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Cooperation partnerships in school education

VIRAL

EnVIRonmental evALuation
project method for secondary schools

VIRAL PROJECT

Survey on environmental issues and climate change

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SUMMARY

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VIRAL

SURVEY ON ENVIRONMENTAL ISSUES AND CLIMATE CHANGE

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1. Introduction

The survey was conducted within the framework of the Erasmus+ project VIRAL **(Project No. 2022-1-ES01-KA220-SCH-000088907)** with the aim of gathering insights and perspectives from both teachers and students on environmental issues and climate change.

The VIRAL Project consists of creating an in-school project about how to make behavioural changes with the students and teachers in terms of individual environmental practices. Moreover, in order to give tools for the schools on how to monitor and evaluate projects, the partners also contribute to developing their project management skills. Therefore, this project addresses needs, the need of integrating an environmental related project in the school that can foster behavioural changes in the students and staff to contribute to climate change mitigation, and developing the professional skills of teachers in terms of project monitoring and evaluation.

Based on this, the purpose of the survey was to assess the level of awareness, knowledge, and perceptions towards environmental sustainability, as well as to identify areas where educational interventions and initiatives could be implemented to promote positive behavioural changes.

Participants in the survey are members of three different schools/organisations: Botánic Cavanilles Vocational Training Study Center (IES Botanic), in Spain, Escola Profissional Cândido Guerreiro (EPAlte), in Portugal, and Stiching Onderwijs Midden-Limburg (SOML), in the Netherlands.

A brief description of each school is provided to facilitate a better understanding of the survey results and to contextualise the responses from the different educational institutions involved in the project.

Botánic Cavanilles Vocational Training Study Center (IES Botanic)

IES Botanic is located in La Vall d'Uixó, a town of around 31.388 inhabitants situated in eastern Spain, in the province of Castelló, one of the third provinces of Valencian Community, Spain. IES Botànic Cavanilles is a secondary school and vocational training institute and it was founded in 1952 and currently has 129 teachers and 975 students. The institute consists of two distinct buildings. The first, with over 70 years of history, is primarily dedicated to secondary education. The second building, much newer, completed construction in 2015 and is exclusively used for vocational training.

The school offers education in ESO (Educación Secundaria Obligatoria), Bachillerato (Baccalaureate), and vocational training programs at Basic, Intermediate, and Advanced levels across three professional fields. The institute provides the following programs: ESO, including curricular diversification programs (3PDC, 4PDC), and other custom reinforcement and extension programs; Baccalaureate in Humanities and Social Sciences; Baccalaureate in Sciences and Technology; General Baccalaureate; Basic Vocational Training in Administrative Services and Electricity and Electronics; Intermediate Vocational Training: Management Assistance, Automotive Technology, Vehicle Bodywork, Vehicle Electromechanics, Machinery Electromechanics, and Telecommunications Installation; e, Advanced Vocational Training: Administration and Finance, Assistance to Management, Automotive Technology, and Industrial Automation and Robotics.

The school educational project aims to collaborate with families in preparing their children for life, enabling them to improve their immediate surroundings. We do this through participatory, dynamic, inclusive, and globally oriented methods. To achieve this, we emphasise varied teaching methods and catering to diverse learning needs. Interdisciplinary projects, co-teaching, and active student-centred methodologies play a significant role in our pedagogical approach. We also focus on projects centred on core values that involve our entire educational community. These projects promote synergies between the two types of education we offer: Secondary Education and Vocational Training. Below it is possible to see some pictures of the school building and projects:

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DIVERSITAT
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IES BOTÀNIC CAVANILLES 2021 - 2022

Escola Profissional Cândido Guerreiro (EPAlte)

EPAlte is located in a rural area of Alte, a small village located in the central Algarve at the northwest end of Loulé's municipality. Alte is famous mostly for its natural features, the water springs and waterfall. It's also considered one of the most typical villages in Portugal, and with less than 2.000 inhabitants famous for its slow pace of life. Alte is also one of the best places to contemplate some traditional Algarve architecture. The main activities of the villagers are commerce, agriculture and tourism.

The school has in total 78 students, 24 teachers and 9 technical and administrative staff. In terms of the educational system, EPAlte customises an Educational Innovation and Flexibility Project, as the courses on offer meet the needs of the business sector, within the regional development. This Educational Project, embodied in the Cândido Guerreiro Professional School, pursues a central purpose in the various courses, which is providing trainees technical-professional skills that allow them an immediate and adequate entry into the job market. Therefore, the school teaches Tourism, Commerce, Educational Action, Health Assistant and Distribution Operator.

In terms of infrastructure, the school has a management system for water or energy consumption and does not have a canteen, but it has an agreement with the Centro e Animação de Alte to provide a catering service. To transport students, the school uses its own and contracted transport. Also, EPAlte has green spaces and pedagogical vegetal gardens, cultivated and kept by the students. In addition, the school has a compost project, alongside with a few partners in the village and the compost is used (among other projects) in the pedagogical gardens. Below it is possible to see some pictures of the school infrastructure:

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O teu futuro começa AQUI

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Stiching Onderwijs Midden-Limburg (SOML)

Located in the rural area of Echt in the Netherlands, the Connect College of SOML has approximately 1400, about 160 teachers and 30 administrative and technicians and all secondary school courses are taught. The town of Echt is located in the smallest part of the Netherlands with only 4,8 km difference from the Belgium border to the German border. Echt itself has an amount of 7.700 inhabitants and is located in the province of Limburg. It is a charming town in the Netherlands with a variety of activities that reflect its rich culture and community spirit. Overall, Echt's activities reflect a blend of tradition, culture, and a strong sense of community, making it a welcoming and vibrant place to live.

The school pedagogical plan is based on personal development, because everyone is different and the school assumes differences. Therefore, the school project perceives and uses these differences to maximise everyone's personal development. The school climate is safe, security is palpable and structure is present. Everyone is allowed and able to be themselves with respect for each other and appreciation for everyone. The proposal is based on connection to each other, the environment and the future. Our school is a comprehensive school community in the Real(r) community. Together with the partners, the school creates excellent education, challenging for teens, adolescents and young adults. The school provides space, challenge, encourages responsibility, work with discipline, accountability and celebrates successes.

In terms of infrastructure, the school has a canteen, which is managed by an external catering company. And doesn't have vegetable gardens or orchards. However, the students can use outdoor sporting grounds. There is no transport organised by the school, but students, and some teachers, go by bicycle to school. Also, the school doesn't have an efficient management system for water, however for energy consumption the school installed solar panels. Below it is possible to see some pictures of the school:

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1. 1. Principal objective

The VIRAL Project pretends to transform behaviour changes, while raising awareness among the participants on the climate and environmental problems, generating common values in the school towards the same topic. Therefore, a questionnaire was designed to investigate the understanding and perception of these topics by the school community of the VIRAL Project participant schools.

1. 2. General objectives

1. Finding possible ecological practices at individual or collective level that can be improved;

2. Guiding the schools on what behavioural changes can contribute to climate change mitigation;

3. Raising awareness about the importance of the environment from a positive communication;

4. Introduce alternative pedagogies related to environmental education in high schools;

5. Foster behavioural change in terms of climate change mitigation and ecological practices at individual level;

6. Improve the social participation of students and teachers in the schools, engaging them in initiatives carried out in the school environment.

1. 3. Methodology

This survey utilised a questionnaire to collect information on the study variables. Quantitative data were gathered using an online survey, which was filled out after participative events and also distributed via e-mail to the school community in all three languages of the project members: Spanish, Portuguese, and Dutch. General and specific analysis of the results were performed for each school, considering its origin country. It is worth noting that in the analyses that will be developed throughout this document and which will be presented through graphs and tables, a "general" category will also be included, which refers to the sum of all responding participants.

The questionnaire was applied at participatory events, more specifically, on May 4th and 5th, 2023, in Vall d'Uixó (Spain), March 22, 2023, in Loulé (Portugal) and June 16, 2023, in SOML schools (Netherlands). The number of survey participants can be seen in table 1 and the percentage of survey answers in figure 1.

Table 1. Total number (N.) of individuals in each of the school's categories and survey sample.

	IES Botanic (Spain)		EPAlte (Portugal)		SOML (Netherlands)	
	Students	Teachers & *AdSS	Students	Teachers &* AdSS	Students	Teachers & *AdSS
Total N.	975	129	78	33	1400	190
N. Survey	236	49	39	7	47	11

*AdSS - Administrative and technicians.

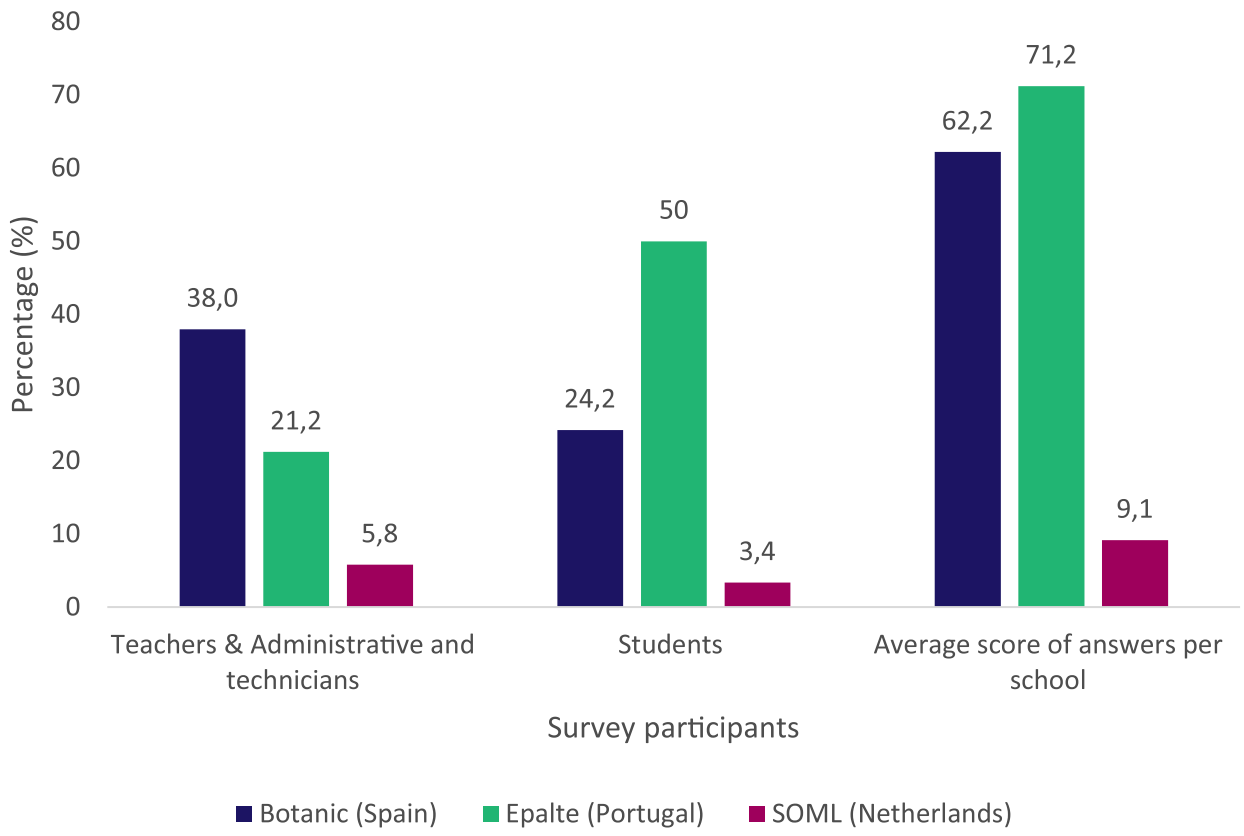

Figure 1. Survey sample (%) according to participants' occupation considering the total number of individuals in each of the school's categories.

The questionnaire included both semi-open-ended and closed-ended questions to gather a comprehensive understanding of the participants' perspectives and experiences regarding environmental issues and climate change. The 41-questions in Annex 1 corresponds to the total number of questions in the questionnaire. As an analysis criterion only those questionnaires that were at least 90% completed were accepted. Also, the questionnaire was structured into four main sections, focusing on awareness, knowledge, and perceptions towards environmental sustainability, where:

Section 1 addresses climate change and environmental issues (some additional specific questions tailored specifically for teachers are included in this section); section 2 covers mobility-related topics; section 3 explores consumption habits, including clothing and technological devices shopping, as well as eating habits; section 4 aims to explore various aspects related to energy, from practical daily actions to perceptions regarding energy efficiency; and finally, a small section 5 focused on understanding the participants' socio-demographic characteristics.

AS A METHODOLOGICAL METHOD, THE FOLLOWING PARAMETERS WERE USED FOR ANALYSIS:

NOTION AND KNOWLEDGE (NOT&KNOW)

This parameter refers to the extent of the respondents' knowledge and general notions about climate change and sustainability, particularly in relation to mobility, consumption, and energy. By assessing the respondents' understanding of the key concepts related to climate change and sustainability, the study aims to identify areas where further education may be needed.

ACTION

This parameter focuses on the specific measures taken by the respondents to mitigate climate change. It aims to assess whether the respondents are taking any practical steps in their daily lives to reduce their carbon footprint and contribute to sustainability.

COMMUNICATION AND PERCEPTION (COM&PERCEP)

This parameter aims to understand how the respondents interpret the available information on climate change and sustainability, and how they communicate their understanding to others. By assessing the respondents' communication and perception, the study aims to identify gaps in knowledge and areas where further communication or outreach may be needed.

2. Results and discussion

A total of 389 answers[1] (Table 1) were provided after the school community members filled out the online survey (Annex 1). The responses obtained from the questionnaire were analysed in this study. Considering that only those questionnaires that were at least 90% completed were accepted, the final sample consisted of 377 participants.

Of these 377 participants, the majority were students, accounting for 82.8% of the participants, and 17.2% teachers and administrative or technical staff. Among the respondents, the majority studied or worked at Botànic (73.6%). Respondents from EPAlte and SOML comprised a smaller percentage (<15%) of the total respondents. In terms of gender, the school community members were evenly split, with 44.9% males, 51.28% females, 1.3% non-binary, and 2.6% chose not to answer (Table 2).

[1]Available in: https://docs.google.com/spreadsheets/d/1ObipGiltmZUO0KDKIPR_SFo12Gs57_5wISjq4Jt3cYXc/edit?usp=sharing

Table 2. Survey sample distribution: Percentage (%) and number (N) of respondents according to variable groups.

School's country	N	%
Spain	278	73,6
Portugal	45	11,9
Netherlands	54	14,5
Gender	**N**	**%**
Male	169	44,9
Female	193	51,2
Non-binary	5	1,3
I prefer not to say	10	2,6
Occupation	**N**	**%**
Teacher, administrative or technical	65	17,2
Student	312	82,8

Regarding the perceptions of climate change, the majority of respondents (87.1%) believe climate change is real and associate it mainly with *environmental problems* and with the *planet being in danger* (**Figure 2** & **Figure** 3). *Sustainable solutions*, *extreme droughts*, *extreme weather events and rising seawater levels* were commonly selected for more than 20% of the total number of answers **(Figure 3)**.

These findings indicate a strong awareness and concern among the respondents about climate change and its potential impacts on the environment. The identification of sustainable solutions and the recognition of extreme weather events and rising sea levels as significant climate change effects suggest a high level of knowledge and understanding of the issue. Such awareness can serve as a basis for implementing targeted educational initiatives and promoting sustainable practices to address climate change and its associated challenges.

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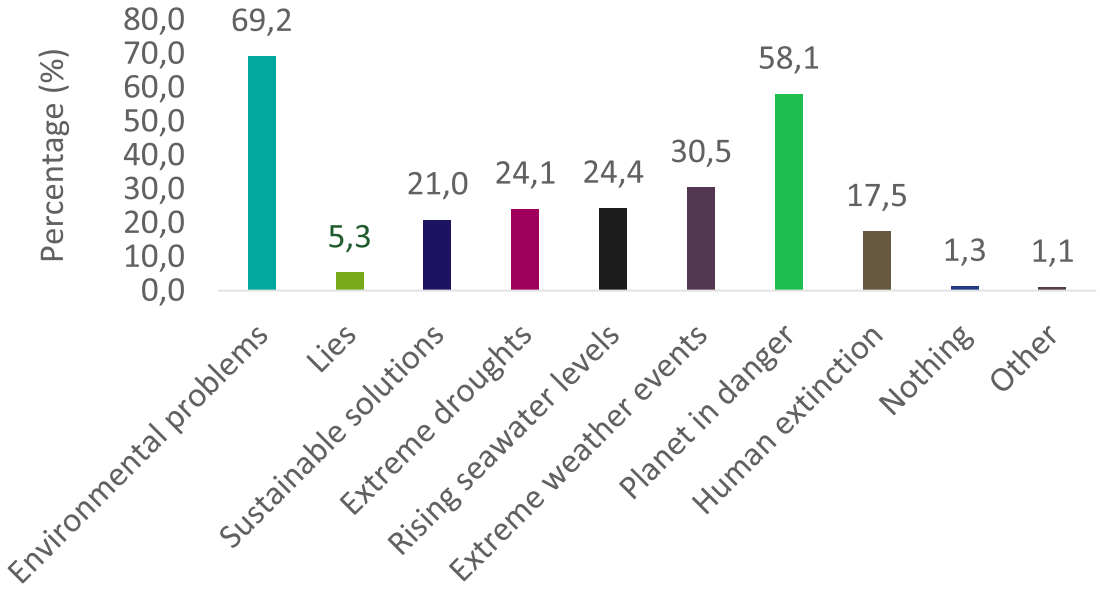

Figure2. Respondent's perceptions regarding the reality of climate change (%).

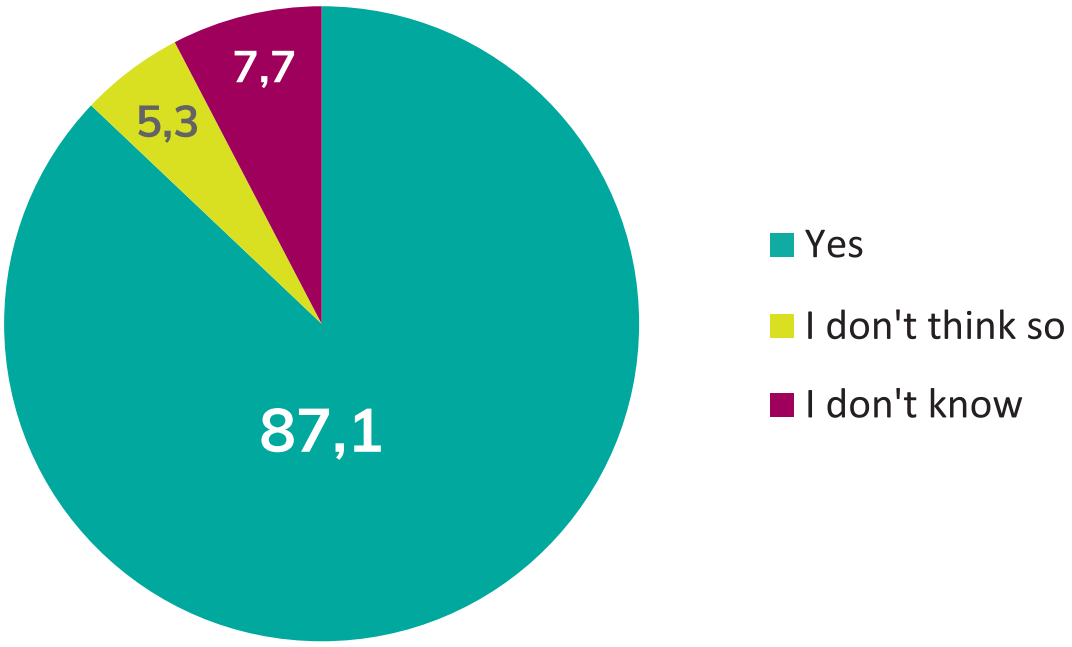

Figure 3. Climate change-related issues.

More than half of the respondents perceived industry as the main cause of climate change (around 70%), followed by *deforestation and transport* (>50%) (Figure 4). In addition, respondents studying in Portugal also highlighted *consumption* as another main concern of climate change (57.8%). Only a very small percentage (<10%) of respondents from Spain and Portugal schools, who believe climate change is a real problem, perceived all the given answers alternatives as influencing factors of climate change. This indicates that there is an opportunity to educate the respondents on how to mitigate these factors and to raise awareness about the impacts of the less recognized factors. Therefore, improving the education on these topics can encourage a more sustainable behaviour and, thus, climate change mitigation

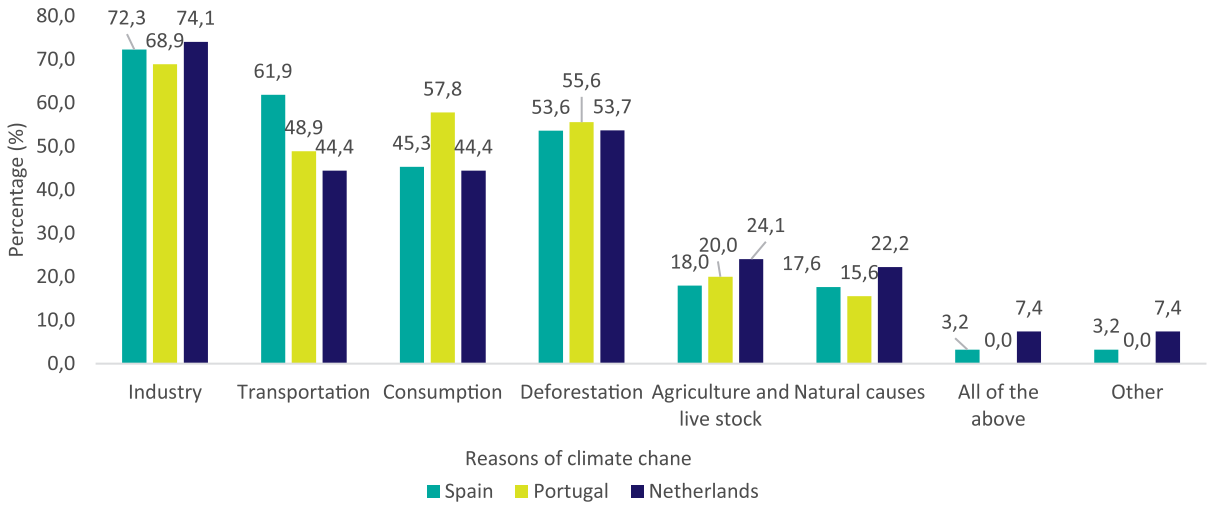

Figure 4. Respondents' perceived reasons causing climate change.

Also, it is interesting to note that *agriculture and livestock* are not considered factors influencing climate change in the respondents' perceptions. However, in the following results, respondents associated the reduction of *meat consumption* with climate change mitigation, particularly, respondents from the Netherlands (27.8%) and Portugal (24.4%) (Figure 4). The way individuals consume and produce animal products could explain their presence on the list of possible influencing factors. Therefore, it becomes important to highlight and address this aspect within the proposed educational activities.

By including these and other topics in educational initiatives, schools can empower students and the broader community to make more environmentally responsible choices in their dietary habits, leading to positive environmental outcomes, in this case linked to consumption.

In terms of actions perceived to effectively mitigate climate change, over half of the respondents have chosen the following actions: *recycling and buying more consciously (77%) and reducing the energy consumption (56.5%), followed by innovative technologies and new energy sources (43,2%), reducing the use of individual transportation (42.8%) and increasing the green spaces in schools and cities (39.9%)* (Figure 5).

In addition to the widely practised recycling methods (which will not be a focus of the project) and the information regarding the energy consumption on the social medias, a big percentage of respondents (40%-50%) perceives the increase of the green space in schools and cities as a viable strategy for climate change mitigation.

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Urban green infrastructure is world widely known as an effective green strategy due to its multifunctionality and the services it provides. Moreover, schools have started to adopt green infrastructure as a green educational tool to enhance students 'competences and knowledge regarding local biodiversity and Nature-Based Solutions (NBS). There are several projects related to green infrastructure elements and NBS, such as Green Surge (2013-2017), GrowGreen H2020 (2016-2020), EKLIPSE (2017-2020).

Despite the majority´s considerable level of awareness regarding mitigating the effects of climate change, a small percentage of people (<5%) still believes climate change is not real (2.5%).

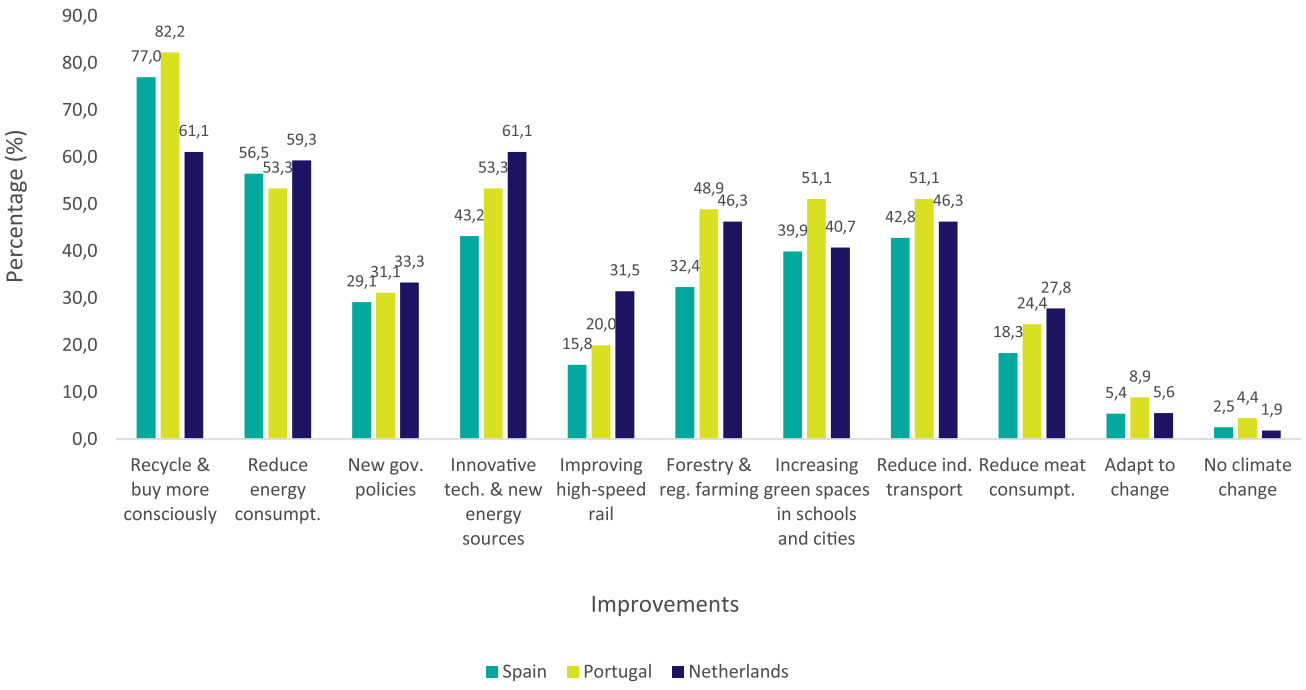

Figure 5. Perceived actions helpful in reducing climate change.

Table 3. Respondent´s concerning level and feelings inspired by climate change (%).

Level of concern	General	Spain	Portugal	Netherlands
Not concerned	**31.8**	4.0	2.2	5.6
Slight concern	**28.9**	12.2	4.4	18.5
Medium concern	**23.1**	29.1	20.0	35.2
Concerned	12.2	32.4	31.1	29.6
Very concerned	4.0	22.3	42.2	11.1
Feelings				
Guilt	17.5	15.1	31.1	18.5
Indignation	**39.0**	**45.0**	**40.0**	7.4
Hope	22.3	20.9	**42.0**	13
Fear	**31.6**	**27.3**	**44.4**	**42.6**
Inability	14.6	11.9	17.8	**25.9**
Happiness	3.7	4.7	2.2	0
Resignation	16.2	20.5	6.7	1.9
I feel nothing	17.2	16.9	8.9	25.9
Other	2.4	2.2	2.2	3.7

The majority of respondents appear to be either *not concerned* or show *slight concern* (around 30%) regarding climate change, while 23.1% indicates a higher level of concern (12.2%) (Table 3). Regarding the situation of schools, in Spain, the *level of concern* is bigger than in Portugal, where a prevalent moderate concern is observed. However, the Netherlands surpasses both with a substantial proportion of respondents expressing significant worry. Moreover, climate change predominantly evokes *feelings of indignation* (39.0%) and *fear* (31.6%) among the respondents. Alongside these feelings, a considerable percentage of respondents from Portugal express *feelings of hope* (42%). Furthermore, more than 25% of Dutch respondents perceive *inability* in relation to climate change issues.

In terms of commuting to school or work, the three sustainable modes of transport—*bicycling*, *walking*, and *public transportation* - consistently account for the highest percentage, exceeding 55% (Figure 6). Regarding respondents' mobility choices, three distinct patterns emerge. Spanish respondents primarily commute by *walking* (71.9%), while a significant majority of Portuguese respondents utilise *public transportation* (68.9%). In contrast, Dutch participants overwhelmingly opt for *bicycles* (81.5%).

It's important to emphasise that EPAlte is a school situated in a small rural village providing bus transportation options for students to commute to and from the school. This initiative supports their attendance since it might be challenging for parents to drive them or for students to access the school through other means. Consequently, the school's location plays a significant role, affecting the varying degrees of accessibility among survey participants. These actions have turned into behavioural habits and have already been implemented in school life.

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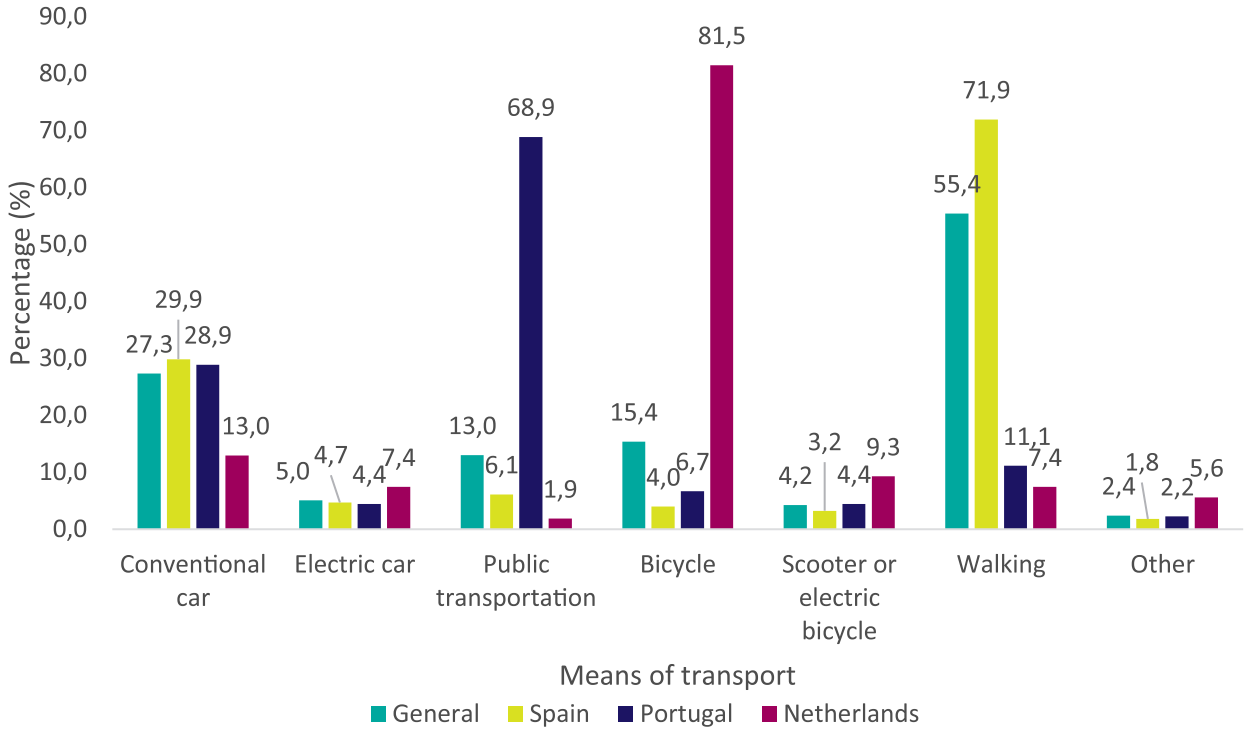

Figure 6. General and specific situation of respondent's mobility in terms of school or work.

In relation to mobility, around a third of respondents express dissatisfaction with various means of transportation, citing difficulties in access for all except bicycle commuting via bike lanes (43%) (Table 4). As for schools, Spanish respondents perceived difficulties in terms of mobility, *pricing*, and *reliability* concerning *public transport*. In contrast, they find *bike lanes* to be relatively easy in terms of infrastructure and accessibility (38.1%). As anticipated, Portuguese respondents rate public transport positively (30% - 40%) in comparison to other infrastructure elements, indicating a commendable bus service provided by their schools. Conversely, respondents from Dutch schools consider only *bicycle lane* access as relatively easy (77.4%). All three countries rate *electric vehicle charging* poorly, indicating ample room for improvement in this area (over 48%).

Overall, respondents from all schools perceived their commuting to work or school as having a minor environmental impact (46.2%) (Figure 6). These outcomes were anticipated, given the distinct mobility practices observed among respondents at each school. For instance, respondents from Botanic Spain commonly walk, those from EPAlte, Portugal, utilise school buses, and SOML, Netherlands, respondents frequently bike (Figure 6). This suggests respondents are aware that their dominant way of commuting is more environmentally friendly than the conventional car, which still remains moderately prevalent among them (approximately 30%) (Figure 7)

Table 4. Respondents 'perception regarding mobility and accessibility (%).

	Items	Easy	Medium	Difficult
General	Bicycle commuting (bike lanes)	**43.0**	21.8	35.2
	Public transport (punctuality/reliability)	34.4	28.2	**37.4**
	Public transport (price)	30.2	29.9	**39.9**
	Public transport (convenience of use)	30.4	28.0	**41.6**
	Electric vehicle charging	24.6	22.4	**53.0**
Spain	Bicycle commuting (bike lanes)	**38.1**	22.9	**39.0**
	Public transport (punctuality/reliability)	31.0	30.2	**38.8**
	Public transport (price)	33.1	29.2	**37.7**
	Public transport (convenience of use)	30.4	26.5	**43.0**
	Electric vehicle charging	23.9	23.0	**53.0**
Portugal	Bicycle commuting (bike lanes)	26.8	26.8	**46.3**
	Public transport (punctuality/reliability)	**46.3**	19.5	34.1
	Public transport (price)	34.1	31.7	34.1
	Public transport (convenience of use)	**36.6**	29.3	34.1
	Electric vehicle charging	26.8	14.6	**58.5**
Netherlands	Bicycle commuting (bike lanes)	**77.4**	13.2	9.4
	Public transport (punctuality/reliability)	**39.6**	26.4	34.0
	Public transport (price)	13.7	31.4	**54.9**
	Public transport (convenience of use)	25.5	33.3	**41.2**
	Electric vehicle charging	26.0	26.0	**48.0**

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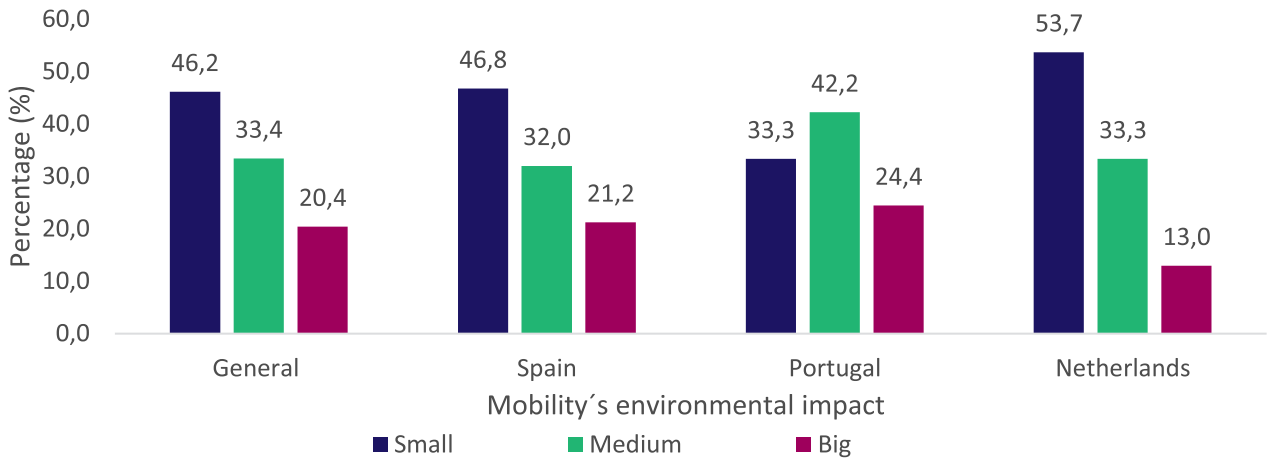

Figure 7. Perceived environmental impact caused by respondent´s means of transportation (%).

According to the majority of the respondents, price is the main influencing factor for employing cleaner energies, followed by a *lack of knowledge about green energy alternatives* (Figure 8). A notable percentage, exceeding 20%, corresponds to respondents who are uncertain how to respond to these inquiries (*do not know how to answer these questions*). This indicates a gap in the knowledge in this area. To tackle this concern, potential strategies include organising discussions or workshops focused on clean energy, along with elucidating the assortment of government subsidies and incentives accessible for renewable energy initiatives.

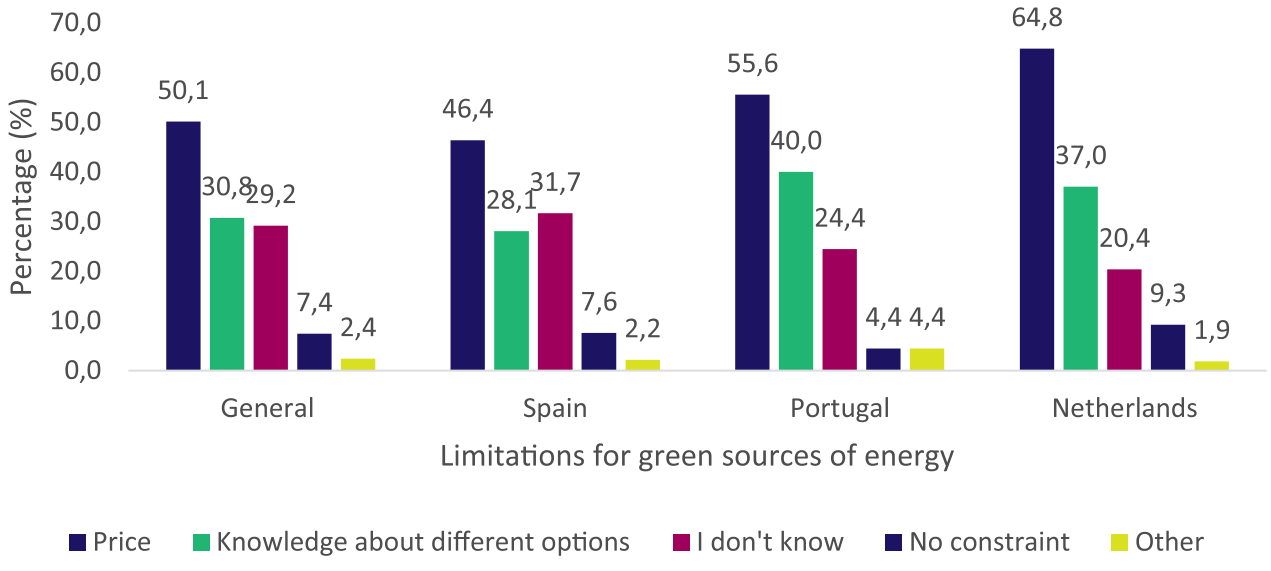

Figure 8. Perceived limiting factors in terms of using green energies.

Table 5. Proposed changes related to efficiency of energy use in the educational centres.

Proposals	General	Spain	Portugal	Netherlands
Installation of solar panels to generate renewable energy	**69.5**	**71.2**	**73.3**	**57.4**
Promoting the use of environmentally friendly means of transportation among students and teachers	**38.5**	**41.0**	33.3	29.6
Lights are always on even if the space is not in use, a lighting system with motion sensors could be implemented	32.1	34.2	28.9	24.1
Energy or heating efficiency	37.1	33.1	**48.9**	**48.1**
Improve school insulation and keep doors and windows closed	27.1	24.8	26.7	**38.9**
Setting energy consumption reduction goals and targets and measuring progress	26.0	26.6	28.9	20.4
Energy efficiency education in classrooms and workshops	33.4	32.7	**40.0**	31.5
Promoting the use of power shut-off devices for electronic equipment when not in use	31.6	29.9	**44.4**	29.6
Promotion of cell phone and computer chargers, producing mechanical energy through bicycles	24.7	26.6	24.4	14.8
Other	1.6	1.8	0.0	1.9
I don't know	0.5	0.4	0.0	1.9

The majority of respondents perceive *the installation of solar panels to generate renewable energy* as the primary potential change to enhance energy utilisation in educational institutions (69.5%) (Table 5), followed by the promotion of *environmentally friendly means of transportation* (38.5%). These findings are consistent with Spain's outcomes. However, concerning Portugal and the Netherlands, the second most frequently cited change is *energy or heating efficiency* (48%). In the Netherlands, there's significant interest (38.9%) in enhancing *school insulation and keeping doors and windows closed*. Conversely, over 40% of Portuguese respondents have chosen improvements like *energy efficiency education in classrooms and workshops*, as well as *the use of power shut-off devices for electronic equipment when not in use*.

The survey results provide an intriguing insight into how students engage with renewable energy sources and strive to curtail electricity consumption within the school environment. The analysis covered aspects concerning product information (Table 7) and factors influencing respondents' decisions when engaging in online shopping for clothing and technological devices (Table 6). The objective was to examine the extent of respondents' familiarity with prevalent sustainable strategies found in their immediate surroundings.

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Table 6. Strategies related to finding products information (%).

Shopping strategies	General	Spain	Portugal	Netherlands
I look at the label of the products to know their origin due to environmental impact issues	35.8	38.5	28.9	27.8
I look at the label of the products for health reasons.	**41.4**	**42.4**	**42.2**	**35.2**
I look for information about the company before buying	11.4	12.6	13.3	3.7
I buy products based on price	**49.9**	**43.2**	**68.9**	**68.5**
I buy because of a recommendation from someone	24.9	25.5	20.0	25.9

Over half of the respondents (Table 6) purchase products primarily based on *price*, whereas 35.8% consider how a product's origin might impact the environment. A relatively small percentage (less than 14%) demonstrates interest in researching *information about the company* before making a purchase decision.

These findings underscore the necessity of enhancing respondents' awareness concerning the significance of taking a company's nature into account when making purchasing decisions. This knowledge would aid in determining the environmental friendliness of products or evaluating the environmental impact of a company's strategies and processes. Encouraging a more conscientious consumer behaviour can be an effective strategy for reducing the impact of climate change.

In terms of the factors influencing the purchase of clothing and technological devices, *quality* and *price* emerge as the most influencing aspects (52% and 42.4% respectively), (Table 7). It's important to note that the figures presented in Table 6 represent the percentages of items considered highly significant by respondents when it comes to buying products.

Table 7. Factors influencing the product purchase (%).

Clothing	General	Spain	Portugal	Netherlands
Price	**42.4**	**37.8**	**71.1**	**42.6**
Design and Brand	23.9	26.6	20.0	13.0
Quality	**52.0**	**48.6**	**66.7**	**57.4**
Environmental impact	19.6	19.8	24.4	14.8
Social impact and human rights	17.8	18.3	22.2	11.1
Locally produced	12.7	12.6	26.7	1.9
Reusing	22.5	**22.3**	**35.6**	13.0
Technological devices				
Price	**54.1**	**48.9**	**75.6**	**63.0**
Design and Brand	33.4	29.1	37.8	51.9
Quality	**66.8**	**61.9**	**75.6**	**85.2**
Environmental impact	20.7	21.9	28.9	7.4
Social impact and human rights	18.8	19.8	24.4	9.3
Locally produced	12.7	14.0	20.0	0.0
Second-hand	17.2	18.7	26.7	1.9

When it comes to purchasing technological devices, *design and brand rank* as the third highly significant factor (33.4%) (Table 7). Respondents from Spain and Portugal exhibit a greater degree of consideration and awareness towards *clothing reuse* (20%-30%) and *second-hand devices* (20-25%) compared to those from the Netherlands (>15%). Furthermore, Spanish and Portuguese respondents perceive a larger environmental impact resulting from technological devices (around 20%) in comparison to their Dutch counterparts (>10%)

Overall, across both product types, the aspects of social impact and *human rights and locally produced* aspects register relatively lower percentages compared to other categories (<20%) (Table 7).

The educators should use this information to foster greater understanding of sustainable practices in relation to clothing purchases among students. They can encourage students to broaden their consideration beyond conventional aspects, emphasising factors such as environmental impact, social implications, and human rights.

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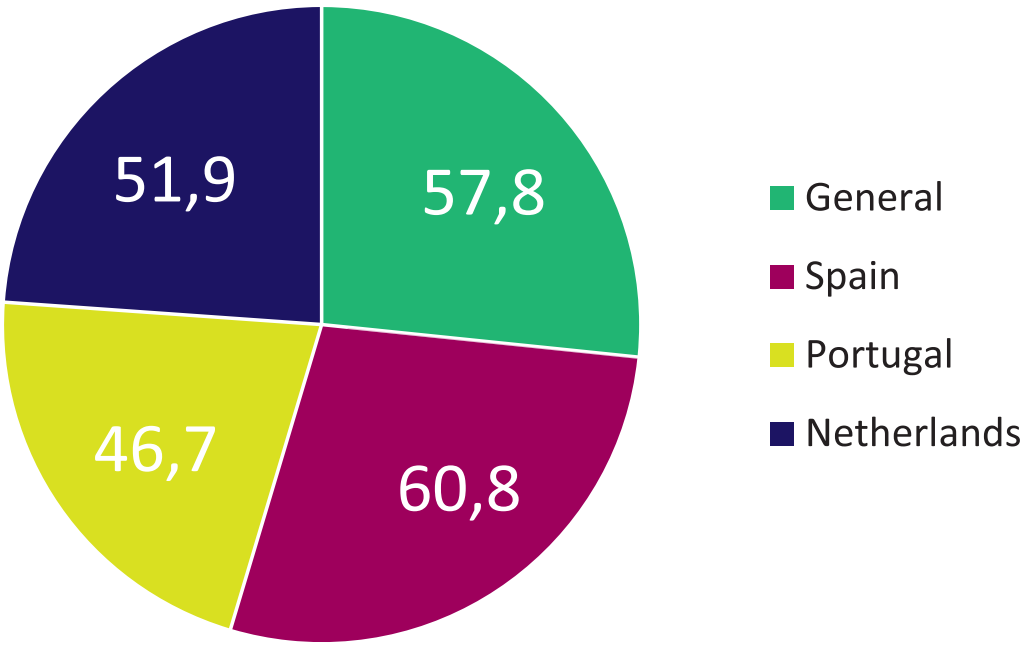

Figure 9. Respondents' knowledge and awareness regarding the energy label for household appliances (%).

Generally, more than half of the respondents demonstrate awareness of the *energy label for household appliances* (Figure 9). Among the schools, Spain presents the highest percentage of respondents who answered positively (60.8%). The Portuguese school is closely followed with an approximate 50% response rate, suggesting an opportunity for further education on energy-saving strategies.

These findings underscore the necessity of enhancing awareness about the significance of energy efficiency and the advantages associated with purchasing energy-efficient household appliances.

Regarding the practical actions taken by respondents to mitigate climate change, the majority engage in *environmental volunteering and activism activities* (58.1%) and opt for reducing *meat consumption* (54.6%) (Table 8). Despite respondents participating in activities, such as *separation of solid wastes, recycling or reusing* (44%) or *planting trees* (39.3), a significant percentage reported *doing nothing* (>57%). The lowest percentage relate to actions like *reducing energy and water consumption at home* (2.7%), *using public transportation and bicycles* (1.3%), and participating in *reuse and exchange with friends and family and workshops* (5.8%) (Table 8).

Students display awareness of prevalent behavioural topics, such as recycling, tree planting, and awareness-raising activities, that can be undertaken from home.

These findings underscore an opportunity to enhance environmental-focused activities within schools. The aim is to reshape the perceptions of school community members and facilitate their comprehension of their role in mitigating climate change through everyday actions. Of special importance are initiatives concerning the adoption of greener transportation methods, education about water conservation's significance, and consideration of the global scarcity of certain resources. By promoting such initiatives and fostering environmental awareness, schools can play a vital role in shaping a sustainable mindset among students and the wider community, contributing to positive environmental outcomes and a more sustainable future.

Table 8. General and specific state of current activities-related to climate change carried out in schools (%).

Actions to reduce climate change	General	Spain	Portugal	Netherlands
Separate solid wastes, recycle or reuse	44.0	43.2	48.9	44.4
Reduce consumption of products	20.4	18.7	24.4	25.9
Reuse and exchange in the network of friends and family and workshops	5.8	5.4	8.9	5.6
Reduce energy and water consumption at home	2.7	2.5	4.4	1.9
Use public transportation and bicycles	1.3	1.1	2.2	1.9
Consume less meat	**54.6**	57.6	46.7	46.3
Raise awareness, set an example	49.6	44.6	68.9	59.3
Plant trees	39.3	37.1	31.1	57.4
Do environmental volunteering and activism activities.	**58.1**	58.3	57.8	57.4
Nothing	**56.2**	55.4	55.6	61.1
Other	21.0	17.3	20.0	40.7

The majority of respondents show their willingness to participate in *initiatives to promote environmentally friendly mobility at school or in their city* (49.1%). Respondents from Spain and Portugal exhibit a higher desire to participate in such initiatives (>54%) (Figure 10) compared to the Netherlands (16.7%).

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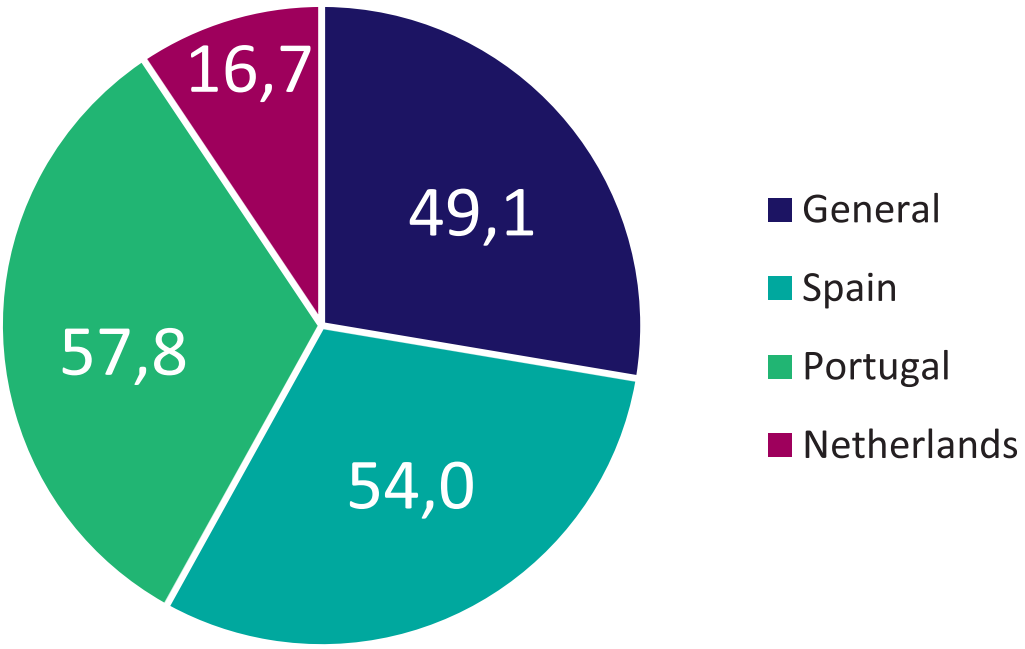

Figure 10. Willingness of respondents to participate in future environmental mobility initiatives (%).

The large percentage of respondents eager to participate in future initiatives to promote environmentally friendly mobility at school or in the city highlights the importance of involving students in school projects. Engaging students in such initiatives can empower them to be active participants in promoting sustainability and eco-friendly practices, fostering a sense of responsibility towards the environment and their community.

Figure 11. General state of respondents' food shopping habits

In general, most of the respondents regularly *buy products with plastic packaging* (41.1%) and proximity products (34%) (Figure 11). The majority of respondents (>39%) *occasionally* buy *biodegradable, organic or products with no packaging*. Regarding proximity *products*, the frequency of buying is higher in Spain and Portugal (35%-50%) compared to the Netherlands (16.7%) (Table 9).

Regarding the general eating habits, 34.5% of respondents always eat homemade food, and 43% eat homemade food five days per week (regularly) (Figure 12).

The majority of respondents have never used home delivery services (48%) and prefer to *eat at the school canteen* (57.8%). Less than 15% of respondents regularly *eat at school canteen* and *use home delivery services. Eating in restaurants* and *buying processed food* seems to be an occasional habit for more than half of them (50%-59%) (Figure 12). The highest percentage of respondents (35.5%) eat meat occasionally, while 23% of them are *always eating meat.*

As for the school's differences, respondents from Portugal use home delivery services less frequently (16.7%) than the respondents from other countries, where the percentage of occasional use is greater (>40%) (Table 10). Moreover, more respondents from Spain and Portugal (>62%) *eat at school canteen* occasionally than those from the Netherlands (37%).

Table 9. Specific situation of school community members' food shopping habits .

Shopping habits	School's country	I do not do the shopping	Never	Occasionally	Regularly	Always
Buy plastic packaging	Spain	15.1	6.1	30.9	**42.8**	5.0
	Portugal	13.3	0.0	33.3	**35.6**	17.8
	Netherlands	35.2	1.9	22.2	**37.0**	3.7
Buy biodegradable packaging	Spain	16.5	7.6	**46.0**	24.1	5.8
	Portugal	11.1	8.9	**48.9**	22.2	8.9
	Netherlands	37.0	3.7	**42.6**	16.7	0.0
Buy no packaging	Spain	15.1	18.0	**40.6**	19.4	6.8
	Portugal	13.3	13.3	**37.8**	22.2	13.3
	Netherlands	37.0	13.0	**31.5**	16.7	1.9
Buy organic and biological	Spain	14.0	12.6	**42.4**	21.6	9.4
	Portugal	15.6	11.1	**37.8**	22.2	13.3
	Netherlands	37.0	14.8	**29.6**	16.7	1.9
Buy proximity products	Spain	15.1	6.5	27.3	**34.9**	16.2
	Portugal	8.9	4.4	15.6	**48.9**	22.2
	Netherlands	42.6	7.4	**31.5**	16.7	1.9

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Figure 12. General situation of respondents' eating habits.

The home delivery services provide more convenience than the preparation of food by family members or having meals outside, but they also have environmental implications due to packaging waste and transportation emissions. Similarly, processed food bought from the supermarket has sustainability implications, including packaging waste and environmental impact of industrial food production, which also carries some health-related risks. The general high rate of people who prefer to eat outside the house can also lead to food waste and environmental impact of restaurants 'practices.

and the environmental impact of industrial food production, which also carries some health-related risks. By making more informed choices, individuals can contribute to minimising their ecological footprint and promoting a more sustainable food system.

Eating at school canteens encourages the importance of sustainable practices in institutional food services and contributes to the growth of the local economy through hiring caterers or kitchen staff. In addition, this practice fosters community´s interrelationships.

Furthermore, eating meat or meat-related products often or very often is not a healthy habit. Regular meat consumption is associated with a higher risk of various diseases, including ischaemic heart disease, pneumonia, diverticular disease, colon polyps, and diabetes. Apart from these health risks, there are other animal diseases caused by bacteria or parasites that can be transmitted if the meat products are not well-managed (e.g., *E. coli* from ground beef, *Trichinosis* from pork or *Salmonella* from poultry).

Promoting more sustainable and balanced diets that reduce meat consumption and incorporate a variety of plant-based options can improve both individual health and the well-being of our planet.

Overall, these results highlight the need for promoting sustainable eating habits, including the reduction of processed food consumption, increased reliance on homemade meals, support for local and organic/biological products, and encouraging more moderate meat consumption. Educating individuals about the environmental and health benefits of sustainable food choices and providing accessible alternatives can significantly contribute to fostering more sustainable eating habits and a greener future.

Table 10. Specific situation of respondents' eating habits according to school's origin country (%).

Eating habits	School's country	Never	Occasionally	Regularly	Always
I eat homemade food	Spain	6.1	19.4	**37.8**	**36.7**
	Portugal	2.2	13.3	**48.9**	35.6
	Netherlands	3.7	9.3	**64.8**	22.2
I use home delivery services	Spain	**42.4**	**40.3**	13.3	4.0
	Portugal	**40.0**	**44.4**	6.7	8.9
	Netherlands	**83.3**	16.7	0.0	0.0
I buy processed food from the supermarket	Spain	26.3	**51.1**	16.5	6.1
	Portugal	13.3	**48.9**	24.4	13.3
	Netherlands	25.9	**51.9**	22.2	0.0
I eat at school canteen	Spain	25.5	**62.2**	9.7	2.5
	Portugal	2.2	**64.4**	24.4	8.9
	Netherlands	**63.0**	37.0	0.0	0.0
I eat meat	Spain	60.1	27.0	10.4	2.5
	Portugal	28.9	22.2	33.3	15.6
	Netherlands	70.4	24.1	5.6	0.0

The most common action to reduce waste of food carried out by respondents is to *order food consciously in the restaurant and take the leftovers home* (60%) (Table 11). The respondents engage in other actions, with a good percentage (around 40%) participating in activities such as *planning well the meals, cooking with the leftovers and considering the products expiration date* in order to use them more consciously. These positive behaviours indicate a commendable effort by the respondents to minimise food waste and adopt more sustainable practices.

Table 11. Carried-out actions to avoid wasting food (%).

Actions	General	Spain	Portugal	Netherlands
In restaurants I only order what I am really going to eat and if there is food left over, I take it home	60.2	62.6	64.4	44.4
I do my shopping for the week, planning the portions I will eat	41.9	42.8	53.3	27.8
I put leftovers in the fridge, well identified and with expiration dates in sight	44.8	41.0	37.8	70.4
I cook with leftovers from other meals and make original dishes	39.5	36.0	48.9	50.0
I never thought of that	7.7	7.6	4.4	11.1
Other	0.3	0.0	0.0	1.9

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Regarding schools 'differences, the Dutch respondents, consider mainly the *expiration date management* (70%), followed by *cooking with the home leftovers* (50%) (Table 11) compared to the other schools where these practices are around 60%.

Respondents have demonstrated a good level of knowledge and a positive behaviour regarding saving food and applying environmentally friendly practices with food products.

In terms of frequency of buying clothing, generally, respondents' shopping habits vary from a few *times* to *very often* (around 30%), and more than half of the respondents buy products online only a few *times a month* (Table 12). This indicates fewer emissions caused by transport and less plastic packaging due to less frequent online shopping.

Regarding schools, Spanish and Portuguese respondents seem to buy clothing more *often* per month (around 31%) than the Dutch ones (24.1%) (Table 12). These differences might be influenced by cultural and lifestyle factors in each country.

It can be observed that a significant proportion of respondents (28.3%) indicated that they *do not engage in online shopping at all*. This suggests a potential opportunity to leverage offline channels or alternative purchasing methods to promote sustainable practices that reduce the environmental impact associated with *online shopping*. Furthermore, a considerable percentage (26.1%) reported engaging in online shopping once a month.

Table 12. Frequency of habits regarding buying (%).

Shopping clothing	General	Spain	Portugal	Netherlands
I do not buy	8.0	7.6	13.3	5.6
Few times	**30.0**	27.7	**33.3**	**38.9**
Often	**31.3**	**32.7**	22.2	31.5
Very often	**30.8**	**32.0**	**31.1**	24.1
Shopping online	**General**	**Spain**	**Portugal**	**Netherlands**
I Do not buy	13.3	11.9	26.7	9.3
Few times	**54.6**	**54.3**	**51.1**	**59.3**
Often	15.9	16.9	4.4	20.4
Very Often	16.2	16.9	17.8	11.1

These results highlight an opportunity to raise awareness about sustainable online shopping practices, such as choosing eco-friendly retailers or considering the environmental impact of packaging and shipping. By providing education and information on these topics, individuals who engage in online shopping can make more environmentally conscious choices, thus contributing to overall sustainability efforts.

It is recommended for the school to consider incorporating educational initiatives and awareness campaigns aimed at increasing environmental knowledge related to online shopping practices. This could involve providing information about the environmental impact of online shopping, promoting responsible consumption, and advocating for sustainable alternatives to reduce the carbon footprint associated with online purchases.

By educating students and raising awareness about the environmental implications of their online shopping habits, the school can contribute to fostering environmentally conscious behaviours and responsible consumer choices.

Regarding the activities related to environmental issues organised by schools, the majority of respondents are engaged in *recycling* (59%) and using *water dispensers or drinking fountains* (54%) (Figure 13). A percentage of 24% is involved in *disposal of disposable plastic cups, plates, cutlery in the lunchroom and events*. In terms of the activities developed in each school, *recycling/reuse* and *the use of water dispensers or drinking fountains* are the most common actions in Spain and Netherlands, with 90% of respondents *selecting water dispensers*. On the other hand, the respondents from Portugal mentioned a higher percentage of composting *and organic vegetable gardens* (>70%) and the *use of the local and organic/ecological products in the school bar and cafeteria* (42%) (Figure 13). These results were expected considering the school in Portugal is located in a rural area.

Activities that were poorly selected (=<10%), such as *clothing collection* and collection of cork stoppers and plastic stoppers, or those that are not so common for some schools, like *composting or organic vegetable gardens* for Spain and the Netherlands, represent excellent opportunities for teaching sustainable strategies. It is recommended that the school administration and relevant stakeholders promote and extend the existing practices, such as *recycling*, *composting* and *organic gardening*. Additionally, there is a need to introduce new initiatives, e.g., *reducing the use of disposable plastic cups*, promoting the *use of water dispensers or drinking fountains*, and implementing *collection programs for clothing and technological products*. By implementing these sustainable practices, schools can play a crucial role in educating students about environmental responsibility and fostering an eco-friendlier mindset.

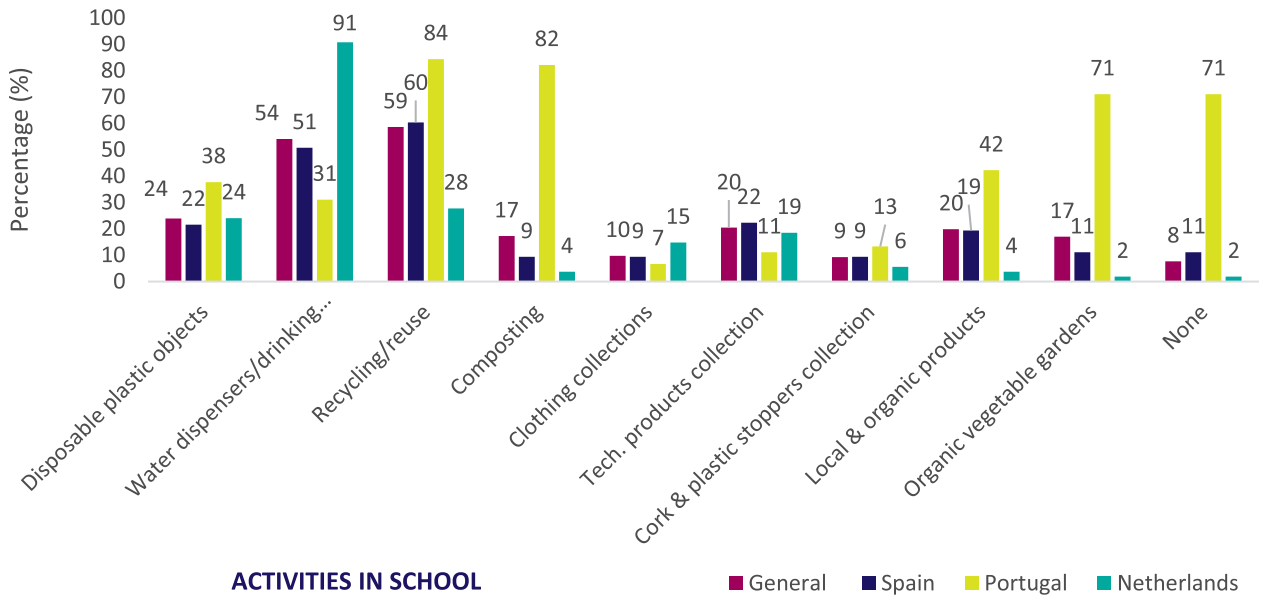

Figure 13. Activities carried-out in schools.

Generally, the majority of respondents use a *warm sweater* to keep warm in winter when the heating is on, indicating they are aware about the energy consumption. However, around 30% of them affirmed they sometimes wear lighter clothing, which could be due to warmer environments. Surprisingly, a smaller percentage of Dutch respondents (<15%) use lighter clothes, such as *T-shirts*, despite the fact that the Netherlands has a colder climate compared to Portugal and Spain. Considering the average temperature of each country, the Netherlands experiences colder weather than Portugal and Spain. One might have expected a higher percentage of respondents from the Netherlands to wear lighter clothing if it was related to higher home temperatures. However, this is not the case. Many houses in Spain, excepting the northern regions, are not well-prepared for lower temperatures and lack proper insulation. Heating in Spain is not common in Spain. Spain and Portugal are both Mediterranean countries where winters are milder and the temperatures are not as low as in the Netherlands.

Wearing lighter clothing in winter could indicate lack of awareness of the impact of heating on during large hours per day or lack of knowledge about suitable attire for indoor settings during colder months. This suggests that more education is needed on this topic among the general public, enabling people to learn the best strategies to save energy related to cooling and heating systems within the home environment, and to be more aware of their environmental impact. By providing such education, individuals can make informed decisions about their energy usage and contribute to more sustainable practices.

Table 13. Respondent' s winter clothing when heating is on (%).

Clothing	General	Spain	Portugal	Netherlands
With a warm sweater	**56.8**	**53.2**	**46.7**	**83.3**
Sometimes with a sweater, sometimes just a T-shirt	33.7	36.3	40.0	14.8
With short sleeves	9.5	10.4	13.3	1.9

In general, more than half of respondents acknowledged using the energy efficient lights (Figure 14), and the majority of them have some of the electronic devices plugged in (45%) (Figure 15). Almost 20% of respondents acknowledged having all electronic devices plugged in when nobody uses them, excepting Netherlands. Almost one-third of Portuguese respondents have all of the electronic devices plugged in (28,9%). Less than 20% of respondents from each country stated they are not aware about the use of energy efficient lights. All these results encourage teaching about energy-saving strategies and devices.

There are positive indications of energy-conscious behaviour, such as using energy-efficient lights (Figure 14) and wearing appropriate clothing in winter (Table 13). However, there are areas that need improvement, such as learning about temperature settings for air conditioners, unplugging electronic devices, and being more aware of energy-efficient practices.

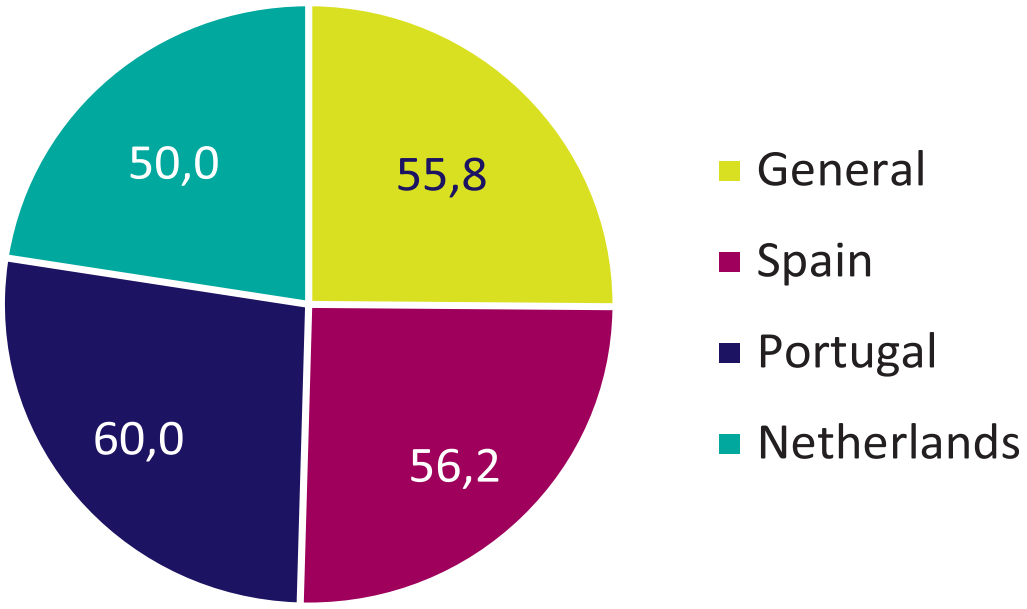

Figure 14. Respondents' use of energy efficient lights (%).

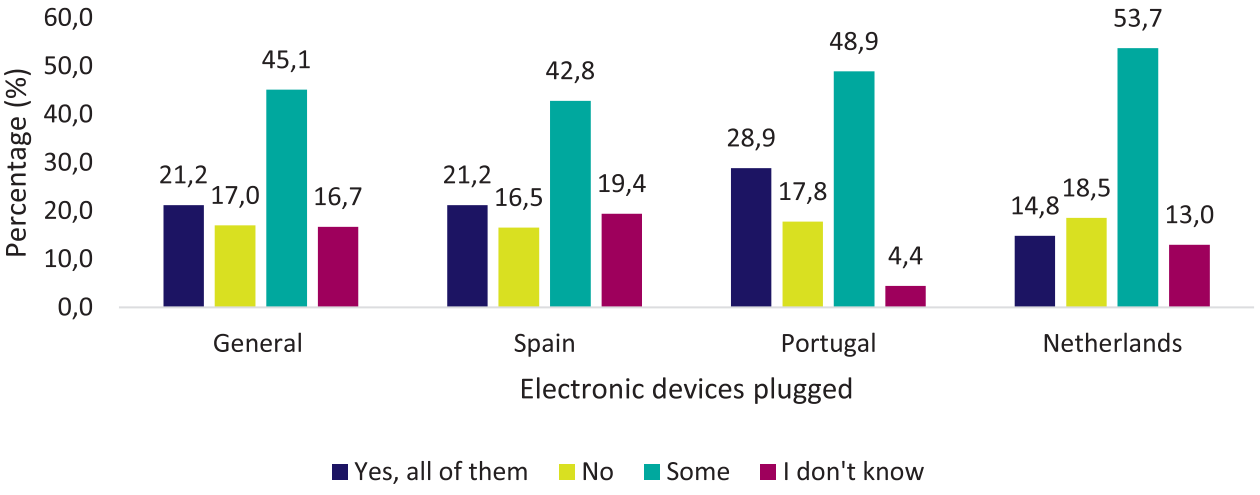

Figure 15. State of plugged electronic devices

On the other hand, the teaching and administrative, and technical staff perceived a *medium level of sensitivity* of students' awareness regarding the environmental issues (46%), while almost 30% of students were perceived as poorly sensitised (Table 14). The percentage of sensitised respondents is lower than 17%. Teachers perceived less than 5% of students have a *very high level of sensitivity* regarding environmental issues (<5%).

Regarding each school, Portuguese respondents were perceived to have a higher level of awareness, with 50% of students being perceived as sensitised and the rest as *medium sensitised* (Table 14).

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Regarding their own perceived level of skills and tools related to the capacity to promote changes in students in relation to the environment, the majority of teaching staff answered that they are skilled (44.4%), and almost 40% perceived themselves as having medium capacity and tools (Table 14). Portuguese and Dutch respondents perceived themselves as having a medium level of skills (33.3% in the case of Portugal and 42.9% in the case of Netherlands) rather than a high one (50%-57%), as seen in the case of Spanish participants.

More than 70% up to 100% (in the case of Portugal) think it is very important for teachers to have more *teaching skills* and tools to promote changes in students in terms of individual behaviours in relation to the environment.

The majority of teaching staff believes that the VIRAL Project can satisfy school *needs* regarding promoting changes in students in relation to the environment (59%) (Table 14). As for schools, Spain presents a similar pattern to the general situation, and all Portuguese respondents perceive it positively (100%). In the case of the Netherlands, less than half trust in this project (40%).

Table 14. Perceived level of awareness related to environmental issues. Teachers' perceptions (%) regarding their students' level of awareness. Teachers' perceived skills (%) to promote changes in students regarding their environment-behaviour. Level of satisfaction with respondents' needs with the VIRAL Project (%).

Awareness related to environmental issues	General	Spain	Portugal	Netherlands
Students' skills				
Not sensitised	3.7	4.9	0.0	0.0
Poorly sensitised	29.6	34.1	0.0	28.6
Medium sensitised	**46.3**	**48.8**	**50.0**	28.6
Sensitized	16.7	7.3	**50.0**	**42.9**
Very sensitised	3.7	4.9	0.0	0.0
Teachers' skills				
Poorly skilled	14.8	17.1	16.7	0.0
Medium skilled	**40.7**	**36.6**	**50.0**	**57.1**
Skilled	**44.4**	**46.3**	**33.3**	**42.9**
Increase teachers' skills				
Yes, it is very important	**75.9**	**70.7**	**100.0**	**85.7**
Maybe it is	18.5	24.4	0.0	0.0
No, I don't think it's necessary	5.6	4.9	0.0	14.3
Satisfaction needs	59.4	52.4	100.0	40.0

3. CONCLUSIONS

The purpose of this survey was to assess the level of awareness, knowledge, and perceptions towards environmental sustainability and also to identify areas where educational interventions and initiatives could be implemented to promote positive behavioural changes. Therefore, through this work there are a few conclusions that are possible to make.

First of all, the overall findings indicate a strong awareness and concern among the respondents about climate change and its potential impacts on the environment. Despite the majority´s considerable level of awareness regarding mitigating the effects of climate change, a small percentage of people still believes climate change is not real. However, it is worth noting that it is necessary to invest in the education of everyone, but especially of this small group. Moreover, even then just a very small percentage of respondents from Spain and Portugal schools, who believe climate change is a *real* problem, the study indicates that we are heading in a good direction in relation to what this new generation thinks in the theme of climate change.

Second, about consumption, we can conclude as problematic the result that *agriculture and livestock* are not considered factors influencing climate change in the respondents' perceptions. In this regard, it is necessary to deepen the understanding of those influencing factors, especially within the scope of what has the potential to be done through environmental education. In general, regarding the *level of concern*, in Spain this topic is bigger than in Portugal, where a prevalent moderate concern is observed. However, as mentioned previously, the Netherlands surpasses both with a substantial proportion of respondents expressing significant worry.

Third, on the theme of mobility, even then school location plays a big role regarding respondents' mobility choices, the different patterns between the three studied schools indicates a different reality of daily mobility to school between Spain, Portugal and the Netherlands. As the way of transport primarily used by an individual or a group implies a significant difference in the environmental impact produced by each one, this result shows that this is a factor that could be improved in some realities, both on the individual side and on the municipal and school administrative side.

Fourth, about energy, as already said, the survey results provide an intriguing insight into how students engage with renewable energy sources and strive to curtail electricity consumption within the school and their houses. However, These and other results lead to the conclusion that there is a need to enhance awareness about the significance of energy efficiency and other actions that decline individual and community energy impact.

To sum up, at the end, it is also important to note that climate change issues linked to consumption, mobility and energy are issues that must always be addressed in the school curriculum, regardless of the level of commitment and understanding that students already have. However, specifically from this study, there are many aspects that can be highlighted. At some points, we can see different positive results particular to each of the three realities studied, Spain, Portugal and the Netherlands. In others, we can learn in greater depth about what can be improved and suggested within the scope of an environmental education project for schools, which will be the next step on the journey of the VIRAL Project.

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3.1. RECOMMENDATIONS

As general recommendations, some proposals can be designed within the scope of the schools involved in the VIRAL Project, such as:

Promote the continuous training of teachers on the topics of energy, mobility and consumption as a response to mitigation and adaptation to climate change;

Promote continuous training of the school's administrative and technicians on the topics of energy, mobility and consumption so that they can contribute to the actions of school projects within the scope of raising awareness of mitigation and adaptation to climate change;

Provide seminars and workshops for students with technicians and specialists in the topics of energy, mobility and consumption to respond to the challenges of climate change through environmental education projects;

Provide the approach and involvement of young people in local policies, reinforcing civic awareness and democratic culture through proposals and school projects that work on environmental issues and that can be discussed and integrated into decision-making processes at the level of local public policies;

Share with the community the activities and projects developed by the school and seek to involve, whenever possible, different social actors in their projects and in the discussion of their proposals; and,

Ensure the visibility of its actions through the dissemination of the work developed within the scope of the VIRAL project as a way of valuing the role of young people as part of the solutions.

ANNEX 1: QUESTIONNAIRE IN NATIONAL LANGUAGES: SP, EN, PT

Annex 1. Survey´s structure and associated parameters: mobility, consumption (consumpt) and energy.

	Questions	Section
1	Which school do you belong to?	
2	Gender	Profile
12	What is your role in the school?	

	Questions	Section	Parameters		
			Not& know	Action	Com& Perce
3**	Where have you heard about climate change?	Climate change	-	-	-
4	What is the first thing that comes to your mind when you hear the term "Climate Change"?	Climate change			X
5	Do you think the climate is really changing?	Climate change			X
6	If you answered yes, what do you think is the reason?	Climate change	X		X
7	What do you think needs to change globally to reduce climate change?	Climate change	X		X
8	What do you think you can do from your place to reduce climate change?	Climate change			X
9	Do you currently do any of the actions in the previous question?	Climate change		X	
10	How concerned are you about climate change?	Climate change			X
11	How do you feel when climate change is discussed?	Climate change			X
13*	In your opinion, are the students at your school sufficiently aware of environmental issues and climate change?	Climate change			X

CONTINUES

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14*	In your opinion, should teachers have more teaching skills and tools to promote changes in students in terms of individual behaviours in relation to the environment?	Climate change			X
15*	Do you think that you have skills and tools on how, from your area, to promote changes in students in terms of individual behaviours in relation to the environment?	Climate change			X
16**	Are you familiar with the VIRAL Project (EnVIRonmental evALuation project method for secondary schools)?	Climate change	-	-	-
17*	If you answered yes, do you think that the VIRAL Project can respond to the needs of the school in promoting changes in students in terms of individual behaviour in relation to the environment?	Climate change			X
18**	How many times a day do you commute to school or work?	Mobility	-	-	-
19	How do you commute to school or work?	Mobility		X	
20	On infrastructure and means of transport -rate between 1, very difficult, and 5, very easy-Public transport (punctuality/reliability)	Mobility			X
21	Rate the environmental impact you think your commute has	Mobility	X		X
22	Would you like to participate in initiatives to promote environmentally friendly mobility at school or in your city?	Mobility		X	
23	About food shopping habits: point out those that you practise [The products I buy have plastic packaging]	Consumpt		X	
24	About eating habits: point out the ones you practise [I eat homemade food]	Consumpt		X	
25	What actions do you take to avoid wasting food?	Consumpt		X	
26	How do you find out about the products you buy?	Consumpt	X	X	
27	On average, how much clothing do you buy per month?	Consumpt		X	
28	Regarding your CLOTHING purchase decision, point out the elements that you take into consideration	Consumpt	X		
29	Regarding your decision to purchase TECHNOLOGICAL DEVICES, point out the elements that you take into consideration	Consumpt	X		

CONTINUES

30	How often do you shop online?	Consumpt		X	
31	In your school, do any of the following activities take place?	Consumpt		X	
32	Do you know the energy label for household appliances?	Energy	X		
33**	Do you have energy efficient appliances at home?	Energy	-	-	-
34**	What type of energy do you use at home?	Energy	-	-	-
35**	Do you have air conditioning in your home?	Energy	-	-	-
36**	If your answer is affirmative, at what temperature do you set the air conditioner in your home?	Energy	-	-	-
37	In winter, how do you dress at home when the heating is on?	Energy		X	
38	Do you use energy efficient lights?	Energy		X	
39	Are the electronic devices in your home plugged into the mains when not in use?	Energy		X	
40	What do you think is a limitation to use cleaner energies?	Energy	X		X
41	What changes could be made to make energy use more efficient in your educative centre?	Energy			X

*** Questions tailored for teachers and administrative staff**
**** Question not relevant for this study**

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Cooperation partnerships
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VIRAL

EnVIRonmental evALuation
project method for secondary schools

VIRAL PROJECT
Guidelines on individual green practices:
how to promote behavioural changes

Aspea – Associação Portuguesa de Educação Ambiental
Strategia Netherlands
dialoguia CONSULTORÍA SOCIAL
soml
low carbon economy®
Escola Profissional de Alte - CIPRL
Escola Profissional Cândido Guerreiro Alte

TITLE
VIRAL PROJECT: Guidelines on individual green practices: how to promote behavioural changes

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SUMMARY

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GUIDELINES ON INDIVIDUAL GREEN PRACTICES: HOW TO PROMOTE BEHAVIOURAL CHANGES

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I. EDUCATIONAL ACTIVITIES BASED ON SURVEY RESULTS

1. Exploring individual green practices: topics for inspiring educational initiatives

In the context of creating climate-resilient societies, it is necessary to foster behavioural change through in-school activities. Changes in behaviour of consumers can result in the reduction of greenhouse gas (GHG) emissions, in the short and long term. Those changes can include mobility, food, use of electricity, etc. The issue is that behaviour cannot be changed only with information. Nowadays, people receive lots of information about environmental problems and climate change effects, but they feel lost in terms of what they can do or how to support the fight against climate change as an individual or as a community. Therefore, as part of positive change, it is necessary to (re)think about mobility, consumption and energy, three big influencing factors in the context of climate change.

(Re)thinking mobility means seeking sustainability in everyone's way of coming and going. This action must consist of the search for resources and means of transport that are less environmentally impactful, that is, energy consumers that, consequently, will pollute less per kilometre travelled. So that sustainable mobility is, by concept, a model for organising air, land and water transport with minimal environmental impact, and which still satisfies the social needs of moving freely and having access, communicating, negotiating and establishing relationships without, however, sacrificing other essential ecological and/or human resources.

(Re)thinking consumption is to search for ways to consume more consciously about choosing products that use fewer natural resources in their production and that guarantee decent employment for those who produce them. Sustainability in this sense must come from the production base to final destination, including the search for reuse and recycling. In this way, consumption must be responsible based on behaviour that incorporates the fact that resources are limited and that corresponds to an active civic engagement for the quality of personal and collective life.

(Re)thinking energy should focus mainly on the development of new intelligent ideas in the context of production, systems and services with a view to low environmental impact. In this context, issues such as heating water and ambient air conditioning and the elements of connectivity and control, for example, should be reviewed with a view to smart heating and air conditioning solutions for comfortable and sustainable homes. Through investigation integrated into renewable energies, energy efficiency, recycling, smart materials, connectivity for solutions innovative sustainable homes with maximum comfort and security.

1.1. Objective of the educational activities

The idea with these proposals is to promote behavioural changes based on the conclusions of the surveys performed in the schools. Therefore, the environmental experts of VIRAL Project have focused on what type of practices can be included in the day to day, fostering behavioural change and giving ideas on how to create activities that can be included in the schools to contribute to a permanent change.

2. Proposals for educational activities

The educational proposals that will present next are a compilation of activities that are already carried out by the three environmental experts institutions partners of the VIRAL Project, proposals from other institutions (which will always be duly referenced) and new proposals that were created within the scope specific of the VIRAL Project. Also, some videos from The Story of Stuff Project (@StoryofStuff) will be used in the aim of presenting suggestions of theoretical support for some of the educational activities.

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2. 1. List of educational activity proposals

- 1. MOVE MORE SUSTAINABLE
- 2. MAPPING THE CITY ENVIRONMENT
- 3. CLEAN WITHOUT CREATING MORE DIRT
- 4. BE AN ENVIRONMENTALIST
- 5. FIGHTING FOOD WASTE
- 6. IT'S IN THE GARDEN
- 7. CLIMATE CHANGE? I?
- 8. LET'S SAVE THE PLANET?
- 9. SUSTAINABLE FOOD 4ALL
- 10. IS OUR DIET SUSTAINABLE?
- 11. LET'S DEPLASTIFY?
- 12. DEALING WITH ENERGY
- 13. CHANGING CLOTHES INSIDE OUT
- 14. WHAT IS OUR CARBON FOOTPRINT?

1. MOVE MORE SUSTAINABLE [2]

MAIN OBJECTIVES

- Discover sustainable transportation alternatives.
- Promote changes in behaviour in relation to mobility by car.

SPECIFIC OBJECTIVES (WHAT IS EXPECTED OF PARTICIPANTS)

- Reflect on other forms of mobility.
- Identify sustainable forms of transport that can replace the car.
- Know the advantages and disadvantages of alternative transport to cars.
- Student development in the context of urban design and independent mobility

ESSENTIAL LEARNINGS

- Give visibility to the need and desire of young and adults to use active modes in their daily journeys (biking, walking, rollerblading, skateboarding, etc.).
- Demanding the improvement of cycling infrastructure and the pacification of streets, especially in school areas.
- Mobilise students to organise by themselves activities that involve the community.
- Support travel free, safe and independent mobility in public spaces.
- Discuss effective ways to reduce greenhouse gas emissions and other pollutants that contribute to global warming.
- Encourage people to travel safely and efficiently, using means of transport that do not harm the environment, you can see several improvements in your life.
- Discuss how sustainable mobility methods can help reduce stress levels, improve the flow of cities and generate smoother traffic for people's daily lives.

DEVELOPMENT

- Students should plan together a non-polluting transport mobility activity. It can be based on go on activities, such as the Kidical Mass (https://kidicalmass.org/). Students must be responsible for the entire ideation of the activity, from idea development and planning to execution.

DURATION TIME

- Recommended 2h/activity.

MATERIALS

- Maps of the city or local area.
- Computer with internet to do the search.
- Drawing materials (pencils, markersl, etc.).
- Notepads or sheets of paper.

[2] Proposal based on activity carried out by Associação Portuguesa de Educação Ambiental (ASPEA).

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2. MAPPING THE CITY ENVIRONMENT[3]

MAIN OBJECTIVES

- Make mental localization using vision.

SPECIFIC OBJECTIVES (WHAT IS EXPECTED OF PARTICIPANTS)

- Identify socio-environmental problems.
- Make mental localization using vision.
- Identify landmarks.
- Apply cartographic and mapping techniques to explore different questions.
- Propose more environmentally friendly measures that we should adopt.
- Cross-referencing past and present cartographic data.

ESSENTIAL LEARNINGS

- Discuss causes and consequences of ecosystem change, justifying the importance of the dynamic balance of ecosystems and how their management can contribute to achieving the goals of sustainable development.
- Distinguish between catastrophes of natural origin and catastrophes of anthropogenic origin, identifying the causes of the main catastrophes of anthropogenic origin.
- Discuss measures that reduce the impacts of disasters of natural and anthropogenic origin on ecosystems, in general, and on the ecosystems in the area surrounding the school, in particular. Relate the role of territorial planning and management instruments with the protection and coservation of Nature.
- Carry out responsible citizenship interventions (feasible and well-founded) aimed at preventing / minimising / remediating the problem under study and promoting the sustainable use of natural resources.

DEVELOPMENT

- In small groups, students will discuss environmental concerns in their city, create mental maps identifying these issues, and then mark them on city maps.
- After that, they need to propose eco-friendly solutions to these problems and present their findings to the class.
- In the long term, students can make a project to present their discoveries to the municipal public administration in order to exercise their citizenship and propose improvements to their city/community.

DURATION TIME

- 90min per session.

MATERIALS

- Maps of the city or local area.
- Drawing materials (pencils, markersl, etc.).
- Notepads or sheets of paper

[3] Proposal based on activity carried out by Associação Portuguesa de Educação Ambiental (ASPEA).

3. CLEAN WITHOUT CREATING MORE DIRT[4]

MAIN OBJECTIVES

- Encourage a change in mentality regarding the way of consumption.

SPECIFIC OBJECTIVES (WHAT IS EXPECTED OF PARTICIPANTS)

- Know the environmental consequences of the most used hygiene and cleaning products.
- Discover more environmentally friendly alternatives that produce the same results.
- Understand the environmental impact of hygiene and cleaning products.
- Search for sustainable options.

ESSENTIAL LEARNINGS

- Identify an environmental or social problem existing in your community (urban solid waste, pollution, poverty, unemployment, social exclusion, etc.), proposing resolution solutions.
- Relate the increase in the world population and the consumption of goods with changes in the quality of the environment (destruction of forests, pollution, depletion of resources, extinction of species, etc.), recognizing the need to adopt individual and collective measures that minimise the impact.
- Discuss the importance of sustainable water management in terms of its use, exploitation and protection, with local, regional, national or global examples.
- Formulate critical opinions about human actions that affect biodiversity and the importance of its preservation.
- Discuss causes and consequences of ecosystem change, justifying the importance of the dynamic balance of ecosystems and how their management can contribute to achieving the goals of sustainable development.
- Discuss options for the conservation of ecosystems and their contribution to human needs, as well as the importance of science and technology in their conservation.
- Interpret the influence of some polluting agents on ecosystems, starting from local or regional issues and critically analysing the results obtained.
- Discuss the impacts of the exploration/transformation of natural resources and propose measures to reduce them and promote their sustainability.
- Interpret data relating to a situation of air, water or soil contamination.
- Carry out responsible citizenship interventions (feasible and well-founded) aimed at preventing/minimising/remediating the problem under study and promoting the sustainable use of natural resources.

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DEVELOPMENT

- Students need to search for environmentally friendly ways to learn how to make hygiene and cleaning that can be made at home.
- In groups they need to produce their own products.

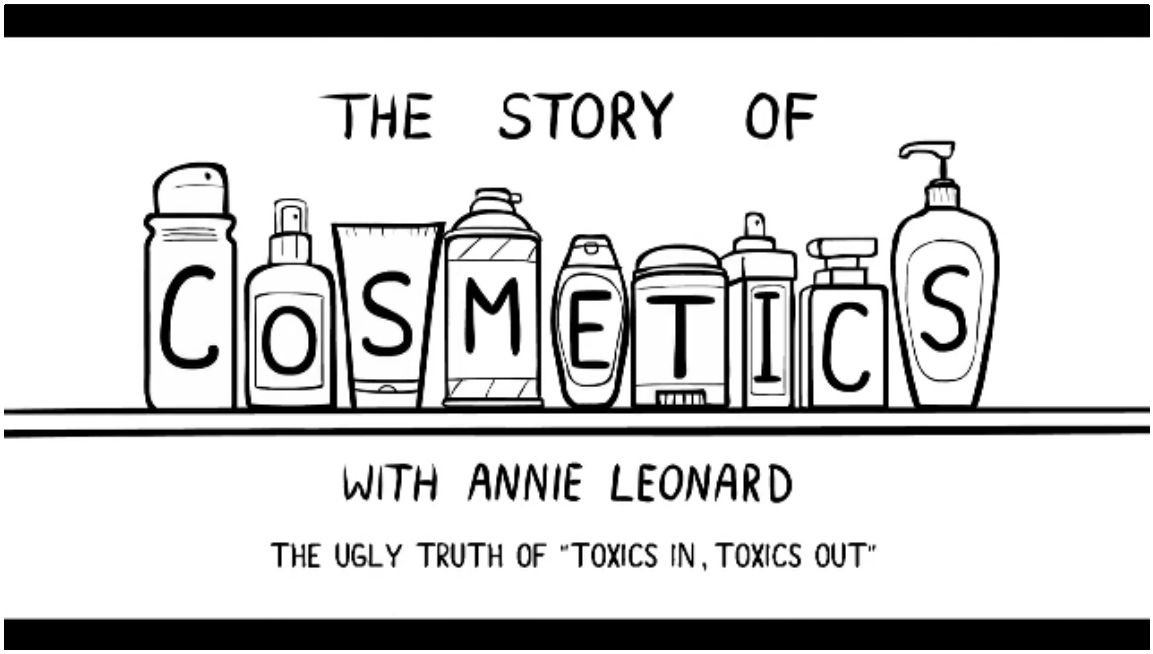
DURATION TIME

- 90min per session.

MATERIALS

- Computer with internet to do the search.
- Specific materials to produce the products.

[4] Proposal based on activity carried out by Associação Portuguesa de Educação Ambiental (ASPEA).



4. BE AN ENVIRONMENTALIST[5]

MAIN OBJECTIVES

- Understand some of today's biggest environmental problems.
- Propose actions to be adopted to change the direction being followed.

SPECIFIC OBJECTIVES (WHAT IS EXPECTED OF PARTICIPANTS)

- Become aware of the increase in the number and intensity of environmental disasters in recent years.
- Relate this fact with human attitudes.
- Be aware of the present and future consequences of these catastrophes.
- Propose attitudes that help mitigate these catastrophes.
- Understand environmental catastrophes and resource exhaustion.

ESSENTIAL LEARNINGS

- Discuss causes and consequences of ecosystem change, justifying the importance of the dynamic balance of ecosystems and how their management can contribute to achieving the goals of sustainable development.
- Discuss options for the conservation of ecosystems and their contribution to human needs, as well as the importance of science and technology in their conservation.
- Discuss measures that reduce the impacts of disasters of natural and anthropogenic origin on ecosystems, in general and on the ecosystems in the area surrounding the school.
- Discuss the impacts of the exploration/transformation of natural resources and propose measures to reduce them and promote their sustainability.
- Interpret data relating to a situation of air, water or soil contamination (that is relevant and/or close to the students).
- Carry out responsible citizenship interventions (feasible and well-founded) aimed at preventing/minimising/remediating the problem under study and promoting the sustainable use of natural resources.
- Carry out responsible citizenship interventions (feasible and well-founded) aimed at preventing/minimising/remediating the problem under study and promoting the sustainable use of natural resources.

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DEVELOPMENT

- Students in groups will create a dynamic of discussion where each group needs to create a point of view about which tematics are more environmentally important, what is the role of an environmentalist and how they can become one.
- The groups need to present their results to the class.

DURATION TIME

- 45 min of discussion and 45 min of presentation.

MATERIALS

- Computer with internet to do the search.
- Drawing materials (pencils, markers, etc.).
- Notepads or sheets of paper.

[5] Proposal based on activity carried out by Associação Portuguesa de Educação Ambiental (ASPEA).

5. FIGHTING FOOD WASTE[6]

MAIN OBJECTIVES

- Know alternatives for food waste other than the trash bin.

SPECIFIC OBJECTIVES (WHAT IS EXPECTED OF PARTICIPANTS)

- Be aware of the amount of food waste that is generated daily.
- Know the importance of composting.

ESSENTIAL LEARNINGS

- Express positive attitudes leading to the preservation of the immediate environment, being able to present intervention proposals, namely behaviours that aim at the five "Rs".
- Relate the increase in the world population and the consumption of goods with changes in the quality of the environment (destruction of forests, pollution, depletion of resources, extinction of species, etc.), recognizing the need to adopt individual and collective measures that minimise the impact.
- Formulate critical opinions about human actions that affect biodiversity and the importance of its preservation.
- Discuss causes and consequences of ecosystem change, justifying the importance of the dynamic balance of ecosystems and how their management can contribute to achieving the goals of sustainable development.
- Discuss options for the conservation of ecosystems and their contribution to human needs, as well as the importance of science and technology in their conservation.
- Interpret the influence of some polluting agents on ecosystems, starting from local or regional issues and critically analysing the results obtained.
- Discuss measures that reduce the impacts of disasters of natural and anthropogenic origin on ecosystems, in general, and on the ecosystems in the area surrounding the school, in particular.

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DEVELOPMENT

- Students should: (1) discuss the impacts of the exploration/transformation of natural resources and propose measures to reduce them and promote their sustainability; (2) analyse situations by identifying examples of interactions between terrestrial subsystems (atmosphere, biosphere, geosphere and hydrosphere); and, (3) interpret data relating to a situation of air, water or soil contamination.
- At the end they can simulate composting with school organic waste.

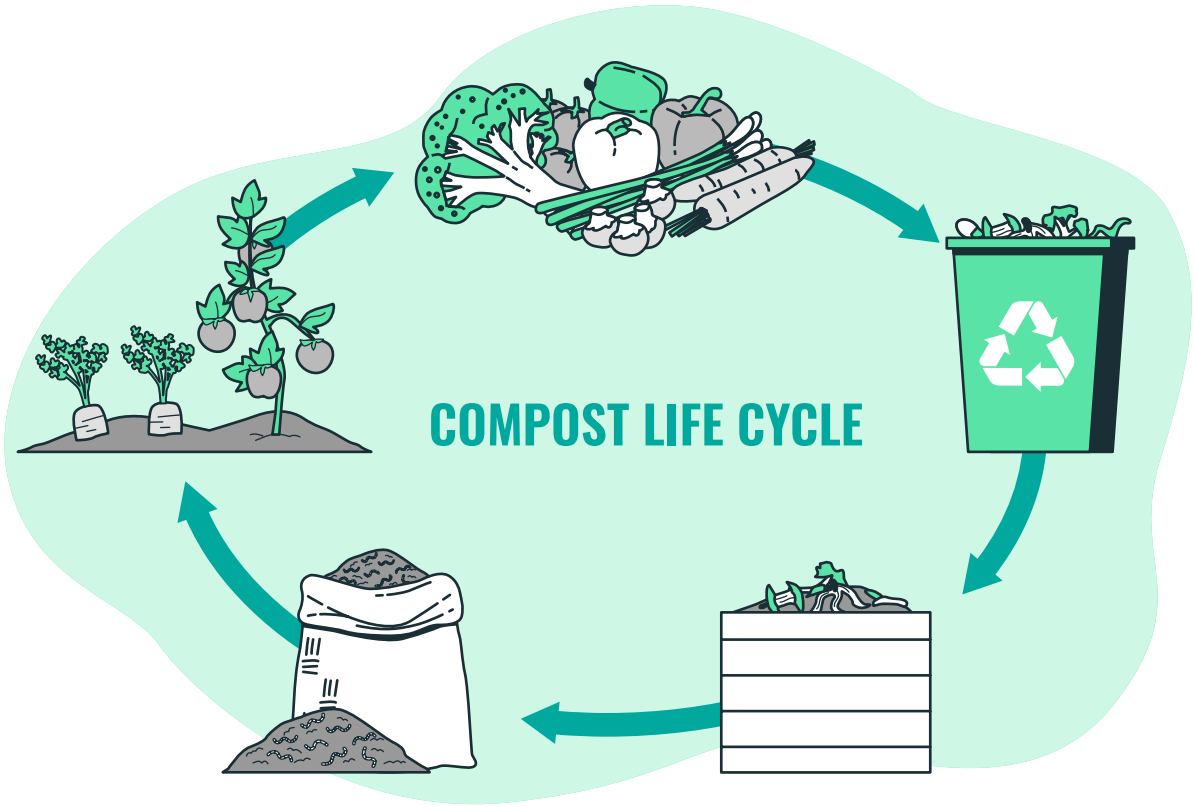
DURATION TIME

- 90min per session.

MATERIALS

- Computer with internet to do the search.
- Drawing materials (pencils, markers, etc.).
- Notepads or sheets of paper.
- Composter and organic waste.

[6] Proposal based on activity carried out by Associação Portuguesa de Educação Ambiental (ASPEA).



6. IT'S IN THE GARDEN[7]

MAIN OBJECTIVES

- Know the impact that large-scale food production has on the environment.
- Discover more sustainable alternatives.

SPECIFIC OBJECTIVES (WHAT IS EXPECTED OF PARTICIPANTS)

- Know the precautions to be taken when growing a vegetable garden.
- Know the advantages and disadvantages of organic production.

ESSENTIAL LEARNINGS

- Relate the increase in the world population and the consumption of goods with changes in the quality of the environment (destruction of forests, pollution, depletion of resources, extinction of species, etc.), recognizing the need to adopt individual and collective measures that minimise the impact.
- Discuss the importance of sustainable water management in terms of its use, exploitation and protection, with local, regional, national or global examples.
- Formulate critical opinions about human actions that affect biodiversity and the importance of its preservation.
- Discuss causes and consequences of ecosystem change, justifying the importance of the dynamic balance of ecosystems and how their management can contribute to achieving the goals of sustainable development.
- Discuss options for the conservation of ecosystems and their contribution to human needs, as well as the importance of science and technology in their conservation.
- Interpret the influence of some polluting agents on ecosystems, starting from local or regional issues and critically analysing the results obtained.
- Discuss the impacts of the exploration/transformation of natural resources and propose measures to reduce them and promote their sustainability.
- Interpret data relating to a situation of air, water or soil contamination.
- Carry out responsible citizenship interventions (feasible and well-founded) aimed at preventing/minimising/remediating the problem under study and promoting the sustainable use of natural resources.

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DEVELOPMENT

- Students in groups will create a mini garden system.
- The groups need to take care of their mini garden system during the semester.

DURATION TIME

- 120 min to create the mini garden system.
- 10 min weekly for maintenance.

MATERIALS

- Tools for gardening.
- Some properly space to plant (inside or outside).

[7]Proposal based on activity carried out by Associação Portuguesa de Educação Ambiental (ASPEA).

7. CLIMATE CHANGE? I?[8]

MAIN OBJECTIVES

- Recognize that our behaviours have environmental implications.
- Identify causes and consequences of climate change.

SPECIFIC OBJECTIVES (WHAT IS EXPECTED OF PARTICIPANTS)

- Understand that global warming results from production of greenhouse gases.
- Understand that climate change comes from an increase in global average temperature of the Earth, with effects on the patterns climatic.
- Understand that human beings are the main responsible for climate change.

ESSENTIAL LEARNINGS

- From this debate, the concept of climate change, some causes and consequences should emerge and result in the idea that the main responsible for climate change is human beings, namely through excessive consumption, so the solutions involve changing our behaviours.

DEVELOPMENT

- Students need to watch the video "The story of stuff".
- In groups they will create a dynamic of discussion about the guiding questions.
- ed to present their results to the class.

GUIDING QUESTIONS

- Did you know about the situation presented in the video "The story of stuff"?
- Could you list some consumer behaviours that are harmful to the environment?
- You've probably heard about global warming and climate change. You know what they are? Is there any relationship between them? What are the main causes?

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- Who are the main responsibles?
- What are the consequences that arise from this?
- Who is affected?
- How will climate change affect us?
- What can be done to mitigate the problem?
- Is there any relationship between our behaviour and this problem?
- What changes can we make in our lives to combat climate change?

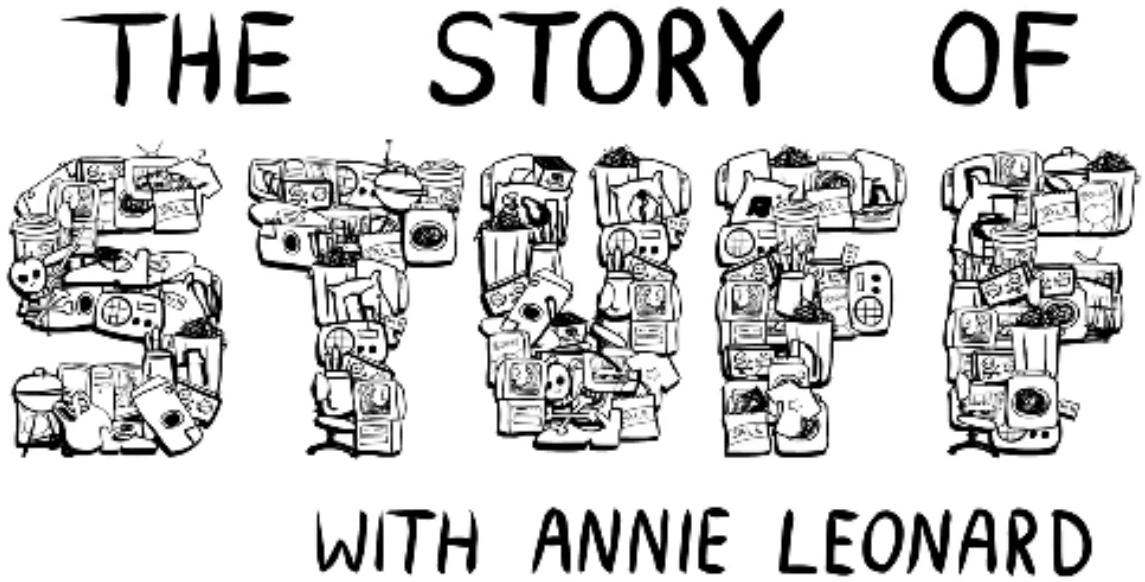
DURATION TIME

- 45 min of discussion and 45 min of presentation.

MATERIALS

- Computer with internet to do the search.
- Drawing materials (pencils, markers, etc.).
- Notepads or sheets of paper.

[8] Proposal based on an activity from the book "GET UP! Climate change". Available at: https://aspea.org/ images/aspea/Recursos/GUG_Alteracoes_Climaticas.pdf



8. LET'S SAVE THE PLANET?[9]

MAIN OBJECTIVES

- Know the importance of acting environmentally friendly.

SPECIFIC OBJECTIVES (WHAT IS EXPECTED OF PARTICIPANTS)

- Reflect on the relationship between consumption habits and climate change.
- Understand that local actions have global implications.

ESSENTIAL LEARNINGS

- To understand that production/use of consumer goods contributes to the production of greenhouse gases and consequently to changes in climate.
- Recognize that changing our behaviour can contribute to mitigating the problem.
- Formulate critical opinions about human actions that affect biodiversity and the importance of its preservation.
- Discuss causes and consequences of ecosystem change, justifying the importance of the dynamic balance of ecosystems and how their management can contribute to achieving the goals of sustainable development.
- Discuss options for the conservation of ecosystems and their contribution to human needs, as well as the importance of science and technology in their conservation.
- Interpret the influence of some polluting agents on ecosystems, starting from local or regional issues and critically analysing the results obtained.
- Discuss measures that reduce the impacts of disasters of natural and anthropogenic origin on ecosystems, in general, and on the ecosystems in the area surrounding the school, in particular.

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DEVELOPMENT

- Organise the class into groups to discuss consumption, such as water, plastics, energy, food, clothing and footwear, paper, hygiene and cleaning products, among others.
- Each group will work in a consumption area.
- Place the conclusions of group work and other information/documents considered relevant on a wall, which could be digital, so that they are available to all members of the class, as well as to their families and other members of the school community.

DURATION TIME

- 45 min of discussion and 45 min of presentation.

MATERIALS

- Computer with internet to do the search.
- Drawing materials (pencils, markers, etc.).
- Notepads or sheets of paper.

[9] Proposal based on an activity from the book "GET UP! Climate change". Available at: https://aspea.org/images/aspea/Recursos/GUG_Alteracoes_Climaticas.pdf

9. SUSTAINABLE FOOD 4ALL[10]

MAIN OBJECTIVES

- Reflect on the relationship between food production and climate change.
- Understand that local actions have global implications.

SPECIFIC OBJECTIVES (WHAT IS EXPECTED OF PARTICIPANTS)

- Understand that food production consumes immense resources, such as water, energy, minerals and soil.
- The production and transport of food contributes to the release of greenhouse gases, such as carbon dioxide and methane, responsible for global warming.
- Events associated with climate change such as droughts, floods and storms cause millions of poor farmers, who were not responsible for creating the problem, to lose their crops.
- We cannot stop eating, but if, for example, we choose local products, if we avoid waste, if we demand food whose production respects nature, we are contributing to the sustainability of the planet.

ESSENTIAL LEARNINGS

- It is hoped that by discussing the questions raised, the group will awaken to the relationship between food and climate change, making them want to delve deeper into the topic.

DEVELOPMENT

- Students in groups will create a dynamic of discussion about the guiding questions.
- The groups need to present their results to the class.

GUIDING QUESTIONS

- How is food produced? Where? How are they transported?
- What do we do with the leftovers?
- How does food production contribute to global warming?
- Does climate change affect food production? As?
- Who are the most affected?
- Is our diet sustainable?

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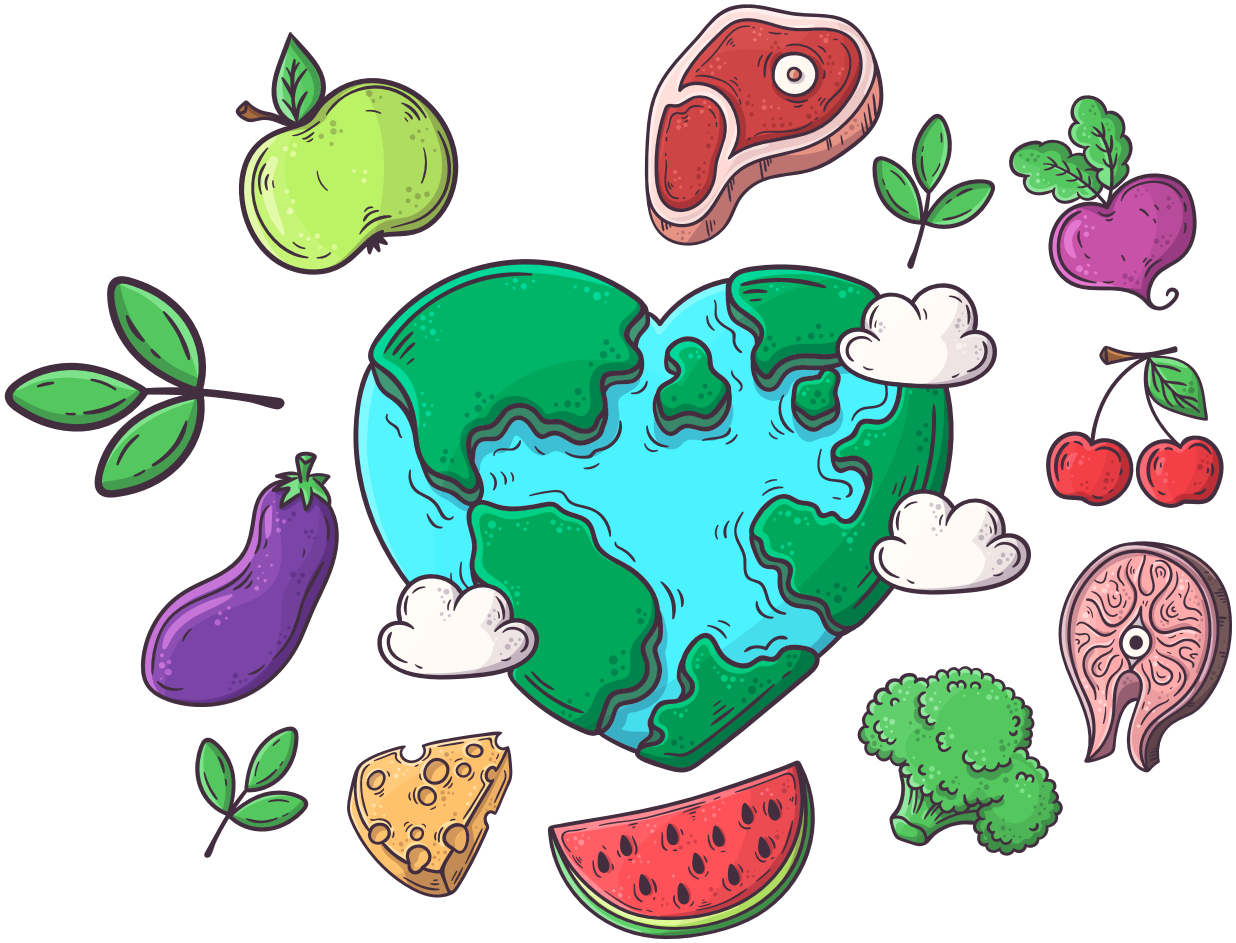
DURATION TIME

- 45 min of discussion and 45 min of presentation.

MATERIALS

- Computer with internet to do the search.
- Drawing materials (pencils, markers, etc.).
- Notepads or sheets of paper.

[10] Proposal based on an activity from the book "GET UP! Climate change". Available at: https://aspea.org/images/aspea/Recursos/GUG_Alteracoes_Climaticas.pdf



10. IS OUR DIET SUSTAINABLE?[11]

MAIN OBJECTIVES

- Reflect on the relationship between food production and climate change.

SPECIFIC OBJECTIVES (WHAT IS EXPECTED OF PARTICIPANTS)

- Understand that the way we eat and drink can change the planet.
- Understand that most of the food we consume is produced intensively, leading to the deforestation of large areas and consequently a reduction in carbon sinks.
- Problematize the issue of the environmental impact of food packaging.

ESSENTIAL LEARNINGS

- It is intended that students will reflect on the impacts of their diet on the environment and how they can change their eating habits in order to contribute to a more sustainable world.
- Students must make suggestions to make the food offered at home and by the school more sustainable.

DEVELOPMENT

- Organise a table with the foods and drinks consumed during a day and their respective quantities (you can weigh or use capacity measures such as spoon, cup, glass, etc.).
- The data should be discussed within the group, measuring the percentage of foods of animal origin consumed by them throughout a day, whether the products used are mostly local and seasonal, whether they are fresh or processed, type of packaging,
- Organise information on a Padlet (https://padlet.com/), reflect on the relationship between food and climate change and share the conclusions of the work carried out with the class and the school canteen administration.

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GUIDING QUESTIONS

- What did you eat and drink today?
- What is the origin of these foods and drinks?
- How did they get to your table? What is the distance travelled?
- How were they produced? How were they packaged?
- How much food did you waste?
- And in the canteen and bar at your school, what is the origin of the food? How are they packaged? How much food is wasted daily (ask employees)? What happens to uneaten food?

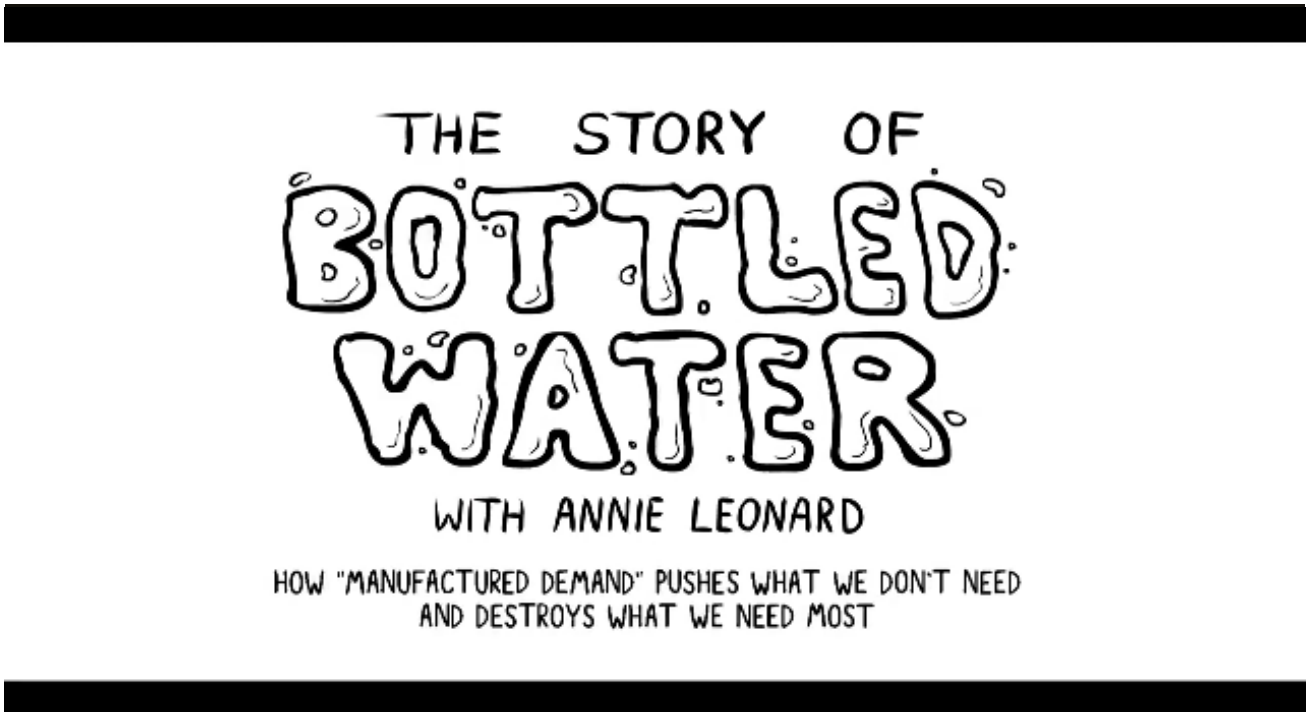
DURATION TIME

- 90min per session.

MATERIALS

- Computer with internet to do the search.
- Drawing materials (pencils, markers, etc.).
- Notepads or sheets of paper.

[11] Proposal based on an activity from the book "GET UP! Climate change". Available at: https://aspea.org/ images/aspea/Recursos/GUG_Alteracoes_Climaticas.pdf



11. LET'S DEPLASTIFY?[12]

MAIN OBJECTIVES

- Investigate how plastic is produced.
- Identifies negative impacts of the use of plastic on health and the environment.

SPECIFIC OBJECTIVES (WHAT IS EXPECTED OF PARTICIPANTS)

- Understand that plastic is not a natural resource.
- Observe that plastic can travel thousands of kilometres in the oceans and accumulate in so-called plastic islands.
- Search for several scientific studies that have shown that they have already found microplastics in the human body.
- Understand that plastics generate greenhouse gases at all stages of their life cycle, fueling climate change.
- Understand that plastics harm the oceans, climate, biodiversity and human health. Therefore, it is urgent to reduce its consumption and use it more sustainably.

ESSENTIAL LEARNINGS

- The group is expected to reflect on the omnipresence of plastics in our daily lives, their origin and impacts on the environment, becoming motivated to learn more about ways to alleviate this problem.
- It is important not to forget that plastics throughout their life cycle release greenhouse gases into the atmosphere, contributing to the increase in the planet's average temperature, polluting the oceans, and having negative impacts on living beings, including humans.

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DEVELOPMENT

- Make a list of products (food, hygiene and cleaning, clothing, appliances, etc.) that you use daily and that contain plastic.
- Estimate the amount of plastic waste produced by your family over the course of a week.
- Organise information, reflect on the relationship between plastic and climate change and share the conclusions of the work carried out with the class.
- Suggests measures to reduce plastic consumption.

GUIDING QUESTIONS

- Is plastic a natural resource provided by nature?
- How is plastic produced?
- Would we be able to have a “plastic-free day” with no use of plastic for 24 hours? Why?

DURATION TIME

- 90min per session.

- Computer with internet to do the search.
- Drawing materials (pencils, markers, etc.).
- Notepads or sheets of paper.

[12] Proposal based on an activity from the book “GET UP! Climate change”. Available at: https://aspea.org/images/aspea/Recursos/GUG_Alteracoes_Climaticas.pdf

12. DEALING WITH ENERGY[13]

MAIN OBJECTIVES

- Understand how energy affects our lives.
- Reflect on the relationship between energy and climate change.

SPECIFIC OBJECTIVES (WHAT IS EXPECTED OF PARTICIPANTS)

- Observe that all human activities require energy consumption.
- Understand that the production of energy from fossil fuels releases greenhouse gases, increasing the intensification of global warming.
- Investigate information related to the production of electrical energy.
- Investigate the environmental impacts of using energy in a more sustainable way.

ESSENTIAL LEARNINGS

- It is expected that the group will become aware of the importance of energy in our daily lives and the existence of different energy sources, and will become more curious to delve deeper into the subject.

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DEVELOPMENT

- Group members must identify situations relating to energy consumption throughout a day (on cell phones, in the shower, at meals, in transport, etc.), concluding that everything we do involves energy expenditure. It can also be replicated at the school's energy efficiency level.
- The group can analyse an electricity bill and compare the percentage of renewable and non-renewable energy resources used for its production. The data should be organised in a table.
- Share the conclusions of the work carried out with the school community.

GUIDING QUESTIONS

- In what situations do we use energy in our daily lives?
- What energy source(s) allow buses to move?
- What type of energy keeps the television on?
- What energy sources do you know? What are renewables?
- Will there be differences in the use of these energy sources? Will they be obtained in the same way? Where does the energy come from?
- What energy resources do you know?
- What are the renewable resources (wind, sun, water, food, etc.)? What about non-renewables (oil, natural gas, mineral coal, uranium, etc.)?
- What are the resources that directly contribute to global warming (oil, natural gas and coal)? Why?
- What can they conclude? What could you change in your daily routines to contribute to a more sustainable world?

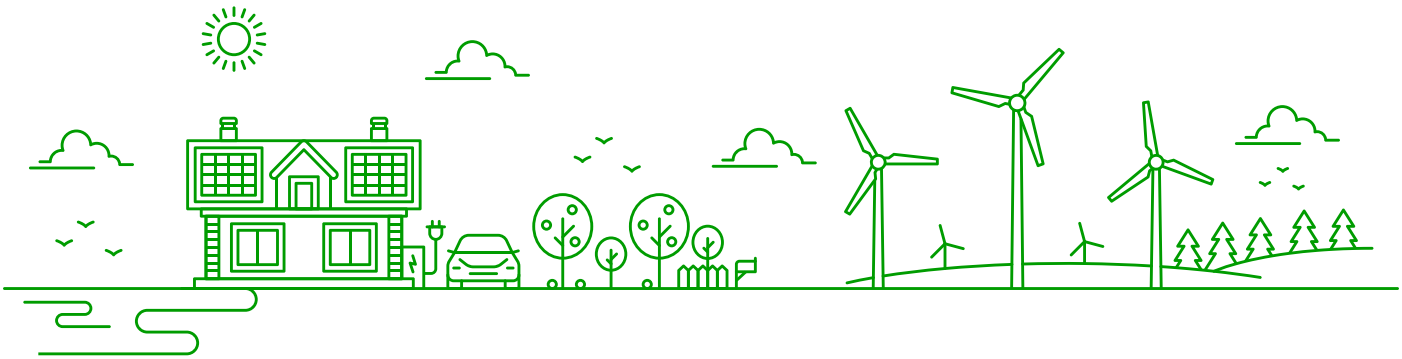
DURATION TIME

- 90min per session.

MATERIALS

- Computer with internet to do the search.
- Drawing materials (pencils, markers, etc.).
- Notepads or sheets of paper.

[13] Proposal based on an activity from the book "GET UP! Climate change". Available at: https://aspea.org/ images/aspea/Recursos/GUG_Alteracoes_Climaticas.pdf



13. CHANGING CLOTHES INSIDE OUT[14]

MAIN OBJECTIVES

- Problematize issues associated with clothing consumption.
- Understand clothing sustainability.

SPECIFIC OBJECTIVES (WHAT IS EXPECTED OF PARTICIPANTS)

- Observe that most of the clothing is produced in countries with high poverty.
- Understand that to obtain the lowest prices, factories do not comply with minimum safety conditions, workers are exploited and this work is often performed by children.
- Know that the production and transport of clothing has serious consequences for the environment, due to the energy and raw materials consumed, the use of chemicals and accumulated waste. The gases released in these processes contribute to global warming and consequently climate change.
- Problematize how we can minimise the environmental and social problems associated with clothing, if, for example, we buy less and more carefully (taking into account the location, method of production and the products used), donate clothes that we no longer use or buy/sell clothes in second-hand stores.

ESSENTIAL LEARNINGS

- The aim is to make the group curious to find out more about the life cycle of the clothes they wear and its environmental and social impacts.

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DEVELOPMENT

- Choose a type of clothing (e.g. t-shirts, shorts) and: (1) count the number of items of clothing; (2) compare this number with that of your colleagues; and, (3) research the clothing life cycle.
- Investigate the origin of the clothes you bring and mark the places where your clothes are produced on a map and calculate the distance to reach them.
- Identifies negative social and environmental impacts and suggests measures to reduce the impact of clothing consumption on the environment.
- Organise the information with a concept map reflecting on the relationship between clothing and climate change and share the conclusions of the work carried out with the class.

GUIDING QUESTIONS

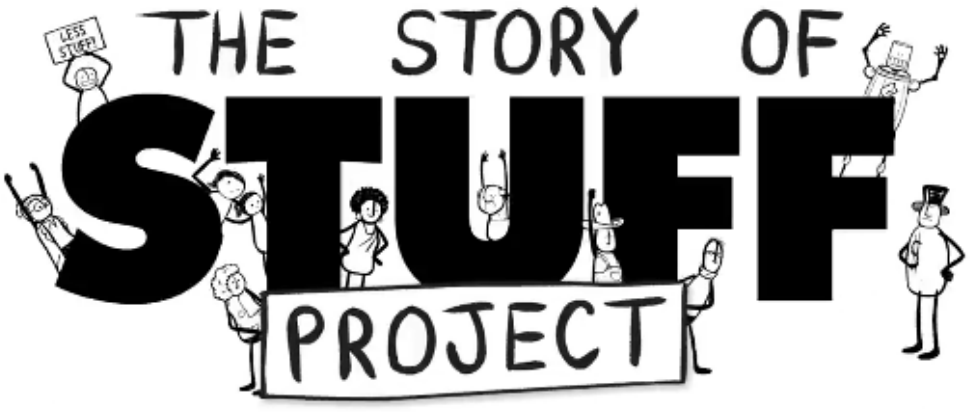
- Do you like being “in fashion”?
- What is the item of clothing you've always dreamed of buying, but don't yet have?
- What is the origin of the clothes you wear?
- Where are most of the clothes you buy produced?

DURATION TIME

- 90min per session.

- Computer with internet to do the search.
- Drawing materials (pencils, markers, etc.).
- Notepads or sheets of paper.

[14] Proposal based on an activity from the book “GET UP! Climate change”. Available at: https://aspea.org/ images/aspea/Recursos/GUG_Alteracoes_Climaticas.pdf



14 WHAT IS OUR CARBON FOOTPRINT?[15]

MAIN OBJECTIVES

- Understand the concept of carbon footprint.
- Reflect on the impact of consumption on the environment and the intensification of climate change.
- Identify actions at individual, collective, governmental and international levels, which aim to contribute to mitigating climate change.

SPECIFIC OBJECTIVES (WHAT IS EXPECTED OF PARTICIPANTS)

- Understand that the production/use of consumer goods has an impact on the quality of the environment and contributes to climate change.
- Problematize that climate change could make the advancement of civilization unsustainable, lead to a large reduction in the human population and cause the extinction of many other species.
- Observe that the most affected populations are the poorest and those living in the most vulnerable areas.
- Understand that to mitigate the problem it is necessary to act at an individual, collective, governmental and international level.

ESSENTIAL LEARNINGS

- Understand that the carbon footprint is the total greenhouse gas emissions caused by an individual, event, organisation, service, place or product, expressed in carbon dioxide equivalent.

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DEVELOPMENT

- Discuss the concept of carbon footprint (emissions of CO2 and other greenhouse gases, which are produced throughout the life cycle of a product) and invite class members to calculate theirs (individual, family or group) using one of the calculators available online and making a commitment to reduce this footprint through specific behavioural changes (e.g. using a canteen instead of plastic bottles; reducing food waste; turning off the lights whenever they leave the room, etc.).
- Draft a regulation of good practices to be made available to the entire school community.

GUIDING QUESTIONS

- What are climate changes? What is your relationship with global warming? What about CO_2 and other gas emissions?
- What are the main causes of climate change?
- Who is mainly responsible?
- Do all countries contribute equally to climate change? Why?
- What are the consequences for different human populations?
- How have their lives changed?
- What can be done to mitigate this problem, at an
- individual, collective, national and international level?
- How important is the Paris Agreement?

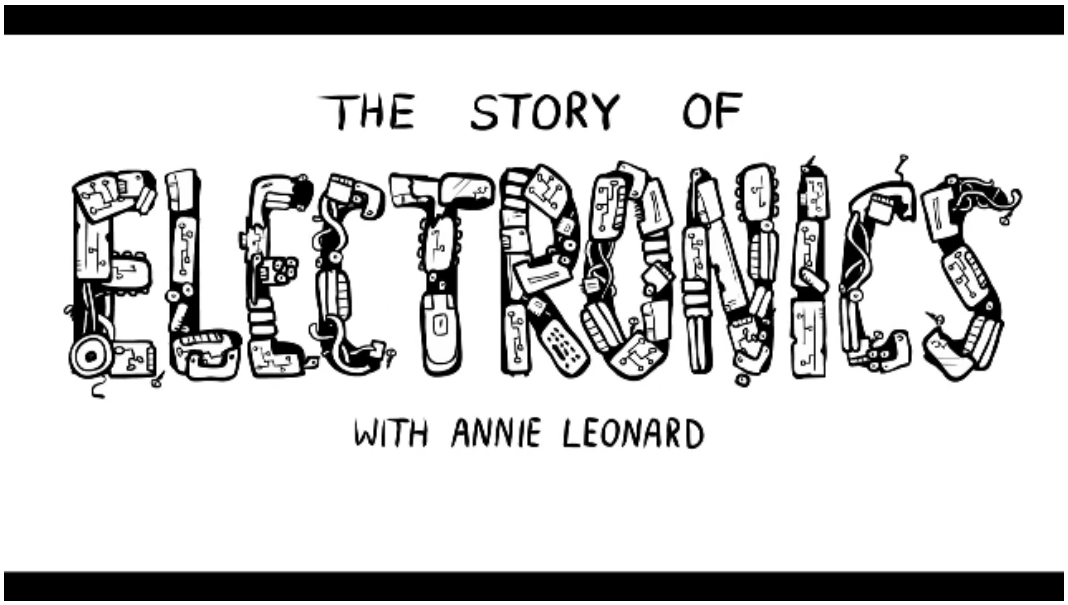
DURATION TIME

- 90min per session.

MATERIALS

- Computer with internet to do the search.
- Drawing materials (pencils, markers, etc.).
- Notepads or sheets of paper.

[15] Proposal based on an activity from the book "GET UP! Climate change". Available at: https://aspea.org/images/aspea/Recursos/GUG_Alteracoes_Climaticas.pdf



II. GUIDELINES TO CREATE AN ENVIRONMENTAL COMMITTEE

This chapter is dedicated to show some guidelines to create an Environmental Committee in each school participant. From this, the proposal is that the Environmental Committee will be used as a tool focused on students to actively learn and contribute with their vision on the current environmental challenges and actions in the school environment and community.

It is also necessary to mention that for a good implementation of the Environmental Committee, the entire school community must have environmental concerns as a foundation. Sustainability needs to be aligned with the school's internal development, otherwise the efforts that the committee will make on the topic will be in vain. However, to ensure that sustainability is, in fact, part of the school's organisational culture and the daily lives of everyone who makes up the community, it is necessary to sow the seed. To achieve this, the committee organisation must begin by electing people responsible for implementing environmentally correct practices in each organisational instance of the school community.

Therefore, the idea is to present a proposal for the creation of an environmental committee that can be created in each of the three schools participating in the project. However, it is not limited to the schools participating in the VIRAL Project and can be replicated for other schools interested in environmental change. For this, the School Councils of the Portuguese project called "Eco-Schools" (https://ecoescolas.abae.pt/) will be used as a model.

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At this point, it is worth explaining that Eco-Schools is an international program of the "Foundation for Environmental Education", developed in Portugal since 1996 by ABAE. It aims to encourage actions and recognise the quality work developed by the school, within the scope of Environmental Education for Sustainability. The program is coordinated at international, national, regional and school levels. This multi-level coordination allows the convergence of common objectives, methodologies and criteria that respect the specificity of each school in relation to its students and characteristics of the surrounding environment. In addition to the support of people and institutions from the National Commission, Eco-Schools also counts on partnerships with several municipalities and specific support from patrons for some of its activities. It also provides methodology, training, teaching materials, support and framework for the work carried out by the school. Its methodology, inspired by the principles of local Agenda 21 (originated in the UN conference ECO 92), is described in 7 steps that aim to guarantee the participation of children and young people in decision-making, thus involving them in the construction of a school and of a more sustainable community.

(This chapter is dedicated to show some guidelines to create an Environmental Committee in each school participant. From this, the proposal is that the Environmental Committee will be used as a tool focused on students to actively learn and contribute with their vision on the current environmental challenges and actions in the school environment and community.

Therefore, based in the Eco-Schools Program, the 7 suggested implementation steps of the Environmental Committees for the schools of the VIRAL Project, are:

1. Formalisation of the Environmental Committees (working group with majority representation of students, teachers, staff, parents, municipality, Non-Governmental Organisations (NGOs) linked to environmental education and other elements of the community, which suggests, discusses and evaluates the activity plan);

2. Carrying out an Environmental Audit (a tool for diagnosing the school's environmental status and allowing for checking progress over time);

3. Construction of an Action Plan (planning/forecasting activities in the various work themes linked to the environment, such as: Consumption, Waste, Mobility, Energy, Biodiversity, Preservation + others that the school intends to work on;

4. Monitoring and Evaluation (analysis of the success of activities carried out in relation to concrete goals – examples: reducing unsorted waste by 20%; creation of green brigades to monitor the actions of the school community;

5. Curricular Work (environment friendly activities and content can be integrated into several subjects);

6. Information and Involvement of the School and the Local Community (dissemination of the Program in the school and community; coordination with other entities; holding an environment day/event, etc.);

7. Eco-Code (set of phrases, ideas, commitments prepared by the school's students, which translate the school's code of conduct/environmental regulations).

In addition to following these 7 steps for implementation, it is worth noting that the school Environmental Committee must include representatives from the entire school community, including students, teachers, non-teaching staff, parents, representatives of the municipality and other sectors that the school deems appropriate (municipal administration, NGOs and environmental associations, environment companies, local media, etc.). In order to represent the entire school community, the size of the committee must be proportional to the size of the school

community. For example, in a small school there may be two students representing each school year, however, in a large school this number could be higher. In the case of students, they must be chosen in the way the school considers most appropriate, taking into account age levels (class representatives, elements from different years, etc.). Ideally they should constitute at least 50% of the committee. Students must also be represented in the coordination of the committee, which must be composed of at least one student and one teacher. However, other hierarchical levels can be created according to need, such as deputy, substitute or co-coordinators, etc.

It is observed that committee meetings are the ideal stage for exercising citizenship and the different stakeholders will be involved in the decision-making process. Decisions can also be discussed in larger meetings such as assemblies of students, classes, etc. No matter how informal it may be, the Council must be representative of all parties involved in this project and must keep minutes of all meetings held as well as decisions taken.

Regarding the Eco-Code, this must be a declaration of objectives translated into concrete actions that all members of the school must follow. This is not a list of vague expressions, like: “Let’s take care of the environment and preserve wildlife”. Each commandment must first describe a concrete action to be carried out by all elements of the school community: students, teachers and staff. It is important that students feel that they participated in the development of this code of conduct, otherwise they will ignore it. The strategy for developing the Eco-Code must be defined by each school. It is an example of an activity that fits perfectly into any curriculum, which can constitute the starting point for new actions. Ex: intra and inter class competitions, voting, dramatisations, creation of posters, etc. It is important that the Eco-Code must be displayed in a highly visible location and be disseminated throughout the school and community, including the local press and the general public.

* As supporting documents, also based and adapted from the proposal of the School Councils of the Eco-Escolas project, we suggest the following documents as examples for the regulation and management of the school Environmental Committees:

01	REGULATION
02	MEETING INVITATION
03	MEETING CALL
04	MINUTE

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1. REGULATION

The School's Environmental Committee of _____
_____
will meet at least _____a year, and whenever necessary, in the room _____from ___ to ___, under the chairmanship of the coordinating student and teacher from the program. The meetings will be called by the program coordinators through a notice, posted on the School's Environmental Committee panel and by letter or email to external entities. Minutes will be drawn up at each meeting to be approved and signed by everyone present.

The Environmental Committee council is based on the following objectives:
- Ensure that the other 6 steps are adopted by planning their implementation;
- Ensure the active participation of students in the Program's decision-making process;
- Ensure that the opinions of the entire school community are taken into account and, whenever possible, put into practice;
- Establish links with the school management structure and the local community;
- Ensure the continuity of the School's Environmental Committee

The following representatives sit on this council:

_____ _____
Program Coordinator (student) Program Coordinator (teacher)

Student Representatives:_____
_____
_____
_____
_____
_____

Teacher Representatives:_____
_____
_____
_____

Non-Teaching Staff Representative:_____
_____
_____
_____

Community Representative:_____
_____
_____
_____

Note: This document must contain the names of the representatives and not signatures, so it must already be duly completed when approved, which must take place at the 1st meeting of the School's Environmental Committee.

2. MEETING INVITATION

From the School's Environmental Committee of _____

_____

we would like to kindly send you this invitation to your excellency to participate in the meeting nº. _____ of our committee, which will take place on _____ ___, 20__ at __h__ in the room _____.

For this meeting, the agenda is:

-
-
-
-
-
-
-
-
-
-

Best regards,

_____

Program Coordinator (student)

Email:

Phone number:

_____

Program Coordinator (teacher)

Email:

Phone number:

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3. MEETING CALL

The School's Environmental Committee of _____
_____
invites all its members to participate in the meeting nº. ____ of our committee which will take place on _____ ___, 20__ at __h__ in the room _____.

For this meeting, the agenda is:

-
-
-
-
-
-
-
-
-
-

Best regards,

_____
Program Coordinator (student)
Email:
Phone number:

_____
Program Coordinator (teacher)
Email:
Phone number:

4. MINUTE nº____/_____

The School's Environmental Committee of _____
_____
on the ___ days of _____, 20___, it met, at ___h___, in the room _____, under the chairmanship of the teacher _____ coordinator of the School's Environmental Committee. On the opportunity the committee was represented by the members: _____
_____
_____
_____
_____
_____
_____

With the following agenda:

-
-
-
-
-
-
-

Main decisions made:

-
-
-
-
-
-
-
-

As there was nothing further to discuss, the Coordinator closed the meeting and these minutes were drawn up, which, after being read and approved, will be signed by the coordinators of the School's Environmental Committee.

_____
Program Coordinator (student)
Email:
Phone number:

_____
Program Coordinator (teacher)
Email:
Phone number:

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