the activities.

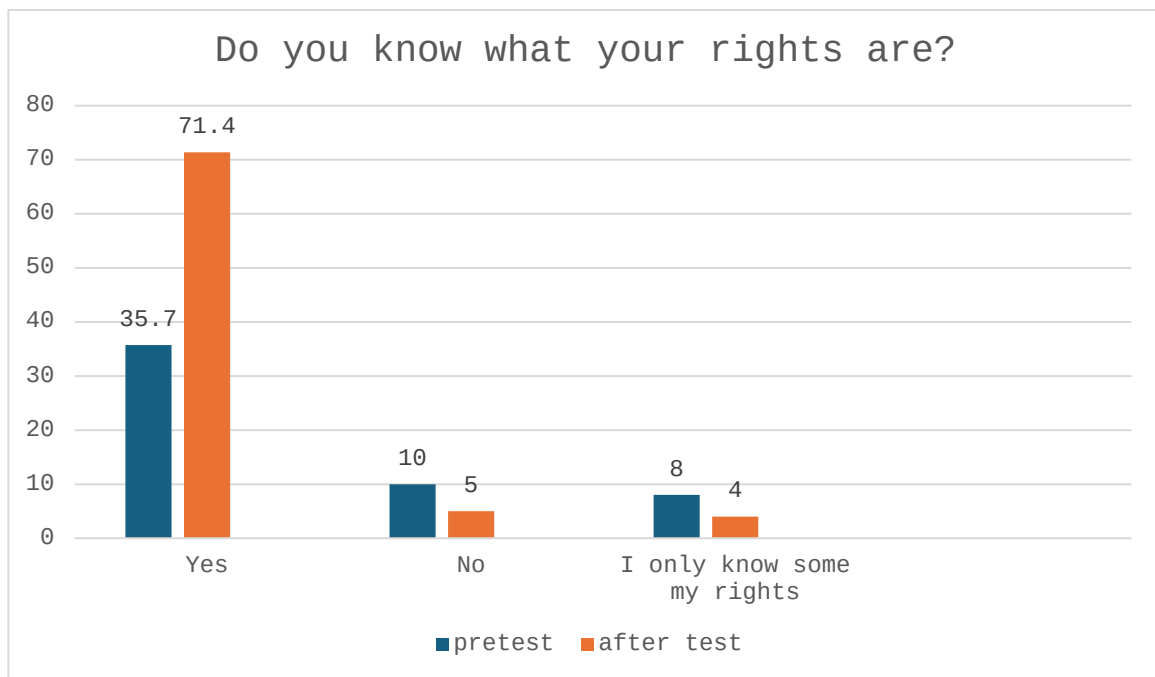


Fig. 33. Knowledge about children's rights

The children also demonstrate their knowledge of human rights through the case studies in the questionnaire. A large number of them answer that a human right is different from insisting on having your desires satisfied. The difference between a desire and a right is more clearly realized at the end of the project.

Indicator 2. Respect for others

The respect for others is tested through the questionnaire with a series of questions that present situations from the practical experience and everyday life of children at school. One of the aspects is respect for others and human differences, which is related to providing support and inclusion. Students from Latvia demonstrate sensitivity to this aspect of human relations. When completing the test for the first time, there are some hesitations about how to act when communicating with unfamiliar classmates. After the project activities, the number of answers expressing a positive attitude and support increases. The other aspect of respect for people is related to expressing one's own opinion when there are pronounced differences in positions in communication. When they have a different opinion, children at school often use an aggressive tone to prevail in the dispute or become too passive - they prefer to remain silent and not present their point of view. Through the project resources, students are provoked to understand how to defend their opinion without offending others. In this way, the skill of assertiveness in communication is developed. The results of the post-project test show a clear increase in the understanding of assertiveness (Fig. 34). The students understood the meaning of tolerance and respect in communication, without neglecting their own opinion.

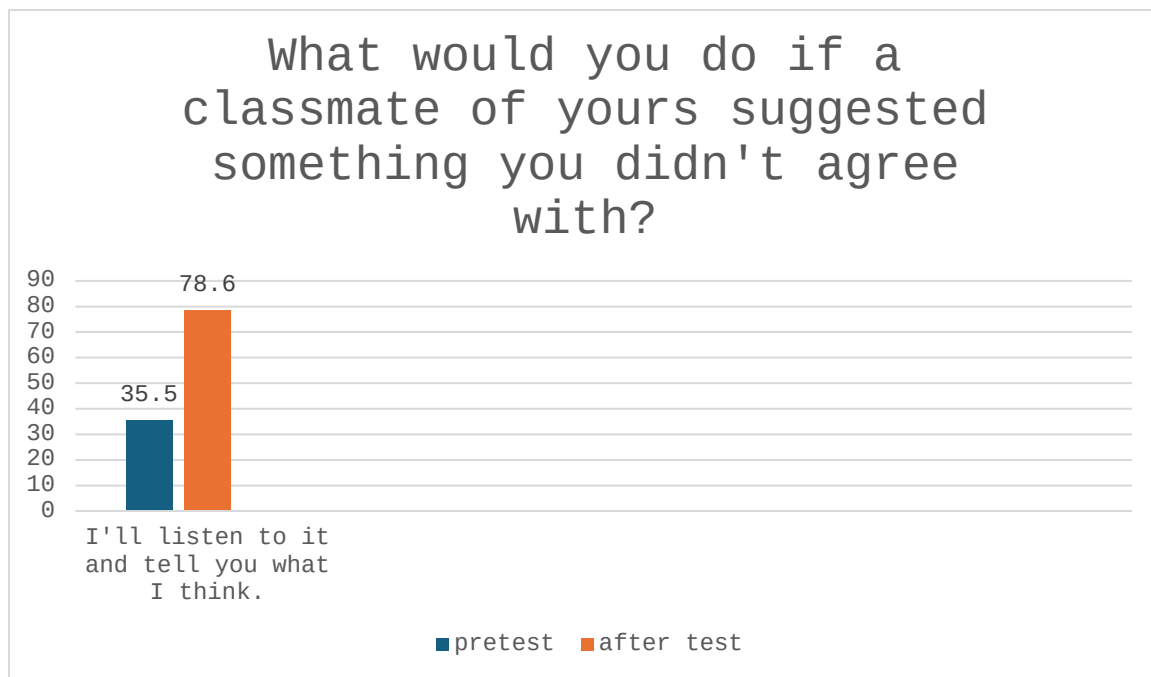


Fig. 34. Expressing respect in communication between classmates – result before and after the CEE training course activities

Indicator 3. Identity characteristics and self-worth

The results of the questionnaire show that students from Latvia have an understanding of identity. They successfully list the features through which identity is manifested. The emphasis in their knowledge is on appearance and the differences that are visible (eye color, hair color, height, etc.). In the first test, these features are leading. In the second filling out of the questionnaire, the answers become more diverse and the number of students who indicate other characteristics of identity, more related to values and beliefs, increases (Fig. 35). The difference is not large (7.1%), but it is important because the topic of identity is difficult for young students. Awareness of all aspects of identity requires social maturity, self-knowledge, which occurs in the following age periods of students' growth. In primary school, it is enough for them to understand that appearance alone is not enough to judge what kind of person we are communicating with and whether we like him. In this regard, the indicator has been achieved, although at a lower level than was initially set in the project.

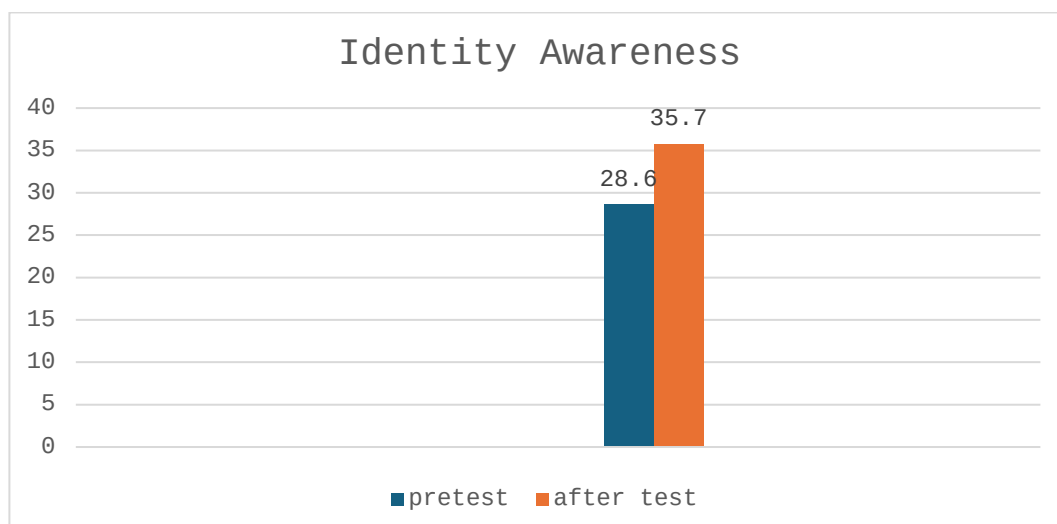


Fig. 35. Awareness of identity characteristics

Indicator 4. Students as valuable members of the community

Half of the students who filled out the questionnaire at the beginning said that their classmates are important to them. They believe that other students in the class can handle different tasks. This percentage increases by 21.4% in the second filling out (Fig. 36). This attitude towards classmates also corresponds with the understanding that students can offer teachers different ideas to improve their classroom.

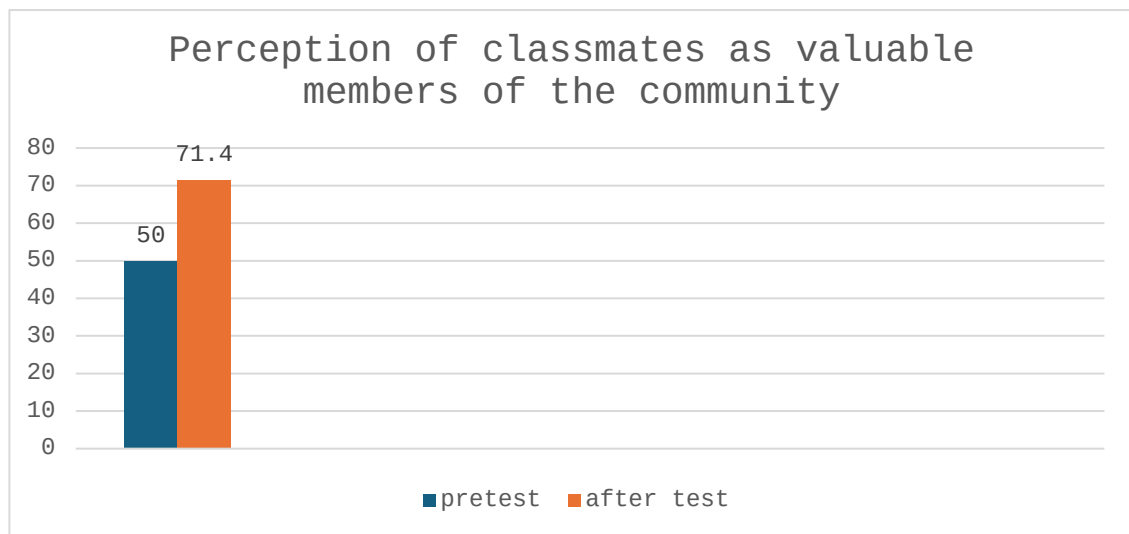


Fig. 36. Student activity in the school community – results before and after training

Indicator 5. Active participation in the life of the school community

The students express the opinion that together they can take care of their school, the classroom, and nature. According to them, they can make efforts to make the school a more attractive place to learn. In the first stage of filling out the questionnaire, 42.9% of the students support this idea. At the end of the project, during the second filling out, this percentage increases to 64.3% (Fig. 37).

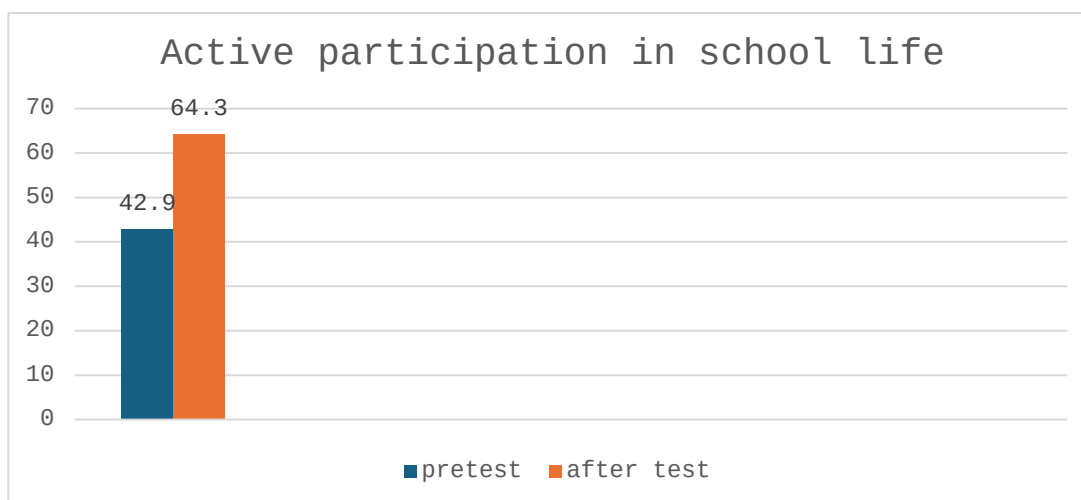


Fig. 37. Comparison before and after CEE training course activities – readiness for active position

Interpretation of results

The data from the Latvian survey show a clear and consistent improvement across all indicators (Table 5).

Table 5. Summary results by indicator - Latvia

Indicator	True answers pretest	True answers after test	Increase (%)	Rating scale
1. Knowledge about children's rights	35,7%	71,4%	35,7%	Level in development
2. Respect for others	42,9%	69%	26,1%	Level in development
3. Identity	28,6%	64,3%	35,7%	Level in development
4. Value of classmates	50%	71,4%	21,4%	Level in development
5. Active participation	42,9%	64,3%	21,4%	Level in development

The data show a clear and consistent improvement across all indicators (Fig. 38). Although the indicators were not fully achieved, the training had a significant positive effect on:

- understanding of rights;
- ethical responses;
- sensitivity to injustice;
- understanding of identity;
- trust in classmates;
- willingness to participate.

The strongest improvement was observed in:

- knowledge of rights;
- understanding of identity;
- moral standards in choosing behavior.

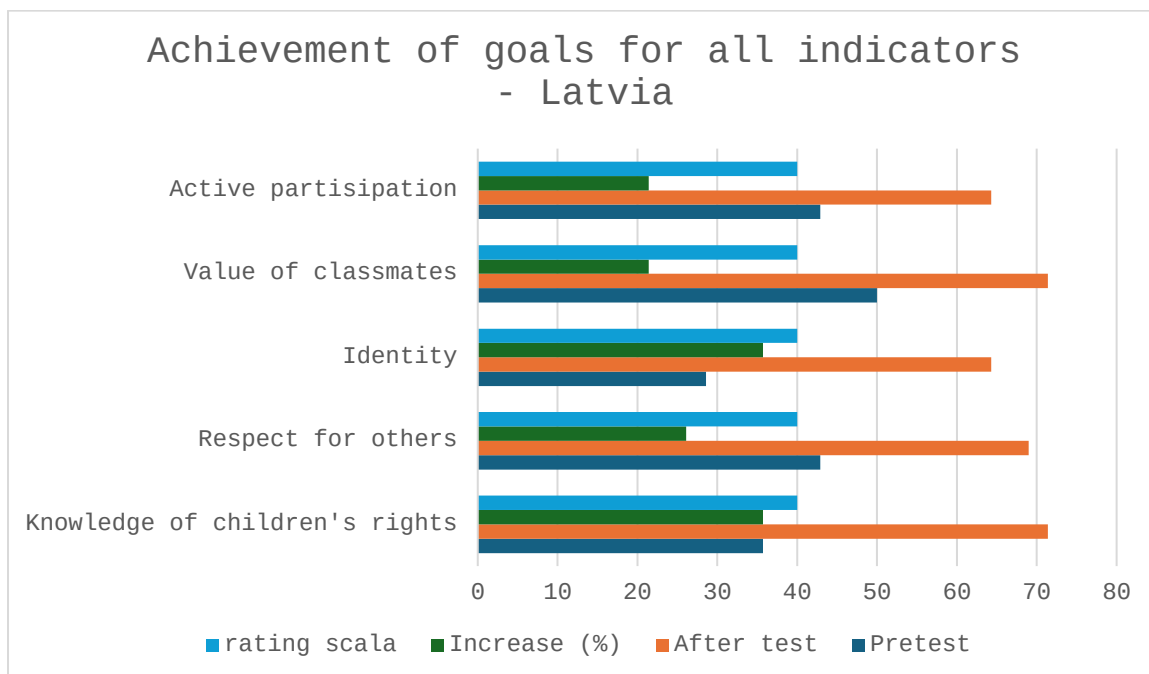


Fig. 38. Summary of indicator achievement – Latvia

Confidence in knowing rights has increased significantly. The understanding of the moral components of behavior has improved, as sensitivity to fair and unfair action has increased. A clear improvement in understanding identity. There has also been progress in terms of communication between classmates in the direction of increasing trust between children. The improvement in communication also reflects on the readiness for cooperation and active participation in school life.

The training of students in Latvia during the project leads to a significant improvement in the knowledge, attitudes and skills of students in terms of rights, respect, identity, the value of classmates and active participation. Although the goals have not been fully achieved, there is an effect of participation in project activities. The use of the project teaching materials has contributed to the enrichment of students' civic competence.

Summary and conclusions

1. The resources developed under the project are applicable, functional and useful for working with students aged 6 to 11. A sufficiently large group of students has been studied to draw conclusions about the progress achieved. There had been provided good evidence that working with CEE training resources leads to an increase in students'

knowledge of children's rights and to an increase in their awareness of manifestations of empathy, respect for others, identity and readiness for active participation in community life.

2. The questionnaire used to collect data for the analysis does not take into account cultural influences and specificities of the educational environment in which students are educated in the partner countries. Some of the differences in the results may be due to the influence of the teaching methods, the size of the school and other factors, which, however, were not specifically studied and cannot be commented on.
3. The data show that there is **a significant, positive change and a clear, visible increase in student achievement across all indicators**. For some groups of students, e.g. in Portugal, this increase is very high and the previously set indicators are achieved to the maximum extent. For other groups of students (e.g. in Bulgaria, Turkey and Latvia), the indicators are not achieved to such a high extent – i.e. the difference between “before” and “after” completing the questionnaire is not so great. The group of students from Latvia shows the same level of change across all indicators. Despite the differences in the responses of students from the individual countries involved in the project, the results overall show good progress in achieving the indicators.
4. The increase in the level of indicators cannot always be measured precisely in the quantitative values that were initially set as a goal, due to the limited time frame of action with the learning resources. The time from the first filling out of the questionnaire at the beginning of the school year to the second filling out at the end of the school year is short and does not allow to take into account a large difference “before” and “after” the use of the CEE training course resources. In such a short time, it is difficult to establish an increase of more than 50% in the implementation of the indicators.
5. It is difficult to register too large a jump in results after training, also because students are in a continuous learning process. They encounter the topics of children's rights, mutual respect and active citizenship not only through the resources in the project, but also through other subjects that they study in parallel. In practice, it is impossible to completely differentiate which knowledge is due to which subject. Students' cognitive development is complex. It is formed at school, but also in the family, as well as in extracurricular activities. There is no way to separate the influence of project work from

other educational activities in order to accurately measure only one aspect of the impact. If it were possible to isolate one of the factors (in this case, project activities), then a significant increase in the result on the indicators would probably also be obtained.

6. When interpreting the results for achieving the indicators, the role of teachers in the process of working with learning resources should also be taken into account. Teachers are an important factor in the progress of students in learning. The study does not control the work of teachers and the preparation of students before and after the implementation of the project. This also affects the final results obtained and may lead to a decrease in the growth of the indicators.
7. Students show very high levels of positive reactions in situations of justice/injustice. In terms of manifestations of empathy and respect for others, a very serious increase is reported. These are manifestations related to the second and third indicators, which show significant growth and achieve the set goals.
8. Overall, for the entire sample of students who completed the questionnaire, the highest rate of increase in scores was observed for the indicators of identity and respect for others. Significant growth was also achieved for the indicator of knowledge about children's rights.
9. Finally, it can be concluded that the Civic and Environmental Education (CEE) training course resources have contributed substantially to achieving the project objectives and have a highly positive impact on the developments of students' social and civic competences.

Part B – Ecological competences

The results of student achievements in the four partner countries are presented in a joint project-level analysis. The purpose of the analysis is to assess changes in students' environmental awareness in relation to the project indicators rather than to compare the performance of individual students, schools or participating countries. Country-level participation data are provided for transparency and to describe the scope of the evaluation. Differences in educational, cultural and implementation contexts between the partner countries should therefore be taken into consideration when interpreting the aggregated results.

A total of 917 students participate in the study in the initial stage of the project and 1065 students in the final phase - after the training has been conducted. The distribution of the number of participants by country is visible in the table below.

Table 1. Number of participants per partner country

Project partner country	Number of students who responded to the questionnaire at the beginning of the project	Number of students who responded to the questionnaire at the end of the project
Bulgaria	258	244
Latvia	263	197
Portugal	224	226
Turkey	172	398
Total:	917	1065

Methodology of analysis of project indicators

The Environmental Awareness Questionnaire was designed to assess students' environmental knowledge, awareness, attitudes and understanding of the consequences of human actions on the environment. The questions were adapted to the age of the participating students and presented practical situations related to children's everyday experiences. Depending on the question type, students selected one or more response options or provided an open-ended answer. Demographic information concerning age, gender and country of residence was also collected.

The evaluation framework was aligned with the indicators established in the project. Different sources of evidence were used according to the nature of each indicator. The student

questionnaire was used primarily to assess students' knowledge and understanding of environmental consequences and their ability to provide relevant examples and propose appropriate environmental actions. Teacher feedback from the piloting and approbation of the lesson plans was used as an additional source of evidence for the indicators concerning environmental initiatives implemented in the classroom and students' creative contribution to their planning and implementation.

Participation in the student questionnaire was voluntary and anonymous. Questionnaires were completed in the students' usual school/classroom environment. Students were informed about the purpose of the questionnaire and the project, and data collection was carried out according to the procedures applicable in the participating schools and partner countries.

The evaluation of changes in students' environmental knowledge was based on a comparison of the results obtained before and after the implementation of the educational activities. The pre-training questionnaire was completed by **917 students**, while **1,065 students** participated in the post-training assessment. As the number of respondents differed between the two assessment periods, the analysis was based primarily on **percentages rather than absolute numbers of responses**, allowing the results of the two groups to be compared consistently.

Open-ended responses were analysed using qualitative content analysis. Responses were coded according to recurring relevant concepts, examples and proposed actions related to environmental problems and the consequences of human behaviour. The analysis considered whether students were able to identify relevant environmental consequences, provide appropriate examples and propose concrete actions. PRE- and POST-training results were then compared to identify changes in the relevance, variety and specificity of students' responses.

For each questionnaire item, the PRE and POST percentages were compared to identify changes in students' understanding of the environmental consequences of different everyday actions. Particular attention was given to the selection of answers directly relevant to the situation presented, as well as to changes in the selection of less relevant alternatives. This made it possible to evaluate not only whether students recognised environmental problems more frequently after the training, but also whether they became better able to distinguish between relevant and less directly related environmental consequences.

Changes were expressed using both **percentage-point difference** and **relative percentage change**. The percentage-point difference was calculated as:

POST (%) – PRE (%)

The relative percentage change was calculated in relation to the pre-training baseline:

$$\text{Relative change (\%)} = ((\text{POST} - \text{PRE}) / \text{PRE}) \times 100$$

For additional interpretation of the level of observed changes, the project applied an internal five-level progress scale:

0–20% – Basic progress

21–40% – Progress in development

41–60% – Stable progress

61–80% – High progress

81% and above – Excellent progress

The five-level scale is used as a supplementary internal analytical framework. Its purpose is to provide a more differentiated interpretation of the observed development rather than reducing the evaluation to only “achieved” or “not achieved.” At the same time, the original project target of a **50% increase** was evaluated separately and remained the principal reference point for assessing achievement of the quantitative indicator. Therefore, positive progress below 50% could be recognised and described while still being transparently reported as below the originally established target.

As the questionnaires included multiple-response questions in which students could select more than one answer, the percentages shown in the figures represent the **distribution/share of responses or selections** and should not automatically be interpreted as the percentage of individual students who answered an entire question correctly. Consequently, the analysis of individual questions is primarily used to demonstrate **patterns and direction of change in environmental knowledge**.

Due to PRE and POST assessments involving different numbers of respondents and individual students were not necessarily matched between the two measurement points, the findings are interpreted as **changes at group level**.

Evidence relating to environmental initiatives and students' creative participation was analysed separately using teacher feedback from the piloting and approbation of the lesson plans. Reported activities were reviewed to identify concrete environmental initiatives implemented

with students and evidence of students' active or creative involvement in planning and carrying out these activities.

The content of the questions strictly corresponds **to the indicators** set in the project:

% of students providing correct answers (in the Q) when being asked about the consequences of specific actions on the environment; T – 50% increase.

Students being able to provide relevant examples in the open-ended questions regarding the consequences of people's actions on the environment.

Number of initiatives implemented in the class aimed at protecting the environment; T – 2 initiatives.

Level of students' creative contributions in planning and implementing the initiatives (in the evaluation of the teacher as presented to parents and the school authorities).

Participation in the questionnaire was voluntary and anonymous. The questionnaires were completed in the students' usual classroom environment. Participants were informed about the purpose of the questionnaire and the project, and data collection was carried out in accordance with the procedures applicable in the participating schools and partner countries.

Indicators for objective 6: Percentage of students providing correct answers (in the Q) when being asked about the consequences of specific actions on the environment; T – 50% increase.

The analysis of the open-ended questions on **biodiversity, climate change and environmental pollution** provides evidence of students' ability to identify and describe relevant environmental concepts. To ensure consistent interpretation, responses with similar meanings were grouped into broader thematic categories.

The pre-training responses indicate differences in students' initial familiarity with the three environmental topics. **Environmental pollution appeared to be the most familiar and easily recognised concept**, with students able to associate it with visible and everyday environmental problems such as waste, litter, dirty surroundings and different forms of pollution. In contrast, **biodiversity was a less familiar and more difficult concept for students before the training**. Their initial associations were more limited and frequently focused on individual elements of nature, such as animals and plants, rather than on the broader idea of the diversity of living

organisms, species, habitats and ecosystems. This suggests that, prior to the training, students had greater awareness of directly observable environmental problems such as pollution, while their conceptual understanding of biodiversity was less developed.

*Table 2. Keywords used by students to describe the term “biodiversity”
in the pre-training questionnaire*

Free text responses: "Biodiversity"		
Response	Count	Percentage
i don't know	116	12,6%
nature	101	11,0%
different animals	65	7,1%
wealth	65	7,1%
nature and various trees	64	7,0%
this means how many different different	64	7,0%
animals	44	4,8%
it has to do with animals	21	2,3%
biology	9	1,0%
plants	7	0,8%
animals and plants	7	0,8%

*Table 3. Keywords used by students to describe the term “biodiversity”
in the after-training questionnaire*

Biodiversity			
Grouped relevant concept	Students	% of 1,065	Comment
Diversity / variety of living things	334	31,4%	Related words/phrases combined
Animals / fauna	328	30,8%	Related words/phrases combined
Plants / flora	315	29,6%	Related words/phrases combined
Living beings / species / life	306	28,7%	Related words/phrases combined
Nature / ecosystems / habitats	261	24,5%	Related words/phrases combined
Insects	58	5,4%	Related words/phrases combined
I don't know / no idea	66	6,2%	Shown separately

The post-training responses in table 3 demonstrate a broader range of relevant environmental associations. Biodiversity was most frequently associated with the **diversity and variety of living things (31.4%)**, **animals/fauna (30.8%)**, **plants/flora (29.6%)**, **living beings/species/life (28.7%)**, and **nature, ecosystems and habitats (24.5%)**. The presence of concepts such as diversity, species, ecosystems and habitats is particularly important, as it indicates that students' understanding extends beyond simply naming individual plants or animals and towards recognising relationships and variety within the natural environment.

Table 4. Keywords used by students to describe the term “climate change” in the pre-training questionnaire.

Free text responses: "Climate change"		
Response	Count	Percentage
fireworks	69	7,5%
storms	68	7,4%
disaster	65	7,1%
when an asteroid hits the planet	64	7,0%
change in temperatures, change in seasons	64	7,0%
heat	61	6,7%
i don't know	48	5,2%
it's getting hotter	23	2,5%
there are more storms	16	1,7%
global warming	11	1,2%
it's hotter and there are more storms	11	1,2%
temperature	6	0,7%
climate change	6	0,7%
glaciers	5	0,5%
changing seasons	5	0,5%

Table 5. Keywords used by students to describe the term “climate change” in the after training questionnaire

Climate change			
Grouped relevant concept	Students	% of 1,065	Comment
Global warming / rising temperature	348	32,7%	Related words/phrases combined
Changes in climate / weather	252	23,7%	Related words/phrases combined
Extreme weather / natural disasters	114	10,7%	Related words/phrases combined
Seasonal changes	71	6,7%	Related words/phrases combined
Melting ice / glaciers	52	4,9%	Related words/phrases combined
Pollution / emissions	35	3,3%	Related words/phrases combined
I don't know / no idea	19	1,8%	Shown separately

Climate change, as indicated in tables 4 and 5, was subsequently associated with **global warming and rising temperatures (32.7%)**, **changes in climate and weather (23.7%)**, and **extreme weather and natural disasters (10.7%)**.

Responses concerning environmental pollution remained particularly concrete (tables 6 and 7), referring to a **dirty or contaminated environment (45.4%)**, **waste, garbage and litter (39.2%)**, **harm to animals, plants or people (17.3%)**, **air pollution and related sources (15.0%)**, and **water pollution (10.5%)**.

Table 6. Keywords used by students to describe the term “pollution” in the pre-training questionnaire

Free text responses: "Pollution"		
Response	Count	Percentage
trash	175	19,1%
garbage on the streets	65	7,1%
harm	65	7,1%
when i go outside the streets will be covered	64	7,0%
everyone pollutes nature and we need to	64	7,0%
i don't know	29	3,2%
waste	13	1,4%
rubbish	12	1,3%
rivers	11	1,2%
environmental pollution	8	0,9%
filth	6	0,7%
everywhere being dirty	5	0,5%
trash can	5	0,5%
pollutes nature	4	0,4%
dirty	3	0,3%

Table 7. Keywords used by students to describe the term “pollution” in the after training questionnaire

Environmental pollution			
Grouped relevant concept	Students	% of 1,065	Comment
Dirty / contaminated environment	484	45,4%	Related words/phrases combined
Waste / garbage / litter	418	39,2%	Related words/phrases combined
Harm to animals, plants or people	184	17,3%	Related words/phrases combined
Air pollution / smoke / transport / factories	160	15,0%	Related words/phrases combined
Water / river / sea pollution	112	10,5%	Related words/phrases combined
Soil / land pollution	80	7,5%	Related words/phrases combined
Plastic pollution	35	3,3%	Related words/phrases combined
Chemicals / toxic substances	19	1,8%	Related words/phrases combined
Noise pollution	9	0,8%	Related words/phrases combined
I don't know / no idea	14	1,3%	Shown separately

The relatively small number of students who responded “**I don’t know/no idea**” after the training—66 (6.2%) for biodiversity, 19 (1.8%) for climate change and 14 (1.3%) for environmental pollution in tables 6 and 7, also indicates that most participating students were able to formulate relevant associations with the three environmental concepts. The higher number of uncertain responses for biodiversity compared with climate change and pollution nevertheless suggests that **biodiversity remains the most conceptually challenging of the three topics**, even after the training.

Overall, the results indicate that students entered the project with different levels of awareness across environmental topics: pollution was relatively well recognised because of its direct connection with everyday experience, while biodiversity required a more developed conceptual understanding. Following the CEE training activities, students demonstrated a broader and more specific environmental vocabulary, particularly through references to diversity of living things, species, ecosystems, global warming, extreme weather and different forms and

consequences of pollution. These findings provide evidence towards the project indicator concerning students' ability to give relevant examples related to environmental issues and the consequences of human actions on the environment.

To assess students' understanding of the consequences of changes in the natural environment, the questionnaire presented a picture and description of practical situations in which the areas surrounding a school were described. Students were asked to identify all possible consequences of this situation and were allowed to select more than one response. As the question permitted multiple answers, each response option was analysed separately and the percentage represents the proportion of students who selected the respective option rather than a distribution totalling 100%. Particular attention was given to changes between the pr

Pre- and post-training assessments in the selection of environmentally relevant consequences, as well as to changes in the selection of incorrect or uncertain responses. An increase in the identification of relevant consequences after the CEE training activities is interpreted as evidence of improved understanding of the relationships between human modification of the environment.

Question 1: *The areas near the school are predominantly man-made. There is no natural environment for the development of plants and animals. What are the consequences of this situation on the environment? Choose all correct answers!*

This multiple-response question assessed students' understanding of the environmental consequences of predominantly man-made areas and the lack of suitable natural habitats for plants and animals. The comparison of pre- and post-training responses shows changes in students' recognition of these consequences: deforestation remained the most frequently selected response (45.3% before and 41.1% after training), while recognition of habitat loss for animals and plants increased from 16.5% to 18.7%. A particularly notable change was observed in recognising that nature becomes weaker and less able to protect against environmental disturbances, which accounted for 17.5% of responses after training, while the selection of waste decreased from 19.0% to 5.6%. Overall, the post-training responses suggest a shift towards recognising consequences more directly related to the loss of natural habitats and the reduced resilience of ecosystems.

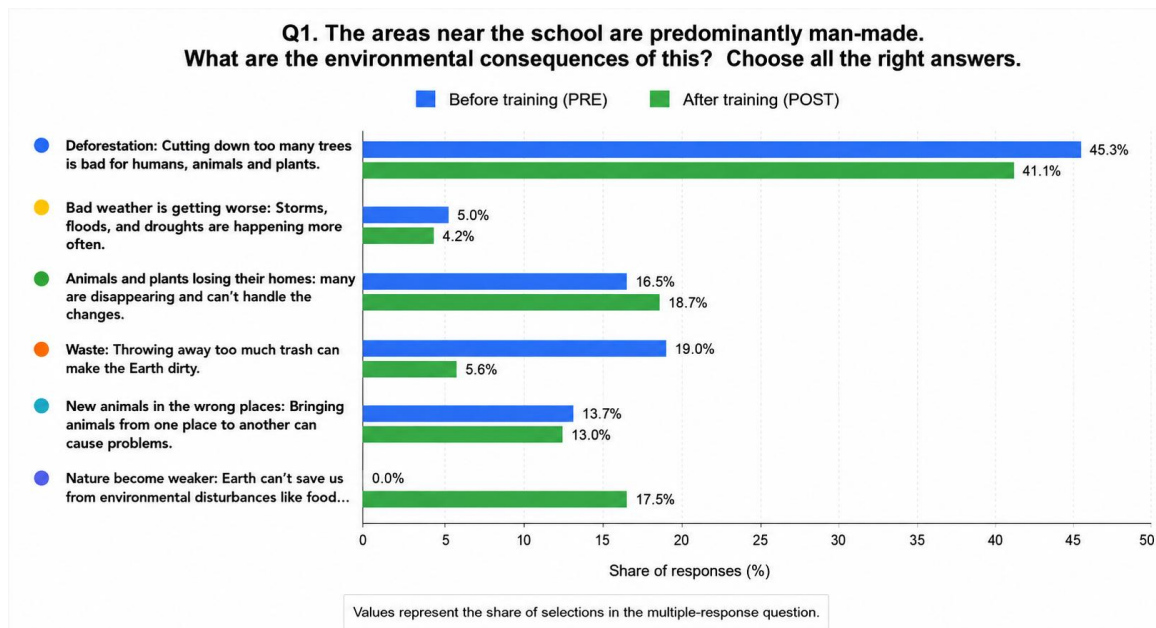


Figure 1. Student responses on consequences of a dominantly man-made environment before and after CEE training.

Question 2: A large amount of food is being thrown away every day. What are the environmental consequences of this? Choose all the right answers.

Comparing pre- and post-training responses shows change in students' understanding of the environmental consequences associated with waste of food. The proportion of responses identifying **waste of limited resources such as energy, water and land** increased from **16.8% before training to 29.1% after training**. At the same time, **noise pollution decreased from 19.1% to 9.7%**. This suggests that after the training students were less likely to associate food waste with an environmental consequence that is not directly related to the situation presented. Overall, the results indicate a **more focused understanding of the relationship between food waste and the unnecessary consumption of limited natural resources** after the training.

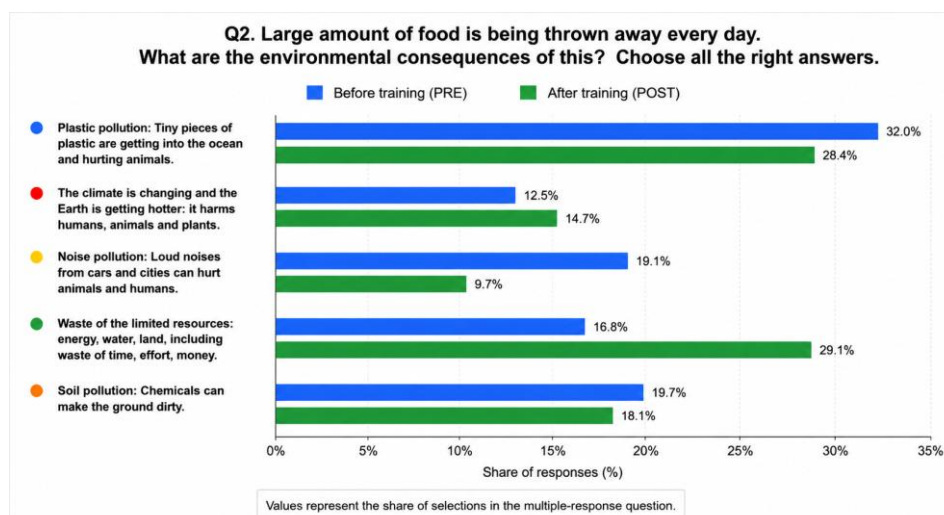


Figure 2. Student responses on consequences of a daily food waste before and after CEE training.

Question 3: Many parents choose to drive their children to school by car. What are the environmental consequences of this? Choose all the right answers!

The results show clearer identification of consequences directly related to car use. The proportion of responses identifying **air pollution after the training** increased from **31.2% to 38.6%**, while **noise pollution** also increased from **29.6% to 34.7%**, making these the two most frequently selected consequences after training. At the same time, **plastic pollution**, which is less directly related to travelling to school by car, decreased substantially from **13.5% to 3.7%**. Results suggest that after the training students were **better able to distinguish the direct environmental consequences of car transportation from less relevant environmental problems**.

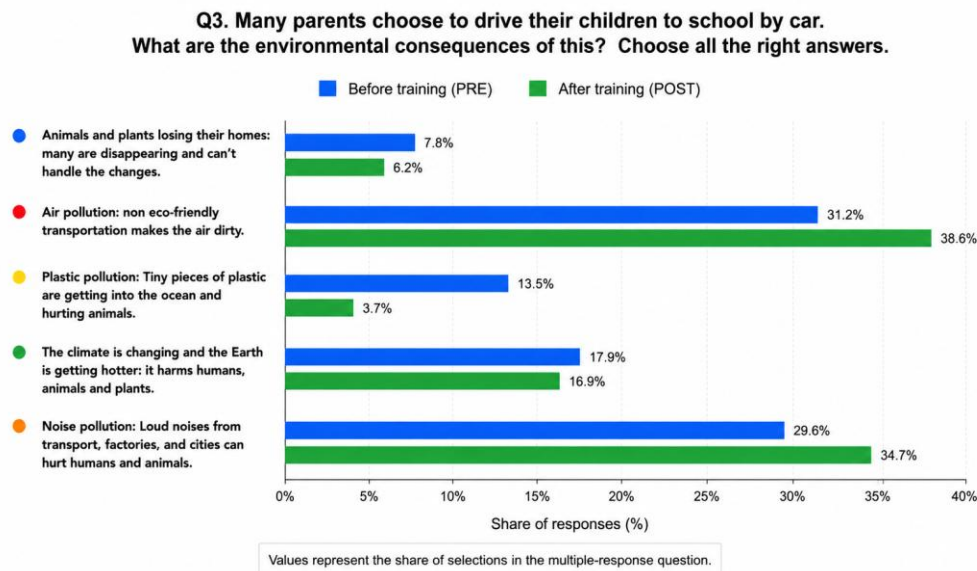


Figure 3. Student responses on consequences of choosing to drive to school by car before and after CEE training.

Question 4: Bad habits and old school buildings contribute to the wasteful use of heat and electricity. What are the environmental consequences of this? Choose all the right answers.

Figure 4 show students' understanding of the environmental consequences of the **wasteful use of heat and electricity caused by bad habits and old school buildings**. The comparison shows an increase in the recognition of broader environmental consequences: the number of students who link the situation to **climate change increased from 21.6% to 27.2%**, while those recognising the negative effects on **animals and plants increased from 16.4% to 26.9%**. At the same time, the selection of air pollution decreased from 28.8% to 19.9%, and soil, plastic and noise pollution were also selected less frequently after the training. Overall, the results

suggest that after the training, students demonstrated a more focused understanding of the connection between **wasteful energy consumption, climate change and its impact on biodiversity**.

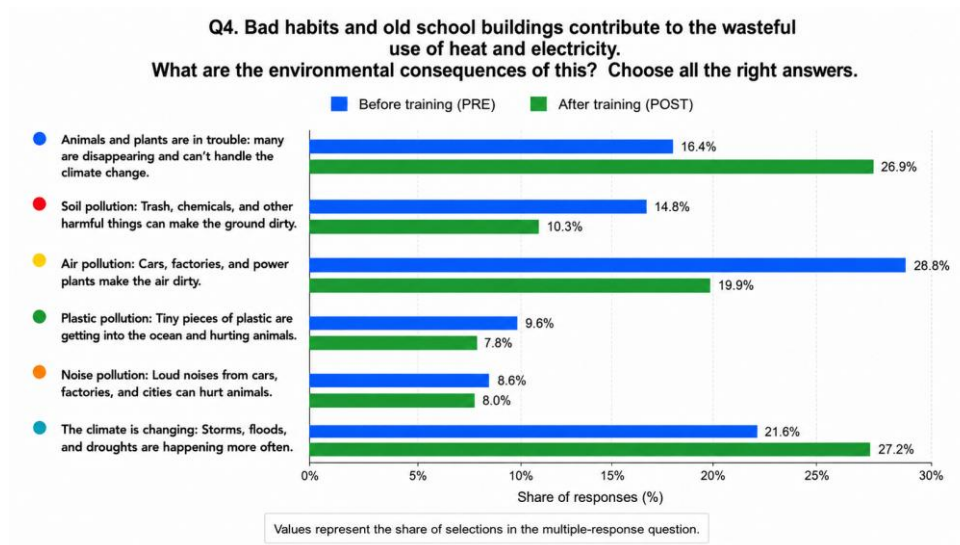


Figure 4. Student responses on consequences of bad habits and old school buildings before and after CEE training.

Question 5: Careless habits lead to high water consumption. What are the environmental consequences of this? Choose all the right answers!

After the training, students continued to identify water scarcity as the main consequence of excessive water consumption (41.7% before and 37.4% after training). As it shows in figure 5 recognition of the waste of limited resources increased considerably from 12.9% to 22.2%. Overall, the results indicate a better understanding of water as a limited natural resource that should be used responsibly.

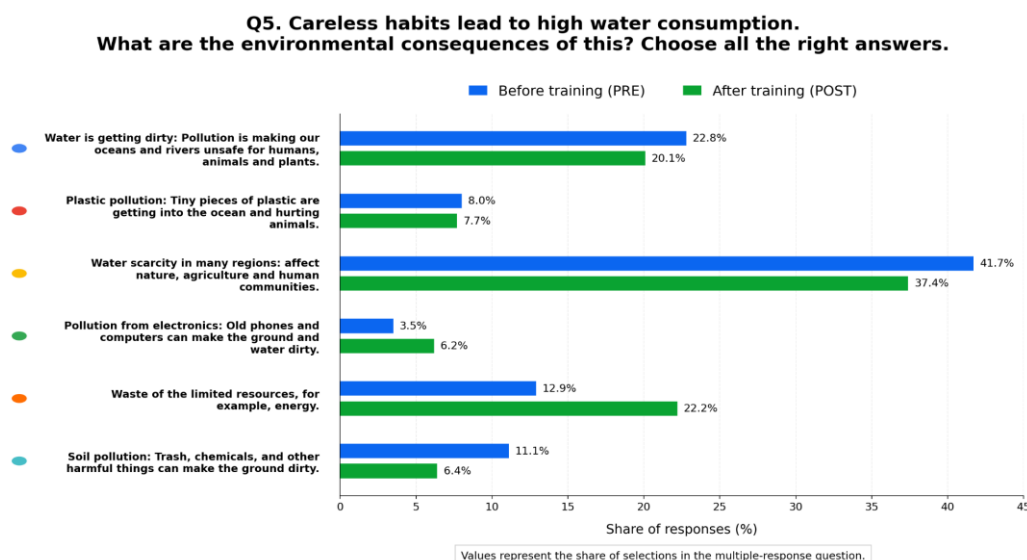


Figure 5. Student responses on consequences of bad habits and old school buildings before and after CEE training.

Question 6: *Various non eco-friendly chemicals are used in cleaning. What are the environmental consequences of this? Choose all the right answers.*

For the question concerning the use of **non-eco-friendly chemicals in cleaning** students showed a clearer understanding of the related environmental and health consequences after training. Recognition of **health problems caused by harmful chemicals increased from 26.4% to 38.0%**, becoming the most frequently selected consequence, while water and air pollution remained highly recognised (34.0% before and 32.7% after on air and 17.3% before and 22.6% after). At the same time, less directly relevant **noise pollution decreased from 8.7% to 4.2%**, suggesting improved ability to distinguish the consequences directly associated with harmful cleaning chemicals.

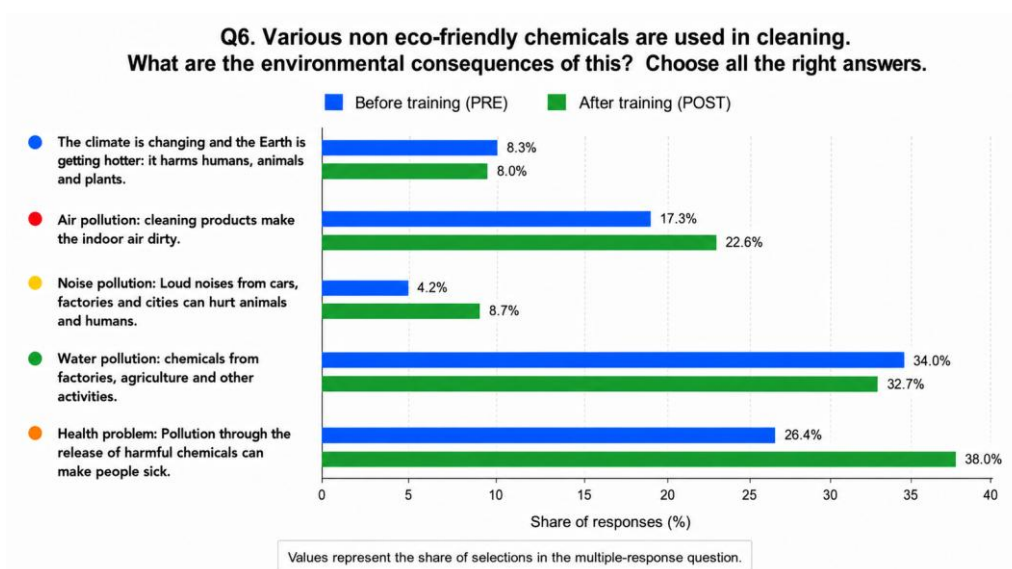


Figure 6. Students responses on consequences of use of non-eco chemicals in cleaning before and after CEE training.

Question 7: *Single use plastic packaging is so convenient! But what are the consequences for the environment? Choose all the right answers.*

For the question on the environmental consequences of **single-use plastic packaging**, the results show a clearer understanding of plastic-related impacts after the training. Recognition of **microplastic pollution** increased substantially from **29.1% to 38.3%**, while soil pollution also increased from **18.8% to 21.7%**. At the same time, the selection of **noise pollution**, which is less directly related to single-use plastics, decreased markedly from **16.1% to 4.2%**. Overall, the results suggest that students became better able to distinguish the environmental consequences directly associated with single-use plastic waste.

Q7. Single use plastic packaging is so convenient! But what are the consequences for the environment? Choose all the right answers.

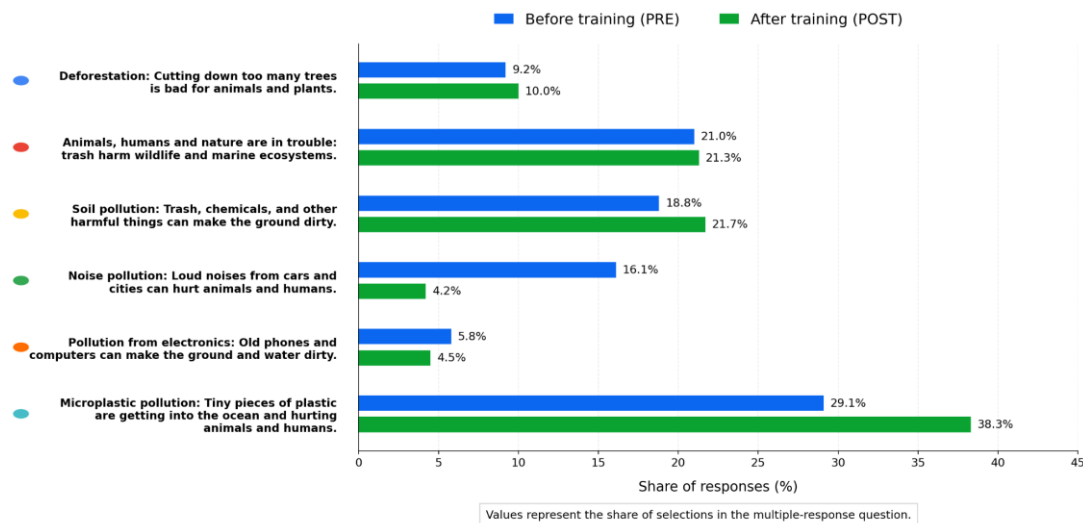


Figure 7. Students' responses on the environmental consequences of single-use plastic packaging.

Question 8: Sometimes we don't know how to sort waste correctly. What are the environmental consequences of not sorting waste and not recycling properly? Choose all the right answers.

Comparing students' responses in figure 8 before and after the training regarding the environmental consequences of not sorting waste and recycling it properly. The most significant change was observed in the recognition of the waste of limited resources, which increased from 15.9% before training to 32.1% after training. Students also showed greater awareness of soil pollution as an environmental problem, with an increase of 7.8 % points. At the same time, the selection of less directly related consequences, particularly noise pollution, decreased from 13.2% to 5.1%. These results indicate that after the training students demonstrated a clearer understanding of the connection between proper waste sorting, recycling and the conservation of limited natural resources.

Q8. Not sorting waste and not recycling properly are big problems. What are the environmental consequences of this? Choose all the right answers.

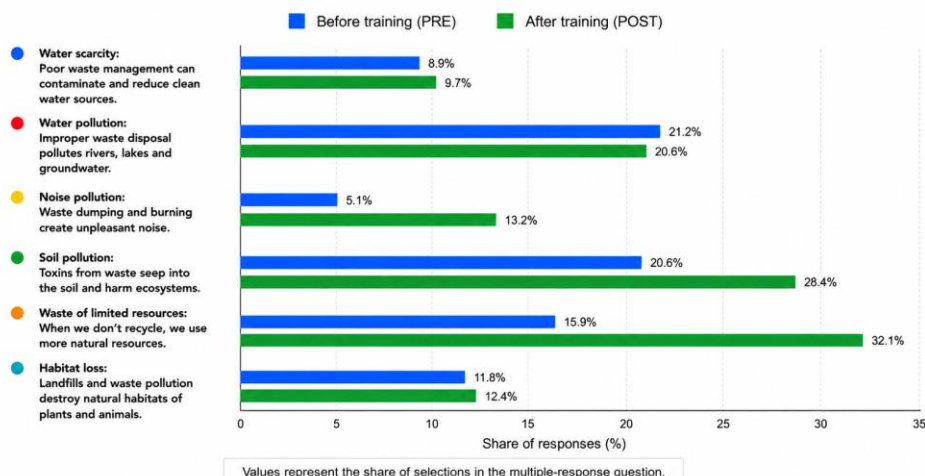


Figure 8. Students' responses on the environmental consequences of not sorting waste and recycling properly: pre- and post-training comparison.

Question 9: Not only do we make a lot of noise, but also various mechanical devices. What are the environmental consequences of noise? Choose all the right answers.

The results in figure 9 show a clearer understanding of the consequences directly associated with noise after the training. Recognition of health problems increased from 30.7% to 37.7%, while recognition of the negative impact of noise on wildlife on land and in the sea increased substantially from 24.3% to 36.6%. At the same time, selections of less directly related consequences decreased, including climate change (10.9% to 5.6%), air pollution (8.4% to 5.1%), new animals in the wrong places (11.9% to 6.6%), and urban sprawl (13.8% to 8.4%). Overall, the results indicate that students became better able to identify the specific health and environmental impacts of noise pollution.

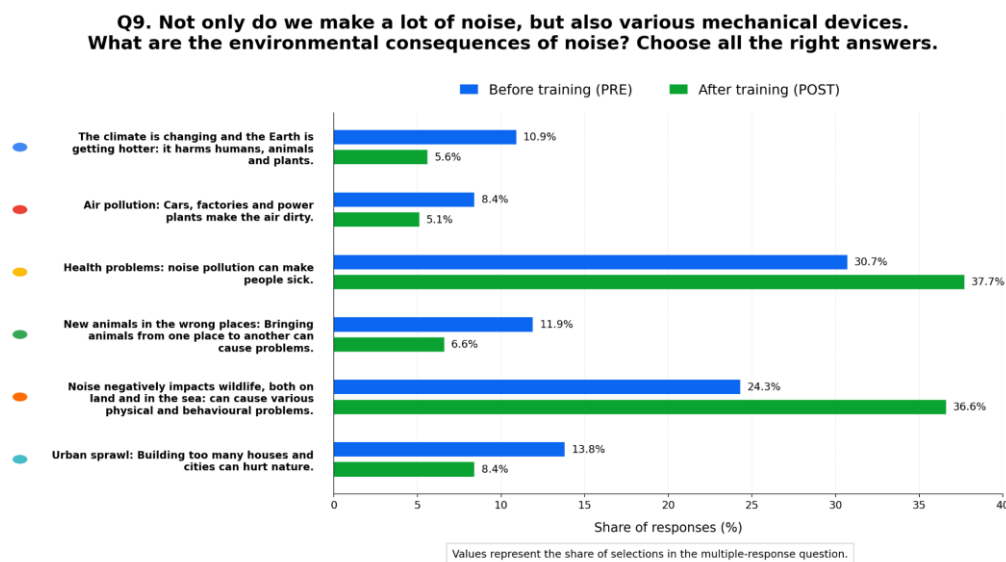


Figure 9. Students' responses on the environmental consequences of noise made by electronical and mechanical devices: pre- and post-training comparison.

Question 10: Sometimes, we use materials inefficiently, especially paper. High paper consumption has serious consequences for the environment! Choose all the right answers.

The pre- and post-training result comparison in figure 10 indicate an improved understanding of the environmental consequences of inefficient material use and high paper consumption. Recognition of the waste of limited resources increased from 28.8% to 35.0%, while recognition of deforestation increased substantially from 28.7% to 37.2%. At the same time, selections of less directly related consequences decreased, including climate change (12.1% to 10.5%), air pollution (7.9% to 5.9%), noise pollution (10.3% to 5.1%), and urban sprawl (12.2% to 6.3%).

Overall, the results suggest that after the training students more clearly connected high paper consumption with resource use and deforestation, demonstrating a more focused understanding of its environmental consequences.

Q10. Sometimes, we use materials inefficiently, especially paper. High paper consumption has serious consequences for the environment! Choose all the right answers.

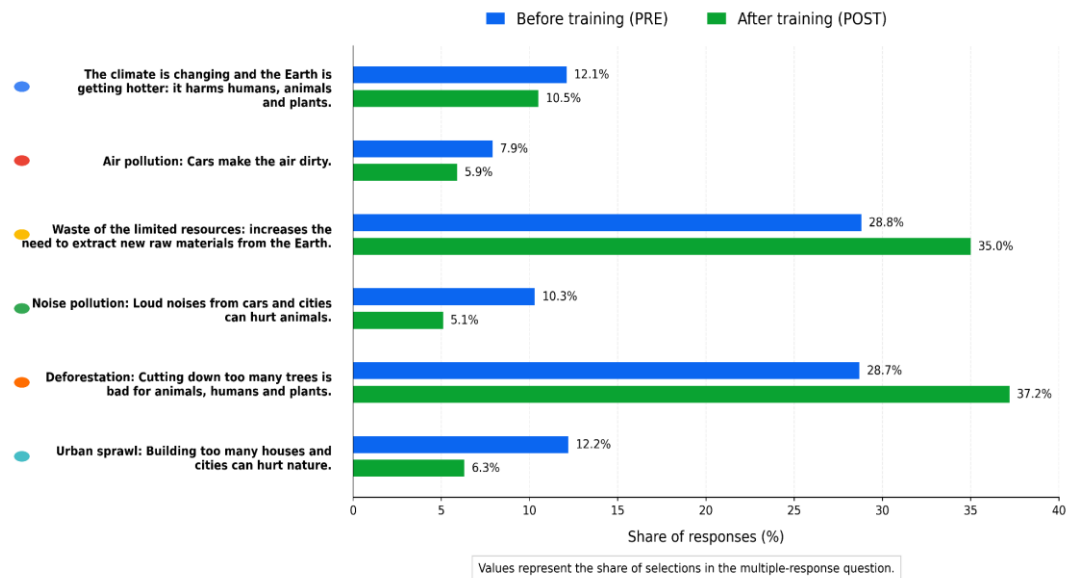


Figure 10. Students' responses on the environmental consequences of inefficient use of paper and other supplies: pre- and post-training comparison.

Interpretation of results

The comparison of the pre- and post-training results demonstrates an **overall positive development in students' environmental knowledge across the ten analysed situations**. The improvement is visible not only through increases in the selection of environmental consequences directly associated with the situations presented, but also through decreases in the selection of less directly related alternatives. This second aspect is particularly important, as it indicates that students developed a better ability to **differentiate between different environmental problems and establish more accurate cause-and-effect relationships**.



Environmental situation	Changes in more directly relevant responses	Changes in less directly related responses	Overall interpretation
Q1. Predominantly man-made areas	Habitat loss increased 16.5% → 18.7%; recognition that nature becomes weaker increased 0.0% → 17.5%	Waste decreased 19.0% → 5.6%; bad weather 5.0% → 4.2%; introduced animals 13.7% → 13.0%	Clear positive development. Responses shifted towards habitat loss and reduced ecosystem resilience.
Q2. Food waste	Waste of limited resources increased strongly 16.8% → 29.1%; climate change increased 12.5% → 14.7%	Noise pollution decreased 19.1% → 9.7%; plastic pollution decreased 32.0% → 28.4%	Clear positive development. Students increasingly associated food waste with unnecessary consumption of limited resources and were less likely to select noise pollution.
Q3. Travelling to school by car	Air pollution increased 31.2% → 38.6%; noise pollution increased 29.6% → 34.7%	Plastic pollution decreased substantially 13.5% → 3.7%; habitat loss decreased 7.8% → 6.2%	Clear positive development. Students became better at identifying air and noise pollution as direct consequences of car transportation.
Q4. Wasteful use of heat and electricity	Climate change increased 21.6% → 27.2%; effects on animals and plants increased strongly 16.4% → 26.9%	Soil pollution decreased 14.8% → 10.3%; plastic pollution 8.8% → 8.0%; noise pollution 9.6% → 7.8%	Positive development. Students increasingly connected inefficient energy consumption with climate change and consequences for living organisms.
Q5. High water consumption	Waste of limited resources increased 12.9% → 22.2%; water scarcity remained the dominant response (41.7% → 37.4%)	Soil pollution decreased 11.1% → 6.4%; plastic pollution remained relatively low (8.0% → 7.7%)	Positive development, with some mixed changes. Students demonstrated stronger recognition of water/resource conservation, although water scarcity itself decreased slightly as a share of selections.



Q6. Non-eco-friendly cleaning chemicals	Health problems increased substantially 26.4% → 38.0%; water pollution remained strongly recognised (34.0% → 32.7%)	Noise pollution decreased 8.7% → 4.2%; climate change remained relatively low (8.3% → 8.0%)	Clear positive development. Responses became more concentrated on health effects and water pollution associated with harmful chemicals.
Q7. Single-use plastic packaging	Microplastic pollution increased 29.1% → 38.3%; soil pollution increased 18.8% → 21.7%; harm to wildlife/marine ecosystems remained stable (21.0% → 21.3%)	Noise pollution decreased substantially 16.1% → 4.2%; electronic pollution decreased 5.8% → 4.5%	Clear positive development. Students increasingly identified consequences directly associated with plastic waste while reducing less relevant selections.
Q8. Improper waste sorting and recycling	Waste of limited resources increased strongly 15.9% → 32.1%; water pollution remained strongly recognised (21.2% → 20.6%)	Noise pollution decreased substantially 13.2% → 5.1%	Strong positive development. Students demonstrated a much clearer understanding of the connection between recycling and conservation of raw materials and resources.
Q9. Noise pollution	Health problems increased 30.7% → 37.7%; effects of noise on wildlife increased strongly 24.3% → 36.6%	Climate change decreased 10.9% → 5.6%; air pollution 8.4% → 5.1%; introduced animals 11.9% → 6.6%; urban sprawl 13.8% → 8.4%	Strong positive development. Students became substantially better at distinguishing the specific health and wildlife consequences of noise.
Q10. High paper consumption	Waste of limited resources increased 28.8% → 35.0%; deforestation increased strongly 28.7% → 37.2%	Noise pollution decreased 10.3% → 5.1%; urban sprawl 12.2% → 6.3%; air pollution 7.9% → 5.9%	Strong positive development. Students increasingly associated excessive paper consumption with resource use and deforestation while selecting less directly related consequences less frequently.

Particularly strong changes were observed in students' understanding of **resource conservation**. For food waste, the share of responses identifying the waste of limited resources increased from 16.8% to 29.1%, while for improper waste sorting and recycling it increased

from 15.9% to 32.1%. In relation to high water consumption, recognition of the waste of limited resources increased from 12.9% to 22.2%. Similarly, for high paper consumption, recognition of resource waste increased from 28.8% to 35.0%, accompanied by an increase in recognition of deforestation from 28.7% to 37.2%.

The results also indicate improved understanding of the **effects of human activities on ecosystems and biodiversity**. For predominantly man-made areas, recognition that the loss of natural environments weakens nature and its capacity to respond to environmental disturbances increased considerably, while recognition of habitat loss also increased. In the question concerning noise, the proportion of responses identifying negative effects on wildlife increased from 24.3% to 36.6%. For single-use plastic packaging, recognition of microplastic pollution increased from 29.1% to 38.3%, together with increased recognition of soil pollution.

Another important development concerns students' ability to identify **pollution sources and their specific consequences**. After training, students more frequently connected travelling by car with air and noise pollution, harmful cleaning chemicals with health problems and water pollution, and single-use plastics with microplastic pollution. At the same time, selections of consequences that were less directly connected with the situations presented generally decreased. For example, plastic pollution in the car-transport question decreased from 13.5% to 3.7%, noise pollution in the single-use plastic question decreased from 16.1% to 4.2%, and noise pollution in the recycling question decreased from 13.2% to 5.1%.

Question	Correct selections PRE	Correct selections POST	Change	Relative increase	Overall interpretation
Q1. Predominantly man-made areas	16.5%	36.2%	+19.7 pp	+119.4%	Excellent progress
Q2. Food waste	29.3%	43.8%	+14.5 pp	+49.5%	Stable progress
Q3. Travelling to school by car	60.8%	73.3%	+12.5 pp	+20.6%	Basic progress
Q4. Wasteful use of heat and electricity	38.0%	54.1%	+16.1 pp	+42.4%	Stable progress

Q5. High water consumption	54.6%	59.6%	+5.0 pp	+9.2%	Basic progress
Q6. Non-eco-friendly cleaning chemicals	60.4%	70.7%	+10.3 pp	+17.1%	Basic progress
Q7. Single-use plastic packaging	68.9%	81.3%	+12.4 pp	+18.0%	Basic progress
Q8. Improper waste sorting and recycling	37.1%	52.7%	+15.6 pp	+42.0%	Stable progress
Q9. Noise pollution	55.0%	74.3%	+19.3 pp	+35.1%	Progress in development
Q10. High paper consumption	57.5%	72.2%	+14.7 pp	+25.6%	Progress in development
Overall average	47.8%	61.8%	+14.0 pp	+29.3%	Progress in development

The comparison of PRE and POST results demonstrates a clear positive development in students' environmental knowledge. Across the ten analysed environmental situations, the average share of correct selections increased from **47.8% before the training to 61.8% after the training**, representing an improvement of **14.0 percentage points**, or approximately **29.3% relative to the baseline**.

Positive development was observed in **all ten questions**. The strongest relative improvement was recorded for predominantly man-made areas (**+119.4%**), followed by food waste (**+49.5%**), wasteful use of heat and electricity (**+42.4%**), and improper waste sorting and recycling (**+42.0%**). Particularly strong absolute increases were also observed for noise pollution (**+19.3 percentage points**) and predominantly man-made areas (**+19.7 percentage points**).

The results therefore indicate that the educational activities contributed to strengthening students' ability to recognise relevant environmental consequences and to establish clearer relationships between everyday human activities and their environmental impacts. Although the overall relative increase of **29.3%** is below the originally established target of **50%**, the results demonstrate substantial and consistent positive progress across all ten analysed areas.

Indicators for objective 7: Students being able to provide relevant examples in the open-ended questions regarding the consequences of people's actions on the environment.

The achievement of Objective 7 was assessed through an open-ended question designed to evaluate changes in students' understanding of environmental challenges and their willingness to take action.

Students were presented with several environmental problems, including:

- **Climate change:** the Earth is getting hotter, affecting ecosystems, weather patterns, people, animals and plants.
- **Animals and plants losing their homes:** many species are disappearing or are unable to adapt to environmental changes.
- **Environmental pollution:** including water, noise, air and soil pollution, as well as pollution caused by waste such as food and plastic.

Students were then asked the open-ended question: **“What will you do to change this?”**

The purpose of the question was not only to assess whether students could identify environmentally responsible actions, but also to explore the level of agency expressed in their responses. In particular, the analysis examined whether students demonstrated an understanding of the environmental problems presented to them and were able to provide examples of relevant actions that could solve these problems. This made it possible to further assess whether students expressed a willingness to take action individually or demonstrated initiative by proposing actions that involved other people.

Open-ended responses were considered particularly valuable because students were not provided with predefined answer options. Instead, they had to formulate their own responses, allowing the evaluation to capture both - their understanding of possible environmental actions and their expressed willingness to contribute to change.

For the analysis, responses were systematically classified according to the level and type of environmental agency demonstrated. A distinction was made between **personal environmental actions**, **student initiatives involving others**, and **responses showing uncertainty about how to act**. This distinction made it possible to assess not only whether students knew what could be done to act against climate change and environmental degradation, but also whether they positioned themselves as active participants.

Code	Category	Meaning	Examples
1	Personal environmental action	Students identify an action they can personally carry out, but it remains primarily an individual behaviour.	“I will use less plastic!” “I will walk to school!” “I will save water!”
2	Student initiatives - include others	Students intend to influence, involve, organise, educate, ask, encourage, or work with others to address the problem.	“I will ask my parents to walk more.” “I will warn people.” “I will organise a clean-up.”
3	Do not know how to act or irrelevant answer	No meaningful intention/action can be identified.	“I don't know.” “Yes.” “It's getting hotter.” irrelevant answers.

The comparison of responses collected before and after the training course was used to identify changes in students' awareness of how to address environmental problems and to assess changes in their expressed willingness to take environmental action.

Question 11: *What will you do to change this?*

Climate change: the Earth is getting hotter, affecting ecosystems, weather patterns, people, animals and plants.

Code	Category	Before CEE training course (n)	Before CEE training course (%)	After CEE training course (n)	After CEE training course (%)
1	Personal environmental action	395	43,1	661	62,1
2	Student initiatives - include others	100	10,9	39	3,7
3	Do not know how to act or irrelevant answer	422	46,0	365	34,3

Table 7. Students' actions addressing climate change before and after the CEE training course.

The results presented in Table 7 show a clear shift towards greater understanding of personal actions that can be taken to address climate change after the CEE training course. Before the training, **395 students out of 917 (43.1%)** provided examples of personal environmental actions. After the training, this number increased to **661 students out of 1065 (62.1%)**. At the

same time, the number of students who did not know how to act or provided an irrelevant response decreased from **422 students out of 917 (46.0%) before the training to 365 out of 1065 students (34.3%) after the training.**

The number of responses reflecting **student initiative involving others** decreased from **100 students out of 917 (10.9%) before the training to 39 students out of 1065 (3.7%) after the training.** This should not necessarily be interpreted as a negative result. Together with the substantial increase in personal environmental actions, it may indicate that after the training students were more likely to identify concrete actions they could take themselves rather than relying on or involving others.

Overall, the findings indicate increased awareness among students of how they can personally respond to climate change. In particular, the increase from **395 to 661 responses identifying personal environmental actions** provides evidence of a considerable shift towards more action-oriented responses after the CEE training course.

Question 12: *What will you do to change this?*

Animals and plants losing their homes: many species are disappearing or are unable to adapt to environmental changes.

Code	Category	Before CEE training course (n=917)	Before CEE training course (%)	After CEE training course (n=1065)	After CEE training course (%)
1	Personal environmental action	396	43,3	655	61,6
2	Student initiatives - include others	159	17,4	25	3,3
3	Do not know how to act or irrelevant answer	360	39,3	384	36,1

Table 8. Students' actions addressing loss of biodiversity e before and after the CEE training course.

The results presented in Table 7 indicate a clear shift towards **personal environmental action** after the CEE training course. Before the training, **396 responses (43.3%)** identified actions that students could personally undertake to address biodiversity loss, while after the training this increased to **655 responses (61.6%)**, representing an **increase of 18.3%**. This suggests that

after the training, students were considerably more able to identify concrete actions they could take themselves, such as protecting habitats, planting trees, reducing waste, or taking care of animals.

At the same time, responses showing **uncertainty about how to act or providing irrelevant answers** decreased from **360 (39.3%) before the training to 384 (36.1%) after the training**, a decrease of **3.2 percent**. Although the absolute number increased because more responses were collected after the training, the lower percentage indicates a modest improvement in students' ability to identify relevant environmental actions.

Responses classified as **student initiatives involving others** decreased substantially, from **159 (17.4%) before the training to 25 (2.3%) after the training**. Therefore, the results do not provide evidence of increased willingness to initiate collective or socially oriented action towards acting against loss of biodiversity. Instead, the main positive change is concentrated in students' **personal environmental agency**: after the course, they were more likely to identify actions they themselves could impose in their daily life.

Overall, the findings indicate that the CEE training course was associated with a **stronger action-oriented understanding of biodiversity loss**, particularly at the individual level. However, the decrease in responses involving other people suggests that the development of **collective initiative and the ability to mobilise others** may require further attention in future learning activities.

Question 13: *What will you do to change this?*

Environmental pollution: including water, noise, air and soil pollution, as well as pollution caused by waste such as food and plastic.

Code	Category	Before CEE training course (n=917)	Before CEE training course (%)	After CEE training course (n=1065)	After CEE training course (%)
1	Personal environmental action	487	53.2	598	56.1
2	Student initiatives - include others	46	5.0	53	5.0

3	Do not know how to act or irrelevant answer	383	41.8	415	38.0
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Table 8. Students' actions addressing pollution before and after the CEE training course.

The results indicate a **positive change in students' responses to environmental pollution** after the CEE training course. The proportion of responses identifying **personal environmental actions** increased from **53.2% (487 responses) before the training to 56.1% (598 responses) after the training**, representing an increase of **2.9%**. Students proposed concrete actions such as sorting waste, reducing plastic use, saving water, recycling, avoiding littering and using more environmentally friendly forms of transport. The responses given after the CEE training include, for example, sorting waste and cycling more.

Responses showing **uncertainty about how to act or providing irrelevant answers** decreased from **41.8% (383 responses) to 38.9% (415 responses)**, a reduction of **2.9 %**. Although the absolute number of such responses increased because the after training sample was larger, their proportion decreased. This suggests a modest improvement in students' ability to identify relevant actions for addressing environmental pollution.

The proportion of responses classified as **student initiatives involving others** remained almost unchanged, accounting for approximately **5.0% both before and after the training** (46 and 53 responses, respectively).

Overall, the findings indicate that students already demonstrated a relatively strong ability to name actions to decrease pollution before the CEE training course, and this improved moderately afterwards. The main positive change was an **increase in personal environmental action accompanied by a decrease in uncertainty or irrelevant responses**. However, the results do not indicate an increase in students' tendency to involve or mobilise others. This pattern may partly reflect students' comparatively high initial familiarity with pollution-related environmental problems, leaving less scope for improvement than in less familiar environmental topics.

Interpretation of results

The combined results demonstrate a positive development in students' ability to provide relevant examples of actions addressing environmental problems. After the CEE training course, the **number of students identifying personal environmental actions increased**

across all three environmental topics. For climate change, the number increased from 395 students before the training to 661 students after the training; for biodiversity loss, from 396 to 655 students; and for environmental pollution, from 487 to 598 students.

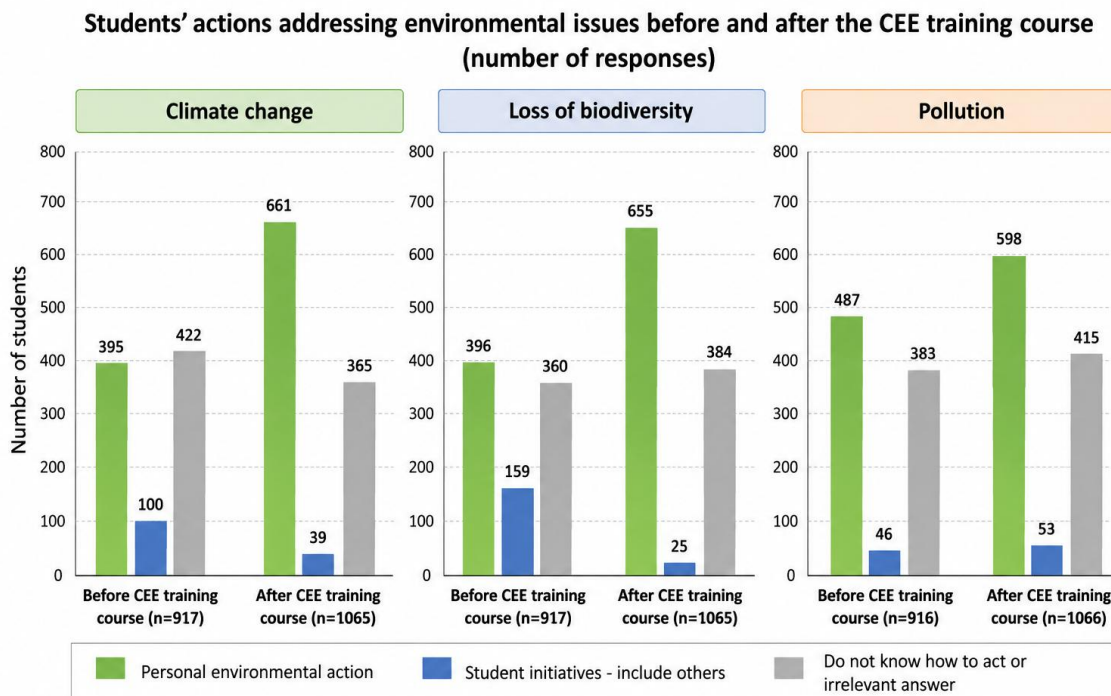


Figure 11. Students' actions addressing environmental issues before and after the CEE training course.

The strongest increases were observed for climate change and biodiversity loss. For climate change, 266 more students were able to provide examples of personal environmental actions after the training (661 compared with 395 before training). For biodiversity loss, the increase was 259 students (655 compared with 396). For environmental pollution, 111 more students provided relevant examples of personal actions (598 compared with 487). These results indicate that after the training substantially more students were able to identify concrete actions they could personally undertake in response to environmental challenges.

The smaller increase observed for environmental pollution should also be considered in relation to students' initial knowledge. The earlier open-ended questions showed that students already demonstrated the greatest familiarity with pollution before the training. Accordingly, pollution also had the highest initial number of students able to identify personal environmental actions (487 students), leaving less scope for improvement than in the areas of climate change and biodiversity loss.

The results concerning student initiatives involving others show a different pattern. **For climate change, these responses decreased from 100 to 39 students, while for biodiversity loss they decreased from 159 to 25 students.** For environmental pollution, the number remained relatively stable, changing from 46 to 53 students. Therefore, the results provide stronger evidence of development in students' personal environmental agency than in their willingness to organise or involve other people in environmental action.

Overall, the results provide evidence of achievement of the indicator “Students being able to provide relevant examples in the open-ended questions regarding the consequences of people’s actions on the environment.” Following the CEE training course, **considerably more students were able to independently provide relevant examples of actions they could take to address climate change,** biodiversity loss and environmental pollution. The increase was particularly substantial for climate change and biodiversity loss, demonstrating that the project activities supported students in transferring their environmental knowledge into concrete ideas for action.

It should nevertheless be noted that the pre- and post- groups differed in size (917 students before and 1,065 after the training). Therefore, the increase in absolute numbers should be interpreted together with the response distributions rather than as evidence of individual longitudinal change. The overall pattern, however, supports the conclusion that after the training a larger number of participating students were able to formulate relevant environmental actions independently.

Summary and conclusions

1. The evaluation of students' environmental awareness before and after the CEE training course demonstrates an **overall positive effect of the project educational activities.** The combined findings show development in students' environmental knowledge, their ability to recognise the consequences of human actions on the environment, and their ability to propose relevant actions in response to environmental problems.
2. The analysis of the multiple-response questions showed **positive development across all ten environmental situations examined.** After the training, students' responses were generally more focused on consequences directly related to the situations presented, while less relevant alternatives were selected less frequently. The average share of correct selections increased from **47.8% before the training to 61.8% after the training,** corresponding to a **29.3% relative increase from the baseline.** Although this result is

below the originally established target of a **50% increase**, it demonstrates measurable and consistent progress in environmental knowledge across the areas assessed.

3. The results indicate particularly important development in students' understanding of **resource conservation, responsible consumption, waste management and recycling, pollution, biodiversity and ecosystem impacts**. Students became better able to connect everyday behaviours—such as food waste, excessive water and energy consumption, travelling by car, using single-use plastics, incorrect waste sorting and high paper consumption—with their environmental consequences.
4. The open-ended questions provide additional evidence of the effectiveness of the educational activities. Following the training, the number of students able to independently identify **personal environmental actions** increased in all three areas examined: from **395 to 661 students for climate change**, from **396 to 655 for biodiversity loss**, and from **487 to 598 for environmental pollution**. These findings support the achievement of the indicator concerning students' ability to provide relevant examples related to environmental problems and actions.
5. At the same time, the evaluation identified an area requiring further development. Responses involving **collective environmental initiatives or the involvement of other people** did not increase: they decreased for climate change and biodiversity loss and remained relatively stable for pollution. This suggests that the project had a stronger effect on students' **personal environmental agency**—understanding what they themselves can do—than on their readiness to initiate collective environmental action. Future educational activities could therefore place greater emphasis on student-led initiatives, cooperation, leadership and involving families, classmates and local communities in environmental action.
6. The results should be interpreted at **group level**, as the PRE and POST assessments involved different numbers of participants (917 and 1,065 respectively) and did not necessarily involve the same individual students. Nevertheless, the consistency of the positive patterns across the different questionnaire items, together with the development observed in the independently formulated open-ended responses, provides evidence that the CEE training activities contributed to strengthening students' environmental awareness and their capacity to translate environmental knowledge into practical ideas for action.
7. **Overall, the student evaluation indicates that the project produced meaningful educational progress.** While the quantitative target of a 50% increase in correct selections was not fully reached according to the graph-based analysis, students demonstrated broader environmental understanding, improved recognition of relevant cause-and-effect

relationships, and a greater ability to identify concrete actions they can personally undertake to protect the environment. These results support the conclusion that the developed and implemented CEE educational materials made a positive contribution to the environmental competence of participating students.