COOLSCHOOLS: Realizing potentials of nature-based climate shelters in school environments for urban transformation

"Nature-based climate shelters in Schools: Empowering Teachers for Sustainable Education" MOOC (2024)

Report

Disclaimer

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INTRODUCTION

The Massive Open Online Course (MOOC) "Nature-based climate shelters in Schools: Empowering Teachers for Sustainable Education", designed mainly for teachers in primary and secondary schools, focuses on the concepts "nature-based climate shelters in schools" (referred to as "NBCSS" in the MOOC[1]), and "urban nature-based solutions" (urban NBS).

With these two concepts at its base, the MOOC helps educators explore nature-based climate shelter interventions (NBCSIs) for turning their schools into nature-based climate shelters, while involving their students in the creation process. Towards this goal, the MOOC uses the design thinking approach, a creative and collaborative process for solving problems by understanding people's needs, producing and testing ideas and improving solutions through feedback. Structured around the stages of the design thinking approach, the MOOC offers concrete, real NBCSIs by presenting examples and resources of the four case studies cities of the COOLSCHOOLS project (Brussels, Rotterdam, Barcelona and Paris). By participating in this MOOC, teachers are given the tools to empower their students to take an active role in enhancing their environment, while developing 21st-century skills and increasing their environmental awareness.

The MOOC achieved notable success, drawing in 900 participants from 54 countries. Out of 900 participants, 441 were actively engaged and 205 completed the course, resulting in a high 46% completion rate[2] and 49% engagement rate[3]. Active participation led to a significant increase in knowledge about nature-based solutions (NBS) and related teaching methods, with 98% of survey participants expressing a positive attitude towards applying course ideas and examples in their teaching practices, as shown by post-surveys.

This document is the official report of the MOOC, providing data and insights on various aspects of the course. It outlines the parties involved in designing and implementing the MOOC, details the course structure and content, describes the dissemination and promotion strategy, and includes participant feedback to assess the course's effectiveness and overall success.

ORGANISERS

The COOLSCHOOLS project

COOLSCHOOLS is a transdisciplinary applied-research project running from March 2022 to February 2025, aimed at exploring the multiple co-benefits of implementing NBS, specifically nature-based climate shelters, in school environments. The project examines how these green spaces can serve as innovative strategies for urban climate adaptation, promoting health and well-being. COOLSCHOOLS emphasizes the transformative potential of NBCSIs at a broader urban scale by centering on the needs and perspectives of children and youth. The research investigates the impacts of nature-based climate shelters across various dimensions, including social justice, biodiversity conservation, public health, safety, inclusive governance, and quality education, extending from schools to metropolitan regions.

[1] See Annex 3 for the complete MOOC content.

[2] The course **completion rate** is calculated by dividing the total number of participants who completed at least one section of the MOOC) by the total number of participants that completed the course.

[3] The course **engagement rate** is calculated by dividing the number of participants who completed at least one section of the course by the total number of people who registered to the course.

COOLSCHOOLS produces new evidence and share tools to enhance the capacity for nature-based climate shelters and promotes inclusive transformations among local school communities, urban planners, policymakers, researchers, and the public. This initiative builds upon the experiences of four pioneering European projects in implementing NBS for climate adaptation in school environments:

- Brussels Ose le vert (2016-2023), Opération Ré-création (2021-2024) which also serves as an Urban Living Lab (ULL), where experimental co-creation processes and participatory methods are tested.
- Barcelona Climate Shelters in schools (2018-2021), Transformem els patis (2021-onwards)
- Paris Oasis (2018-onwards)
- Rotterdam Groenblauwe schoolpleinen (2019-onwards)

Nature-based solutions (NBS)

Table 1. Nature-based solutions (NBS) definition (European Commission)

Aligned with the European Commission's definition[4], COOLSCHOOLS sees NBS as…

"Solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social, and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes, and seascapes, through locally adapted, resource-efficient, and systemic interventions. Nature-based solutions must therefore benefit biodiversity and support the delivery of a range of ecosystem services", (European Commission, 2022).

Nature-based climate shelters in schools

Table 2. Nature-based climate shelters definition

Nature-based climate shelters in schools are green spaces designed mainly within schoolyards, but also the wider school environment, to serve multiple purposes. These areas provide students and the school community with a refuge from the impacts of climate change and mitigate various urban environmental challenges. By incorporating natural elements, these shelters create a healthier daily environment for students and offer an enhanced learning space, where they can develop cognitive skills and knowledge about sustainability. Each school can decide when to open these spaces to the community, but their importance, especially during heatwaves, is significant.

Beyond the climate adaptation benefits, nature-based climate shelters also offer a range of advantages that extend to the wider community. A study by Baró et al. (2022)[5] highlights the diverse roles of the nature-based climate shelters and NBS. The study also refers to the co-designing processes of creating such nature-based climate shelters, the challenges of implementing them effectively, as well as the potential of upscaling such solutions to a municipal level, benefitting in this way the broader community's efforts for urban resilience.

[4] Definition available at: https://research-and-innovation.ec.europa.eu/research-area/environment/nature-based-solutions_en

[5] Baró, F., Camacho, D. A., Perez del Pulgar, C., Ruiz-Mallén, I., & García-Serrano, P. (2022). Nature-based climate solutions in European schools: a pioneering co-designed strategy towards urban resilience. In *Urban Resilience to the Climate Emergency: Unravelling the transformative potential of institutional and grassroots initiatives* (pp. 125-146). Cham: Springer International Publishing.

Finally, these shelters support the climate adaptation and educational objectives of the European Union and the United Nations by utilizing NBS. NBS leverage natural ecosystem services and green infrastructures to improve sustainability and the living conditions in urban settings. The benefits of nature-based climate shelters are extensive: they foster a healthier environment, enhance learning experiences, create inclusive social spaces, support biodiversity, strengthen climate resilience, and provide educational opportunities to understand and promote a sustainable future.

The European Schoolnet Academy

European Schoolnet Academy (EUN Academy) was launched in 2014 in response to the need to scale up professional development opportunities for teachers, to help them with the growing number of challenges they face in the classroom. EUN Academy therefore primarily offers massive open online courses (MOOCs), which are entirely free of charge and open for anyone to join, with no limit to the number of participants. This focus on openness, and the pedagogical approach that goes alongside it, is based on three premises:

- The need to cost-effectively scale professional development offers to larger numbers of teachers, to give more teachers the opportunity to access and benefit from these.
- The conviction that teachers need to be self-reflective practitioners, willing to interact with peers and with a high level of self-efficacy.
- The fact that successful professional development encourages the development of learning communities, where teachers share their expertise, according to research results.

EUN Academy's courses target teachers and other education professionals, such as Head teachers, ICT coordinators, or school counsellors. The potential outreach of a course depends on the design of the course activities, the target audience, as well as on the dissemination strategies utilized. A typical course on the Academy platform attracts between 300 and 2,000 teachers, depending on the topic and target group.

Participant engagement in EUN Academy courses reaches far beyond the participants of the courses, as a significant degree of activity generated on the courses happens via a range of social media channels. EUN Academy on Facebook can reach up to 2,000 or more impressions per post. Dissemination of course activity by European Schoolnet's Ministries of Education has a significant reach into the national education communities.

The MOOCs offered through the EUN Academy run for a limited time, are tutored and upon successful completion of a course, participants receive digital badges and digital certificates. The MOOCs follow a connectivity and collaborative approach, and include peer assessment between teachers. In 2023, EUN Academy achieved an average course engagement rate of 68%, and a course completion rate of 43% across 10 MOOCs.

THE MOOC

Course Structure

The MOOC "Nature-based Climate Shelters in Schools: Empowering Teachers for Sustainable Education" (2024) was run by the COOLSCHOOLS project and supported by Scientix ®. The course helped primary and secondary school teachers transform their schools into climate shelters using nature-based solutions. It employed a design thinking approach and provided practical examples from the four case studies cities of COOLSCHOOLS, enabling teachers to involve students in environmental projects and to develop 21st-century skills.

The course was officially launched on the 1st April 2024 and lasted until the 8th May 2024. It comprised four modules and ran for 5.5 weeks, with modules opening one by one every week, followed by a 1.5-week grace period. The estimated total time to complete the course was 25 hours. While MOOCs are by definition open for the public at all times, and therefore participants can enrol freely and complete them at their own pace, the course granted a certificate of completion only to the participants who enrolled and managed to complete all the expected assignments within the timeframe when the MOOC was still active (1st April – 8th May 2024). Participants also benefited from two live events, which were considered part of the MOOC: a closed TeachMeet available only to the MOOC's participants, and an open online webinar.

The course is available on the European Schoolnet Academy catalogue. To take part in the course, participants need to create an account (if they do not have one already), and register for the course.

The learning objectives encompass: gaining knowledge of the concepts of nature-based climate shelters, urban NBS and NBCSIs; learning to design greening activities within the school environment; discovering innovative ways of engaging students in NBCSIs by following the design thinking approach; exploring and benefiting from the knowledge, tools and resources of the four case studies cities of the COOLSCHOOLS project; and engaging in collaborative learning experiences with peers to co-develop a Nature-based Climate Shelter in Schools Action Plan (Annex 2).

The MOOC's modules were structured as follows:

- Module 1: Understanding Nature-based Climate Shelters in Schools opens on 01/04/2024
- Module 2: Empathize and Ideate opens on 08/04/2024
- Module 3: Experiment and Evolve opens on 15/04/2024
- Module 4: Deploy, Review and Assess opens on 22/04/2024

In addition to not setting any discriminatory criteria to enroll, and being freely available to all, the MOOC is predominantly valuable for teachers in primary and secondary schools wishing to explore NBS, sustainability education and NBCSIs with their students. Other educational professionals and stakeholders, such as Heads of schools, school support staff, and policy makers with an interest in the topic, were also welcome to join. As the course is offered in English, participants needed to be able to understand education-specific oral and written communication and be confident in expressing themselves and interacting in written English.

Teachers who completed the course live (between 1st April – 8th May) could obtain a certificate of participation. To receive it, they needed to submit their "Nature-based Climate Shelter in Schools Action Plan", as well as review three action plans of other participants. The final deadline to complete all activities was set to the 8th of May 2024, 23:59 CEST. The participation in the in-module activities amounted to 5% of the final grade, whereas the "Nature-based Climate Shelter in Schools Action Plan", together with the peer reviews, counted for 95% of the final grade. The overall passing grade was 95%.

Live events

The first live event, organised by the MOOC, was the webinar "Nature-Based Climate Shelters in Schools: Insights from Research and Practice for the Benefits of Students and the General Public"[6]. The webinar was available to everyone who registered - both the MOOC participants and the public. It focused on an overview of the research results on the need for quality environmental education and the role of nature-based climate shelters in it, as well as on the relevant benefits. Speakers at this online gathering included some of COOLSCHOOLS' Consortium members. The event took place on 11th April 2024, at 17:00-18:00 CEST and was attended by 58 people. The webinar addressed topics, such as: short and long-Term Pedagogical Benefits of Nature-based Climate Shelters in Schools; challenges at stake regarding NBCSIs; the COOLSCHOOLS Guidelines: How to turn your schoolyard into a nature-based climate shelter[7] and the steps schools can follow when employing NBCSIs; state-of-the-art information on the research on schoolyard transformations and school governance; existing inequalities between schools/ schoolchildren.

Figure 1. Webinar session "COOLSCHOOLS MOOC Webinar: Nature-based climate shelters in schools"

The "Nature-based Climate Shelters in Schools: Empowering Teachers for Sustainable Education MOOC" TeachMeet (Figure 2), was the second event, organised during the MOOC. The event took place on 24th of April, at 17:00 – 18:00 CEST, and was exclusive to the participants of the MOOC. During this online event, five teachers displayed learning initiatives and green practices and/or other transformation attempts they have undertaken in their school environments, in order to turn them to a nature-based climate shelter. The online event counted around 30 participants from various countries.

[6] MOOC Webinar available at: https://www.youtube.com/watch?v=JPZ3e297Tqg

[7] The Guidelines are available at: https://coolschools.eu/the-coolschools-guidelines-for-schools-how-to-turn-your-schoolyard-into-a-nature-based-climate-shelter/

Figure 2. TeachMeet session "Nature-Based Climate Shelters in Schools"

The speakers of the TeachMeet came from Greece (3), Republic of Maldives (1) and Slovakia (1) and covered several levels of education; two of the speakers work in an Early Childhood Education and Care setting, two - in a secondary school, and one - in a primary school.

DISSEMINATION AND COMMUNICATION

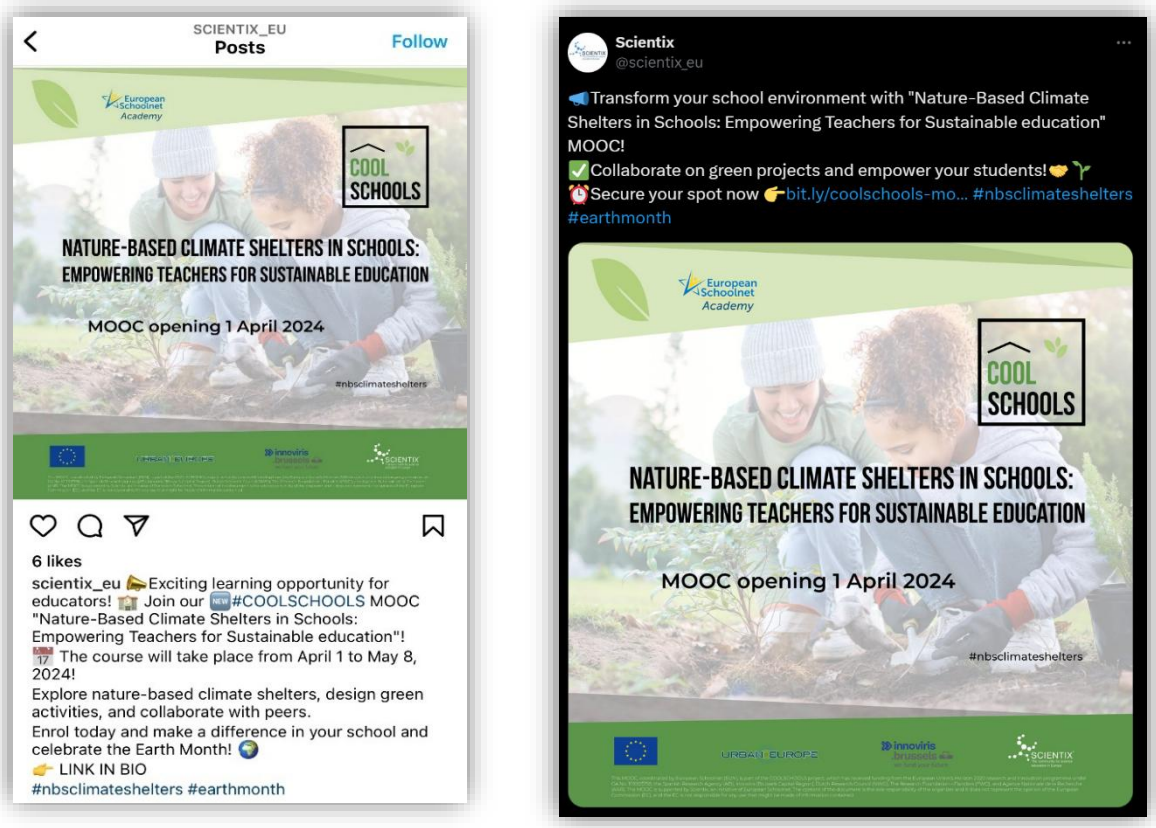
Dissemination activities and promotional package

The MOOC was disseminated in several ways, designed and carried out through the Promotional Package, created as part of Work Package 6 "Educational Transformations", T6.2: Massive-open online course (MOOC) on using NBCSIs in schools for educational purposes.

Figure 3. MOOC visual identity

The strategy to disseminate the MOOC was based on different elements, such as: social media messages, including information and instructions to register; visuals; a newsletter item; a one-pager information sheet, and a promotional video (see Annex 1). Social media messages were crafted for the MOOC to be disseminated on X (Twitter), Instagram, and Facebook, where a group for teachers interested or participating in the MOOC was also created[8]. The group now counts 179 members[9]. Below are some examples of social media messages included in the Promotional Pack:

Figure 4. MOOC promotional messages on Instagram (right) and X/Twitter (left)



The period of promotion was from the 15th February 2024 to the 1st of April 2024, with **#nbsclimateshelters** being the main hashtag used to accompany any promotional activity related to the course. Table 3 below summarises the key information for the promotion and dissemination of the MOOC.

The MOOC was also disseminated on the COOLSCHOOLS website[10], COOLSCHOOLS' social media via X/Twitter[11], as well as at the local level among the COOLSCHOOLS partner'[12] network of schools.

[8] Access the group's page on Facebook here: https://www.facebook.com/share/oNwZWXjdRSjRZSLZ/?mibextid=K35XfP

[9] Last counted on July, 4th 2024.

[10] COOLSCHOOLS website available here: https://coolschools.eu/

[11] COOLSCHOOLS X/Twitter page available here: https://x.com/P_Coolschools

[12] List of COOLSCHOOLS' Consortium members available here: https://coolschools.eu/our-team/

Table 3. Key information on MOOC promotion and dissemination

Promotion and dissemination data summary	
Promotion dates	15 February 2024 – 1 April 2024
Course hashtag	#nbsclimateshelters
Short URL	bit.ly/coolschools-mooc
Promo pack URL	https://www.scientix.eu/live/moocs/coolschools-mooc
Promo video URL	https://youtu.be/x5ObqkJgZSI
Project handle/hashtag	#coolschools

Promotion

The MOOC ran during the STEM Discovery Campaign 2024 (SDC24) co-organised by Scientix and the Life Tera project, which contributed to increase its reach and visibility among educators in Europe and beyond, as the Campaign engaged over **100,000 teachers** and more than **500,000 students**, while a total of over **700,000 individuals** actively took part in the Campaign (Figure 5 below). The SDC24 encouraged teachers to showcase their STEM- and sustainability-related activities by pinning them on an interactive map, as well as to take part in various initiatives to enable knowledge exchange based on their good practices in teaching and learning. Participation in the MOOC was eligible as an activity to pin on the map of the SDC24.

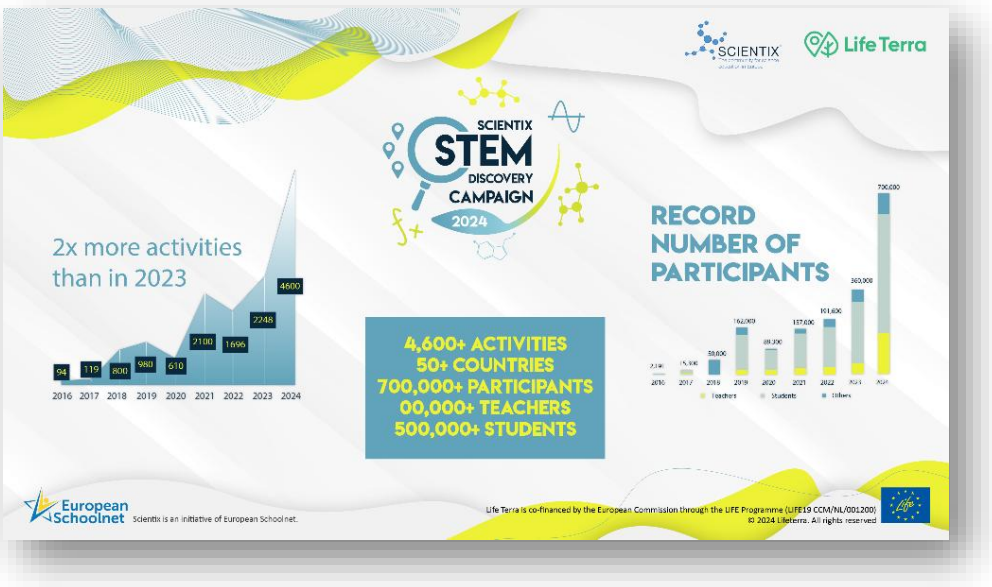


Figure 5. STEM Discovery Campaign 2024 reach

OUTCOMES AND COURSE IMPRESSIONS

Overview and key findings

Overall, the MOOC proved to be very successful, as key numbers indicate. The course has indeed drawn significant attention, with 900 individuals from 54 countries registering for participation. Among them, 441 actively engaged in the course, extending its impact to over 5,290 students indirectly. Notably, 205 participants successfully completed the MOOC, showcasing a noteworthy 46% completion rate, while the robust 49% engagement rate underscores the course's effectiveness in sustaining learner involvement[13].

As for the geographical outreach of the course, Figure 6 below provides a map with a breakdown of participation from European Schoolnet member countries[14]. For more information about the top ten countries of participants in the MOOC, check Table 4 below.

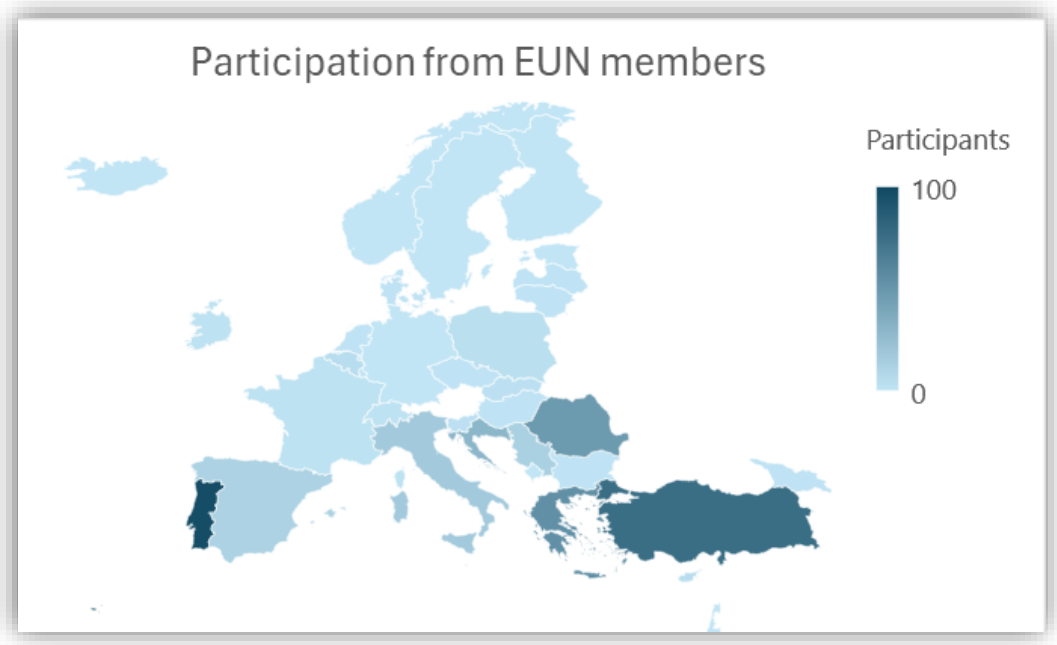


Figure 6. MOOC participation by EUN members

[13] The participant is counted as a **completer** if the participant has explored all the sections of the MOOC and did all the activities. A person is counted as a participant if the person has completed at least one unit of the course (in any module). The course **engagement rate** is calculated by dividing the number of participants who completed at least one section of the course by the total number of people who registered to the course. The course **completion rate** is calculated by dividing the total number of participants who completed at least one section of the MOOC) by the total number of participants that completed the course.

[14] List available at: http://www.eun.org/about/members

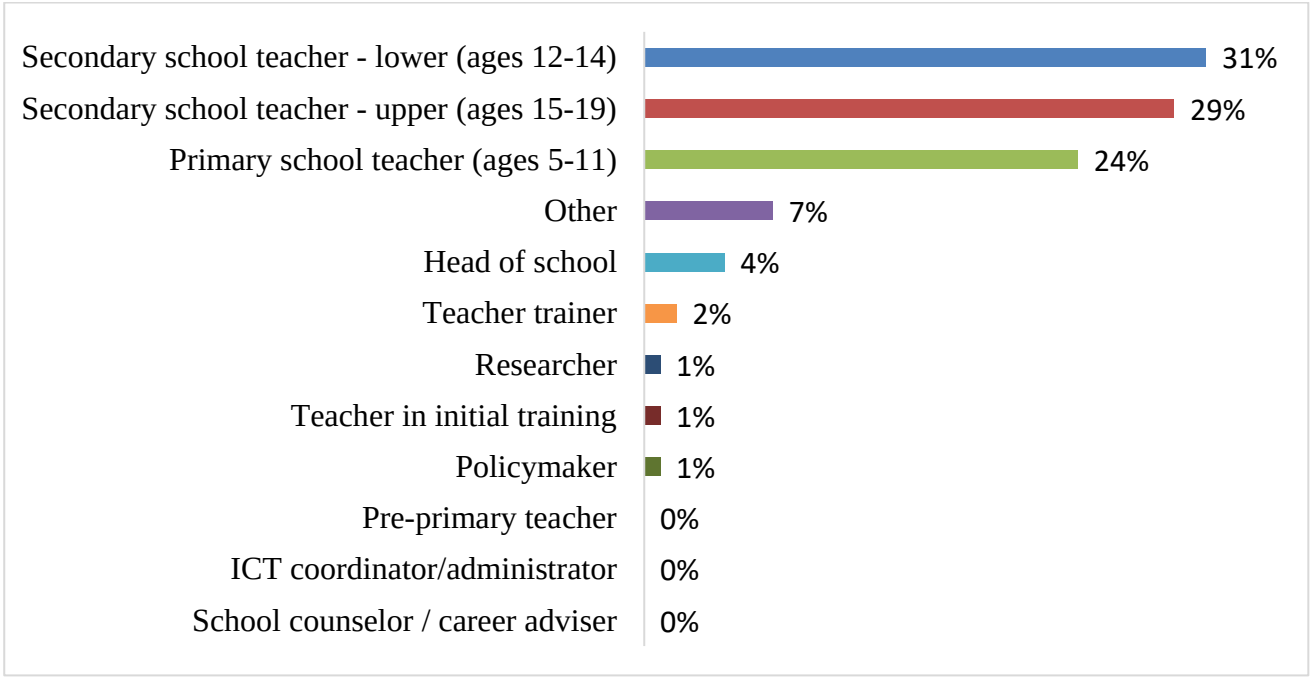
Table 4. Top ten countries, where MOOC participants and completers were located

Top 10 countries by number of people who:			
1) Participated in the MOOC		**2) Completed the MOOC**	
Portugal	97	Portugal	51
Turkey	76	Turkey	32
Greece	54	Greece	30
Romania	48	Romania	23
Croatia	30	Croatia	18
Italy	17	Italy	7
Serbia	13	Serbia	5
Spain	12	Spain	5
N. Macedonia	9	N. Macedonia	5
Albania	6	Albania	3

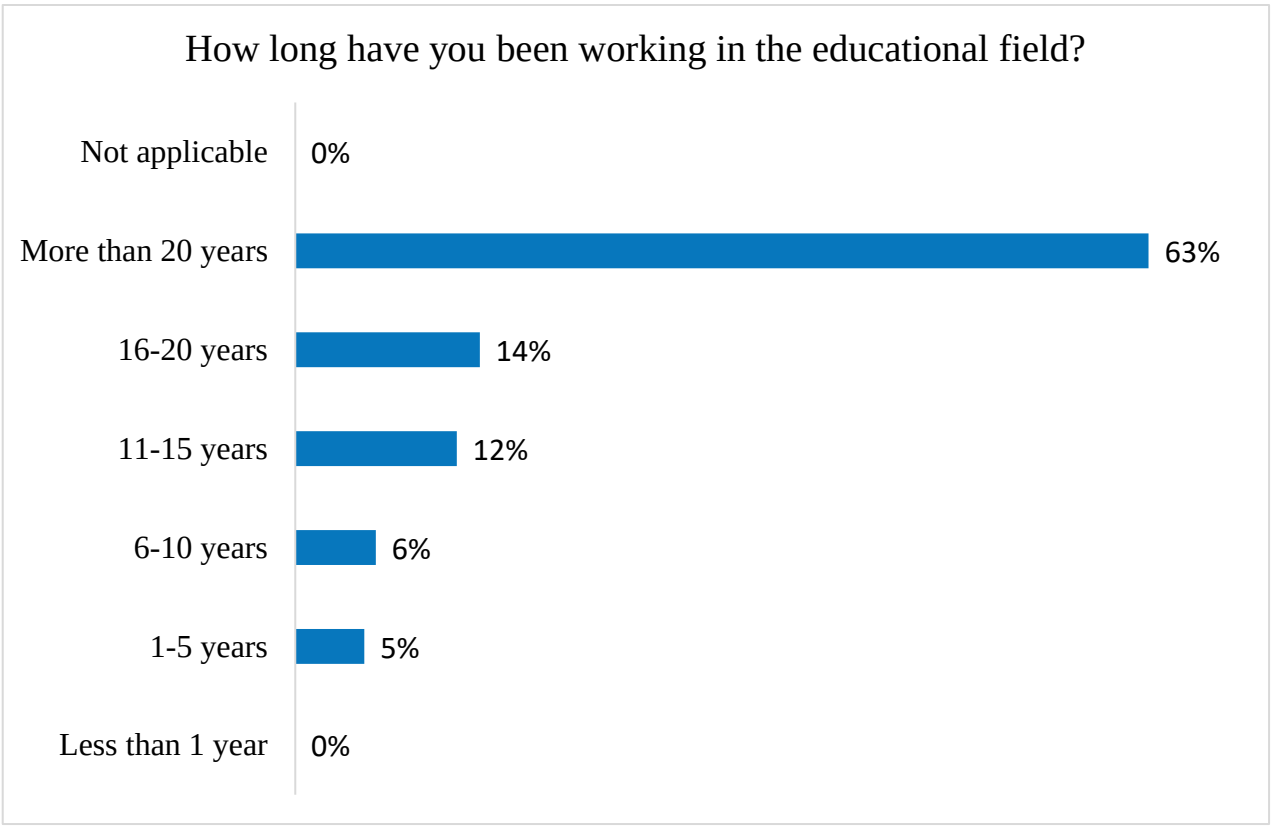
Profile of participants

Participants' course satisfaction was measured through pre- and post-participation surveys, with 122 participants responding to the former, and 101 – to the latter. Participants' profiles indicate that the main audience of the MOOC comprises teachers mainly in secondary schools and primary schools, wishing to explore ways to turn their school environments into nature-based climate shelters, as well as urban NBS. The majority of participants are lower- (31%) or upper secondary school teachers (29%), female (84%), and 36 years of age or older. Most of the participants (63%) have been working in the education field for more than 20 years.

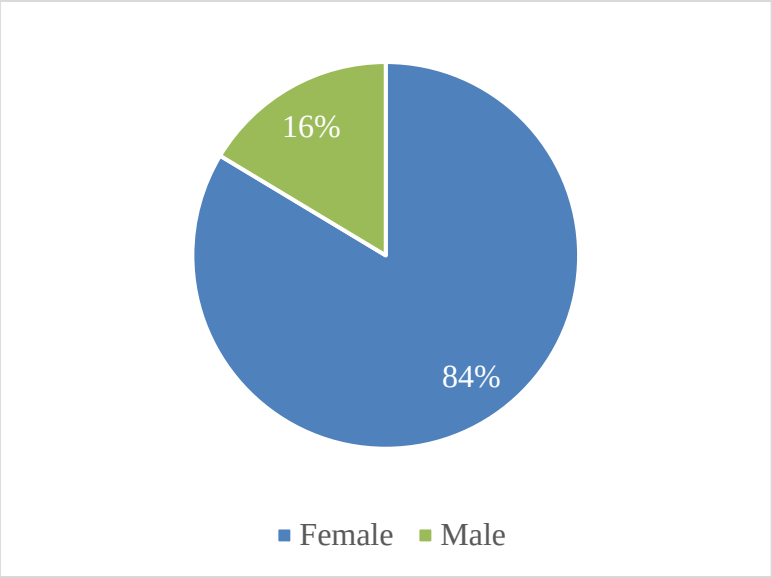
Graph 1. Participants' occupation



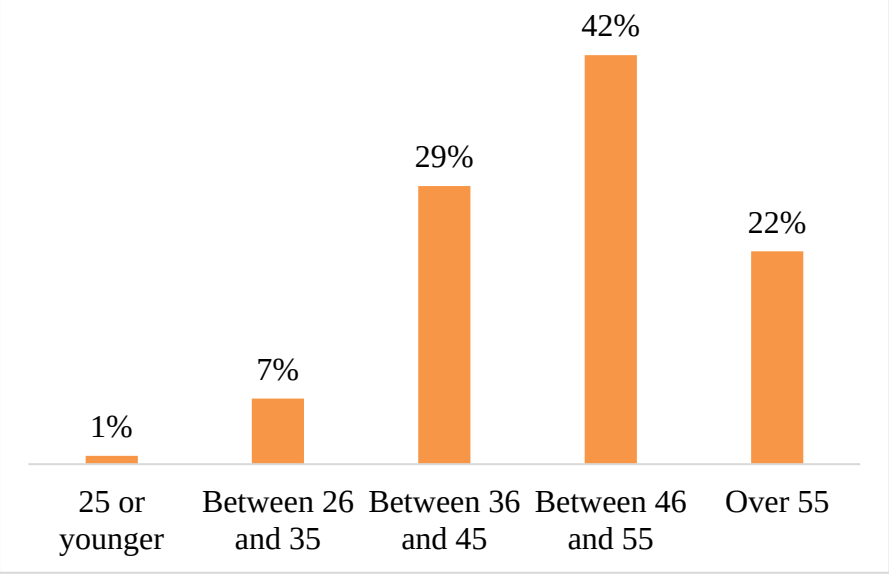
Graph 2. Participants' professional experience (in years)



Graph 3. Participants' gender



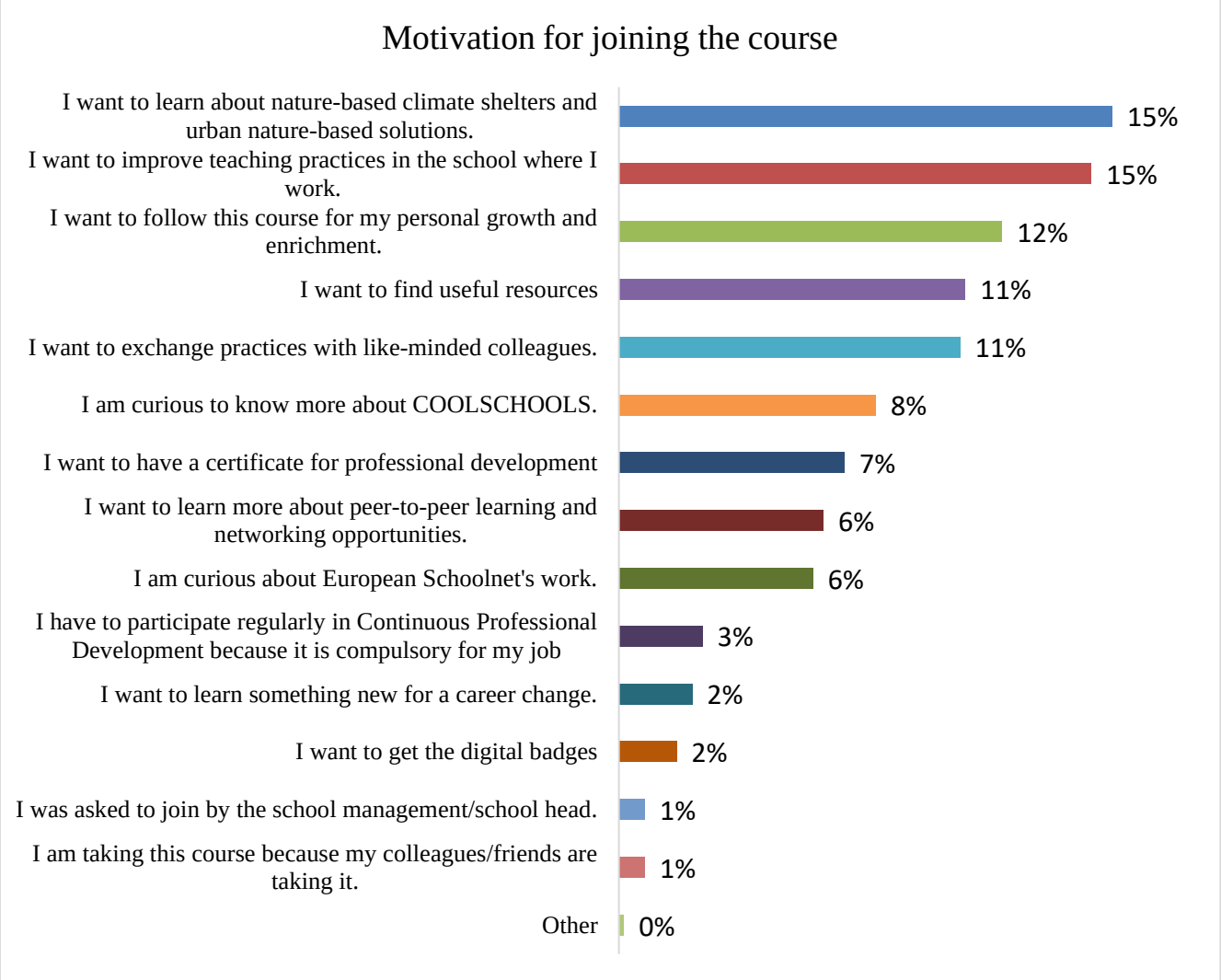
Graph 4. Participants' age



Among the main reasons why participants felt motivated to join the course, one compelling reason is the desire to learn more about nature-based climate shelters and urban NBS (15%). With an increasing emphasis on NBS and sustainable education, teachers and educators seek to explore innovative approaches that will allow them to improve the teaching and learning practices where they work (15%). Beyond professional development, participants enrolled for personal growth, viewing the course as an opportunity to expand their knowledge and broaden their perspectives (12%). They also saw their participation as a way to equip their own practices with

useful resources (11%). Finally, another significant motivation for joining the course was participants' desire to feel part of a community, where educators can share insights, experiences and collaborative ideas.

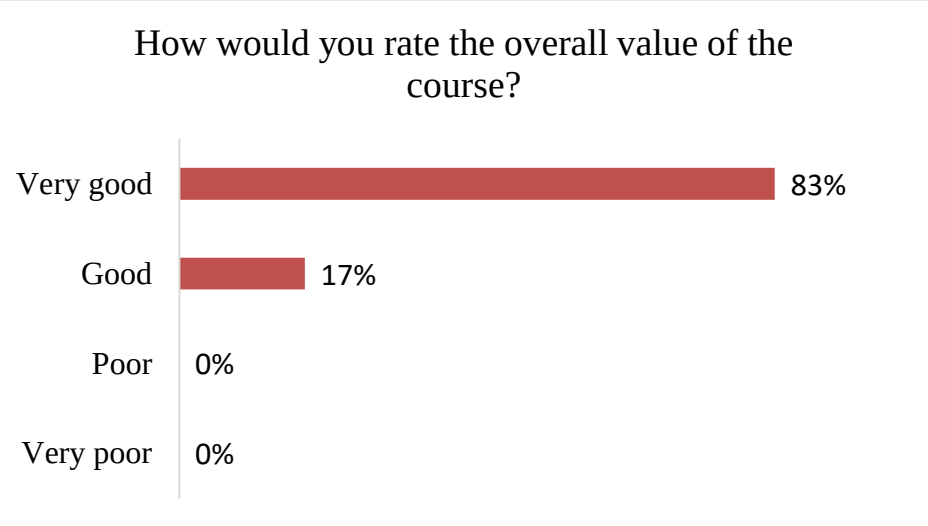
Graph 5. Participants' motivation for joining the course



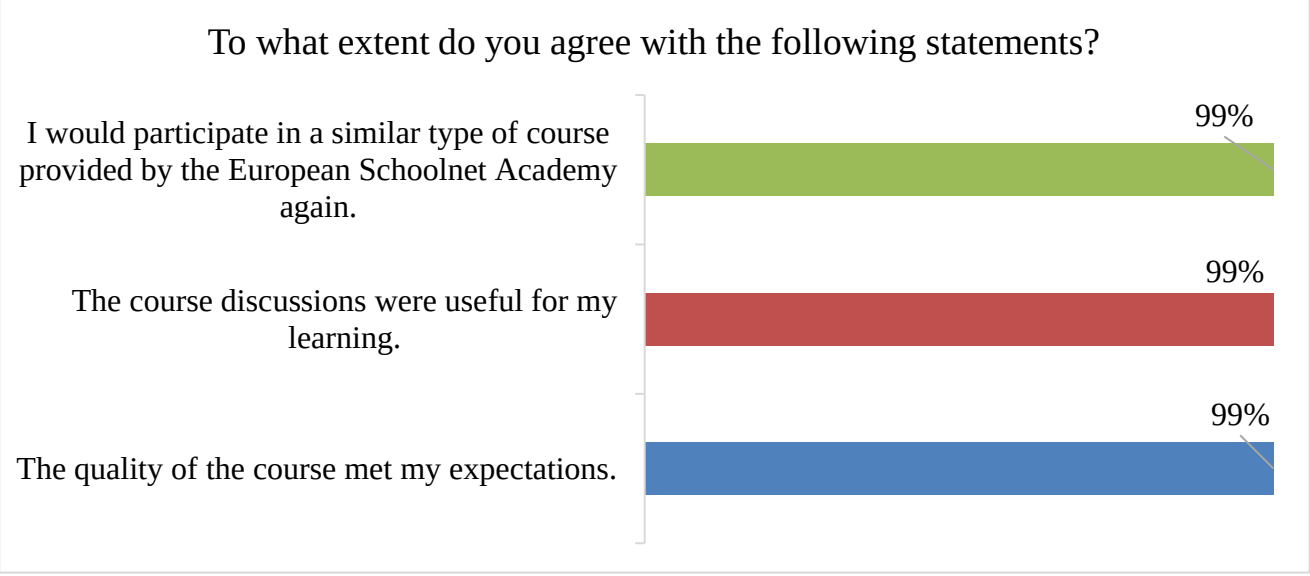
Course impressions

Post-participation survey respondents seemed to indeed enjoy the MOOC, with 83% of them expressing their opinion on the overall value of the course as "Very Good" and 17% of them "Very good". Moreover, 99% of the respondents claimed that the course met their expectations and that it was considered significantly useful. Finally, 99% of the respondents expressed that they would participate in a similar type of course again.

Graph 6. Course impressions (value)



Graph 7. Course impressions (quality)



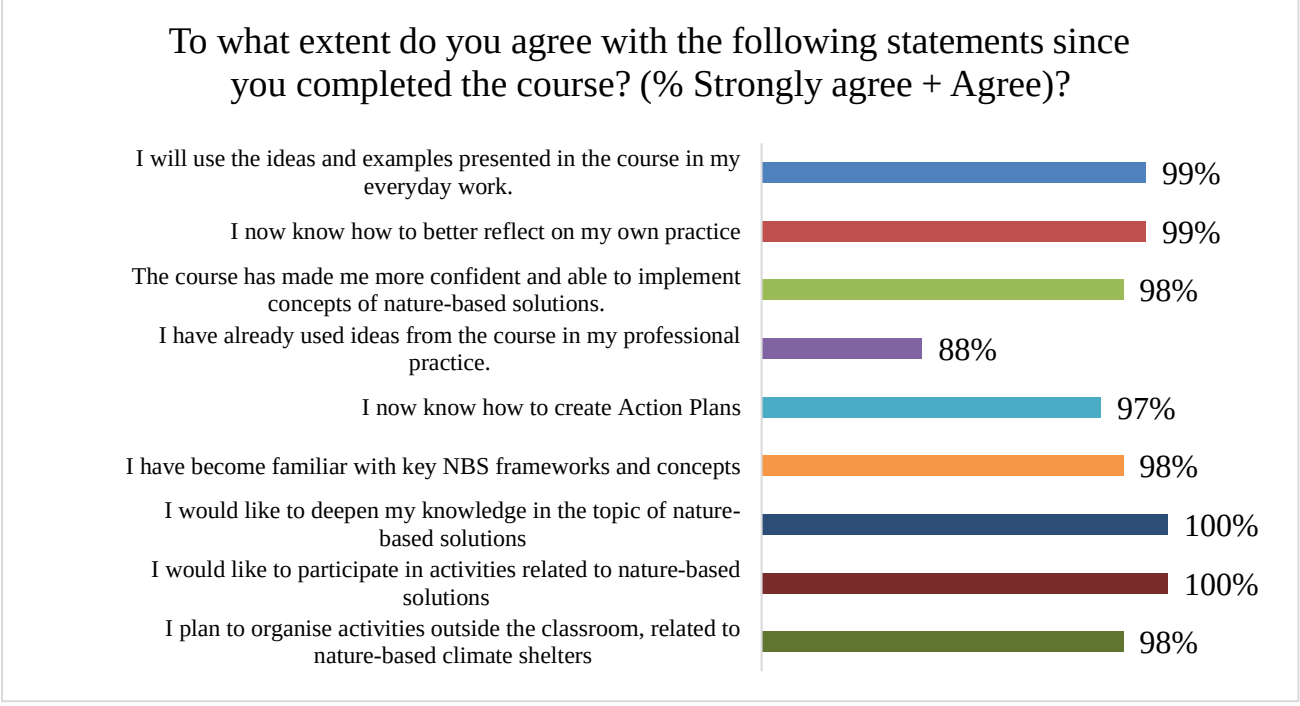
Overall, participants' self-evaluated competence related to the topic has improved during the course, as the next section on the results of pre- and post- surveys illustrates.

Survey results

Based on the answers provided by respondents to pre- and post-participation surveys, knowledge about the topic of nature-based climate shelters and urban NBS, as well as their related pedagogies increased significantly after actively participating in and completing the MOOC. After the course, most respondents to the post-participation survey stated that they had gained good knowledge of the topic and felt ready to implement it in their classroom (99%) and a slightly smaller portion expressed having gained confidence regarding the matter (98%).

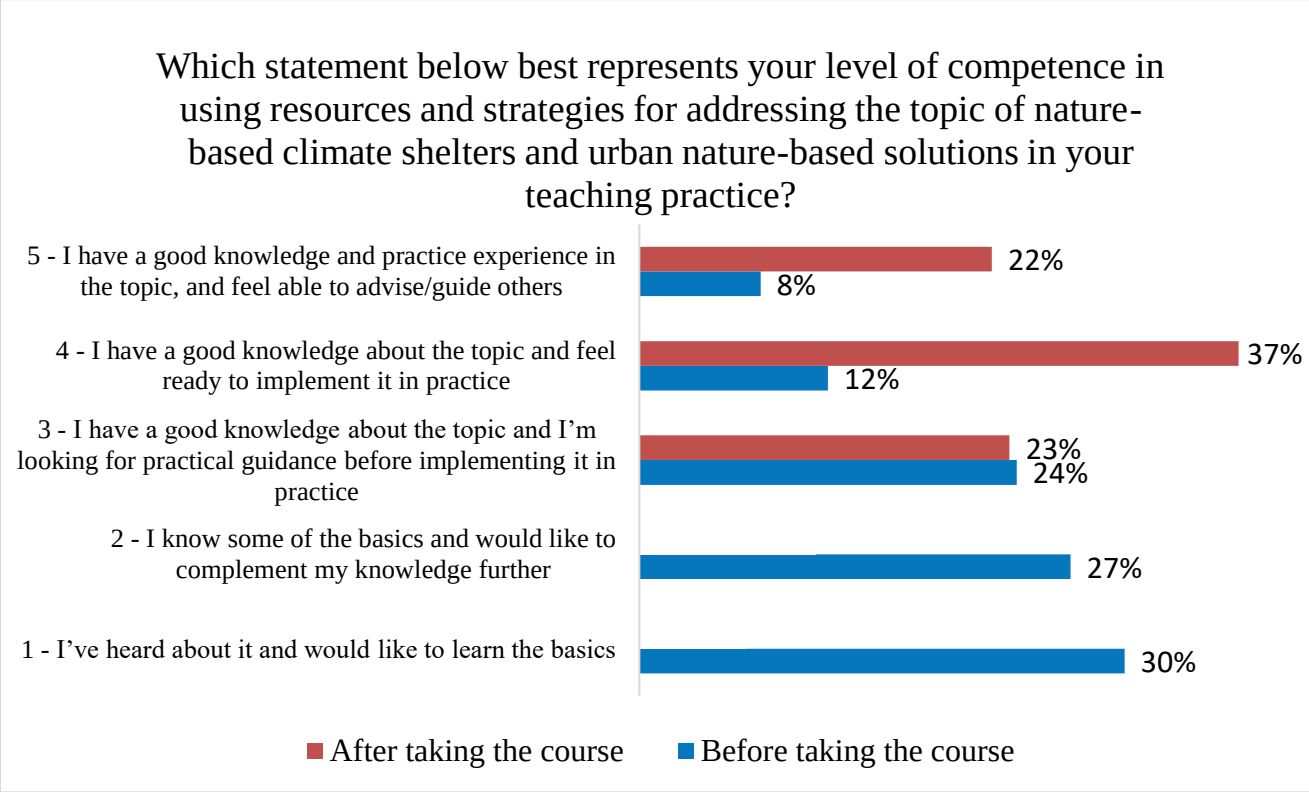
Concerning the Action Plans that were used in the course, respondents expressed a highly positive attitude, with 97% of them stating that they now know how to create them. Graph 8. outlines in more detail the main outcomes of the course, according to participants' responses.

Graph 8. Extract from the post-MOOC survey completed by participants



Moreover, the comparison between data from pre- and post- surveys shows that the number of people feeling confident and able to give advice to others on the MOOC's topic increased considerably (from 8% to 22%), while the percentage of those feeling confident in implementing it into their teaching practice increased notably (from 12% to 37%). Graph 9 offers more information regarding the change in participants' self-evaluation related to the course topic based on pre-to-post-participation surveys.

Graph 9. Comparison of participants' pre- and post-participation surveys' data



Participants' feedback

Based on the feedback received by participants, they seemed to have appreciated the quick and helpful support they received whenever they asked for help during the course. This, in combination with the positive learning experiences they acquired, made them feel more knowledgeable about topics related to nature-based climate shelters and urban NBS. This made them feel more confident and ready to turn this knowledge into action. They found that the MOOC provided many useful tools to help students work towards a greener and better world. The resources were very suitable and inspiring, making them feel more confident and motivated to take action. Participants also acknowledged the real-world applicability of the content, expressing gratitude for the rich array of resources provided by the course to apply in future work.

The feedback also reflected a desire for more opportunities to share experiences and insights among the participants. It was also suggested that incorporating more teachers' perspectives on their transformative efforts, and their stories and reflections when turning their schoolyards into nature-based climate shelters, would foster a stronger sense of community among teachers. In summary, the feedback reflected a positive and enriching experience, with participants expressing gratitude for the valuable insights gained.

CONCLUSIONS

The "Nature-based Climate Shelters in Schools: Empowering Teachers for Sustainable Education" MOOC (2024) offered an enriching learning experience designed for teachers in primary and secondary education worldwide, as well as other educational stakeholders interested in the topic. This course highlights the benefits of transforming schools into nature-based climate shelters, as well as the potential of urban NBS. Through the MOOC, participants had access to a diverse range of resources, promoting collaborative discussions on best practices and pedagogies, and opportunities to participate in live events that enhance their learning journey. They also gained first-hand experience with the design thinking approach, leading the creation of an Action Plan to guide their own school(yard) transformation efforts. Through the design thinking approach and the MOOC's activities and content, participants had the chance to focus and get inspired by their peers, to facilitate collaboration amongst one another, and the inclusion of students in the process of transforming schools into nature-based climate shelters. The course content is archived on the EUN Academy platform for continued exploration, serving as a valuable resource for those interested in pursuing similar endeavors.

ANNEXES

Annex 1. MOOC promotional materials used in the dissemination campaign

Visuals for social media

Figure 7. Promotional visual for Facebook and Twitter/X social media posts

Figure 8. Promotional visual for Instagram social media posts

Newsletter item

Join the "Nature-Based Climate Shelters in Schools" MOOC, starting 1 April 2024, to learn how to implement nature-based climate shelter interventions in your school using the design-thinking approach. This online course, part of the COOLSCHOOLS project, is tailored for educators interested in using student-centred learning experiences for preparing students for mitigating the effects of climate change. Through four modules, you will explore the nature-based climate shelter interventions and urban nature-based solutions concepts, while developing and peer-reviewing innovative action plans for school environments. Don't miss out, register now and empower yourself for sustainable education.

Promotional video

MOOC promotional video available at: https://youtu.be/x5ObqkJgZSI

One-pager

MOOC promotional one-pager available at: https://www.scientix.eu/live/moocs/coolschools-mooc

Annex 2. Action Plan Template

The following section includes the Action Plan template that was used in the MOOC.

NATURE-BASED CLIMATE SHELTERS IN SCHOOLS

Action Plan

All fields in this template are mandatory for submitting your Action Plan to the ***MOOC "Nature-based Climate Shelters in Schools: Empowering Teachers for Sustainable Education***", organized by the COOLSCHOOLS project. In case a field is not relevant to your Action Plan, please write N/A. Your Action Plan and any materials/resources included in it, should be in **English**.

Title of the Action

Author(s):

Abstract:

Add a paragraph here summarizing the Action Plan and the action it is addressing. This text will be used to introduce your Natre-Based Climate Shelters in Schools Action Plan when it is published online, so please try to be as clear and concise as possible, e.g., what is your Action Plan about, what the goal of the action is, and how you are going to achieve it.

Keywords:

Add here 5 keywords that you think best describe your Action Plan. Other teachers will find your Action Plan based on these keywords, so please try to be as accurate as possible.

Introduction (leave this section as it is)

This Action Plan is supported by the MOOC "Nature-Based Climate Shelters in Schools: Empowering Teachers for Sustainable Education," organised by the COOLSCHOOLS project with the support of Scientix, which encourages the greening activities of schoolyards using urban nature-based solutions (urban NBS) and nature-based climate shelters in schools (NBCSS). The MOOC trains teachers in implementing green schoolyard transformations using urban NBS through student-centered and "design thinking" approaches, supported by NBS case studies, relevant frameworks, and a tailor-made Nature-Based Climate Shelter Action Plan template.

COOLSCHOOLS' practices and results aim to generate opportunities for city uptake of the nature-based climate shelters approach by other schools, neighbourhoods and cities.

Source: https ://coolschools.eu/the-project and https://www.scientix.eu/live/moocs/climate-shelters-for-schools

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Part I: Overview of Planning (Key Steps)

Key Step	Details
Step 1. Linking the action to the school context	*Describe your school environment in 1 paragraph. Include school's geographic location (urban, rural area, country/city, etc.), type of school (vocational, technical, etc.), education level ((pre-)primary school, secondary school, etc.) and any additional information that could help understand why this Action Plan and the proposed action are important to your school.*
⇒ **Age of students**	*Specify the age of the students to be involved in the implementation process.*
Step 2. Setting the Strategic Goals of the action	*List here at least two strategic goals for your action.* *Strategic goals should be specific, ambitious but attainable, as well as measurable and providing a timeframe for the completion. Write your goals according to the SMART principle, i.e., Specific, Measurable, Achievable, Relevant and Time-bound. If the actions for achieving an objective are unclear or if the objective requires too many actions, you should break down the objective into more manageable, attainable elements.* *For example: 'By the end of May 2024, we will have performed needs assessment research and clearly defined the sustainability issues in school.'*
Step 3. Setting the Timeline	*Specify the main steps of the implementation of the action, and when they would take place.*
Step 4. Deciding on the Key Stakeholders	*Name all stakeholders you plan to involve in the nature-based climate shelter interventions (NBCSIs) and school greening activities, e.g., students, parents, school administration, architects, other experts, etc.*

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Key Step	Details
Step 5. Figuring out the scope of the action ***Overall aim: creating a nature-based climate shelter or an urban NBS***	*Explain here the subject/key topic of your action.* *Note that the overall aim is to create a nature-based climate shelter (NBCSS) or an urban nature-based solution integrating subjects from across the curriculum, e.g., biology, chemistry, geography, mathematics, literature, history, language, or any other subjects. Demonstrate how you can make your school green through any school subject.*
⇒ **Connecting the action to GreenComp Competences**	*Indicate below which of the 12 GreenComp competences your action addresses (for more information, refer to pages 12-15 here):* **Area: Embodying sustainability values** ☐ Valuing sustainability ☐ Supporting fairness ☐ Promoting nature **Area: Embracing complexity in sustainability** ☐ Systems thinking ☐ Critical thinking ☐ Problem framing **Area: Envisioning sustainable futures** ☐ Futures literacy ☐ Adaptability ☐ Exploratory thinking **Area: Acting for sustainability** ☐ Political agency ☐ Collective agency ☐ Individual agency
⇒ **Addressing key NBS societal challenge**	*Indicate below which of the twelve NBS societal challenge*

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Key Step	Details
area(s)	*areas your action addresses:* ☐ Air quality ☐ Biodiversity enhancement ☐ Climate resilience ☐ Green space management ☐ Health and well-being ☐ Knowledge building for sustainable urban transformation ☐ Land regeneration ☐ Natural and climate hazards ☐ New economic opportunities and green jobs ☐ Participatory planning and governance ☐ Social justice and social cohesion ☐ Water management
⇒ **Connecting to the STEM Strategy Criteria**	*Indicate below min. one of the 21 STEM School Strategy Criteria that your action plan addresses, to ensure interdisciplinarity. To know more about the STEM Strategy Criteria, see here.* ***Key Element: Instruction*** ☐ Personalization of learning ☐ Problem and project-based learning (PBL) ☐ Inquiry-Based Science Education (IBSE) ***Key Element: Curriculum Implementation*** ☐ Emphasis on STEM topics and competencies ☐ Interdisciplinary instruction ☐ Contextualization of STEM teaching ***Key Element: Assessment*** ☐ Continuous assessment

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Key Step	Details
	☐ Personalized assessment ***Key Element: Professionalisation of Staff*** ☐ Highly qualified professionals ☐ Existence of supporting (pedagogical) staff ☐ Professional development ***Key Element: School Leadership and Culture*** ☐ School leadership ☐ High level of cooperation among staff ☐ Inclusive culture ***Key Element: Connections*** ☐ With industry ☐ With parents/guardians ☐ With other schools and/or educational platforms ☐ With universities and/or research centres ☐ With local communities ***Key Element: School Infrastructure*** ☐ Access to technology and equipment ☐ High quality instruction classroom materials
⇒ **Connecting to 21st Century Skills**	*When creating an action on nature-based climate shelters / urban nature-based solutions, students are improving their skills and learning about future careers. Creating such actions and incorporating different subjects into them is one way to gain knowledge of how interrelated actions, subjects, projects, people, and the world, are.* *Add here how the action corresponds to 21st century skills. To find out more: http://www.p21.org/our-work/p21-framework*
Step 6. Implementation with students	*More details on the (planned) implementation of your action with students should be provided in Part II of the Action Plan (next section).*

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Key Step	Details
⇒ **Online material(s) to be used**	*List here **all** links to online tools, applications and support documents that you will use in the process of the nature-based climate shelter intervention (NBCSI) and greening activities of your school.*
⇒ **Offline material(s) to be used**	*List here **all** offline (physical) tools/materials you will use in the process.*

Part II: Overview of Action with student participation

Describe here in detail all actions that will be taken in the implementation of the nature-based climate shelter intervention (NBCSI) and/or greening activities process. Remember that your action plan and proposed action need to involve students and should involve creating a NBCSI and/or an urban nature-based solution. If you are using any external documents, please go to the end of this template and add them to the Annex.

Specific Task	Procedure	Time
Stage 1. Empathize		
Identify the problem area	*Describe a learning activity for your students to identify: 1) areas that could benefit from greening activities or nature-based climate shelter intervention at school, 2) what type of action is needed (NBCSI and/or greening activity), 3) who would benefit from this action.*	
Assess the needs	*Describe a learning activity for your students to identify the sustainability / NBCSS needs, including why it is needed and what the different stakeholders would need in the process of NBCSI and/or greening activity.*	
Assess the possibilities	*Describe a learning activity for your students to identify the possibilities and resources you have at your disposal in school to use in the climate shelter intervention / greening activity.*	
Stage 2. Ideate		
Define the action (e.g., project or activities to create a prototype,	*Describe a learning activity for your students to define: 1) the aim, outcome, scope and timeline of the action, 2) possible contributors*	

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Specific Task	Procedure	Time
solution, etc.)	*(e.g., external experts, school administration, support staff, etc.), 3) how to involve the community, 4) possible challenges and risks based on the previous step.*	
Stage 3. Experiment		
Development	*Describe a learning activity for your students to develop the prototype/solution, etc., as well as to identify what materials are needed, and who should be involved in the development of the prototype/solution, etc.*	
Assessment	*Describe a learning activity for your students to present the prototype/solution, etc. and to receive feedback that would allow them to continue to the next step of the design and deployment.*	
Stage 4. Evolve		
Improvements	*Describe a learning activity for you and your students to assess and improve the prototype/solution, etc. based on comments received.*	
Stage 5. Deploy		
Promotion of the prototype/solution, etc.	*Describe a learning activity for your students to identify opportunities how to promote the prototype/solution, etc., and to present it to the wider community.*	
Sustainability	*Describe a learning activity for your students to identify potential further use, maintenance, and improvements of the developed prototype/solution, etc.*	

Part III: Monitoring and evaluation of the Action

In this section, provide more details about the monitoring and evaluation process of your action with students' participation.

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Monitoring progress

Add here how and how often you will track and measure the progress in the implementation process. Describe what exactly will be measured, how each strategic goal will be fulfilled, and how those findings will be reported, to whom and for what purpose.

Student feedback

Add here how your students will give you feedback and discuss the process and the solution.

Teacher's remarks

Add your comments and evaluation here after the implementation of this action plan if you have been able to test it, otherwise leave it blank.

About the COOLSCHOOLS Project

By investigating school environments in Barcelona, Rotterdam, Brussels and Paris, as well as by providing guidelines and policy recommendations for turning schools into nature-based climate shelters, COOLSCHOOLS' practices and results aim to generate opportunities for city uptake of the nature-based climate shelters approached by other schools, neighborhoods and cities. The project is focused on producing and sharing new evidence, tools and insights on the critical capacities that enable nature-based and inclusive transformation among local school communities, urban planners, policy makers, interested researchers, and the general public.

Annex

Add any annex here (e.g., questions for student surveys). If you have more than one Annex, copy the title below and it will move to a new page by itself.

This Action Plan is part of the MOOC "Nature-based Climate Shelters in Schools: Empowering Teachers for Sustainable Education", coordinated by European Schoolnet (EUN), is part of the COOLSCHOOLS project, which has received funding from the European Union's Horizon 2020 research and innovation programme under GA No. 101003758, the Spanish Research Agency (AEI), Innoviris (Brussels Capital Region), Dutch Research Council (NWO), The Research Foundation – Flanders (FWO), and Agence Nationale de la Recherche (ANR). The MOOC is supported by Scientix, an initiative of European Schoolnet. The content of the document is the sole responsibility of the organizer, and it does not represent the opinion of the European Commission (EC), and the EC is not responsible for any use that might be made of information contained.

Annex 3. "Nature-based climate shelters in Schools: Empowering Teachers for Sustainable Education MOOC" (2024) – Original content

The following section contains the MOOC's original content.

COOLSCHOOLS: Realizing potentials of nature-based climate shelters in school environments for urban transformation

"Nature-based climate shelters in Schools: Empowering Teachers for Sustainable Education MOOC" (2024)

Full Course

Disclaimer

The "Nature-based climate shelters in Schools: Empowering Teachers for Sustainable Education" MOOC (2024), coordinated by European Schoolnet, is part of the COOLSCHOOLS project. This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under Grant Agreement No. 101003758, the Spanish Research Agency (AEI), Innoviris (Brussels Capital Region), Dutch Research Council (NWO), The Research Foundation – Flanders (FWO), and Agence Nationale de la Recherche (ANR). The MOOC is also supported by Scientix, funded by the European Union's H2020 research and innovation programme – project Scientix ® 4 (Grant agreement No. 101000063). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the granting authority can be held responsible for them.

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Design of the MOOC: European Schoolnet, European Schoolnet Academy

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LANDING PAGE ON EUROPEAN SCHOOLNET ACADEMY[15]

Welcome to the MOOC "Nature-based climate shelters in Schools: Empowering Teachers for Sustainable Education MOOC" (2024)[16]

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- About the course
- Learning Objectives
- Prerequisites
- Modules
- Certification
- Course staff
- Behind the course
- Disclaimer
- Copyright

Course Code	GreenSchools
MOOC starts	April 1 2024
MOOC ends	May 8 2024
Estimated effort	5 hours (25h in total)

Share with friends and Family!

[15] https://www.europeanschoolnetacademy.eu/courses/course-v1:COOLSCHOOLS+GreenSchools+2024/about

[16] Video available at: https://www.youtube.com/watch?v=x5ObqkJgZSI&t=1s

About the course

The course presents the concepts of "Nature-based Climate Shelters in Schools" (NBCSS) and Urban Nature-based Solutions (NBS) through the prism of design thinking. Nature-based climate shelters in schools are green spaces in schoolyards accessible to both students and the broader community that help mitigate the impacts of climate change, while offering a space for outdoor learning.

Through Nature-based Climate shelter interventions (NBCSIs), educators engage students in the design of a Nature-based climate shelter in their own school to allow them to develop agency in improving their surroundings, 21st century skills and environmental awareness.

You can follow the course at your own pace. We will open one module at the beginning of each week, and there are **only a few deadlines you need to pay attention to (those for the quizzes and/or the peer-review activity).**

Join us in the Facebook group or share your thoughts on X (formerly Twitter) using the hashtag #nbsclimateshelters.

Learning Objectives

- Gain knowledge of the concepts of Nature-based Climate Shelters and urban Nature-based solutions by exploring the value and advantages associated with these concepts, while reviewing state of the art knowledge, learning materials and practical case studies.
- Learn to design and implement greening activities within your school, through the analysis of best practices and collaboration with other participants.
- Discover innovative ways of engaging students in the learning process through a methodical exploration of the design thinking approach and how it aligns with the development of a climate shelter intervention.
- Engage in a collaborative learning experience with your peers and co-develop a Nature-based Climate Shelter in Schools Action Plan for designing a Nature-based Climate Schelter Intervention or greening activities with your students.

Prerequisites

The course is developed for practicing teachers with all levels of experience and across all subject areas, as well as for student teachers preparing for entry into the profession. It might also appeal to educational professionals in roles like school administrators or support staff, and/or to community leaders interested in implementing these practices.

Modules

- Module 1: Understanding Nature-based Climate Shelters in Schools opens on 01/04/2024
- Module 2: Empathize and Ideate opens on 08/04/2024
- Module 3: Experiment and Evolve opens on 15/04/2024

- Module 4: Deploy, Review and Assess opens on 22/04/2024

Certification

To earn a course certificate, course participants need to submit their Nature-based Climate Shelter in Schools Action Plan and review three action plans of other participants. The final deadline to complete all activities is **08 May 2024, 23:59 CEST.** The participation in the in-module activities will amount to 5% of the final grade, the Nature-based Climate Shelter in Schools Action Plan, together with the peer reviews, will count for 95% of the final grade. **The overall passing grade is 95%**.

Note to teachers from Portugal: *You can get your successful participation in a European Schoolnet Academy course formally recognised as a valid continuous professional development, and thereby acquire the relevant number of training hours, by sending your certificate to the Conselho Científico e Pedagógico de Formação Contínua (CCPFC) at Rua do Forno, nº 30, 1º andar - apartado 2168, 4700 - 429 Braga, Portugal. For more information, please contact the* CCPFC.

Note to teachers from Emilia-Romagna: *Per i docenti della regione Emilia-Romagna iscritti alla piattaforma regionale* https://iscrizioni.istruzioneer.it/ *è possibile ottenere, oltre all'attestato rilasciato da European Schoolnet Academy, anche l'attestato rilasciato dall'Ufficio Scolastico Regionale per l'Emilia-Romagna (Servizio Marconi) che attua un'azione di facilitazione ed accompagnamento a questa attività. Maggiori informazioni al link:* https://bit.ly/EuroSmooc21.

Note to teachers from Ireland: *It may be possible to count the completion of this course as part fulfilment of any discretionary CPD hours, subject to your school management's approval. Therefore, please enquire with your school management if your participation in this course can be formally recognised.*

Course Staff

Nikolaos Tezas - Course Coordinator

Nikolaos is a COOLSCHOOLS pedagogy expert in the Science Education Department of European Schoolnet (EUN). Nikolaos also engages in pedagogical and coordination activities in the EU-funded projects NBS EduWORLD, OUTSTE(A)M and GenB, as well as moderates and delivers workshops online and in person.

Isidora Salim - Course Coordinator

Isidora works as a Project and pedagogical coordinator in the Science Education Department of European Schoolnet (EUN). Isidora currently coordinates the 2023 STEM Discovery Campaign, and the GenB project. She also coordinates the Scientix Science Project Online workshops, including the delivery of some workshops.

Ivelina Ivanova - Course Coordinator

Ivelina is a Project Manager in the Science Education Department of European Schoolnet (EUN). Ivelina coordinates the Horizon Europe project NBS EduWORLD and EUN's participation in the projects NBS Academy and COOLSCHOOLS, (co-)funded by the European Union. She has also coordinated the conclusion of the Nature-based Solutions Pilot (Phase 2), as well as the Scientix Ambassadors, the Scientix National Contact Points, and the Scientix STEM School Label.

Gabriela Krizovska - Course Moderator

Gabriela is an English and ICT teacher at the Primary school: ZS s MS Jarna in Poprad, Slovakia. She has been involved in many international and national projects and has actively worked as an eTwinning and Scientix ambassador for several years. She was also a moderator of the MOOC "Exploring Nature-based Solutions in Your Classroom "(2023). She was the founder of an ERASMUS + project in ten European countries. She has taken part in numerous MOOCs, some of them at European Schoolnet Academy. Apart from her pedagogical degree, she obtained her engineering degree at the technical university in Slovakia. In her professional life, she often gets the chance to evaluate projects and help teachers learn about the European Union's initiatives in Scientix STEM education and training. She has also been a member of the STEM School Label activity and a mentor in its pilot project for schools in Slovakia.

Behind the course

This MOOC is organised by COOLSCHOOLS in partnership with Scientix.

COOLSCHOOLS (March 2022-Feb 2025) is a transdisciplinary applied-research project aiming to analyse the multiple co-benefits of implementing Nature-based solutions (NBS) for climate adaptation, or what we call Nature-based Climate Shelters in school environments. Our conceptual framework proposes and advances Nature-based Climate Shelters as innovative strategies for urban climate adaptation focusing on school environments. It goes beyond the idea of locally confined, safe cooling centres with air conditioning; instead, our approach leverages the multiple co-benefits of nature-based solutions (NBS), in order to achieve enhanced community health and well-being.

Scientix is the community for science education in Europe (www.scientix.eu) and is an initiative from European Schoolnet.

European Schoolnet is the network of 30+ European Ministries of Education. EUN aims to bring innovation in teaching and learning to its key stakeholders: Ministries of Education, schools, teachers, researchers, and industry partners.

Disclaimer

Funded by the European Union

This MOOC, coordinated by European Schoolnet (EUN), is part of the COOLSCHOOLS project, which has received funding from the European Union's Horizon 2020 research and innovation programme under GA No. 101003758, the Spanish Research Agency (AEI), Innoviris (Brussels Capital Region), Dutch Research Council (NWO), The Research Foundation – Flanders (FWO), and Agence Nationale de la Recherche (ANR). The MOOC is supported by Scientix, an initiative of European Schoolnet. The content of this MOOC is the sole responsibility of the organizer and it does not represent the opinion of the European Commission (EC), and the EC is not responsible for any use that might be made of information contained. Original template by European Schoolnet (EUN Partnership AISBL). License CC-BY.

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MODULE 1: UNDERSTANDING NATURE-BASED CLIMATE SHELTERS

1.0 Module Introduction

About this module

Welcome to the 'Nature-Based Climate Shelters in Schools: Empowering Teachers for Sustainable Education' course!

During this Module, you will discover the concept of **nature-based solutions (NBS)** and be introduced to the basics of **nature-based climate shelters in schools (NBCSS)** and their value for health, cognitive and social development of students. In addition, we will explore together the value of nature-based climate shelters for the environment and to mitigate and adapt to climate change. Finally, we will briefly outline the pedagogical and educational value of nature-based climate shelters, and how they can help your students develop a range of skills.

Therefore, during this module you will:

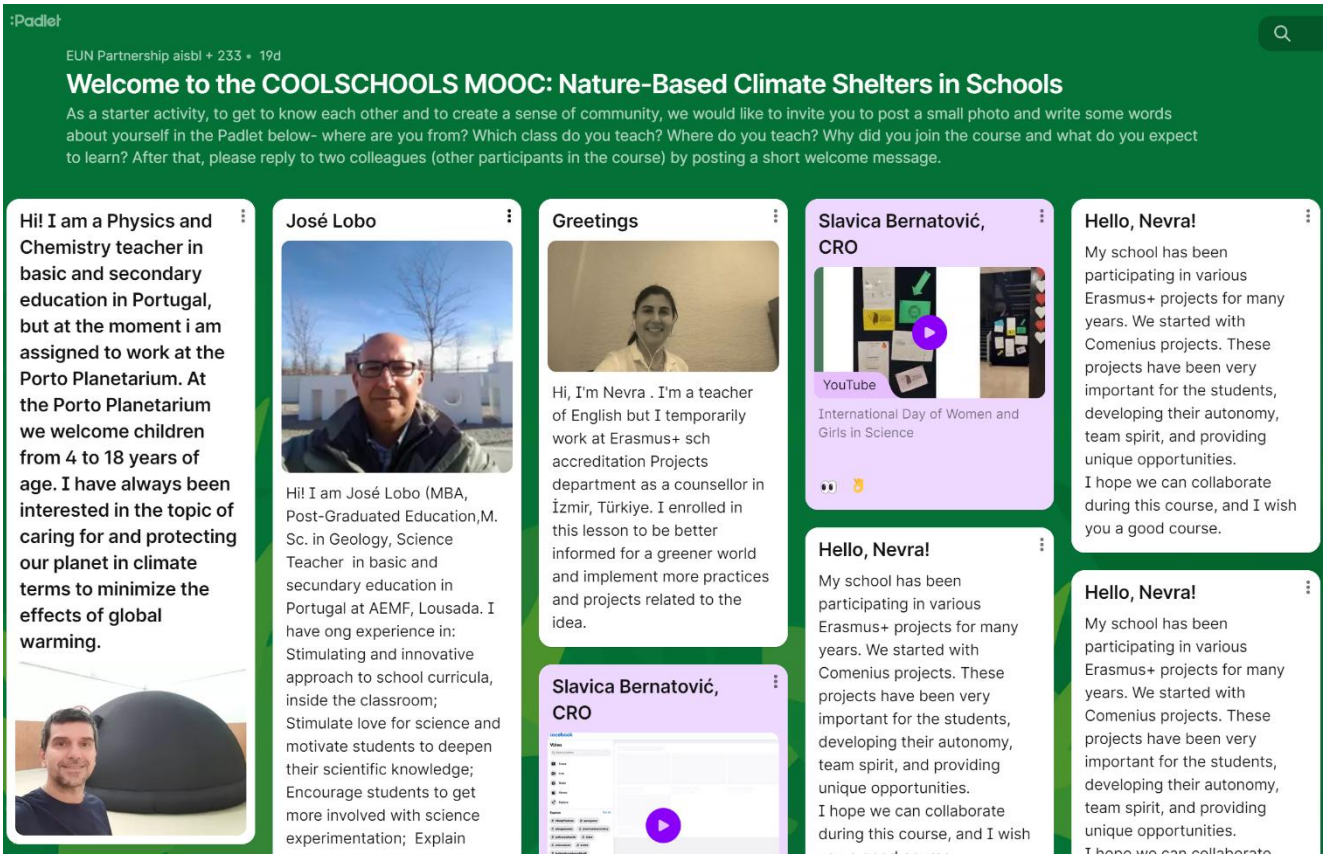
- Define and recognise urban NBS and NBCSS while reviewing state-of-the-art knowledge about the two concepts.
- Classify the health and cognitive benefits of NBCSS for students by exploring the implications of implementation of concepts.
- Recognize the environmental and biodiversity benefits of NBCSS and urban NBS through a review of current research on the topic.
- Recognize the social benefits of NBCSS and urban NBS for students and the wider community through the methodical analysis of state-of-the-art of research and practices of implementing the concepts.
- Become familiar with the peer-review activity.

Ready to start? Click on "Next" and have a look on how to participate in this MOOC.

Activity

Welcome to the COOLSCHOOLS MOOC: Nature-based Climate Shelters in Schools!

As a starter activity, to get to know each other and to create a sense of community, we would like to invite you to post a small photo and write a few words about yourself in the Padlet below- e.g.: Where are you from? Which subject(s) do you teach? Where do you teach? Why did you join the course and what do you expect to learn? etc. After that, please reply to two colleagues (other participants in the course) by posting a short welcome message.



1.1 What are Nature-based Climate Shelter?

Nature-based solutions in urban environments

NBS are a broad concept defined by the European Union as:

"Solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social, and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes, and seascapes, through locally adapted, resource-efficient and systemic interventions. Nature-based solutions must therefore benefit biodiversity and support the delivery of a range of ecosystem service" (European Commission, 2022).

In an urban environment, NBS help reduce temperature, filter pollution, and help minimise certain climate change-related risks, such as flooding (as natural soils, instead of concrete, help with the evacuation of excess rainwater). These are but a few of the benefits of NBS in the urban environment, and we will see more about them in upcoming units.

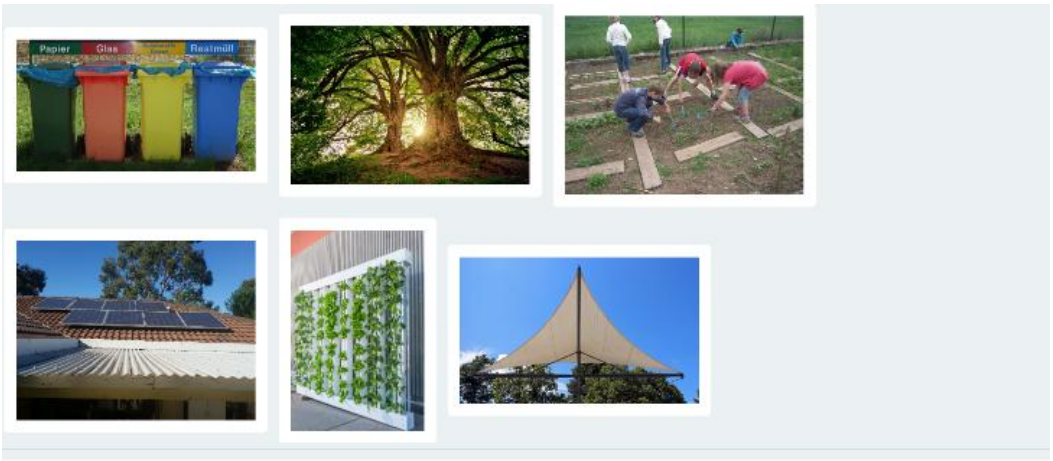
Please watch the following video to familiarise yourself with the concept of "nature-based solutions".

Is this NBS?

Drag and drop.

PROBLEM

Which of these do you think are Nature-based Solutions? Drag and drop images into two categories NBS and NOT NBS:



NBS

NOT NBS

Nature-Based Climate Shelters in Schools

A NBCSS is a green space in a school (more specifically, its schoolyard) accessible to both students and the community, that offers:

- shelter from the impacts of climate change,
- mitigation of some urban impacts of climate change,
- a healthier environment for the students on a daily basis,
- an enhanced learning space for students to develop.

This school transformation maximises the use of nature-based solutions in the school urban environment to support climate resilience, improved well-being, and cognitive development.

A Parisian preschool after its transformation into a Nature-based Climate Shelter. © Vincent Guiné - CAUE de Paris.

In a very intuitive manner, introducing NBS in the urban school environment means creating a green space using trees, vegetal surfaces, and soil to create shade and allow water to drain, while avoiding the absorption of heat. But it is also essential that the transformations include the creation of sensory playgrounds and environments, new socialising, and physical activity spaces. Indeed, NBCSS will only reach their full potential if they allow all students to actively engage with the schoolyard and its new features.

The following video introduces the concept of a "Green Schoolyard", another name for a nature-based climate shelter in schools.

While the primary beneficiaries of a NBCSS are the students who attend the school, the shelter can also be opened to the public when the school is not in session, and during a heatwave, thus benefitting the entire community.

The COOLSCHOOLS project

This MOOC encourages the greening activities of schoolyards using urban nature-based solutions (NBS) and nature-based climate shelters in schools. It trains teachers in implementing green schoolyard transformations using urban NBS through student-centered and "design thinking" approaches, supported by NBS case studies, relevant frameworks.

The COOLSCHOOLS project, as the organiser of this MOOC with the support of Scientix, is a transdisciplinary applied-research project that aims to analyse the multiple co-benefits of implementing nature-based solutions for climate adaptation through ***NBCSS***. COOLSCHOOLS explores how these interventions can act as drivers of transformation at larger urban scales through an approach that puts at the centre the needs and views of children and youth.

The nature-based climate shelters envisioned and supported by the COOLSCHOOLS project utilise ***green transformations*** (the use of natural features like green spaces and trees), rather than other building transformations (such as the addition of air conditioning, or artificial shading structures, also known as "grey" transformations).

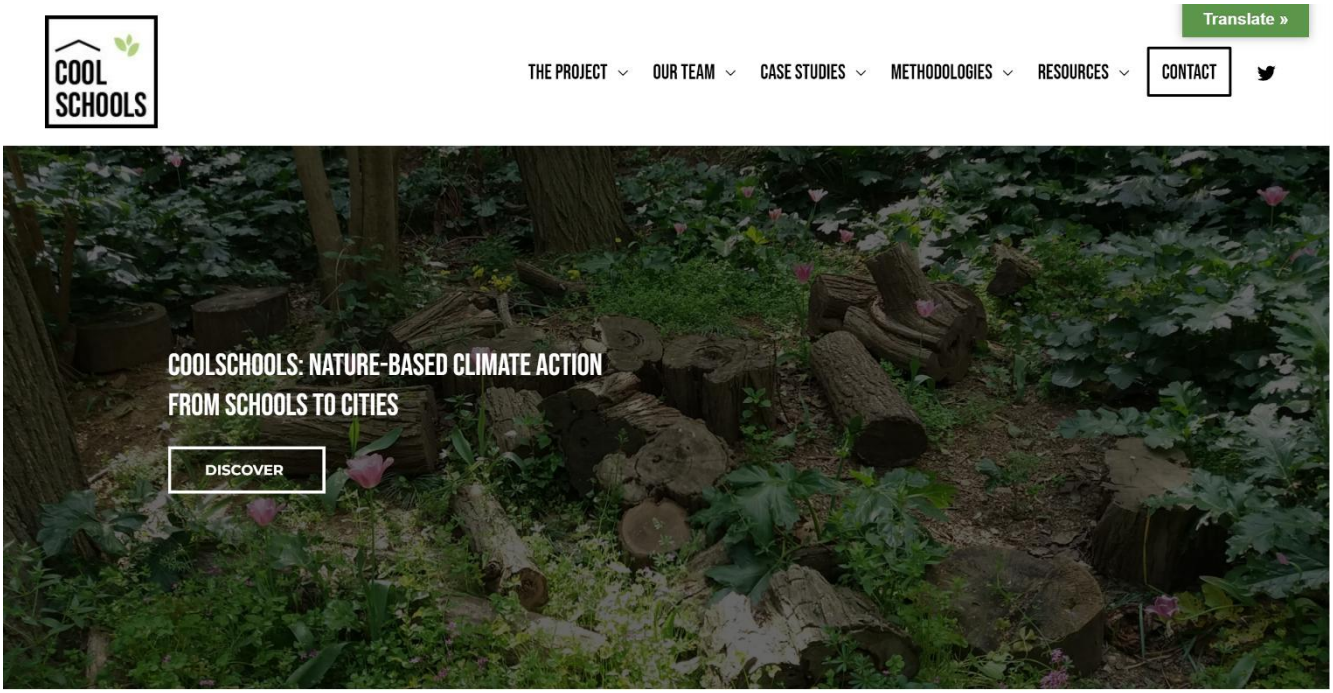
This approach leverages the multiple co-benefits of NBS to achieve enhanced community health and well-being.

We study the different capacities and impacts resulting from the implementation of nature-based climate shelters in school environments from the perspectives of social justice, biodiversity conservation, public health, safety, inclusive governance, and quality education from schools to the metropolitan region.

COOLSCHOOLS' practices and results aim to generate opportunities for city uptake of the nature-based climate

shelters approach by other schools, neighbourhoods, and cities.

Visit the project's website to learn more about this initiative: https://COOLSCHOOLS.eu/



The COOLSCHOOLS Case Studies and the United Nations' Sustainable Development Goals

The COOLSCHOOLS project builds and expands on the experience of four pioneer European projects in the implementation of NBS for climate change adaptation in school environments (targeting primary and secondary education):

- Brussels: Ose le vert (2016-2023), Opération Ré-création (2021-2024)
- Barcelona: Climate Shelters in schools (2018-2021), Transformem els patis (2021-onwards)
- Paris: Oasis (2018-onwards)
- Rotterdam: Groenblauwe Schoolpleinen (2019-onwards).

Explore the four case studies here: https://COOLSCHOOLS.eu/case-studies/

The guidance and advice provided in this course are based on the experience and best practice of these four case studies, where municipalities have undertaken the transformation of a large number of schoolyards into nature-based climate shelters. The four initiatives were implemented by local governments in schools as a result of the widespread development of sustainability policies aiming to adapt cities to the future impact of climate change.

These strategies emphasise the importance of providing citizens (particularly children) with access to urban green spaces, in line with the United Nations' Sustainable Development Goal (UN SDG) #11.7, which envisions "by 2030, to provide universal access to safe, inclusive and accessible green and public spaces, in particular for women

and children, older persons and persons with disabilities" (United Nations, 2015)

Read more about the SDGs here: https://sdgs.un.org/2030agenda

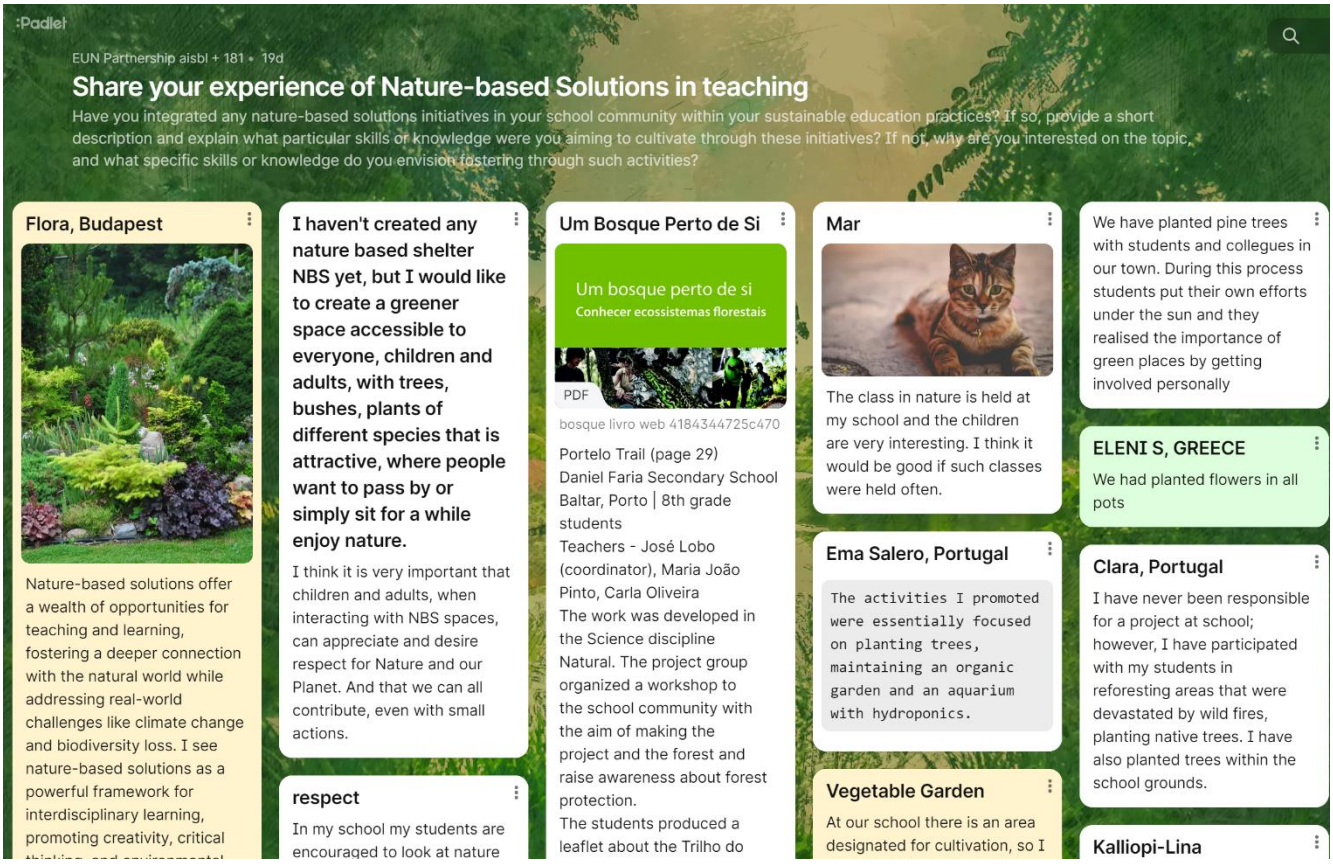
Achieving the UN SDGs is also a priority for the European Union, which implemented a range of large-scale initiatives (such as *The European Green Deal*).

Read more about the EU strategy on SDGs here: https://commission.europa.eu/strategy-and-policy/sustainable-development-goals_en

Activity

Share your experience with nature-based solutions in teaching!

Have you integrated any nature-based solutions initiatives in your school community, within your sustainable education practices? If so, provide a short description and explain what particular skills or knowledge were you aiming to cultivate through these initiatives. If not, why are you interested in the topic, and what specific skills or knowledge do you envision fostering through such activities?



1.2 The Benefits of Nature-based Climate Shelters for Students, and the Community

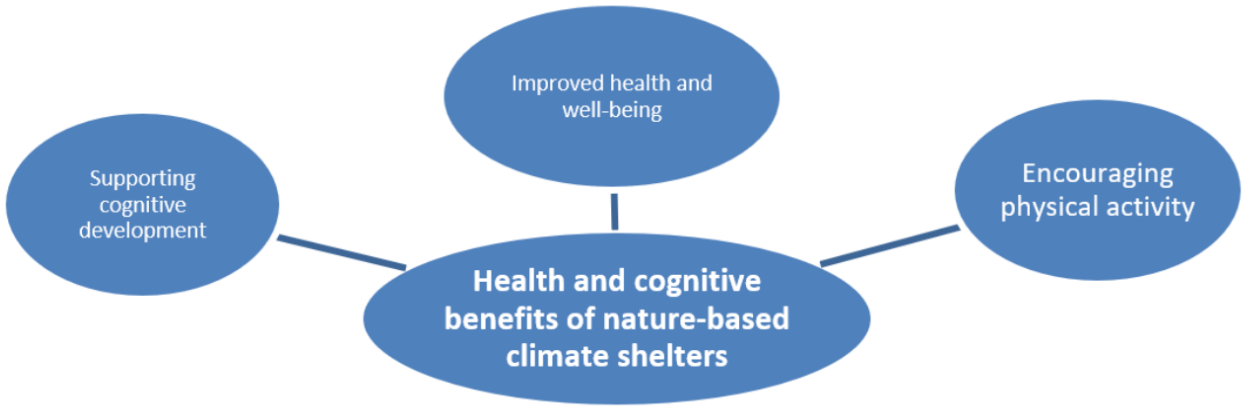
The Health and Cognitive benefits of Nature-based Climate Shelters in Schools

Nature-based climate shelters play a vital role in enhancing students' overall health and well-being by providing them with a conducive environment for learning and growth. There is no shortage of scientific evidence demonstrating the health and cognitive benefits associated with the presence of nature in the daily life of individuals, and in particular children.

As elaborated in Gallez et al. (under review)[17] ,"exposure to NBS can lead to stress reduction (Chawla et al., 2014; Squillacioti et al., 2022; Vanaken & Danckaerts, 2018), reduced hyperactivity (Thygesen et al., 2020; Zare Sakhvidi et al., 2022), and improved concentration levels (Faber Taylor & Kuo, 2009), cognitive development (Amicone et al., 2018; Dadvand et al., 2015; de Keijzer et al., 2016; Jarvis et al., 2022; Markevych et al., 2019), and socioemotional wellbeing (Flouri et al., 2014; Pérez-del-Pulgar et al., 2021; Ward et al., 2016)."

Summarising the key benefits for students' health, wellbeing, and cognitive development in the project research, we can establish that by integrating nature into school environments, NBCSS contribute to:

- **Improved Health and Well-being:** The presence of green spaces has been linked to reduced stress levels, improved mental health, and overall well-being among students. NBCSS offer a sanctuary where students can escape the pressures of school life and connect with nature, fostering a sense of calm and relaxation.
- **Encouraging Physical Activity:** NBCSS encourage physical activity and outdoor play, promoting a healthy and active lifestyle.
- **Supporting Cognitive Development:** Exposure to natural environments has been shown to enhance cognitive functions, such as attention, concentration, and creativity. NBCSS provide opportunities for experiential learning and exploration, stimulating students' curiosity and critical thinking skills.

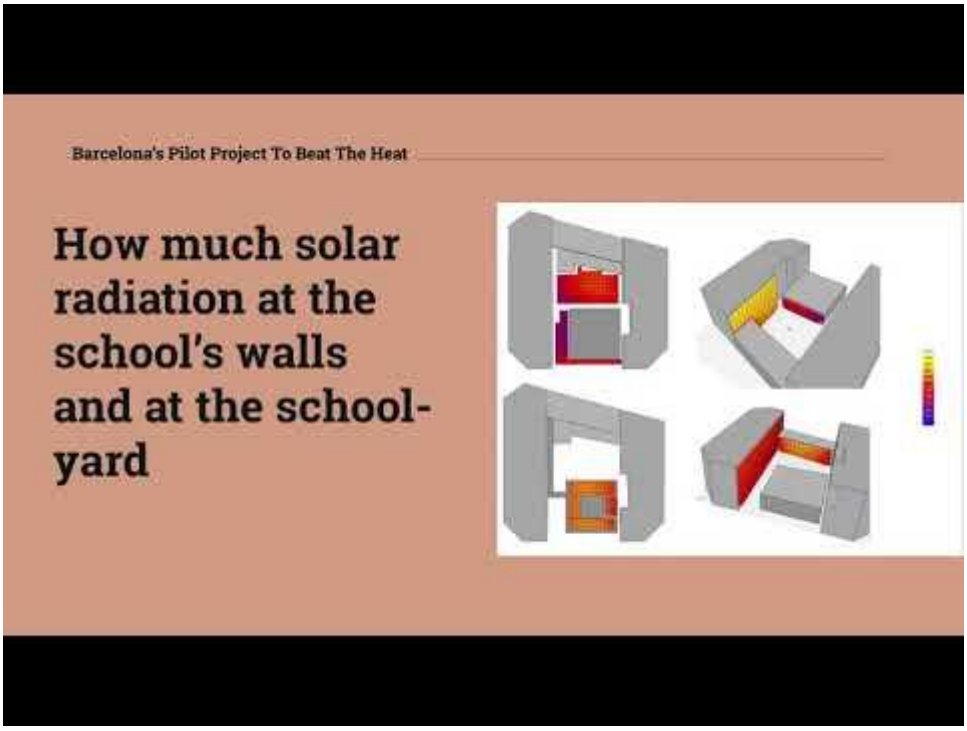


The Health and Cognitive Benefits of Nature-based Climate Shelters in Schools.

One of the ways NBCSS improve the well-being of students and the community is by providing shelter from

[17] This publication is currently under review and corresponds to the COOLSCHOOLS Deliverable 1.1.

heatwaves. You will discover how in the video below from the Barcelona City Council:



The Environmental and Biodiversity benefits of Nature-based Climate Shelters in Schools

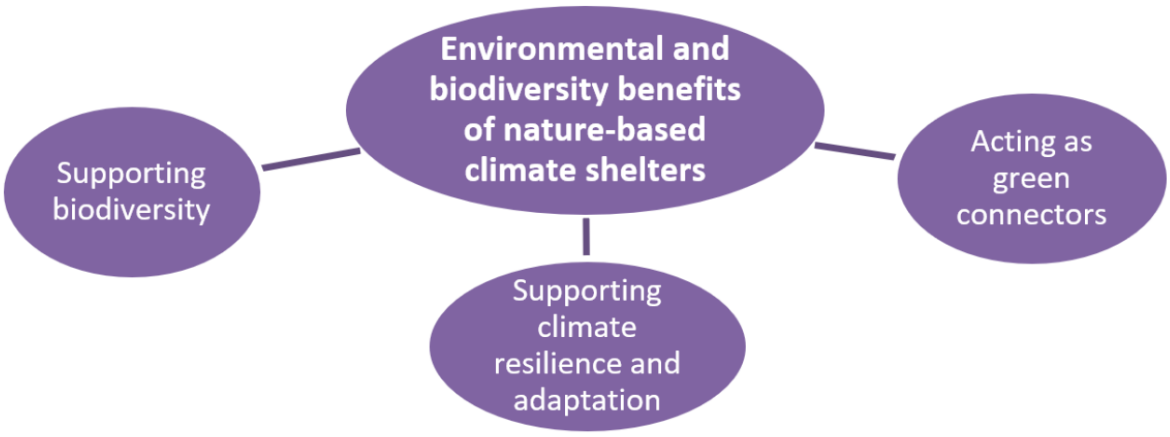
The importance of urban NBS components for the environment and biodiversity has as well been highlighted in Gallez et al.[3], where it is stated that:

Urban NBS components such as green spaces in schools deliver a wide range of natural ecosystem services that regulate the urban environment. Air purification (Baró et al., 2014; Nowak et al., 2018) and urban temperature regulation (Bowler et al., 2010; Skelhorn et al., 2014) are examples of such regulating ecosystem services. Urban green spaces can mitigate water runoff during heavy rains, purify the air through pollutant uptake or deposition, and deliver aesthetic benefits as well as possibilities for recreation to urban residents (Gómez-Baggethun et al., 2013).

It can therefore be concluded that NBCSS contribute to the preservation and enhancement of the natural environment through the following key aspects:

- **Supporting biodiversity:** NBCSS serve as havens for native flora and fauna, supporting biodiversity within urban ecosystems. These green spaces provide habitats for various species, contributing to the conservation of local biodiversity.
- **Acting as green connectors:** NBCSS serve as green connectors within urban landscapes, linking fragmented habitats and facilitating the movement of wildlife. By providing interconnected green spaces, nature-based climate shelters contribute to the resilience and sustainability of urban ecosystems.
- **Supporting climate resilience and adaptation:** Nature-based climate shelters play a crucial role in climate resilience by mitigating the impacts of climate change. These green spaces help regulate

temperatures, reduce heat island effects, and mitigate urban heat stress[18], creating more resilient and adaptive urban environments.



The Environmental and Biodiversity Benefits of Nature-based Climate Shelters in Schools. Created by COOLSCHOOLS, 2024.

The Social Benefits of Nature-based Climate Shelters in Schools

Green spaces in schools foster socialisation, social equity, and inclusion by promoting gender equality and equal access, addressing socio-economic disparities.

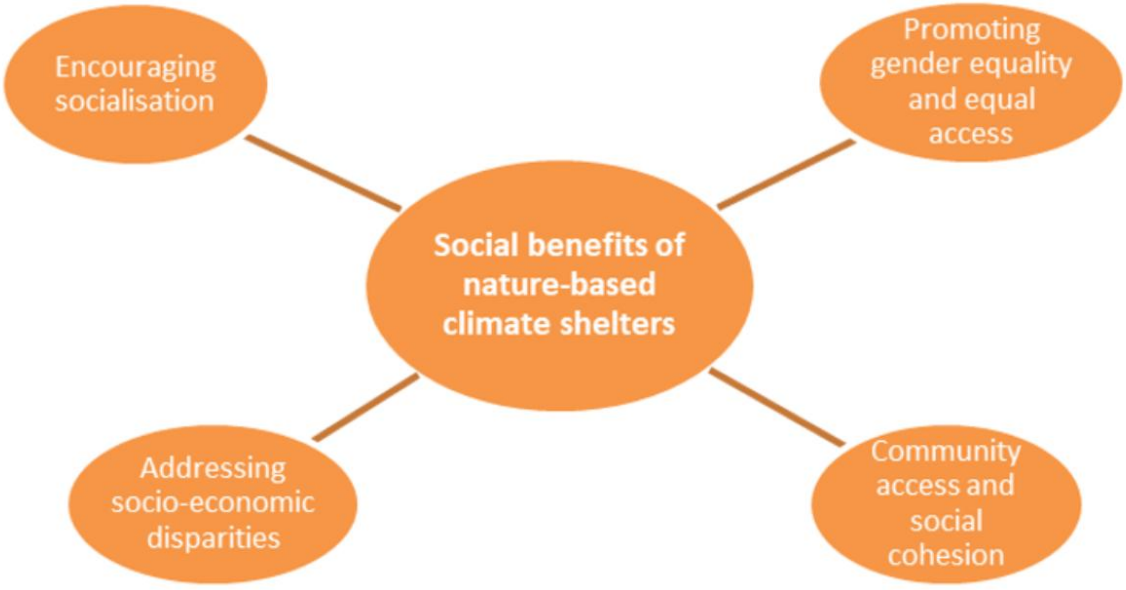
Gallez et al. (under review)[3] with relation to societal benefits underscore that, "among other things, NBS can foster more frequent, diverse, and non-competitive physical activity among children (Akpinar, 2017; Dyment & Bell, 2008; Fernández-Barrés et al., 2022)". Additionally, Sekulova & Ruiz-Mallén (in press) (2) also emphasise that NBS encourage "social cohesion and diversified physical activity (Raney et al. 2019, Bohnert et al. 2021, Mårtensson et al. 2014, Mårtensson et al. 2014). They are also found to offer more equitable play opportunities in a way that encourages creativity (Van Dijk-Wesselius et al. 2022, Lucas and Dyment 2010).

With this in mind, it can be understood that NBCSS contribute to social equity and inclusion by:

- **Encouraging Socialization**: NBCSS serve as communal gathering spaces, where students can interact with their peers, fostering social bonds and collaboration.
- **Promoting Gender Equality and Equal Access**: NBCSS provide inclusive environments, where all students, regardless of gender, can participate in outdoor activities and recreational opportunities. By breaking down gender stereotypes and barriers to access, NBCSS promote gender equality and social inclusion.

[18] "Urban heat island effect" is the phenomenon, by which temperatures are higher in urban environments compared with the surrounding rural areas. This is due to the fact that the construction materials of urban structures stock and radiate heat to a higher extent than natural surfaces. This is combined with "waste heat", resulting from the increased activity in the city (industrial activities, human daily activities, etc.).

- **Addressing Socio-economic Disparities**: NBCSS offer equal access to green spaces for children from disadvantaged socio-economic backgrounds, providing them with opportunities for outdoor learning and recreation. By reducing barriers to access, NBCSS help bridge the socio-economic gap and promote equitable opportunities for all students.
- **Community Access and Social Cohesion**: A common feature of NBCSS in the case studies' cities is their accessibility to the community. By opening up these green spaces to the public, nature-based climate shelters promote community engagement and social cohesion. They provide opportunities for people of all ages and backgrounds to connect with nature, fostering a sense of belonging and collective stewardship of the environment.



The Social Benefits of Nature-based Climate Shelters in Schools. Created by COOLSCHOOLS, 2024.

The Educational Benefits of Nature-based Climate Shelters in Schools

NBCSS offer a range of pedagogical benefits, both during the design stage and in the long-term use of green spaces.

Firstly, involving the students in the design of the green space helps them understand the benefits of natural features in the urban landscape, the technological and natural solutions to climate change. In addition, getting the students to contribute to the design of the green space also enables them to collaborate on a common project, discuss, empathize, and express their thoughts and reasoning.

Furthermore, NBS as a topic in itself presents the opportunity to be integrated in a variety of school subjects, such as: science, technology, engineering, mathematics, arts, etc., as well as in any cross-curriculum education programme, furthering cross-curriculum collaboration among the different subjects as well.

To date, many projects exist that explore the integration of NBS into education, using a variety of approaches and methods, which would be supported by outdoor activities, such as the planning, designing and creation of NBCSS.

In the long term, providing students and teachers/educators with direct access to urban green spaces creates learning spaces to foster quality education on climate change in thematic areas, such as wellbeing, safety, biodiversity conservation, inclusive decision making and other attributes. Such green spaces can become an experimental field for outdoor education, helping students develop a range of green competences, as defined in **GreenComp: The European Sustainability Competence Framework.**

The infographic below gives you an easy overview of the GreenComp Framework. Read the full concept of the GreenComp Framework here: https://joint-research-centre.ec.europa.eu/greencomp-european-sustainability-competence-framework_en.

The GreenComp Framework. European Commission, 2024

The GreenComp framework and other competence frameworks published or supported by the European Commission, such as the Key competences for lifelong learning published in 2018 by the European Union or the Digital Competence Framework for Citizens (DigComp), all serve to emphasise the need to help students develop new sets of skills and competences for the future. Indeed, while education has long been focused on delivering knowledge, it is now widely accepted that even though factual knowledge is important, students will need to develop a range of transversal skills that will help them become active citizens, work collaboratively with others, and communicate effectively.

These skills, commonly known as "soft skills", are explained succinctly in the video below:

1.3. Introduction to the Peer Activity

Discover the Peer-review activity

In this section, we give you an introduction to our COOLSCHOOLS peer-review activity. To successfully pass the MOOC, you will need to create a **Nature-based Climate Shelter** in Schools Action Plan for the implementation of your own nature-based climate shelter in school, using the template provided. Once you have devised your action plan, you will need to review and provide feedback on the **Action plan** of two other participants, using the Action Plan Rubric.

An **Action plan** is a **documented, formalised planning process** that outlines strategies, actions, and activities that will be accomplished over a given period to achieve a specific goal. In education, Action plans are used to guide teachers or schools, while elaborating on certain elements of the planning and implementation process, such as school context, strategic goals, needs, available resources and scope of the actions to be taken.

This document **allows adjustments to be made over time**, as well as results to be assessed, to promote continuous improvement of different processes in the school. In addition to **strategic management guidance**, Action plans also include **pedagogical guidelines** to improve education quality.

An Action plan also defines the timeline and key stakeholders, as well as the summary, online tools and resources (online and offline) that will be used during the implementation. In addition, it provides an overview of the activities that will involve students in the NBCSS interventions, as well as how to monitor the progress of the intervention and students' development

The action plan template is divided into four sections dedicated to the descriptive elements mentioned above, in addition to the main action plan table, the monitoring strategies and the annexes. Additional fields indicating for example the publication licenses, are also included.

Get to know the Action Plan template

To receive a course certificate, you need to create and submit a *Nature-based Climate Shelter in Schools Action Plan*. You will be working on filling in your Action plan throughout the whole MOOC and will **submit it during the final peer assessment activity, in Module 4.**

The *Nature-based Climate Shelter in Schools Action Plan* has been designed to accommodate you in the implementation of NBCSS and urban NBS, while involving students in the designing and implementation process. By guiding you through the ***design thinking approach,*** the template would help you define the scope of the interventions based on the available resources in your school, as well as how students could be part of the action.

NATURE-BASED CLIMATE SHELTERS IN SCHOOLS

Action Plan

All fields in this template are mandatory for submitting your Action Plan to the ***MOOC "Nature-based Climate Shelters in Schools: Empowering Teachers for Sustainable Education"***, organized by the COOLSCHOOLS project. In case a field is not relevant to your Action Plan, please write N/A. Your Action Plan and any materials/resources included in it, should be in **English**.

Title of the Action

Author(s):

Abstract:

Add a paragraph here summarizing the Action Plan and the action it is addressing. This text will be used to introduce your Natre-Based Climate Shelters in Schools Action Plan when it is published online, so please try to be as clear and concise as possible, e.g., what is your Action Plan about, what the goal of the action is, and how you are going to achieve it.

To begin with your *Nature-based Climate Shelter in Schools Action Plan*, we suggest you start by describing and analysing your school environment, while focusing on the needs of your school and students. This will help you set the strategic goals of your action.

Next, you should define the timeline and the key stakeholders that could aid and guide you in the process. This would allow you to define the scope of the required actions, as well as how to most effectively involve students.

In addition, you will have to describe activities involving students, related to each stage of the design thinking approach and the implementation of the NBCSI. Each stage requires you to consider the activities, as well as benefits of its implementation for students.

Lastly, you will have to define and describe how will you monitor the progress of your action, how often, and how will you report and to whom. This will allow you to keep track of the implantation process, identify and mitigate challenges that emerge, as well as provide information for future replication and improvements of the NBCSS.

The template also includes a segment regarding licences. Licenses are created for authors (also called licensors) to grant copyright permissions to their creative work and provide the recipients with a regulated way of knowing what authors desire regarding the use of their material. We recommend using Attribution ShareAlike CC BY-SA in your Action plan. Learn more about different licenses here.

We will go through other sections in the upcoming modules.

Discover the Action Plan Rubric

In addition to being content creators in this course, you will also evaluate the Action Plans created by your peers. Each participant will be asked to peer-assess the work done by two other participants and provide constructive feedback.

For consistency, it is important to have a common point of reference when evaluating your peers' work. For this reason, we will use an *evaluation rubric* covering all the categories that need to be considered while evaluating the quality and content of an Action plan.

Rubric for assessing "Nature-Based Climate Shelters in Schools" Action Plans

Instructions to fill in this Rubric:

- Go through each category of the rubric and identify **to what extent the Action Plan masters the aspect addressed**. For example: if the Action Plan makes no reference to school's needs that have informed the plan, you should mark "There is no reference made to school's needs." For each item, you can add **comments and remarks**. Why did you choose that level? What areas would you identify as strengths? What areas do you feel could be improved? What would you like to know more about?
- If you use this rubric to assess the work of your peers, make sure that you include **fair, encouraging, and helpful feedback** that allows the author to improve their design. Note that you can also use it to self-assess your own work.
- Remember: a rubric is an alternative assessment method – **the level of mastery does NOT correspond to grades. Rubrics emphasize strengths and help identify areas/skills that need improvement.**

You will notice that each rubric category corresponds to a different section of the Action plan.

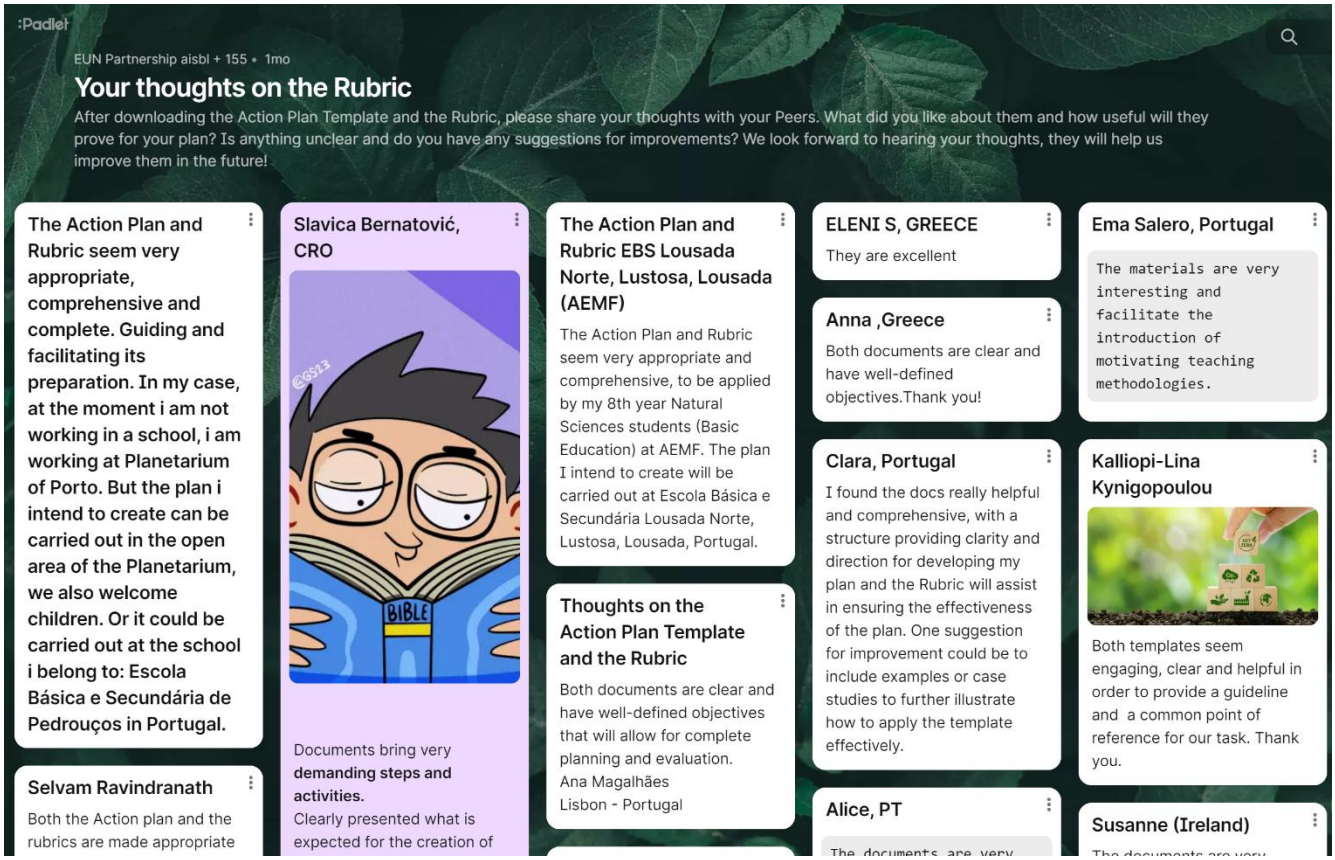
Download the **evaluation rubric** here, so that you can get to know the criteria you will be assessed on.

In the peer assessment activity in Module 4, the rubric will be integrated into the peer assessment activity. You will need to work on the platform.

Activity

Your thoughts on the Rubric

After downloading the Action Plan Template and the Rubric, share your thoughts with your Peers. What did you like about them and how useful will they prove for your plan? Is anything unclear and do you have any suggestions for improvements?



1.4 End of Module Quiz

Quiz[19]

Q1. Nature-based solutions in schools constitute one of the 17 United Nations Sustainable Development Goals?

- True
- False

Q2. Nature-based climate shelters in schools must include (select all that apply):

- Trees to provide shade and reduce temperature
- Air conditioning to cool inside the classes
- Recycling stations in the school
- Sensory playgrounds that use green features (bushes, soils, wood, etc)
- Solar panels on the roof

Q3. Nature-based climate shelters promote gender equality by:

- Creating gender-free spaces using natural features that attract students regardless of their gender
- Providing an even number of schoolyard areas for girls and for boys

Q4. The key benefits of nature-based climate shelters in schools are (select all that apply):

- Improved well-being as students explore outdoors and are more physically active
- Financial benefits as fruits and vegetables from the garden can be sold
- Environmental benefits for diversity offering habitats and green corridors for animals and insects
- Create challenging spaces that nurture healthy competition between students
- Enhanced learning spaces that will help students develop green competences and care for the environment

[19] Quiz due May 8, 2024 23:59 CEST

1.5 Module Round-up

Summary

Great work! We have made it through Module 1

In the next module, we will explore the first steps in the planning of a **Nature-Based Climate Shelter Intervention (NBCSI)**, though the perspective of the design -thinking process.

- You have learnt how to define and recognise urban NBS and NBCSS while reviewing state-of-the-art knowledge about the two concepts.
- You now know how to classify the health and cognitive benefits of NBCSS for students by exploring the implications of implementation of concepts.
- You learnt how to recognize the environmental and biodiversity benefits of NBCSS and urban NBS through a review of current research on the topic.
- You can now recognize the social benefits of NBCSS and urban NBS for students and the wider community through the methodical analysis of state-of-the-art of research and practices of implementing the concepts.
- You became familiar with the peer-review activity.

Next module starts on Monday. Keep up the good work!

MODULE 2: EMPHASIZE AND IDEATE

2.0 Module Introduction

About this Module

What to expect from Module 2?

During this module, you will be introduced to the first steps of the development of *nature-based climate shelter interventions* and *urban NBS* and how they were implemented as part of case studies in Belgium, France, the Netherlands, and Spain. The aim of Module 2 is to introduce you to the **design thinking approach** as a means to guide and inspire you on how to greenify your school's outdoor and indoor spaces. Specifically, through this module, you will be guided through the *'Empathize'* and *'Ideate'* stages of the design thinking approach, which will inform your first steps while designing and developing your own NBCSIs and the greening actions.

Our focus will be on identifying needs and available resources, as well as on brainstorming suitable solutions that correspond to your situations. In addition, you will be presented with different possibilities and activities to involve the students in, through the above-mentioned steps.

Therefore, by the end of this module, you will be able to:

- **Deepen** your understanding of the design thinking approach and how to develop Nature-based climate shelter interventions by comparing their implementation in selected studies.
- **Brainstorm** ways to include students in the stages of *Emphasize* and *Ideate* by browsing through resources and taking inspiration from selected case studies.
- **Examine** and **identify** available resources, possible solutions and challenges in implementing the NBCSI or greenifying school spaces by choosing suitable brainstorming tools together with your students.
- **Develop** a Plan on how to implement the stages of design thinking and NBCSI development with students, by working on your Nature-based climate shelter in schools Action Plan.

Ready to start? Click on "Next"

2.1 The design thinking approach

Overview

Design thinking[20] is a non-linear, human-cantered problem-solving approach or process used in various fields to challenge assumptions, redefine problems and create innovative NBCSIs to prototype and test. In the context of education, embracing design thinking can offer innovative solutions to classroom challenges while promoting

[20] For more information about the design thinking approach, you can check out this source: Foster, M. K. (2021). Design Thinking: A Creative Approach to Problem Solving. Management Teaching Review, 6(2), 123-140. https://doi.org/10.1177/2379298119871468. Depending on the field of application of the design thinking approach, the name of the stage varies. Nonetheless, the process itself remain the same.

creativity and empathy. It consists of five key stages (also shown in the image below):

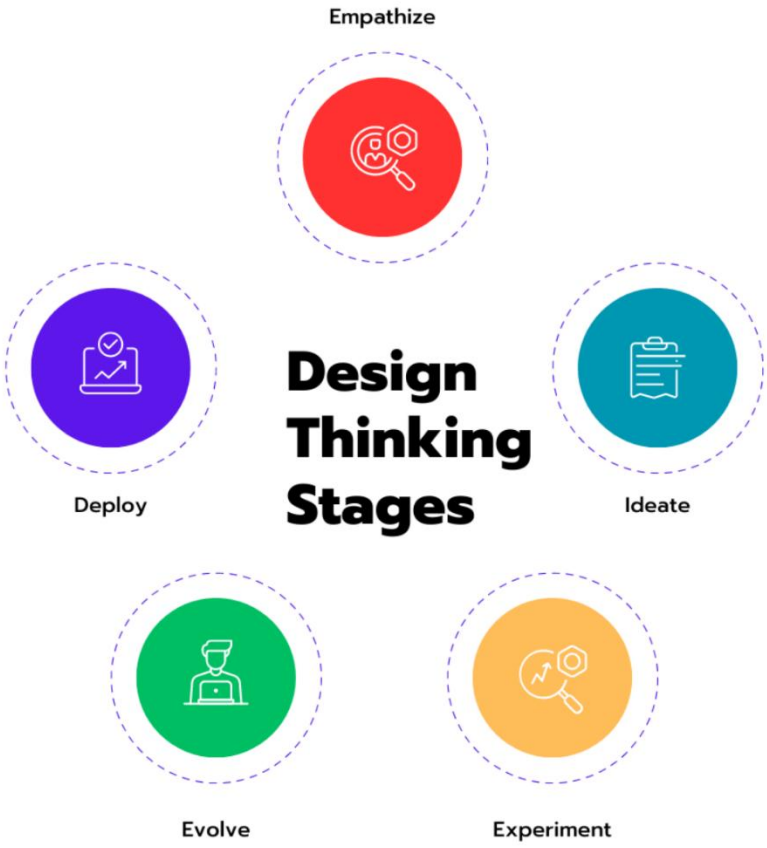
Empathize: Understanding the needs, desires and motivations of the students and key stakeholders involved. This often involves conducting interviews, surveys, and observations to gain insights.

Ideate: Refining the problem statement, based on insights gained during the empathize stage. It involves generating a wide range of creative ideas to solve the defined problem by encouraging brainstorming and open-minded exploration of possibilities.

Building scaled-down versions of the potential NBCSIs for the Experiment and Evolve and stages. The aim is **Experiment:** to test if the idea responds to the identified needs and if the solution is feasible based on available resources.

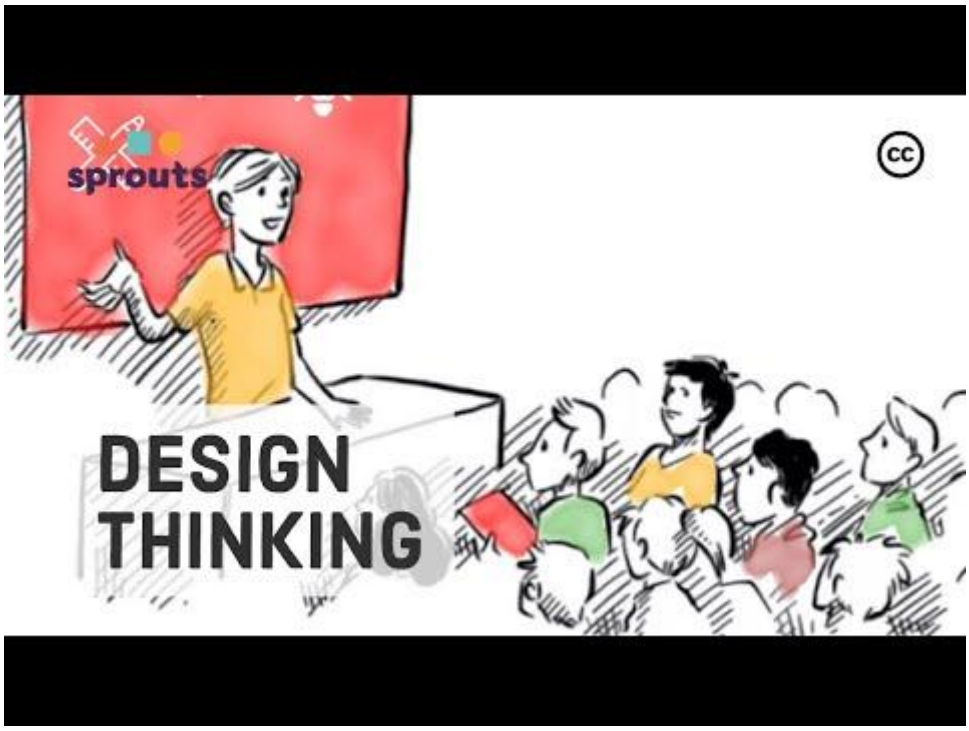
Evolve: Evaluation of progress, as well as of the results of the Experiment stage, re-evaluation of the 'product' and going back to the drawing board.

Deploy: NBCSIs developed through the Experiment and Evolve stages are implemented and launched into the real-world context. It is the final stage, where the refined solution is put into action to address the initial problem or challenge identified during the earlier stages of the process.



The stages of the Design thinking process. Infographic by COOLSCHOOLS, 2024.

By embracing the principles of design thinking, you can foster a culture of innovation and problem-solving in your teaching and learning environment. Through empathy, creativity and iteration, together with your students you can develop solutions (e.g., in the form of NBCSIs) that address both their own and the various needs of the school through meaningful learning experiences. This process can help both you and your students to adapt to changing environments and prepare or success in an increasingly complex world.



Empathize

To create a project that will make a difference to your students, school, and community, we will break down the planning process into a few steps. The first step is focused on identifying the issue, available resources, needs and challenges in the process of designing and developing a NBCSI and greening actions in the schoolyard and communal spaces. A brief introduction is included on what this entails, with an emphasis on different activities that would involve students in this step, and the skills they could develop.

As previously mentioned, design thinking has five stages: **empathize, ideate, experiment, evolve, and deploy.**

Let's focus on the first stage: **Empathize**. This stage is also called 'discovery' and, to put it simply, here is when a problem is identified. This stage focuses on discovering and understanding the needs, challenges, and motivations of users, for whom the solution is being designed. When implemented in school settings, the goal is to develop deep empathy for the perspectives and concerns of the school community, allowing the advocacy and proactivity of the students and the school staff to react based on the insights gathered in the process.

In this course, we ask you to 'empathize' and discover a problem that you can address at your school that could be solved with the implementation of a nature-based climate shelter intervention or an urban nature-based solution. This can be anything, from students saying that the playground is too hot to play on in the summertime, to realizing that large puddles are forming due to rain and improper drainage. Both of those ideas can be solved with the

implementation of the NBCSI or an urban nature-based solution.

The *Empathize* stage involves putting aside assumptions and preconceptions and immersing oneself in the experiences of the students and school staff through methods, such as interviews, observations, and surveys.

Collaboration. Microsoft Stock Image

In addition, in this stage it is important to identify whom you can collaborate with. Your students should be the first on the list of collaborators to identify ways that this problem could be solved. Other stakeholders, such as school staff, parents, local authorities, or other community members, could also be involved in the identification of the problem, as well as in the design of the NBCSI.

This stage lays the foundation for the entire design process, ensuring that solutions are human-centered and responsive to the real needs of the school and students.

Nature-based climate shelter intervention in school and the Design thinking process

The development of a NBSCSI involves a structured process based on the design thinking process to ensure environmental sustainability, safety, and educational value. Here's a general outline of the process:

1. Technical diagnosis:

Assess the current condition of the schoolyard or school space that needs greening, considering factors like available space, soil quality, drainage, and existing vegetation. The step also includes the definition of priorities and needs of users of green spaces, considering environmental, educational, and recreational aspects. Lastly, it requires identifying and engaging relevant stakeholders when gathering input.

2. Discussion and a development proposal:

Collaborate with landscape architects, environmental experts, students, and educators to design the green schoolyard. The proposal should be developed based on collective vision, identified needs and constraints specific to the school context.

3. Sketching and preliminary design:

Develop priorities, timeline and budget for implementing the green schoolyard project. Required actors, such as architects, landscape inspectors, school staff, are involved in the process. They are the ones transforming the first

plan into a real sketch, making sure to consider:

- Technical constraints (firefighter access, rainwater management, noise propagation, etc.),
- Constraints related to use (intensity of use and versatility of the different areas, circulation of flows, facilities adapted to each age, etc.),
- Best practices to be put in place (inclusiveness of spaces, diversity of floor coverings, easy-to-maintain layouts, etc.).

4. Exhibition of the preliminary project:

Upon the development of the plan and the prototype of the school specific solution, *present* the project to the school community (i.e. students, teachers, parents, school staff) with the aim of gathering feedback for the refinement of the solution.

5. Deployment:

Monitor and set maintenance plans to ensure the longevity of the green space after its development. In addition, periodical assessments of the uses the green spaces should be conducted to make timely adjustments to the design of the spaces, as well as management or maintenance practices to ensure and enhance the effectiveness and sustainability of the green schoolyard over time.

Case study 'Operation Re-Creation' (Brussels): How is the technical diagnosis performed?

The section will focus on summarising the 'Operation Ré-création' case study conducted in Brussels, Belgium starting 2021, as an attempt to help schools with tacking climate change and establishing a nature-based climate shelter. The section will provide a quick overview and focus on the step of *technical diagnosis*, i.e., identification of needs and resources in the school, as well as definition objectives and relevant stakeholders in the process of implementation in Brussels.

Operation Ré-création is coordinated by Bruxelles Environnement in partnership with Perspective. The project was initiated in 2021 with a selection of 20 schools in Brussels and providing them with funding to create green recreational spaces in their schoolyards. This initiative is undertaken as a response to Brussel's environmental strategies focusing on soil permeability, water management, reduction of heat island effect, reinforcement of the green network (creation of semi-natural habitats), nature awareness & education, well-being of citizens and children.

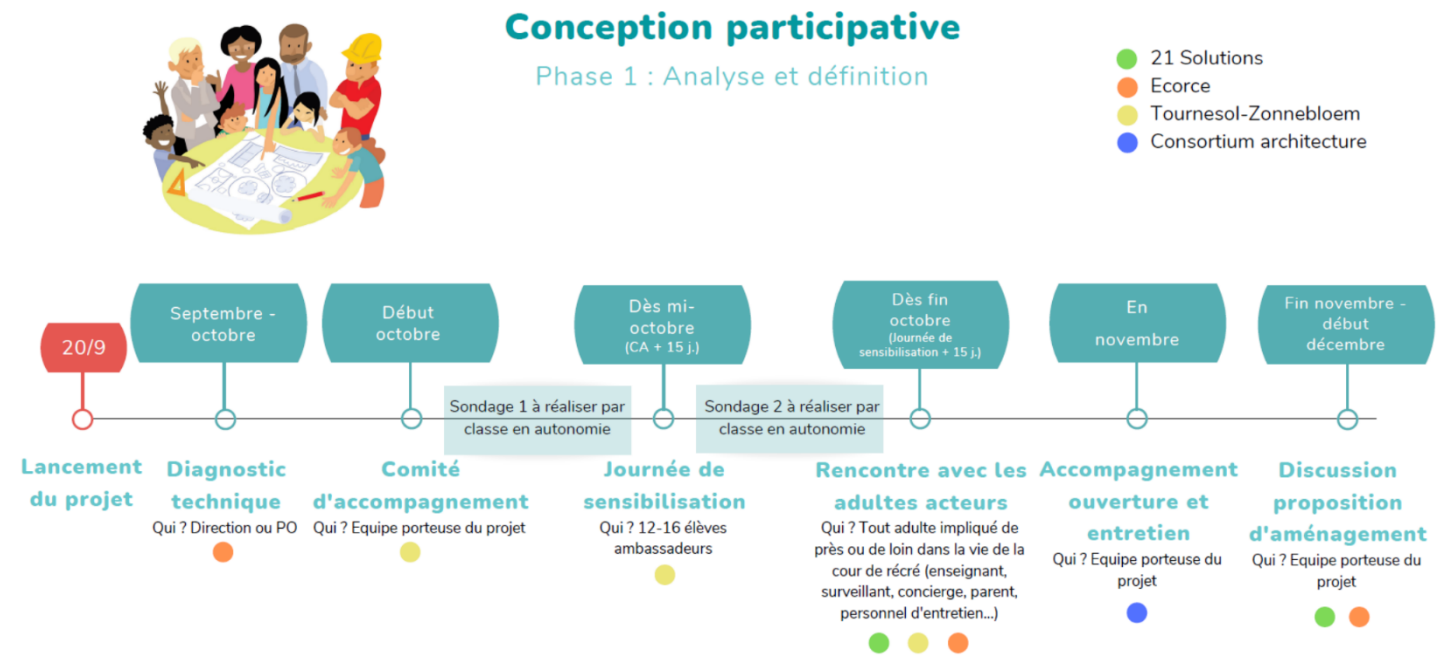
'Opération Ré-création' used a participatory process, involving all the users of the schoolyards in the diagnosis, design, as well as realisation and maintenance of the green schoolyard.

Technical diagnosis

Technical diagnosis refers to assessment of the current condition of the schoolyard or school space that needs greening, to the examination of students' and school staff's needs and perspectives towards the implementation of the NBCSI and urban NBS, as well as to the identification and engagement of relevant stakeholders when gathering input. As a part of Opération Ré-création, school staff assessed:

- Inventory of existing assets (e.g. furniture).
- Inventory of assets (e.g. existing bike corner, defined areas).
- Stress inventory (e.g., extensive tree root system).

- Stormwater management (e.g., standing water, cisterns).



Analysis and definition phase of the development of a green schoolyard in the Case study 'Operation Re-Creation' (Brussels) (2022). Brussels Environment. https://www.bubble.brussels/operation-re-creation-une-conception-participative/.

In addition, the school administration in collaboration with a non-profit organisation that supported the project, established the framework of the project clarifying the school's needs and ambitions, in order to remove any obstacles and develop a plan, specific to the school context. Lastly, the involvement of students in the process was identified. As a part of this stage, a survey was carried out among all students examining their experience, needs and desires in relation to the existing courtyard.

Case study 'Oasis' (Paris): How is the technical diagnosis performed?

The section will focus on the summary of the 'Oasis' case study conducted in Paris, France starting 2018, as another example of an attempt in Europe to help schools tackle climate change and provide a nature-based climate shelter in the school. This section will provide a quick overview and focus on the step of technical diagnosis and involvement of different experts in the co-creation of the solution in Paris.

The 'Oasis' schoolyards project started in 2018, with a total of 101 schools involved in 2022. The project focused on the renewal of the schoolyards with the aim of improving the city's schoolyards thermal conditions, as well as of addressing the lack of green areas within the city, the quality of life and development spaces for children.

As a part of this project, students worked together to decide how they would recreate their playground. Discussions and negotiations between the students were placed at the forefront of these attempts. Students had different ideas on how to make suitable changes in their schoolyard and collaborated on finding a joint solution. Watch the below

video to see how they negotiated this. In addition, pay attention to how the students developed their plans. Each of the students had a hand in co-creating their new playground and learned how to involve various stakeholders in the process.

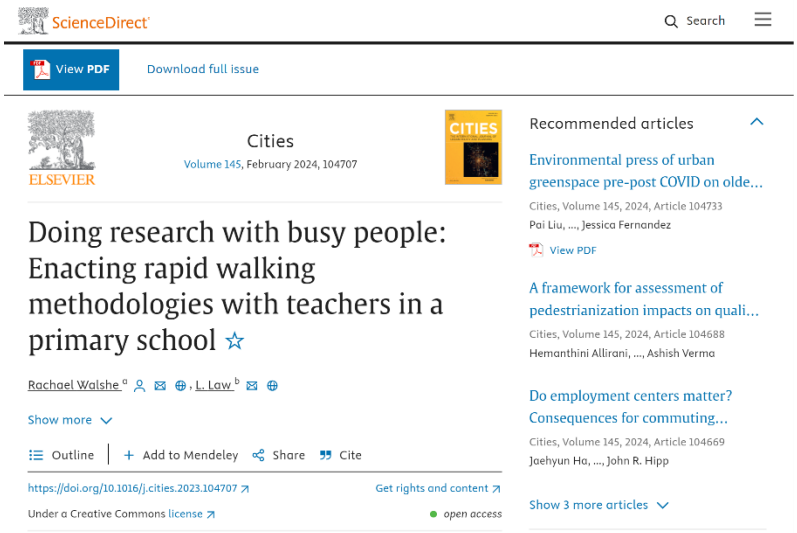
'Empathize' with students

Students are the primary users of all spaces in the schools, thus considering their perspectives could provide an invaluable insight into their needs, preferences, and challenges. In the two case studies we reviewed – those of Brussels and Paris, we can see how students were part of the first stage. The students were able to identify a problem and a solution was slowly discovered. Involving students in this stage of the NBCSI and the design thinking enriches the process. It promotes student agency and empowerment and fosters a culture of empathy and collaboration within the learning community, in addition to enabling the development of more tailored and effective solutions.

Take a moment and watch the below video by M. Mintzer, who talked about how children often see the world differently than adults. In her case, the children helped design a city and the adults used their ideas to make something worthwhile. Find some inspiration on how to most effectively include your students in the research of needs and defining objectives and solutions from this TEDTalk.

Additionally, involving students in the *'Empathize'* stage promotes empathy and understanding among the students themselves, as well as between students and other stakeholders involved in the process. This collaborative approach not only enhances the '*Design'* stage, but also cultivates a positive and inclusive learning environment.

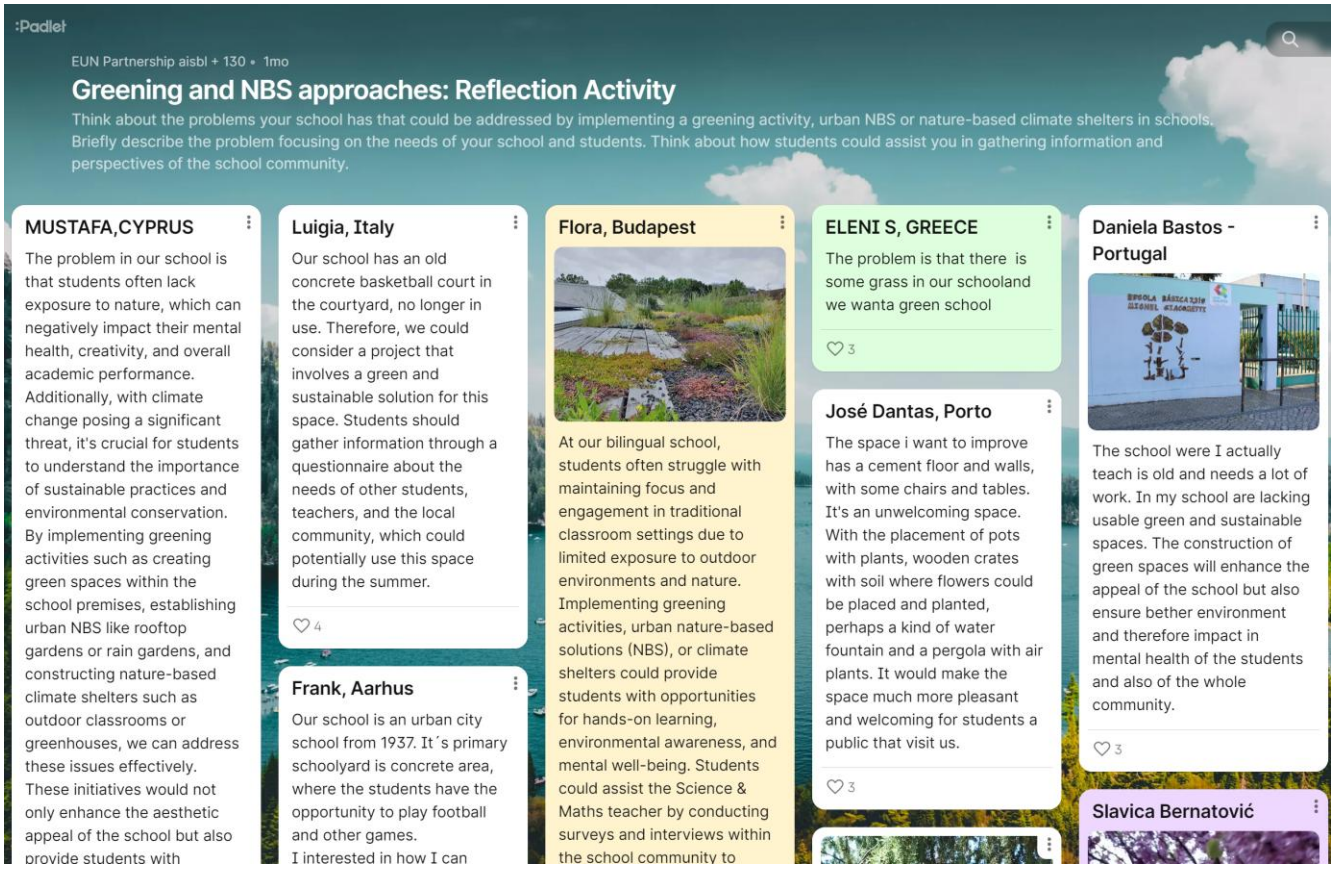
Find more inspiration on how to involve students in the research by exploring the paper below[21].



[21] Walshe, R. and Law, L. (2024) 'Doing research with busy people: Enacting rapid walking methodologies with teachers in a primary school', Cities, 145, p. 104707. Available at: https://doi.org/10.1016/j.cities.2023.104707.

Greening and NBS approaches: Reflection Activity

Think about the problems your school has that could be addressed by implementing a greening activity, urban NBS or nature-based climate shelters in schools. Briefly describe the problem focusing on the needs of your school and students. Think about how students could assist you in gathering information and perspectives of the school community.



2.2 Ideate

Ideate

The next stage of the design thinking process is **Ideate**. The aim here is to interpret the results attained during the *Empathize* stage and generate a wide range of creative solutions, based on the needs and resources previously identified.

In this stage, you, together with your students and other stakeholders, look into what would be the best solution for your school and decide between implementing a NBCSI or an urban NBS greening activity. Encourage your students to think divergently and explore unconventional ideas, while considering the insights gathered in

the *Empathize* stage of the process.

Different techniques are used in this stage to foster creativity and generate numerous ideas, such as brainstorming sessions, sketching and prototyping. It is important to encourage collaboration, experimentation and exploration, which will lead to innovative and effective solutions.

The video below, featuring one of the youngest ever published researchers, provides an example of how students can be included in complex processes.

This project was done by a group of very young researchers who learned about the topic and created a solution.

Involving students in this stage could be beneficial, as they are natural out-of-the-box thinkers who bring diverse perspectives and experiences, which could lead to more relevant and creative solutions. In addition, involving students fosters the sense of ownership and collaboration, as well as the development of transversal skills, such as active listening, problem solving and critical thinking.

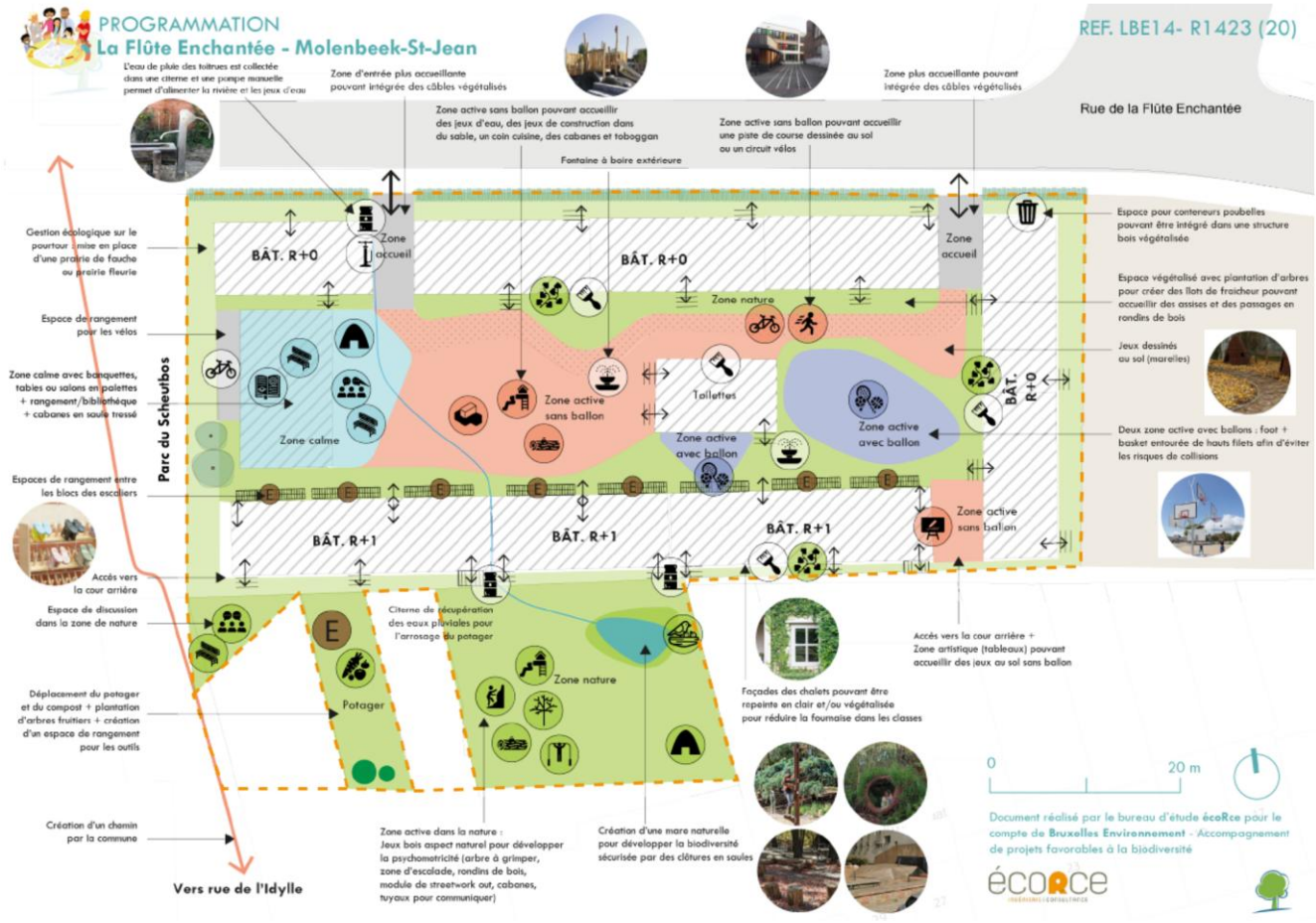
The focus of this stage is to make sense of the research needs, to interpret the results, and brainstorm potential solutions based on the needs, but also on the available resources.

Case study 'Operation Re-Creation' (Brussels): How were proposals developed?

This step of the NBCSI includes the development of the proposals, as well as sketching and committee meetings to agree on the final design of the green space in the school.

As part of the proposal development in 'Operation Re-Creation', a project that started in 2021, a series of *discussions and brainstorming sessions* were conducted between school staff, management, parents and students, during which ideas were discussed. These discussions were based on diagnosing the existing resources

and constraints within the schoolyard, while inspiration was drawn from existing solutions and students' proposals. The experts developed sketches of the new green yard, taking into consideration various constraints of the existing schoolyard, budget, and inclusivity of the space. The plan was then presented to the school, feedback was gathered, and adaptations were made before the development of the preliminary design and the prototype.



Example of a sketch developed by the landscape architects and architects for the purpose greening a schoolyard in the project. Operation Re-creation (2021). https://www.bubble.brussels/operation-re-creation-une-conception-participative/

Case study 'Refugis Climatics' (Barcelona): How to tackle climate change and extreme heat waves in the city?

The Refugis climàtics (Nature-based climate shelters in schools) project was conducted by Barcelona City Council and funded by Urban Innovation Action (UIA), a European Commission programme. The project started in 2019 and its aim was to convert 11 schools, considered vulnerable to heat, into nature-based climate shelters open to the wider community. The transformation included several sets of measures to that allowed the improvement of the schoolyard. Specifically:

- Blue measures (incorporating water points),

- Green measures (spaces for shade and vegetation) and
- Grey measures (insulation, ventilation and shading constructions).

Students were involved in every step of the process, thus were able to provide their insights in designing nature-based climate solutions and evaluate the measures taken.

In addition, 'building upon the Refugis Climatics project, Barcelona City Council launched a new programme for the transformation of schoolyards to improve both the physical spaces towards climate adaptation and the dynamics and relationships that take place there, with the aim of improving equality through the diversification of play activities. The intention of the programme is to turn schoolyards into community facilities accessible to the neighbours (https://coolschools.eu/case-studies/).

Case Study 'Groenblauwe Schoolpleinen' (Rotterdam): How to ideate?

The 'Groenblauwe Schoolpleinen' (GREENBLUE SCHOOLYARDS) project was initiated in 2019 by the Rotterdam City Council, as part of the "green-up the city" and the "Rotterdam Weatherwise" climate adaptation programs. The aim of the action was to improve and green schoolyards of primary schools in the city, making them more green- and climate-proof, so they become an oasis of can play and learning in a natural environment.

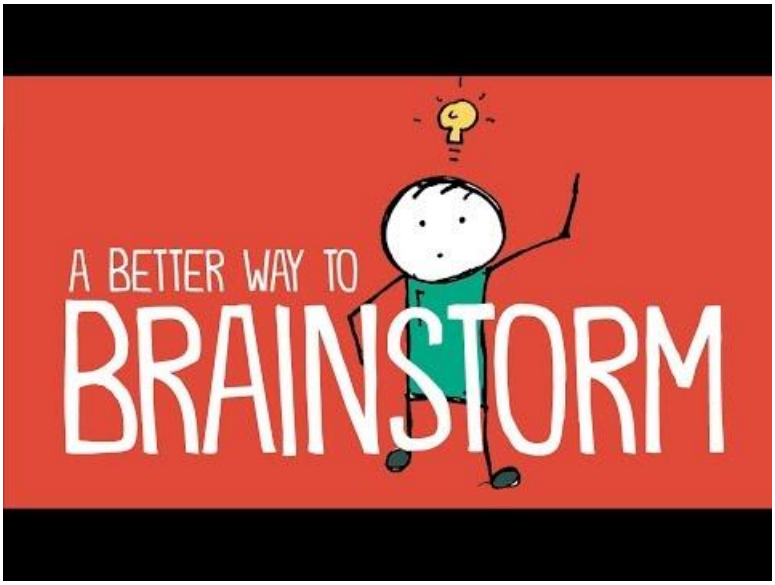
'Besides the physical transformations of schoolyards, the pilots serve as a trigger to explore the possibility that green/blue schoolyards are accepted as a common measure in housing and new construction at the level of public policy.' (https://coolschools.eu/case-studies/)

Inspiration for action: https://www.groenblauweschoolpleinen.nl/inspiratie-voor-maatregelen/

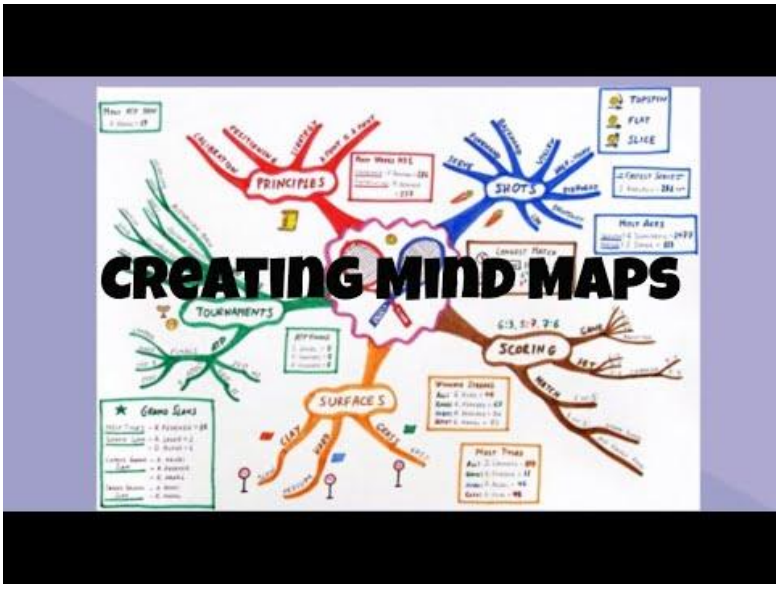
'Ideate' with students

Implementing the *'Ideate'* stage of design thinking process with students includes facilitating creative brainstorming sessions and providing tools and resources to inspire innovative thinking. Some of the methods for conducting the ideation are:

- **Brainstorming Sessions**: conduct small-group brainstorming sessions, where students can freely and collaboratively come up with ideas and share them. Encourage them to think creatively and avoid judgment.



- **Mind Mapping:** encourage students to visually represent their ideas and to explore connections between them.



- **Prototyping Tools:** Prototyping allows students to quickly bring their ideas to life and test their feasibility. Encourage students to use prototyping tools, such as paper, cardboard, or digital platforms, e.g. Tinkercad or Canva.

The key to the *Ideate* stage is peer collaboration. Students should be encouraged to build upon each other's ideas, provide constructive criticism, and refine their concepts collaboratively.

By incorporating these methods, you can effectively facilitate the *Ideate* stage, while fostering creativity, collaboration, and innovative problem-solving skills.

2.3 Practical advice

How to engage students in the design thinking process and NBCSI?

Here you can find three examples of Learning Scenarios[22] developed with the objective of introducing green-space learning activities to primary or secondary students.

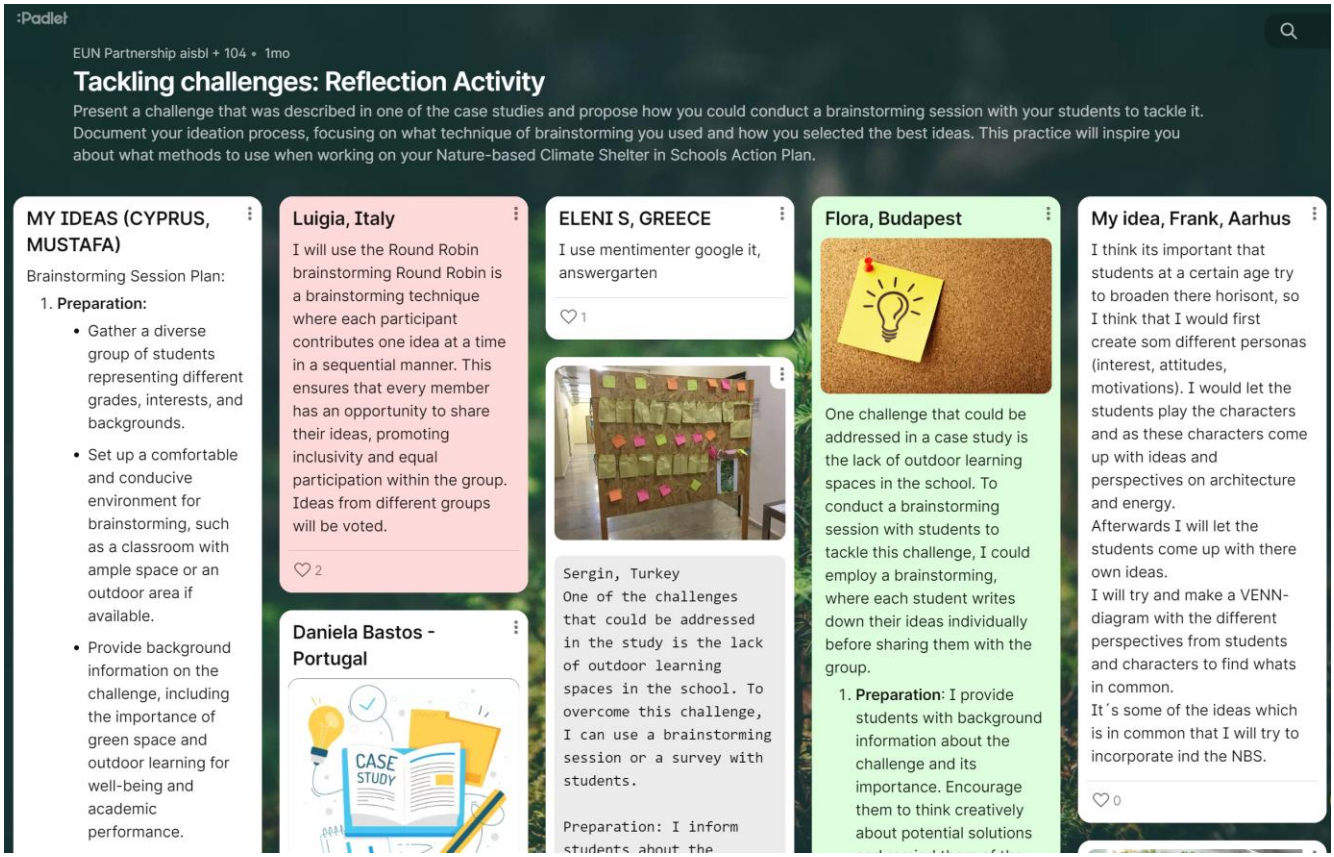
- Koc, A. (2020). *A Green School is a Healthy School.* https://www.scientix.eu/resources/details?resourceId=28164

[22] *A Learning Scenario is a stand-alone description of educational activities to be carried out in classroom connected to a specific topic, including objectives, pedagogical methodologies, duration, target age, etc. The different parts of the Learning Scenario include but are not limited to: title; abstract; licenses; curriculum integration; aim of the lesson; outcome of the lesson; relevant educational trends; 21st-century skills; activities; assessment.

- Thoma, R. (2020). *The traveling foxes.* https://www.scientix.eu/resources/details?resourceId=28161
- Devernay Cimic, I. (2020). *Sustainable Architecture*. https://www.scientix.eu/resources/details?resourceId=129917

Tackling challenges: Reflection Activity

Present a challenge that was described in one of the case studies and propose how you could conduct a brainstorming session with your students to tackle it. Document your ideation process, focusing on what technique of brainstorming you used and how you selected the best ideas. This practice will inspire you about what methods to use when working on your Nature-based Climate Shelter in Schools Action Plan.



2.4 Module Summary

Module Round-up

Drag and Drop

PROBLEM

Connect the activities conducted in the first two stages of the design thinking process.

Work on your Nature-based climate shelters in School Action Plan (I)

As previously explained in Module 1, to pass the MOOC, you will need to **create** a Nature-Based Climate Shelter in School Action Plan using the provided template , as well as **provide feedback** on two other participants' plans using the Action Plan Rubric.

It is now time to start work on your first ideas about you own Nature-Based Climate Shelter in School Action Plan.

Here is your Task:

Start filling in the template for your Action plan by focusing on the 'Empathize' and 'Ideation' stages of the Design thinking process (go to *Part II: Overview of Action with student participation*). Your goal is to turn your schoolyard into a nature-based climate shelter. At the moment, you will focus on the first two stages of your project. Remember to think of ways to include your students in every step of this process.

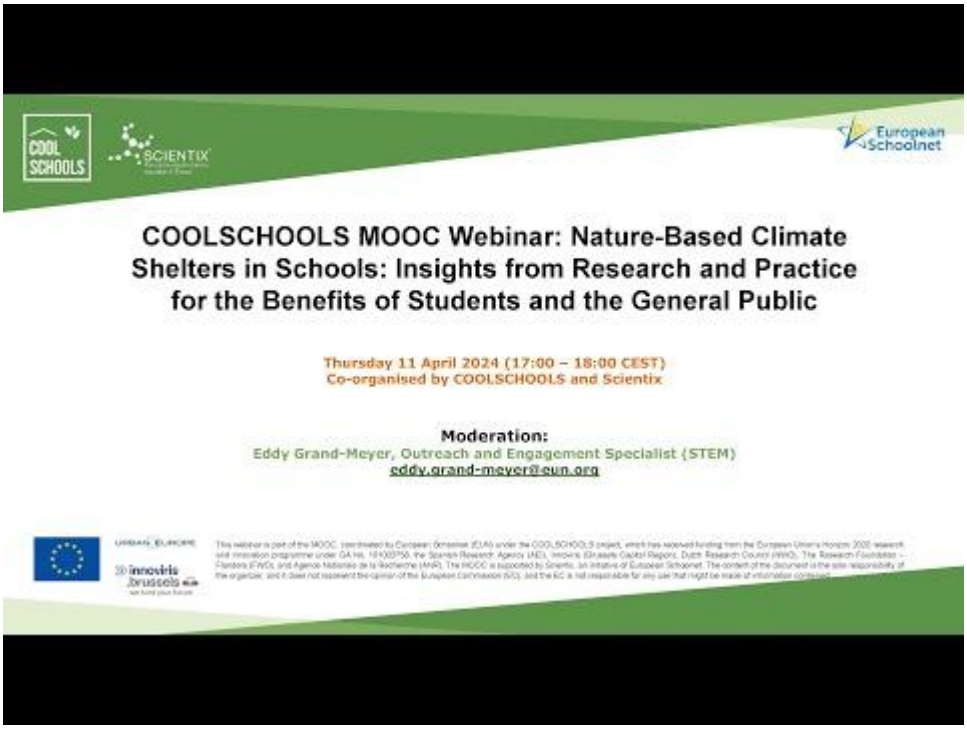
2.5 Live Event: Webinar

Webinar

Webinar: Nature-Based Climate Shelters in Schools: Insights from Research and Practice for the Benefits of Students and the General Public

Date: Thursday, 11 April, 17:00- 18:00 CEST

Recording[23]:



You can also access the full presentation here[24].

[23] Recording available at: https://www.youtube.com/watch?v=JPZ3e297Tqg

[24] Access the presentation here:

In this COOLSCHOOLS webinar, organised in partnership with Scientix as part of the COOLSCHOOLS Massive Open Online Course, we will provide a brief introduction to the project and an overview of the results of the research conducted to re-emphasise the importance of quality environmental education and the crucial role that **nature-based climate shelters** can play in supporting it. We will explore the benefits of nature-based climate shelters to offer equal access to green spaces to all students, and the best practice for the meaningful involvement of all stakeholders and actors in the implementation and long-term maintenance of a nature-based climate shelter.

Francesc Baró

Francesc Baró is an (urban) environmental scientist. His research is motivated by making cities inclusive, healthy, resilient and sustainable. In order to understand the complexity of urban social-ecological systems, he conducts applied research at the interface of urban ecology, urban geography, urban planning and ecosystem service science. His interdisciplinary research approach combines geospatial modelling, advanced quantitative and qualitative data analysis and participatory methods. He serves as advisor for local and metropolitan governments and other organizations and has been involved in several international research projects on urban ecosystem services, green infrastructure and nature-based solutions. Currently, he is the co-coordinator of the COOLSCHOOLS project (www.coolschools.eu), focused on nature-based solutions in school environments.

Elsa Gallez

Elsa Gallez is a PhD candidate at the Geography Department of the Vrije Universiteit Brussel (VUB). She holds an MSc in Urban Environmental Management from Wageningen University and Research (WUR) and a BSc in Geographical Sciences from the University of Namur (UNamur). Her doctorate is part of the COOLSCHOOLS project, funded by the European Union's Horizon 2020 programme, and examines school-related socio-environmental inequalities in the four cities of the project, with Brussels as the main case study.

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Filka Sekulova

Filka Sekulova is a senior researcher at the IN3 institute, (Universitat Oberta de Catalunya), and part of the Urban Transformation and Global Change Laboratory. Her work is placed at the intersection of (ecological) economics (PhD, MS, BS), psychology (BS), and social sciences, with focus on de/post-growth and urban greening, through the perspectives of justice, community organizing and subjective well-being. Filka is an affiliated member of the Barcelona Lab for Urban Environmental Justice and Sustainability.

Connection details

These events will take place via Microsoft Teams meeting. You can join a Microsoft Teams meeting by using an invite link which will be shared with you before the event. You can then launch or download the Teams app, or simply join using your web browser (no download required). The easiest way is to join anonymously (no account or sign in required).

Alternatively, if you have an educational license, you can sign into your Microsoft account. Here, you can find more information on how to join a Microsoft Teams meeting. As an attendee of a meeting in Teams, you can watch live events and participate in the moderated Q&A, but you cannot share audio or video.

Before watching a live event, **make sure your browser allows third-party cookies**. You can ensure your browser supports Microsoft Teams and Microsoft Azure Media Player.

Please note that this Microsoft Teams service allows audio and other information sent during the session to be recorded, which may be discoverable in a legal matter. By joining this session, you automatically consent to such recordings. If you do not consent to being recorded, discuss your concerns with the host or do not join the session.

The recording will be shared in the current section shortly after the event.

2.6 Module Round-up

Summary

Great work! We have made it through Module 1

In the next module, we will explore the first steps in the planning of a **Nature-Based Climate Shelter Intervention (NBCSI)**, though the perspective of the design -thinking process.

- You have learnt how to define and recognise urban NBS and NBCSS while reviewing state-of-the-art knowledge about the two concepts.
- You now know how to classify the health and cognitive benefits of NBCSS for students by exploring the implications of implementation of concepts.
- You learnt how to recognize the environmental and biodiversity benefits of NBCSS and urban NBS through a review of current research on the topic.

- You can now recognize the social benefits of NBCSS and urban NBS for students and the wider community through the methodical analysis of state-of-the-art of research and practices of implementing the concepts.
- You became familiar with the peer-review activity.

Next module starts on Monday. Keep up the good work!

MODULE 3: EXPERIEMENT AND EVOLVE

3.0 Module Introduction

About this module

What to expect from to Module 3?

During this module, you will be introduced to the next steps in the development of nature-based climate shelters and see how they were implemented as a part of case studies in Spain, the Netherlands, Belgium, and France. **This module will focus on** the *'Experiment'* and *'Evolve'* stages of the design thinking approach, and how they can be used in the implementation and designing of your own nature-based climate shelter.

The focus will be on developing and testing a scaled-down version of your suggested solution, as well as on working on continuous refinement efforts. Based on the received feedback you will attain; you will need to finalize the proposed solution. In addition, you will be presented with different possibilities and activities to involve the students in each stage.

Therefore, by the end of this module you will be able to:

- **Deepen** your understanding of the *design thinking approach* and how to **develop** *nature-based climate shelter interventions* by comparing their implementation in selected studies.
- **Get inspired** and plan various ways to implement the *Experiment* and *Evolve* stage of the design thinking approach in your case by exploring selected case studies and resources.
- **Consider** challenges, common in transforming a schoolyard into a nature-based climate shelter, think of possible solutions and make connections to your own case by reflecting on the practised evidence of selected case studies.
- **Brainstorm** ways to include students in the stages of *Experiment* and *Evolve* by browsing through resources and taking inspiration from selected case studies.
- **Develop** a plan on how to implement the stages of the design thinking approach and NBCSI development with students, by working on your Nature-based climate shelter in schools Action Plan.

Ready to start? Click on "Next"

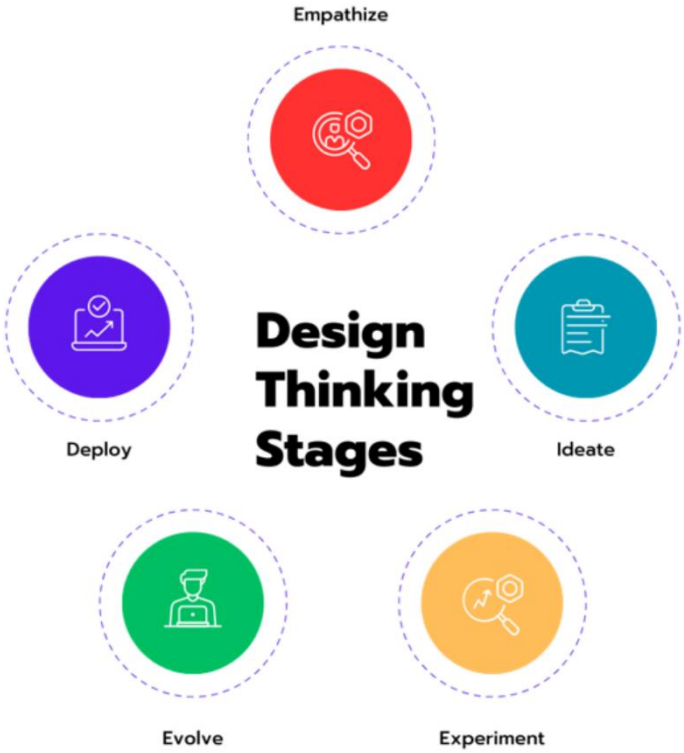
3.1 Experiment

Experiment

What a journey it's been! After having gained insights into the needs of all parties involved in making a nature-based climate shelter in your school a reality, and after having brainstormed creative solutions to specific challenges and problems that were identified, you are now ready for the next stage. Welcome to the **Experiment** stage.

In this stage, you will **dive into and explore scaled-down versions** of potential NBCSI to your identified problems and challenges, creating in this way a **first version** of your nature-based climate shelter. These scaled-

down versions will test the solution's effectiveness in addressing the identified needs and feasibility based on available resources. Your work in the *Experiment* stage will help you validate assumptions, test hypotheses, and gather real-world feedback before committing to full-scale implementation. Moreover, your practices during this stage will cultivate a culture of learning and adaptation within your school community!



The stages of the Design thinking process. Infographic created by COOLSCHOOLS, 2024.

Concerning the scaled-down NBCSI, **there are a lot of options to choose from, depending on the needs of all stakeholders involved** (e.g., municipality representatives, funding bodies, parents, teachers, students, headmasters, school administration staff, experts, etc). For instance, you might choose to create **physical models**, **digital simulations**, or even **mock-ups** of the proposed interventions in the schoolyard. Additionally, some other ideas to consider when planning the scaled-down versions of your solutions can be to:

1. **Create** scaled-down versions of your solutions that are quick to develop and do not require a lot of resources (e.g., maquettes, paper or digital designs).
2. **Use** a nature-based learning station in the schoolyard to assess the effectiveness of certain elements of your solutions, e.g., their capacity to engage students and promote environmental education.
3. **Test** different parts of the solution that are easy to prepare/construct.

Conduct trial runs of educational programs or activities centred around the schoolyard's natural features, to evaluate their educational value and appeal to students.

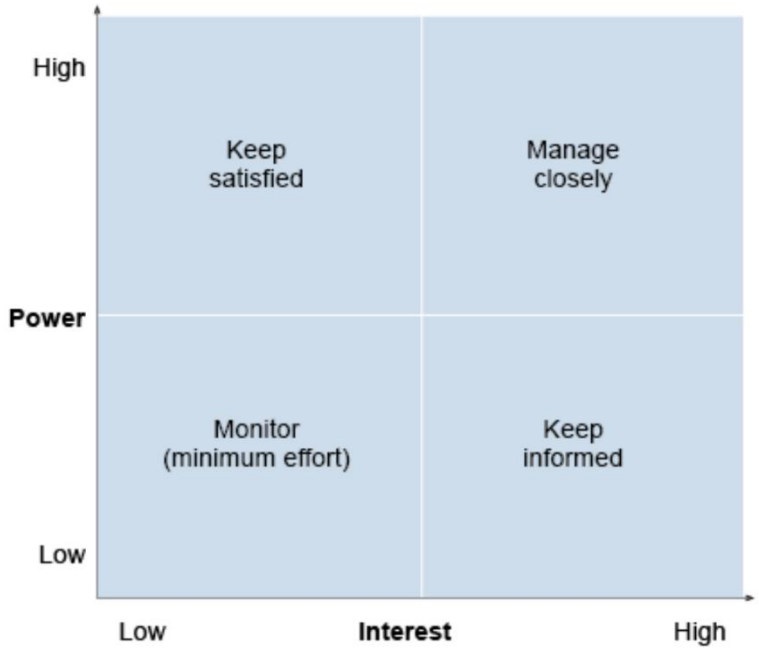
Stakeholders and Available Resources

A step further into the *Experiment* stage, it is essential to consider the stakeholders involved in transforming your schoolyard into a nature-based climate shelter as the embodiment of all solutions for the problems and challenges identified in your schoolyard. **By engaging municipality representatives, funders, parents, teachers, students, headmasters, school administrative staff, and experts, you ensure that your solutions are inclusive.**

By incorporating their perspectives and identified needs and depending on the testing done during the *Experiment* stage, your NBCSI can either ***strengthen*** from essential feedback, ***change*** to adjust to newly identified needs or completely ***dissolve***, starting a new process by following the stages of the design thinking approach from the beginning.

A good tool to identify and monitor stakeholders is the "Power and Interest" grid. Imagine two axes: one showcasing the extent of Interest (x) and one that of Power (y). There are four possible quarters where you can place your stakeholders:

- High power and low interest = **monitor** these stakeholders.
- High power and high interest = **keep** them **satisfied**.
- Low power and high interest = **keep** them **informed**.
- High power and high interest = **manage** them closely.



Power and Interest grid (Freeman, 1984).

Keep in mind that how you allocate your stakeholders across the quarters of the "Power and Interest" grid will be determined by **various factors**, such as your **available resources**, the **resources** that are **needed**, **level of involvement** as well as factors of **legitimacy**, **urgency**, and **power** [salience model by Mitchel, Angle & Wood

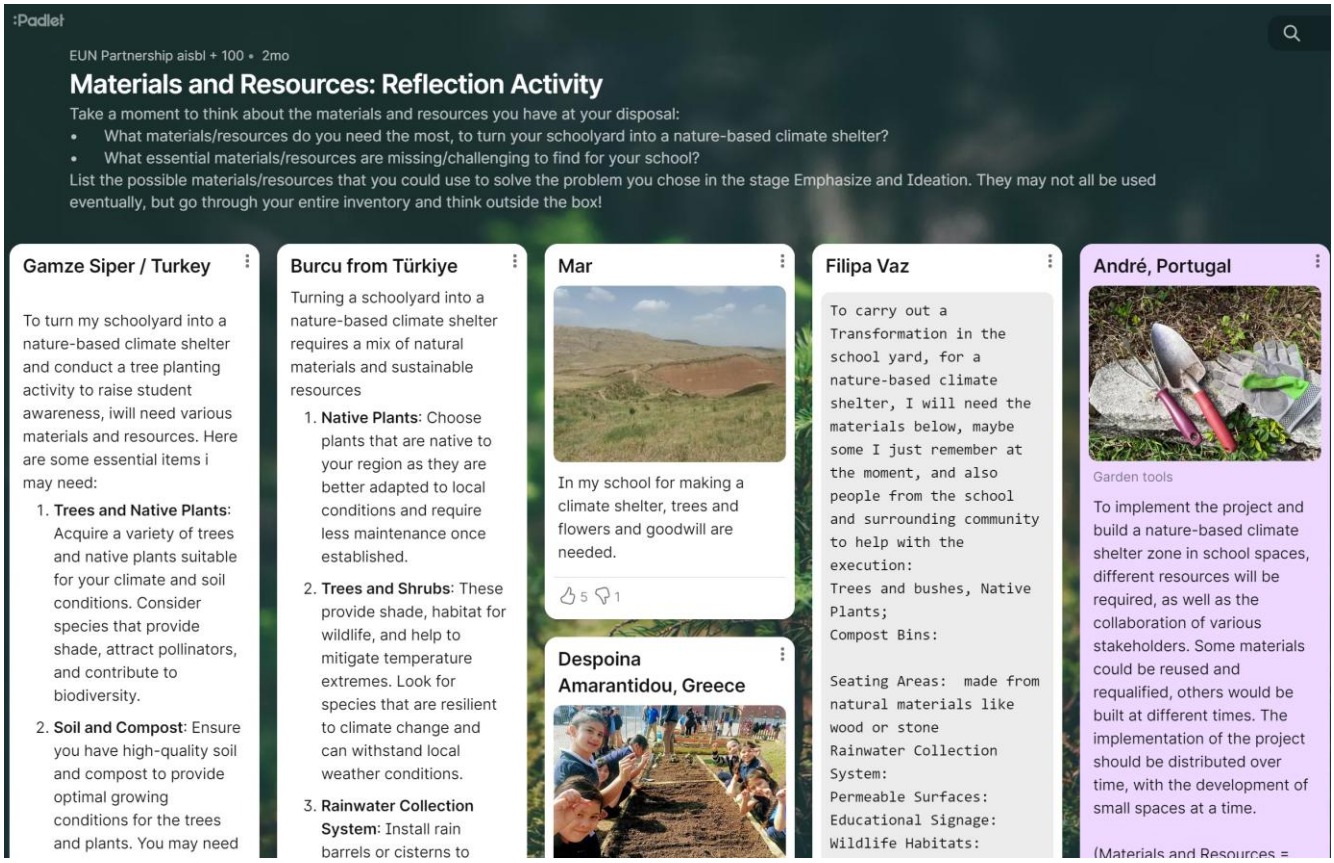
(1997)[25].

Materials and Resources: Reflection Activity

Take a moment to think about the **materials** and **resources** you have at your disposal:

- What materials/resources do you need the most, to turn your schoolyard into a nature-based climate shelter?
- What essential materials/resources are missing/challenging to find for your school?

List the possible materials/resources that you could use to solve the problem you chose in the stage *Emphasize* and *Ideation*. They may not all be used eventually but go through your entire inventory and think outside the box!



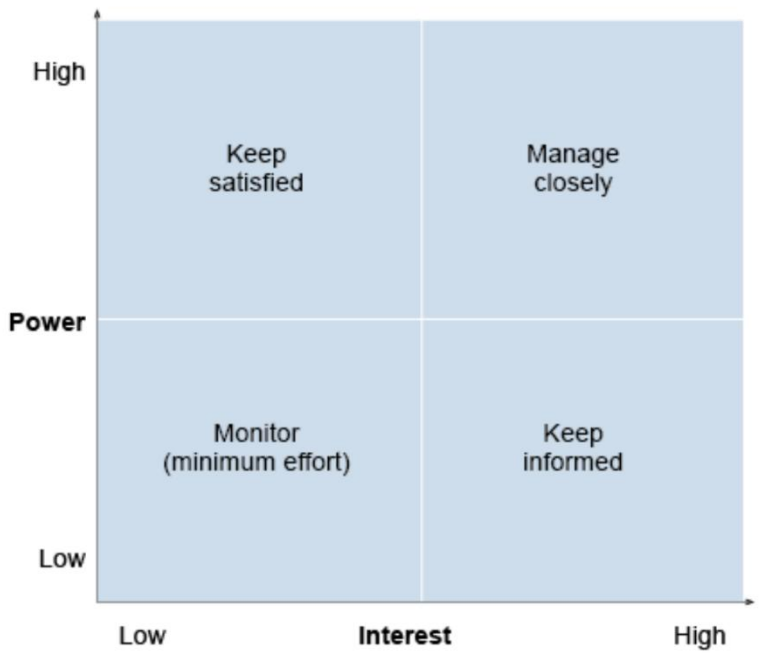
[25] Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. Academy of management review, 22(4), 853-886.

Work on your Nature-based Climate Shelter in School Action Plan (II)

Now that you have a better idea about the materials needed for your next steps, it is time to consider more carefully what stakeholders you will try to address with your scaled-down NBCSI. This will determine how you will shape the next stages of the design thinking approach. To complete this task, open your Nature-based Climate Shelters in School Action Plan go to *Part I: Overview of Planning*, and focus on *Step 4*. Feel free to use the Power and Interest Grid below, as well as the following questions for help:

What stakeholders have:

- High power and low interest? => monitor these stakeholders.
- High power and high interest? => keep them satisfied.
- Low power and high interest? => keep them informed.
- High power and high interest? => manage them closely.



Power and Interest grid (Freeman, 1984).

Case study 'Operation Re-Creation' (Brussels): What can the stage Experiment look like?

Delving further into the case study *'Operation Re-creation'*, can give you more practical information about how the *Experiment* stage was carried out. **Exploring different examples for this stage can trigger your own ideas when you completing your Nature-Based Climate Shelter in Schools Action Plan.**

In 'Operation Re-creation', from the first stages of the transformation, the responsible individuals included and consulted all those connected with the schoolyard, valuing each contribution. Students in specific, were put at the

center of all approaches in an age-appropriate manner and were considered a central collaborator in all of the following scaled-down versions of their final solutions.

To begin with, they organised a **student awareness day** with representative students from all grade levels participating in the organising phase. During this day, the responsible individuals prepared specifically designed **activities** and **stations** that made possible the testing of different ideas/solutions to the problems identified in the *Emphasize* and *Ideate* stages. These activities focus on testing green games, soil permeability, comfort with heat/cold conditions in specific areas, and brainstorming possible improvements by showcasing other case studies. Students eventually came up with concrete feedback about what worked and what didn't, allowing for meaningful alterations. Later, an **activity log** was co-created, including all parties' reflections.

Follow this link to explore the project's participatory design, and specifically Step 3,4,5 and 6: Operation Re-creation: a participatory design

Additionally, check out the **Guidelines on transforming schoolyards in the region of Brussels**. The Guidelines were written by the entities working on 'Operation Re-creation' project, such as AAC Architecture, OMGEVING, 21 Solutions, along with various other individuals and departments at Brussels Environment and Perspective Brussels. Focusing on the **"Four Stages to designing a playground in the Brussels Region"** will give you ideas about the Experiment Stage and how to involve your students in an efficient way.

Revamping Playgrounds

To refresh your memory about the 'Operation Re-creation' project do visit the project's website *or revisit the information shared about it in Module 2 (2.1.4 and 2.2.2).*

Case study 'Oasis' (Paris): How can we move past failures?

Exploring how the *Experiment* stage was carried through in the 'Oasis' (Paris) case study **is a great opportunity to see what can happens when tested scaled-down versions of NBCSI fail.**

Initially, apart from including students' ideas, needs and suggested solutions, the organisers of this project asked them to create maquettes of their ideal nature-based climate shelter. Moving forward, they also began the construction and implementation of their plans.

As the first iteration failed, the project started looking outwards for new ideas and approaches. Check out the following video to see the Project 'Oasis' (Paris) trip to Brussels on how they implemented their nature-based climate shelter.

Essentially, the 'Oasis' (Paris) case study was able to get back on track through the simplest solution - **brainstorming** with like-minded individuals, **talking inspiration** from their experiences, already tested practices, as well as feedback and **building** upon their shared vision!

As a schoolyard's transformation is not an easy feat, various aspects could go wrong. This intensifies the

importance of the *Experiment* stage.

A good idea moving on, would be to consider the *Recommendations* booklet created by 'Oasis' (Paris) project. In this booklet, you will find a lot of considerations to keep in mind when planning your *Experiment* stage. Additionally, since the design thinking approach is not linear, but allows for meaningful re-examination of previous stages, the recommendations provided in the booklet can give you more ideas.

Recommendations booklet for transforming schoolyards

To refresh your memory about the 'Oasis' (Paris) project, visit the project website *or revisit the information shared about it in Module 2 (2.1.5).*

'Experiment' with students

In each of the case studies, students were involved actively in every stage of the *design thinking approach*. From deciding which problem to focus on, to coming up with solutions to their problems and going on to testing different scaled-down version of their solutions, students can have meaningful contributions.

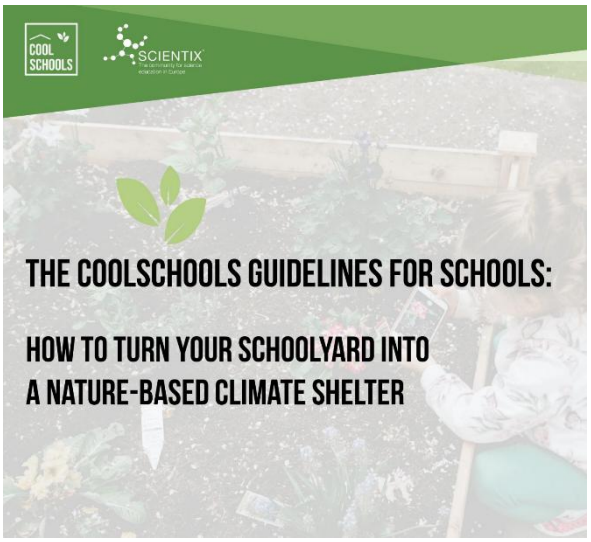
Through the *Experiment* stage, students can bring **fresh perspectives**, **creativity**, and **enthusiasm** to the process, making valuable contributions to the planning. Additionally, involving students fosters a sense of **ownership** and **empowerment** in them, as they have the opportunity to play a direct role in shaping their learning environment. Concerning more practical suggestions, looking back at the presented case studies can be a good way to start!

The COOLSCHOOLS Guidelines

As things are getting more "hands on" during the *Experiment* stage, the **COOLSCHOOLS Guidelines for turning schoolyards into a nature-based shelter** could prove to be a valuable resource.

The Guidelines' aim is to help schools, and more explicitly teachers and educators, to understand what they need to do to coordinate this type of transformation. Equipped by the practical experiences from the case studies that we have been exploring in this MOOC, they also share new evidence, tools and insights on the critical capacities that enable a transformation that is nature-based and inclusive for all.

- Relevant specifically to the *Experiment* stage, are the **practical steps for starting the process** (p.15).
- Pay attention on the outline that was followed in most case studies and focus on the **Design phase** (p.18).
- Finally, do explore **the most common challenges and troubleshooting tips** (p.20).



The COOLSCHOOLS Guidelines for Schools: How to turn your schoolyard into a nature-based climate shelter

Main challenges in the Experiment stage

One of the *Experiment* stage's main challenges is the **potential failure** of the adopted scaled-down versions of your NBCSI after testing them, and potentially **overlooking** students' contributions.

Since an image is worth a thousand words, let us take Ashton Cofer as an example. He and his team of student scientists saw a problem, came up with a solution, and… failed quite a few times. While this is not the ideal way that an experiment should go, he and his team carried on and diagnosed what went wrong. Check out his TEDTalk to see how Cofer and his team adjusted their plans.

In the end, a good approach to have in mind is to strive for **resilience** and **learning from mistakes**, things that go wrong, and from failures. As for including students, Ashton Cofer set the best example of how children can exhibit what it takes to lead to sustainable solutions!

Inventory of Challenges and Risk Factors: Reflection Activity

It is time to envision what the *Experiment* stage of the design thinking process could look like in your case. Use the padlet to write down your ideas concerning the main challenges that you could face, as well as solutions to tackle them.

Even though some challenges are relevant to other stages of the design thinking approach**, it is in the *Experiment* stage that you will experience their impact.**

For this activity, you will need to:

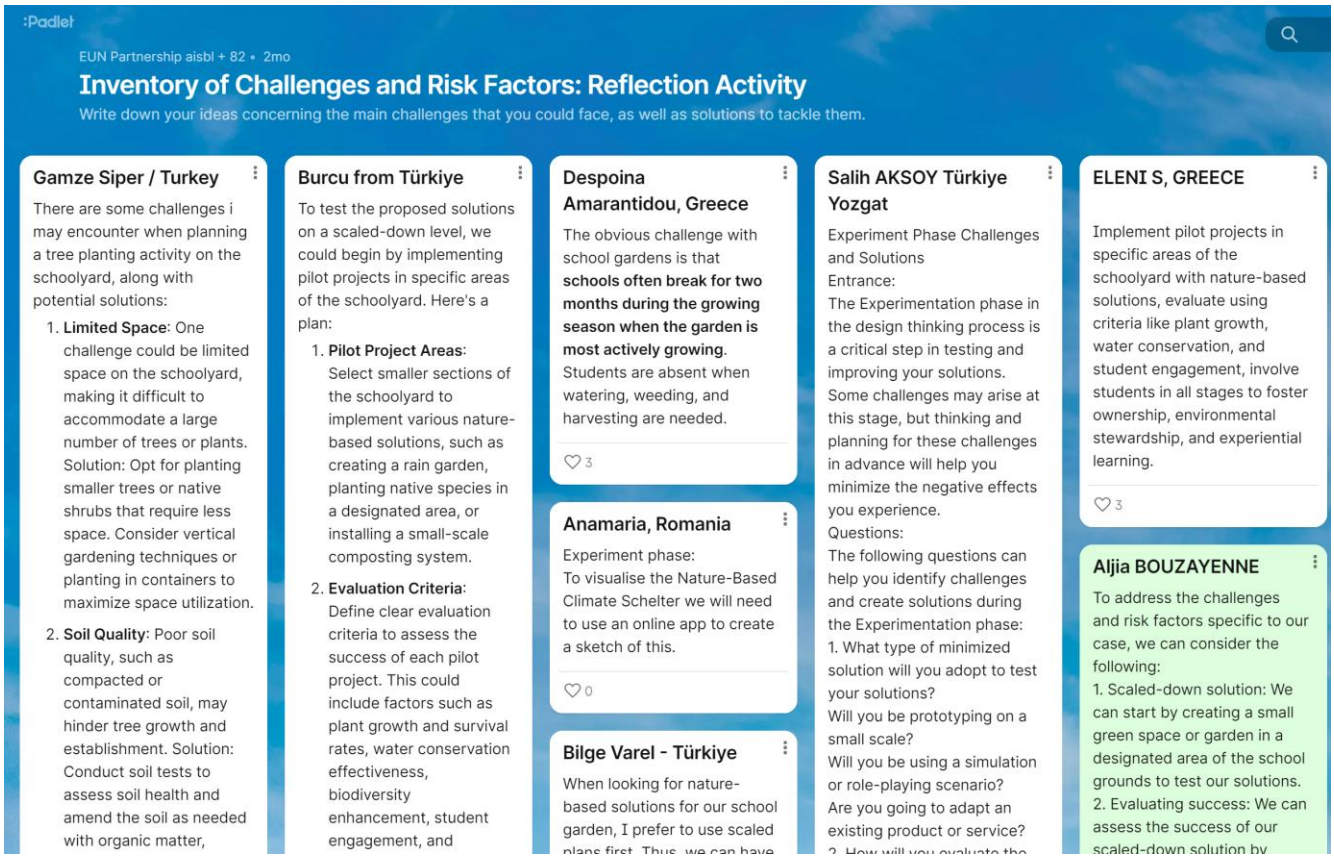
- **Elaborate** on your **initial reflections** for the *Emphasize* and *Ideate* stages from your Nature-based

Climate schelters in School Action Plan.

- **Consider** what you have learned about the **common challenges** of turning a schoolyard into a nature-based climate shelter from the COOLSCHOOLS Guidelines for Schools.
- **Browse** through other teachers' and educators' **responses** on a similar task (Activity 2) COOLSCHOOLS (padlet.com).
- **Come up** with an **inventory** of challenges/risk factors and solutions specific to your case.

You can use the following questions to navigate your thinking:

1. What type of scaled-down solution are you going to adopt to test your solutions?
2. How are you going to evaluate the success of your scaled-down solution?
3. What challenges/risk factors might appear during the planning of the scaled-down solution and its testing?
4. What solutions do you think you could put in place as a "safety net" in this process?
5. How are you going to include your students in this process (i.e. ask them to act as test-subjects, co-create the testing criteria, etc..)?

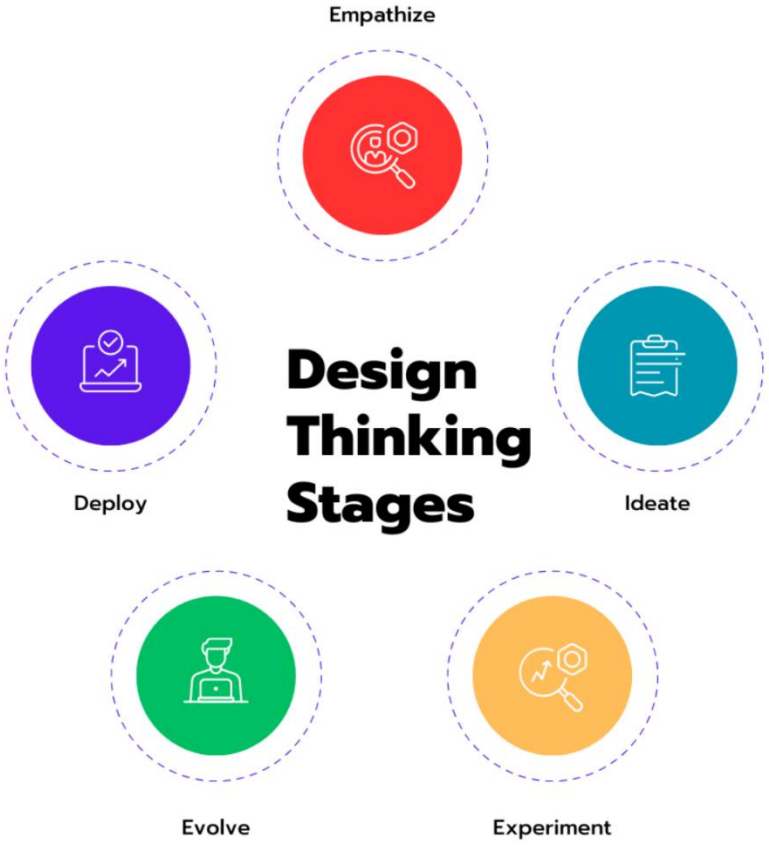


3.2 Evolve

Evolve

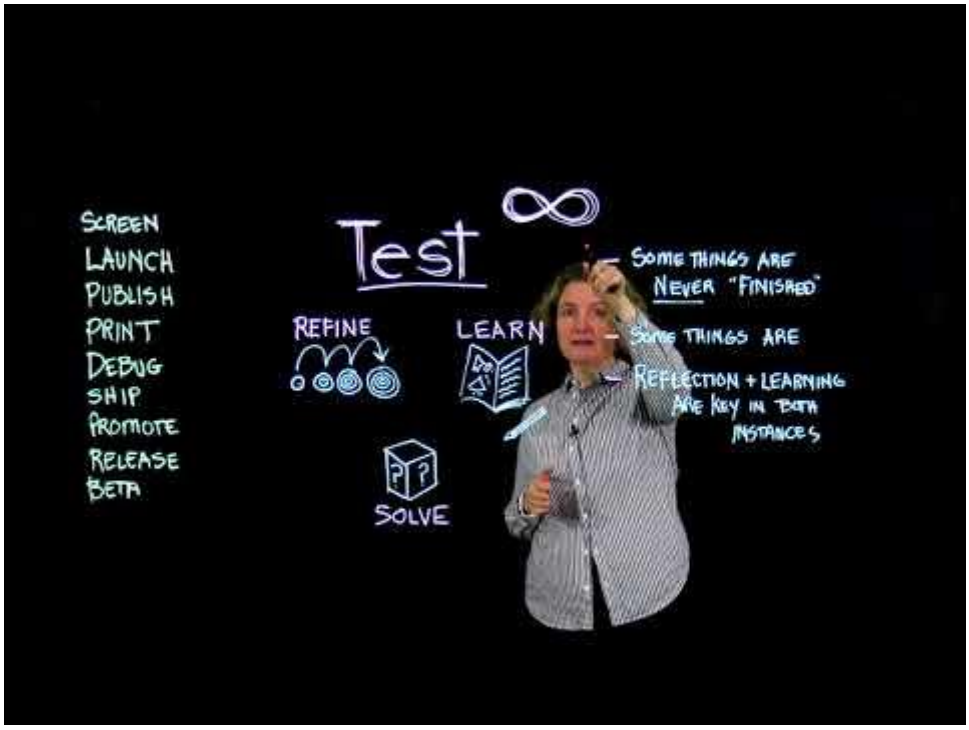
After testing your scaled-down version of your NBCSI and gathering insights, feedback and ideas for possible changes and modifications, you will gradually move on to the ***Evolve*** stage.

This stage is the middle ground between the testing period and the official deployment into the real-world context. Think of this stage as the period, where you use all feedback you gathered from the *Experiment* stage, to take actions accordingly to refine your nature-based climate shelter. In each modification, more testing should follow, beginning in this way a circle of feedback and improvement.



The stages of the Design thinking process. Infographic by COOLSCHOOLS, 2024.

To get another perspective about the *Evolve* stage and what it entails, reflect on this video below. The speaker is analysing the 'Testing' stage of the design thinking approach. **Remember that depending on the field of work and problem at hand, the stages can take different names**. You can think of the video's 'Testing' stage however as what we have defined in our MOOC as *Evolve* stage.



During the *Evolve* stage, by ensuring that your NBCSI are continuously refined and improved based on the provided feedback, you will be able to increase your nature-based climate shelter's effectiveness and impact.

Case Study 'Groenblauwe Schoolpleinen' (Rotterdam): What makes an effective Evolve stage?

To deepen the connections to the case studies presented in the MOOC, let us go back to the 'Groenblauwe Schoolpleinen' (Rotterdam) project and see how it connects to the *Evolve* stage.

Based on practiced experiences, the project has created a 'step-by-step' plan with many ideas on how to take on the task of building a nature-based climate shelter. **In fact, steps 3 and 4 could perhaps inspire your practices in the *Evolve* stage.**

Another green schoolyard?

Additionally, thinking about ways you can further test the feasibility of your planned NBSCI, try evaluating based on some of the **suggestions in the project's activity log**.

Lesson Packages

By incorporating a variety of activities and testing sessions during the *Evolve* stage, you are enhancing the feedback loop and its significance in shaping a successful final product. Engagement opportunities should be your priority in this stage. In particular, activities allowing for students' participation, can lead to first-hand feedback from them and become meaningful observation points from you and the other stakeholders.

To refresh your memory about the 'Groenblauwe Schoolpleinen' (Rotterdam) project, visit the project's *or revisit the information shared about it in Module 2 (2.2.4).*

Case study 'Refugis Climatics' (Barcelona): What is another benefit of the Evolve stage?

Let us go back to the 'Refugis Climatics' (Barcelona) case. To successfully transform 11 schools considered vulnerable to heat into climate shelters, the project placed significant emphasis on the *Evolve* stage.

By meticulously refining solutions based on insights gained throughout the process, they ensured that the interventions effectively addressed the unique needs of each school community. As a result, they compiled a comprehensive booklet of Good Practices, showcasing successful approaches and lessons learned. **This booklet serves as a valuable resource for inspiring and guiding future initiatives, providing practical insights and evidence-based strategies for creating resilient and sustainable school environments.**

Good Practices Project Refugis Climatics

To refresh your memory about the 'Refugis Climatics' (Barcelona) project, do visit the project's website *or the information shared about it in Module 2 (2.2.3).*

'Evolve' with students

In retrospect, based on the practices in the case studies, involving students in the Evolve stage proved valuable for several reasons:

- Their first-hand experiences and perspectives provided unique insights into the effectiveness and feasibility of the solutions, ensuring that they were truly **student-centered and relevant**.
- Students' active participation fostered a sense of **ownership** and **empowerment in them**, inspiring greater engagement and commitment to the project outcomes.
- Collaborating with students helped cultivate a **culture** of **innovation and co-creation in the school**, resulting in more creative and impactful solutions.
- Lastly, by including students in the Evolve stage, the projects not only enhanced the quality and relevance of the interventions but also **empowered students** to be agents of positive change in their school communities.

These are only some of the reasons why students can be great collaborators in this stage too. To support this point even further, let's explore the video below.

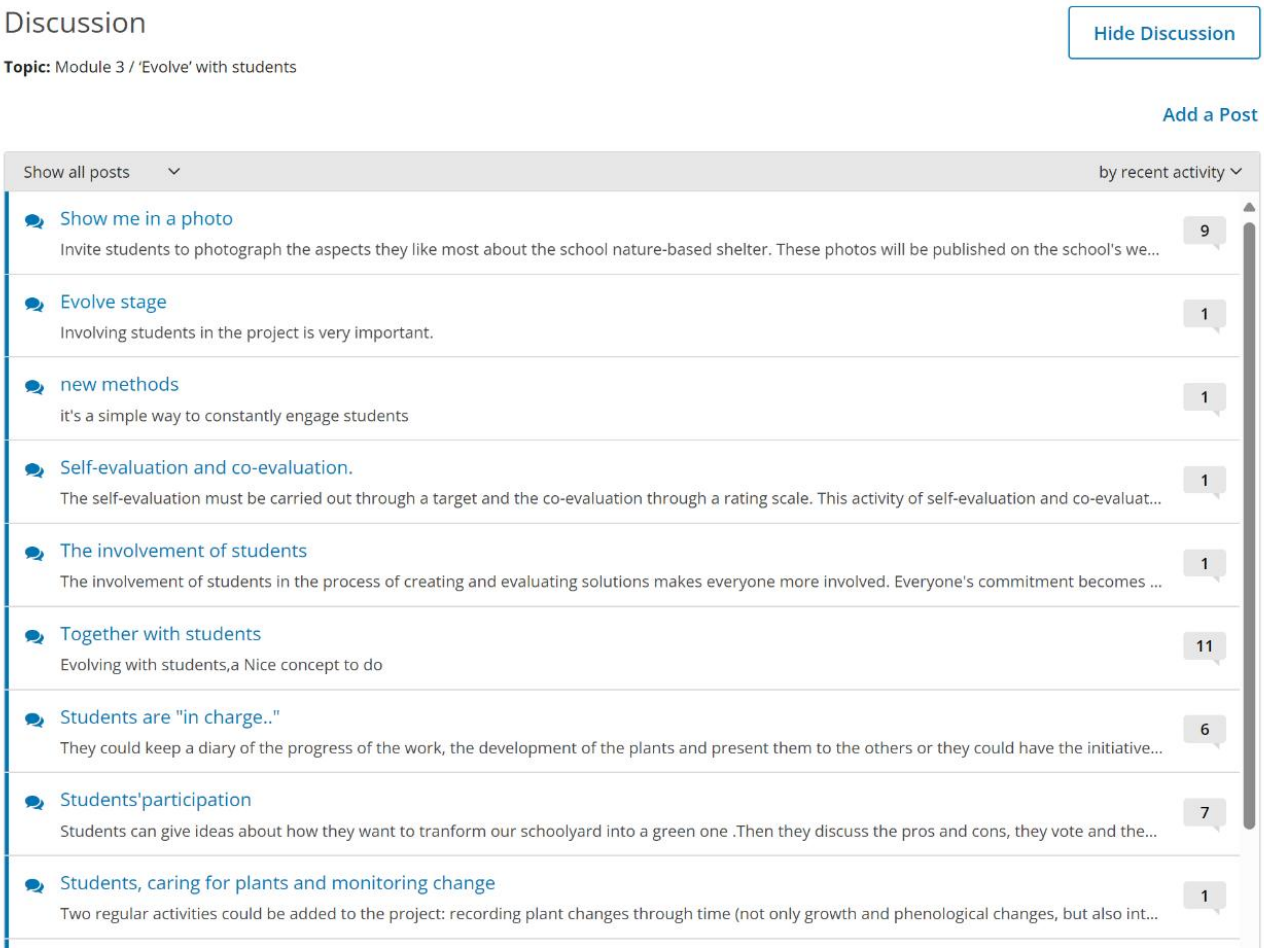
The **BroccoliBot** case exhibits perfectly the Evolve stage of a solution that secondary school students developed about the tackling difficulties when harvesting broccoli. Pay attention to the fact that they refined their initial idea 5 times to get to their desired outcome.

Taking this approach one step further, let us review some more practical ways to include students in the *Evolve* stage:

1. **Co-create** evaluation criteria.
2. Ask them to act as **test subjects** for the organised engagement activities.
3. Ask them to **lead an activity for younger students**, to enable them to take a more active role and experience firsthand what approach is suitable and what – not.
4. **Organise frequent feedback and feedforward sessions**, so that they can keep track of the progress, challenges and opportunities, and feel free to share their ideas.
5. Help them **propose new testing methods**.

Is there any other way you can think of to include students in the Evolve stage?

Share your ideas in the discussion below!



3.3 Resources for further considerations during the Experiment and the Evolve stages

Co-design Strategy

In this section, you are invited to review some **selected resources** that will cover essential aspects of your future transformation efforts. Testing and assessing solutions aimed at turning a schoolyard into a nature-based climate shelter will require consideration of various factors.

Central to all stages in the design thinking approach explored so far, and in the practises adopted in the case studies presented, was the **co-design strategy**. This collaborative strategy involves all stakeholders and focuses on the end-users, in your case - the students themselves. We have explored different ways to include students in the stages, and we have addressed the initial inhibitions that teachers and educators may have. Checking the literature[26]

[26] Lee, E., & Hannafin, M. J. (2016). A design framework for enhancing engagement in student-centered learning: Own it, learn it, and

[27](see two examples below), apart from helping to brainstorm ideas about including students, can also allow for further consideration of the benefits of promoting student-centred approaches.

Referring to our case studies can also provide a better understanding of the main aspects of including students to your transformation attempts (Baró et al., 2022)[28]

Main aspects of the co-design process	Oasis(Paris)	Climate Shelters (Barcelona)	Care in School Environments (Madrid)
Participants in the main co-design process	School community (pupils, staff, parents etc.)	School community + wider local community	School community + wider local community + technical council staff
Tools used during the co-design process	Workshops	Workshops	PAR methodology, survey, workshops
Main stages of the co-design process	Diagnosis, co-design	Diagnosis, co-design, evaluation	Diagnosis, co-design, evaluation
Additional sustainability/resilience educational events	Specific raising-awareness workshops	City sustainability programme in schools	City sustainability programme in schools
Participation of external stakeholders (beyond school community)	Yes, *citizen assemblies*	Yes, as part of main co-design process	Yes, as part of main co-design process

Summary of the main aspects related to the co-design process in the case study projects (Baró et al., 2022).

Budget

Your allocated budget and other financial aspects for your NBCSI will be a central topic of discussions and debate. Depending on your resources, it might be a good idea to adopt practices that are better suited to your situation. For instance, if your budget is low, you could use physical scaled-down versions of your solutions (paper or digital design plans, maquettes, testing nature-based stations with activities). With a moderate budget, you could move to constructing selected parts of your solutions, leaving room for testing and evaluating future modifications. Lastly, if a bigger budget is available, you could hire experts to help you build prototypes for testing (that your students have perhaps initially helped co-design) and evaluate your final products, similar to the case studies discussed in this MOOC.

Additionally, we invite you to explore the recommendations about financial contributions, provided by the 'Groenblauwe Schoolpleinen' (Rotterdam) project: Financial Contributions.

Assessment Frameworks

An assessment framework is essential for both the *Experiment* and the *Evolve* stages. In the *Experiment* stage, it **can provide a structured approach for evaluating the effectiveness of your scaled-down version of your** NBCSI **and guide decision making**. In the *Evolve* stage, it can **facilitate ongoing monitoring and evaluation that can lead to refinement**, securing in this way the desired impact and effectiveness.

share it. Educational technology research and development, 64, 707-734.

[27] Smith, C. (2014). Roger Hart. Key Thinkers in Childhood Studies, 109.

[28] Baró, F., Camacho, D. A., Perez del Pulgar, C., Ruiz-Mallén, I., & García-Serrano, P. (2022). Nature-based climate solutions in European schools: a pioneering co-designed strategy towards urban resilience. In Urban Resilience to the Climate Emergency: Unravelling the transformative potential of institutional and grassroots initiatives (pp. 125-146). Cham: Springer International Publishing.

One example of a framework is this framework for a holistic assessment for the health, social-cultural, environmental, and educational co-benefits of implementing a nature-based climate shelter (Ruiz-Mallén et al., 2023)[29]. **Consider which aspects you could include to your assessment framework**.

3.4 Module Summary

Experiment and Evolve stages: Reflection activity

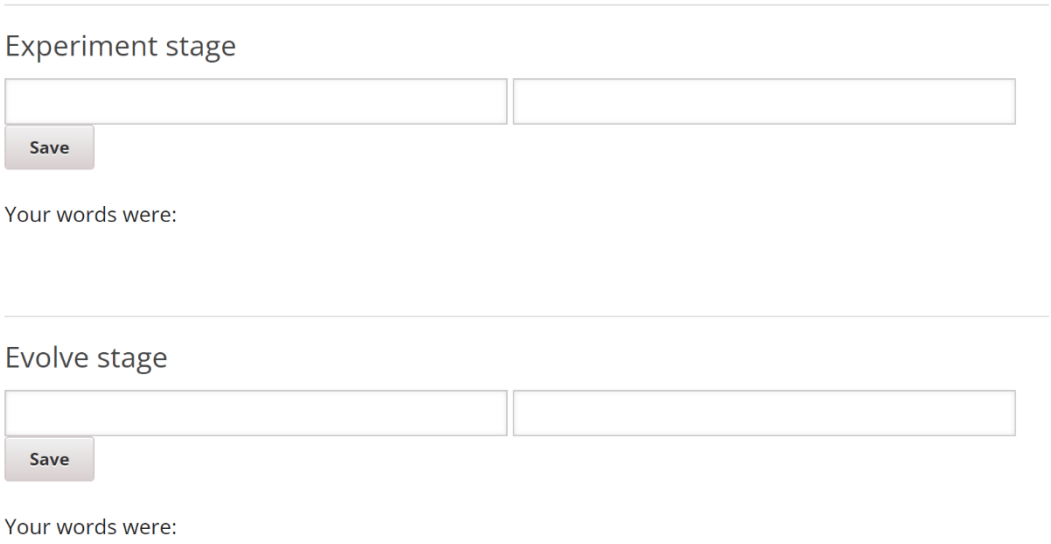
Having already worked through the Experiment and Evolve stages, write down certain keywords that best describe them. Ensuring you have a holistic understanding of them will help you plan your way through these stages.

Here are some suggestions to guide you through the activity.

Some of the words that could be used in the **Experiment stage** could be: User feedback, trial and error, scaled down solutions.

Some of the words that could be used in the **Evolve stage** could be: Progress monitoring, stakeholder engagement, refinement.

Now try to add your own words to describe the **Experiment** and **Evolve** stages in the following activities.



[29] Ruiz-Mallén, I., Baró, F., Satorras, M., Atun, F., Blanc, N., Bortolamiol, S., ... & Sekulova, F. (2023). Nature-based solutions for climate adaptation in school environments: an interdisciplinary assessment framework. In Sustainable Urban Transitions: Research, Policy and Practice (pp. 87-105). Singapore: Springer Nature Singapore.

Work on your Nature-based Climate shelter in school Action Plan (III)

By now you had the change to explore in depth the first four stages of the design thinking approach, and connect them to your own NBCSI. In Module 2, you were also successful in providing your first ideas of ways you could go through the *Emphasize* and *Ideate* stages in your Nature-Based Climate Shelter in School Action Plan. **Now it is time to move on to the Experiment and Evolve stages.**

Task:

Open you Nature-based Climate shelter in School Action Plan and write down all your ideas regarding your actions in the *Experiment* and *Evolve* stages. **Remember to consider the aspects discussed in this Module, and of course highlight the ways you would include your students in your attempts**.

3.5 Module Round-up

Summary

Great work! We have made it through Module 3!

- **You have deepened** your understanding of the *design thinking approach* and how to **develop** *nature-based climate shelter interventions* by comparing their implementation in selected studies.
- **You got inspiration** and plan various ways to implement the *Experiment* and *Evolve* stage of the design thinking approach in your case by exploring selected case studies and resources.
- **You learnt to consider** challenges, common in transforming a schoolyard into a nature-based climate shelter, think of possible solutions and make connections to your own case by reflecting on the practised evidence of selected case studies.
- **You know how to brainstorm** ways to include students in the stages of *Experiment* and *Evolve* by browsing through resources and taking inspiration from selected case studies.
- **You learnt to develop** a plan on how to implement the stages of the design thinking approach and NBCSI development with students, by working on your Nature-based climate shelter in schools Action Plan.

Next module starts on Monday. Keep up the good work!

MODULE 4: DEPLOYMENT, REVIEW, AND PEER-ASSESSMENT

About this module

What to expect from Module 4?

Module 4 will focus on the last stage of the design thinking approach and provide clear examples of what this stage entails. In retrospect, in the ***Emphasize*** stage, you identified problems, gathered perspectives and ideas and made sure that all stakeholders were included in the process. The ***Ideate*** stage saw you brainstorming nature-based climate shelter interventions (NBCSIs), while ***Experiment*** involved testing scaled-down versions of those ideas. The ***Evolve*** stage refined your NBCSIs based on received feedback. In Module 4 and through the ***Deploy*** stage, you **will be asked to think of ways to implement your refined NBCSIs to bring positive change to your school communities**. To do this, you will be introduced to the final considerations to bear in mind in regarding the development of the NBCSIs. Additionally, you will explore how this stage was applied in different case studies.

Therefore, by the end of this module, you will be able to:

- **Deepen** your understanding of the *design thinking approach* and how to **develop** *nature-based climate shelter interventions* by comparing their implementation in selected studies.
- **Explore** different ways to implement your refined NBCSIs.
- **Develop** a plan on how to implement the *Deploy* stage of the design thinking approach and NBCSI development with students, by working on your Nature-Based Climate Shelter in School Action Plan.
- **Extend** your understanding of the design thinking approach and its stages and **improve** your Nature-Based Climate Shelter in School Action Plan by **peer reviewing** other participants' Action Plans.

Module 4 includes 3 Activities with **deadlines (all by Wednesday 8th May 2024 23:59 CEST). You will need to complete the first activity before moving on to the second, and the second before moving to the third. Since the activities have the same deadline (all by Wednesday 8th May 2024 23:59 CEST), make sure to start working on them as soon as possible.** Mark your calendars to stay on top of them.

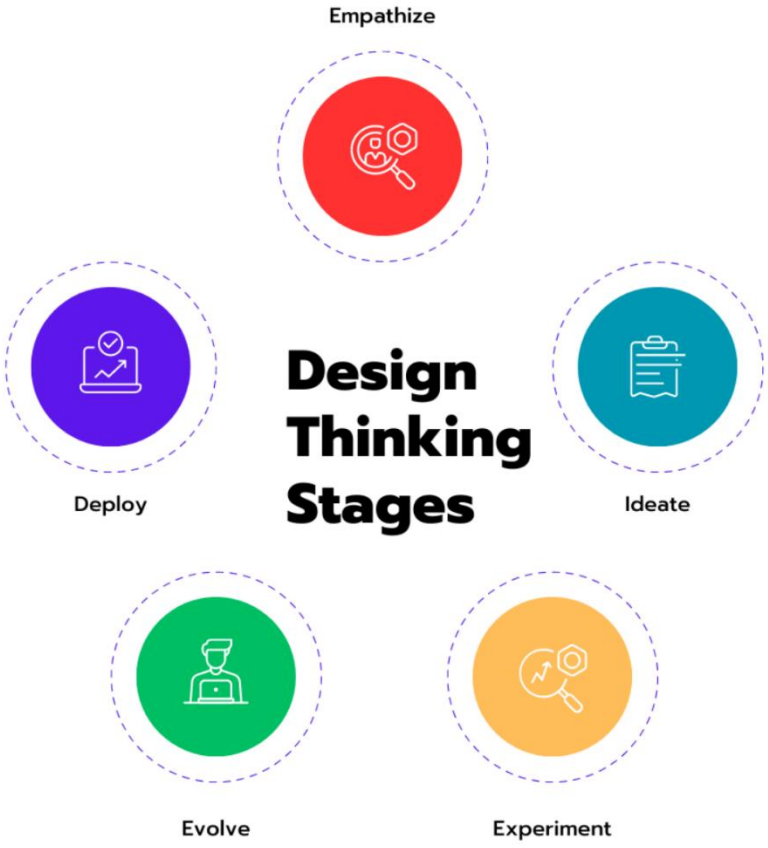
Good luck and enjoy the last chapter of this journey!

Ready to start? Click on "Next"

4.1 Deployment

Deployment

Deploy is the final stage in the design thinking approach. This stage marks the transition from planning and development to the implementation of your solutions in real-world settings. Think of this as the **transformation** of your scaled-down nature-based climate shelter interventions to a full-sized one.



The stages of the Design thinking process. Created by COOLSCHOOLS, 2024.

The *Deploy* stage can take **several forms** and be implemented in various ways, such as:

1. Opening of selected areas of the nature-based climate shelter.
2. Full-scale events, where the solutions are introduced to the public.
3. Organising workshops/ exhibitions of the newly opened areas, followed by their official opening.
4. Whole-school-organised deployment with gradual opening to the extended public.

This stage **holds significant value** as it represents all efforts made during the previous stages. Months (or in some cases, years) of preparations will have led to this specific stage. Here is also the beginning of the positive impact that your NBCSI will bring to the community.

Check this video below, where John Hardy is sharing reflections on the various stages of the creation of his 'green school', that could help give further ideas to you at this stage.

The key stakeholders identified and included in the planned work during the Emphasize stage, continue to play vital roles in the Deploy stage, ensuring the successful execution of its activities. Stakeholders might keep working towards certain goals even after the deployment of the solutions. For example, there can be ongoing deployment organising tasks, training opportunities related to the different zones of the NBCSI, establishment of monitoring and evaluation mechanisms, marketing initiatives, etc.

Case studies: How was the Deploy stage in each of the case studies?

Following our usual practices, here you will have the chance to look closely for inspiration into the **final versions** of other NBCSIs.

- **The 'Operation Recreation' (Brussels)** project oversaw the transformation of schoolyards in 20 schools. By following the link below you will be able to explore the final version of schools in two groups.

Operation Recreation (Brussels) Schools of Group 1 and Group 2

- **The 'Groenblauwe Schoolpleinen' (Rotterdam)** project, initially greenified 6 schoolyards in 2019 and added 6 more in 2020. Take inspiration from browsing the resources on the project's website.

Groenblauwe Schoolpleinen (Rotterdam) Example Projects

- In Barcelona, **the 'Refugis Climatics'** project adopted similar approaches during their Deploy stage.

Transformation of schools as an adaptation to the effects of the heat

- Finally, **the 'Oasis' (Paris)** project can contribute with various examples of its practices as well. You can also check step by step what initiatives were adopted to include students in all stages of the process.

The Oasis Courses

Reflecting on such resources is important for several reasons:

1. It **adds** to your learning of best practices.
2. It **provides** more opportunities for reflection.
3. It **inspires** your planning process for the Deploy stage.
4. It **creates** a sense of community, joined around similar efforts or visions.

Final Products: Reflection Activity

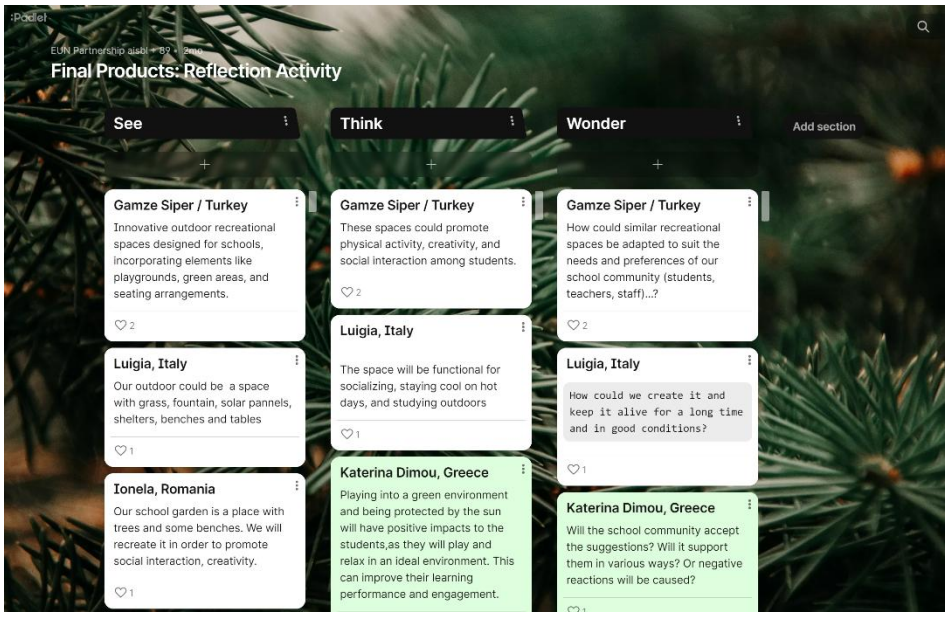
The selected case studies offer various examples of their final products. After browsing through the resources provided, it is important to reflect.

Take a moment to go through resources (refresh your memory if needed), and complete the three columns in the padlet below. What do you see, think, and wonder?

- Operation Recreation (Brussels): Schools of Group 1 and Group 2
- Groenblauwe Schoolpleinen (Rotterdam): Example Projects
- Refugis Climatics (Barcelona): Transformation of schools as an adaptation to the effects of the heat
- Oasis (Paris): The Oasis Courses

You can use the following questions to help initiate meaningful reflections:

1. How can you apply the insights you gained from exploring these final products?
2. Were there elements possible to adopt? Were there others unsuitable in your case?
3. What were some similarities and differences in the examples you explored?



'Deploy' with students

Similarly to all other stages of the design thinking approach, your students can have a very central role in the *Deploy* stage.

Apart from being the central stakeholder, whose reflections shaped the actions taken so far, students' participation will determine a lot of the nature-based climate shelter's success.

There are various ways to include students when organising the details for your *Deploy* stage:

- **Include** students in the planning process and **decision-making**.
- **Select** student **representatives** to present the different zones of the nature-based climate shelter to the public and explain their usage.
- **Train** students to present the most important parts of the whole process (stages in the design thinking approach) that you have undergone together.
- **Assign** students with the task of **talking** to parents and guardians and **involving** them in the nature-based climate shelter's zones.

By following such initiatives, students can showcase their learning and enhance their feeling of ownership. **Spend some minutes thinking of what your students' contribution could be at this stage**. In this way, you will have a clear vision when you go back to work on your Nature-Based Climate Shelter in School Action Plan.

Maintenance of your NBCSIs

Even after going through the different stages of the design thinking approach and assuming that everything goes smoothly in the *Deploy* stage and your NBCSI has been deployed to the public, you still have one more task to keep in mind.

Maintenance is a crucial part of this whole process for several reasons:

- **Preserving functionality**: making sure that every corner/zone in your nature-based climate shelter works as intended.
- **Preventing deterioration**: avoiding the natural wear and tear.
- **Ensuring safety**: reducing the risk of accidents and injuries.
- **Sustaining aesthetic appeal**: cleaning, repainting, small repairs.
- **Adapting to new needs**: adapting to the community as it evolves, and addressing new needs of users.
- **Promoting Sustainability**: using green practices (green materials, minimizing water/energy waste, protecting or enhancing biodiversity, etc.) contributes in the long-term to the nature-based climate shelter's sustainability.

For more information and tips about the concept of maintenance,

1. Check out what the COOLSCHOOLS Guidelines have to offer through the section *Next steps in the process* (p.21).
2. Additionally, take a look at the **'Groenblauwe Schoolpleinen' (Rotterdam) project's** recommendations when creating a green schoolyard and specifically **step 6**, as well as project's 'Oasis' (Paris) Care Guide, which was created based on the projects' experiences and practices.

3. Lastly, the Guidelines 'Revamping Playgrounds' on transforming schoolyards in the region of Brussels, include a lot of advice regarding the nature-based climate shelter's maintenance:
    - Long term management and monitoring (p.17)
    - Safety and maintenance (p.71)
    - Ground coverings (p.74)
    - Maintaining your modifications (p.82, p.91)
    - Co-use agreement and access control (p.92), which also addresses the concept of public use of the nature-based climate shelter.

4.2 Live Event

TeachMeet

TeachMeet: Nature-Based Climate Shelters in Schools

Date: Wednesday, 24 April, 17:00-18:00 CEST.

Recording[30]:

You can also access the full presentation here[31]

[30] Recording available here: https://www.youtube.com/watch?v=q5Ox3Ln513I

[31] Access the presentation here: https://www.europeanschoolnetacademy.eu/assets/courseware/v1/27df4217b8f5a1217b8e36b528f9e51d/asset-

A TeachMeet is an informal way of sharing ideas, good practices, lesson plans, etc. It is also a great way to network with other teachers and educators!

Save the date for the TeachMeet on **Wednesday 24 April** in which you will get to exchange not only with your peers. We will share best practices and great ideas for your Learning Scenario. In the end of this TeachMeet, you will also have the chance to ask questions to the speakers.

Connection details

These events will take place via Microsoft Teams meeting. You can join a Microsoft Teams meeting by using an invite link which will be shared with you before the event. You can then launch or download the Teams app, or simply join using your web browser (no download required). The easiest way is to join anonymously (no account or sign in required). Alternatively, if you have an educational license, you can sign into your Microsoft account. Here, you can find more information on how to join a Microsoft Teams meeting. As an attendee of a meeting in Teams, you can watch live events and participate in the moderated Q&A, but you cannot share audio or video.

Before watching a live event, **make sure your browser allows third-party cookies**. You can ensure your browser supports Microsoft Teams and Microsoft Azure Media Player.

Please note that this Microsoft Teams service allows audio and other information sent during the session to be recorded, which may be discoverable in a legal matter. By joining this session, you automatically consent to such recordings. If you do not consent to being recorded, discuss your concerns with the host or do not join the session.

The recording will be shared in the current section shortly after the event.

4.3 Introduction to Peer Assessment

Why are we using peer assessment on this course?

Peer assessment or peer review activities are a central element of European Schoolnet Academy courses. On the one hand, these activities are the **only way that learning on MOOCs can be more substantively and**

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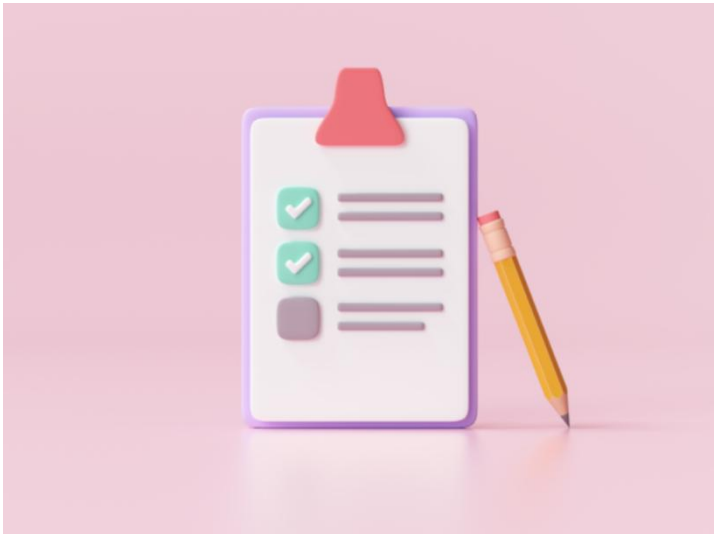
qualitatively validated. On the other hand, they are a mechanism for you to receive more **personalised feedback** on the work you do as part of the course.



"Stock image" found in the Microsoft Word stock.

Beyond this, the **concept of peer assessment** among teachers is an important idea in itself that we **aim to promote with our courses**. In many countries, teachers still rarely engage in a process of peer review. Observing colleagues and giving them feedback is not necessarily a common thing for most teachers. Unlike in the academic community, where peer review is one of the main methods for **validating the quality of an academic's work and supporting its further development,** there is nothing equivalent in the teaching community.

However, **we know from research that reviewing** someone else's work **can be a powerful learning mechanism**, and **exchanging pedagogical practices and ideas** with peers is an **effective way to develop your practice**. Therefore, by using peer assessment activities on our courses, **we aim to introduce and normalise the concept of peer review in the teaching community**.

"Evidence suggests that the use of peer assessment in teacher education & training has the potential to induce a shift of teachers' beliefs away from teacher-centred pedagogies to more student-centred approaches" (Topping 2020)

A third and equally important reason why we use peer assessment on European Schoolnet Academy courses is **because there is a substantial body of evidence that highlights benefits of engaging in a peer assessment process** for the learner. Go to the next unit for a video that outlines some of these benefits.

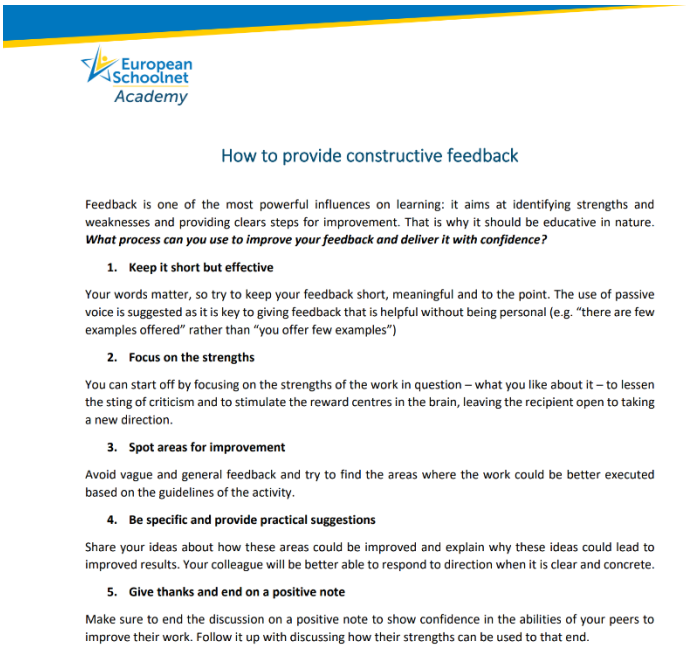
Peer assessment benefits and guidance on how to approach it

Take a look at the following video, which outlines some of the benefits of using peer assessment, as well as offering **some initial advice on how to give feedback as part of the peer assessment.** While the context of the video is different from our setting, almost all of its points are equally valid for this course.

How to assess your peers' work

You might be asking how we can provide each other feedback if **we come from very different contexts**, e.g., teaching different age groups and subjects. Of course, it is important to **keep such differences in mind** when providing feedback for your peer. However, this **diversity of contexts can also be a key strength** of the feedback offered. An "outsider" can often see opportunities and challenges which an "insider" no longer notices. Many pedagogical practices that work at primary school level can also work at secondary level and vice versa, even if slight adaptations might be necessary. And by learning from peers teaching other subjects, we can develop a more cross-curricular perspective on our own teaching.

So how to go about giving feedback to your peers? Here is some more concrete guidance on how to approach the assessment of your peers' work[32]:



European Schoolnet Academy

How to provide constructive feedback

Feedback is one of the most powerful influences on learning: it aims at identifying strengths and weaknesses and providing clears steps for improvement. That is why it should be educative in nature. ***What process can you use to improve your feedback and deliver it with confidence?***

1. **Keep it short but effective**

Your words matter, so try to keep your feedback short, meaningful and to the point. The use of passive voice is suggested as it is key to giving feedback that is helpful without being personal (e.g. "there are few examples offered" rather than "you offer few examples")

2. **Focus on the strengths**

You can start off by focusing on the strengths of the work in question – what you like about it – to lessen the sting of criticism and to stimulate the reward centres in the brain, leaving the recipient open to taking a new direction.

3. **Spot areas for improvement**

Avoid vague and general feedback and try to find the areas where the work could be better executed based on the guidelines of the activity.

4. **Be specific and provide practical suggestions**

Share your ideas about how these areas could be improved and explain why these ideas could lead to improved results. Your colleague will be better able to respond to direction when it is clear and concrete.

5. **Give thanks and end on a positive note**

Make sure to end the discussion on a positive note to show confidence in the abilities of your peers to improve their work. Follow it up with discussing how their strengths can be used to that end.

[32] Access "How to provide constructive feedback" document here:

Practice peer assessment

Before proceeding with the actual peer assessment, let us first carry out a short practice assessment. Take a look at the Learning Activity here[33]. Make sure to read the full lesson description at the top first, and then focus on the activity shown.

Q1: Learning objectives

1. Is the lesson **well aligned with the general learning objectives?**

- **Improvement necessary -** No learning objectives have been defined.
- **Some level of mastery** - The lesson does not link with the defined learning objectives.
- **High level of mastery -** The lesson partly links with the defined learning objectives.
- **Excellent level of mastery** - The lesson clearly links with the defined learning objectives.

Constructive feedback for Q1: Learning objectives

In the comment box below, please explain why you selected that option for this criterion. Please keep in mind that you need to provide constructive feedback to your peer, and your answer cannot be shorter than 200 characters.

Q2: Implementation

1 point possible (ungraded)

2. Is the lesson **clear, relevant and appropriate** and thereby **ready for implementation**?

- **Improvement necessary -** The lesson is not at all clear, appropriate in length nor appropriate for the age group indicated. A comprehensive redrafting is required for it to be implemented.
- **Some level of mastery - The** lesson is only in parts clear, appropriate in length and appropriate for the age group indicated. It requires substantial adjustments to be implemented.
- **High level of mastery -** The lesson is mostly clear, appropriate in length and appropriate for the age group indicated. With minor adjustments it can be implemented.
- **Excellent level of mastery -** The lesson is fully clear, appropriate in length and appropriate for the age

https://www.europeanschoolnetacademy.eu/downloads/Constructive_Feedback_EUNA.pdf

[33] This is an adapted and shortened activity taken from a lesson plan developed by Barış Ertuğrul. The original lesson plan can be accessed here: https://v.gd/Hl5vV0 Note: Although here we are using a different output as an example (a Learning Scenario demonstrating the concept of a lesson), this exercise is set to help you understand the concept of peer reviewing in general, which you will then apply when reviewing Action Plans.

group indicated. It can be implemented without any further development.

Constructive feedback for Q2: Implementation

In In the comment box below, please explain why you selected that option for this criterion. Please keep in mind that you need to provide constructive feedback to your peer, and your answer cannot be shorter than 200 characters.

Peer assessment activity instructions

After a lot of hard work during the previous Modules, you have now reached your final activities in this MOOC. **To successfully complete them**, you simply have to finalise and **submit** your Nature-Based Climate Shelter in School Action Plan, **provide feedback** to other participants' Action Plans during the peer assessment activity and **start thinking of possible changes/improvements** to your Action plan **after reflecting on the feedback** you received from your peers. The final peer-to-peer activity has **3 steps**, to be completed in order:

Activity 1 – Finalise and submit your Nature-Based Climate Shelter in School Action Plan

Activity 2 – Peer Assessment Activity of 3 Action Plans

Activity 3 – Reflect on the feedback you received from your peers

Each next step will become available when you finish the previous one. But remember, **the deadline to finish the peer-to-peer activity (including your response and peer assessment) is Wednesday, 8 May at 23:59 CEST.** If you have any questions about the peer assessment, please post them in the dedicated Discussion Category "Peer Assessment Support".

Step 1 – Submit your Action Plan

Over the last weeks, we have guided you to work on your Nature-Based Climate Shelter in School Action Plan. By now, you should have finished filling in most parts. If you have not completed it yet, please, **do so now within the time allocated** for this activity before submitting it. Your Action Plan must be in **English**, otherwise, it will not qualify for the course certificate.

To upload your Action Plan, please follow these steps:

1. Below the responses field, select **Choose Files**.
2. In the dialog box that opens, **select the file** that you want to upload, and then select **Open**.
3. In the box next to your document, **enter a written description of the document**. This step is **required** to help learners understand and evaluate your Action Plan. The Upload file button will not activate until you enter a description in the Describe field.
4. Across from the Choose Files button, select **Upload file**.
5. You can delete files once they have been uploaded by clicking the "Delete File" button next to each

uploaded file.

6. When you have finished uploading your Action Plan, select **Submit your response** and **move to the next step**. Then click **OK**on the dialog box to confirm.

Important: The deadline for you to submit your Nature-Based Climate Shelter in School Action Plan is on **Wednesday 8th May 2024**, latest at 23:59 CEST.

Step 2 - Review Peers' Action Plans

In this section, we ask you to review the work of your peers through the Action Plan Rubric that we had a closer look at in Module 1.

As you know, the Rubric consists of several criteria, a set of options for each criterion and a text box for written feedback. Go through each of the categories and identify to what extent the activity masters the particular aspects.

It is crucial that you provide **fair, encouraging, and helpful** feedback that allows your peers to improve their Action Plan. **When you review an Action Plan, you evaluate each criterion, select (X) the option that best describes how well the response met that criterion and provide written feedback for each criterion**. Please have a look at "How to provide constructive feedback" first. In the text box provide an explanation for the responses you have chosen. These questions can help you to provide meaningful feedback as well.

- What areas would you identify as strengths?
- What areas could be improved?
- What would you like to know more about?

Important note: Feedback such as "Thank you", "Well done", "Congrats", etc. **is not constructive feedback, and as such is not eligible for the course certificate**. Additionally, your feedback has to be in **English**, otherwise, it will not qualify for the course certificate. Like in the practice peer assessment, you need to provide constructive feedback to your peers, and your answer should **not be shorter than 200 characters for each criterion.**

You will need to review 3 Action Plans of your peers. You will receive your peers' Action Plans **one by one**, meaning, **once you review the first Action Plan**, the **second** will become available. **Once you are done evaluating the second Action Plan**, the **third** Action Plan will become available.

Before we leave you to it, remember that while providing feedback, you are also able to gather **elements that you would like to see in your own** Nature-Based Climate Shelter in School Action Plan. After you complete this activity, you will be able to use these insights and, together with the feedback that you will receive from your peers, make meaningful additions to your own work.

Important: The deadline for you to submit your Nature-Based Climate Shelter in School Action Plan is on Wednesday 8th May 2024, latest at 23:59 CEST.

Step 3 - The Feedback from your Peers

When the peer review is complete (that is, when you have finished evaluating all three Action Plans), **you can see the feedback you received from the peers who reviewed your Action Plan.**

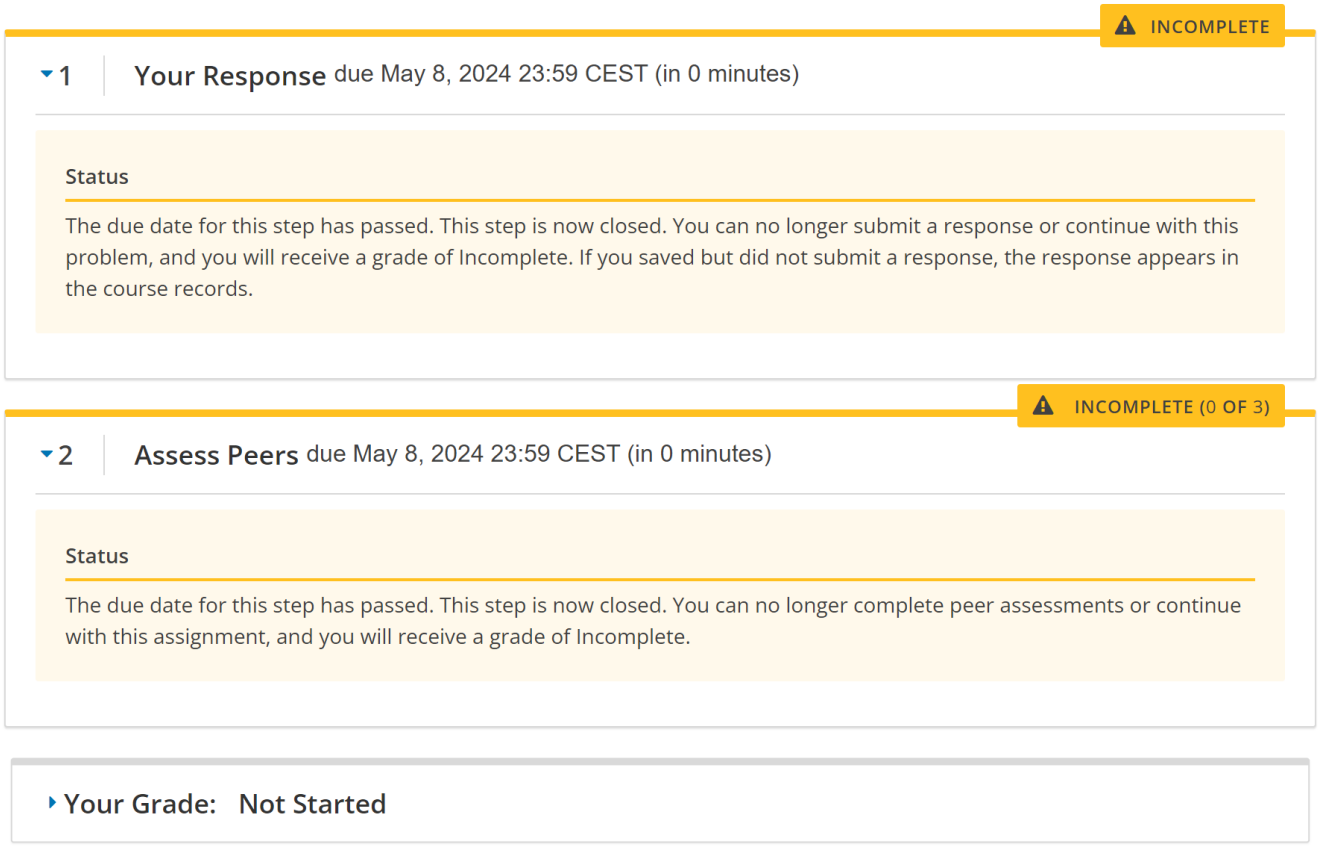
After you carefully read the instructions in steps 1 and 2 and complete the assigned activities, we now invite you to proceed and check the feedback you received from the peers who reviewed your Nature-Based Climate Shelter in School Action Plan. **Try to review in a neutral way, where you critically look on your Action Plans and compare it with the peer-assessment feedback you received.**

Your peers' suggestions can help bring about new ideas, show other perspectives and ways of improvement. We wish you a wonderful and constructive experience with this process.

You have done an amazing job until here! Good luck with the Peer Assessment Activity!

4.4 Peer Assessment Activity

Peer Assessment Activity[34]



4.5 Congratulations! What's Next?

Optional: Nominate Your Nature-Based Climate Shelter in School Action Plan for publication in the Scientix repository!

During the MOOC, you have had the chance to design an Action Plan to outline the implementation strategies of

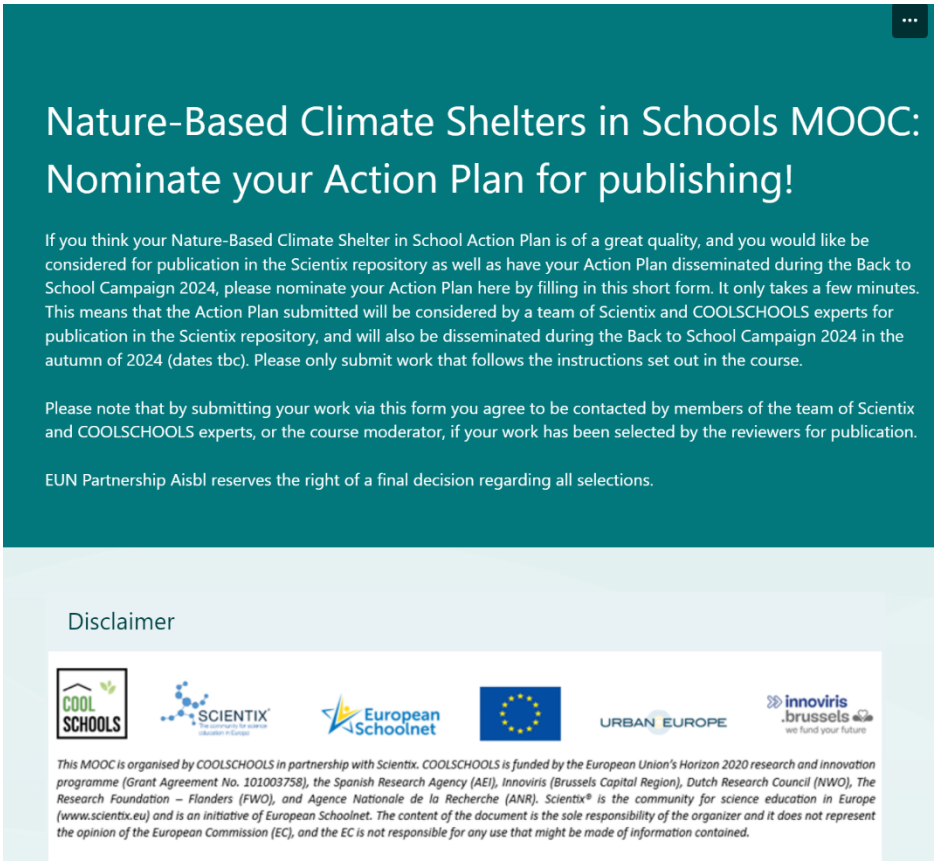
[34] Peer assessment due May 8, 2024 23:59 CEST. The activity is concluded at the time of writing the present Report. The screenshot provided have been taken by a staff member and included here just to offer a visual example of the assignment pane.

a NBCSI. Now you can take this one step further and share your Action Plan with the world by nominating your work for publication in the Scientix repository and also have it disseminated during the Back to School Campaign of European Schoolnet taking place in the autumn of 2024!

To get a chance to see your Action Plan published in the Scientix repository and disseminated during the Back to School Campaign with the support of Scientix and COOLSCHOOLS, please submit your work here: https://forms.office.com/e/4d4Q7RLrZn Before you submit your work, make sure that you have fulfilled all the requirements; otherwise, your Action Plan will be automatically disqualified:

1. Your Action Plan has to follow the used in this MOOC.
2. Your Action Plan must be in English.
3. Your Action Plan should be in a docx or doc format (Word file) and uploaded to a file-sharing service like Google Drive, DropBox, One Drive, etc.
4. Your Action Plan is an original work and if it includes images, the correct licenses and sources are attributed for.
5. Your Action Plan bears the correct licensing that allows the Scientix and COOLSCHOOLS teams to modify your work. To be eligible for publication on the Scientix repository, you must attribute your work under Attribution CC BY or ShareAlike.
6. The deadline to nominate your Action Plan for publication is 8 May 2024, 23:59 CEST.

Please note that a team of Scientix and COOLSCHOOLS experts will review and curate all the submitted Action Plans. Scientix reserves the right to refuse and withdraw Action Plans from the repository if not all requirements are followed.



Nature-Based Climate Shelters in Schools MOOC: Nominate your Action Plan for publishing!

If you think your Nature-Based Climate Shelter in School Action Plan is of a great quality, and you would like be considered for publication in the Scientix repository as well as have your Action Plan disseminated during the Back to School Campaign 2024, please nominate your Action Plan here by filling in this short form. It only takes a few minutes. This means that the Action Plan submitted will be considered by a team of Scientix and COOLSCHOOLS experts for publication in the Scientix repository, and will also be disseminated during the Back to School Campaign 2024 in the autumn of 2024 (dates tbc). Please only submit work that follows the instructions set out in the course.

Please note that by submitting your work via this form you agree to be contacted by members of the team of Scientix and COOLSCHOOLS experts, or the course moderator, if your work has been selected by the reviewers for publication.

EUN Partnership Aisbl reserves the right of a final decision regarding all selections.

Disclaimer

This MOOC is organised by COOLSCHOOLS in partnership with Scientix. COOLSCHOOLS is funded by the European Union's Horizon 2020 research and innovation programme (Grant Agreement No. 101003758), the Spanish Research Agency (AEI), Innoviris (Brussels Capital Region), Dutch Research Council (NWO), The Research Foundation – Flanders (FWO), and Agence Nationale de la Recherche (ANR). Scientix® is the community for science education in Europe (www.scientix.eu) and is an initiative of European Schoolnet. The content of the document is the sole responsibility of the organizer and it does not represent the opinion of the European Commission (EC), and the EC is not responsible for any use that might be made of information contained.

Tell us what you think

Please take a moment to evaluate your experience through this short course survey! Your feedback is important for the development of future courses. You can find the feedback here: https://www.surveymonkey.com/r/coolschoolsmooc-post

Nature-Based Climate Shelters in Schools - Post-course survey

Introduction

Dear participant,

This survey is for enrolled participants of the course "Nature-based Climate Shelters in Schools: Empowering Teachers for Sustainable Education", offered by the project COOLSCHOOLS on European Schoolnet Academy. We aim to collect your feedback and suggestions to consider them when developing future courses.

Data handling:
The data from the survey will be handled according to the European Schoolnet Academy's privacy policy. If you proceed with filling in the survey, you agree with how we handle the submitted data and agree that:
• any information you provide will be anonymously stored and handled;
• your participation in the survey is voluntary and you can withdraw at any time;
• you have received adequate information about your participation in this survey.

Congratulations!

Congratulations! You have finished the MOOC **Nature-Based Climate Shelters in Schools: Empowering Teachers for Sustainable Education!**

We hope you have enjoyed this learning journey and that you feel more ready to take on the task of transforming your schoolyard into a nature-based climate shelter!

You have explored stage by stage the design thinking approach, took inspiration from real-world examples by observing what has happened in selected case studies, brainstormed actions and possible steps, created a first draft of a Nature-Based Climate Shelter in School Action Plan, and benefited from peer review activities that will hopefully refine your future work significantly.

In order to receive a course certificate, you need to submit your Nature-Based Climate Shelter in School Action Plan and review three Action Plans of other participants! If you have met all the course requirements before the deadline, then you should see a **"Request certificate"** button at the top of your Progress tab. Simply click that button to get your certificate!

Want to **show off** your participation in the MOOC, your Action Plan, or even any NBS/ STEM activity by 30

April 2024, for a chance to win an award? The 2024 STEM Discovery Campaign brings you the perfect opportunity with the Scientix Awards! How do you take part in them? Very easy - fill in the submission form and agree to make your entry eligible for the awards! Wonderful prizes are waiting for you! @LIFETerraEurope @Scientix https://bit.ly/24SDC

We are looking forward to seeing what your nature-based climate shelter will look like! Get to work!

COURSE HANDOUTS

Nature-based Climate Shelter in Schools Action Plan (also included as Annex 2 in this report)

Action Plans Evaluation Rubric