

**ECOLOGIES Monitoring and Reflection Final Report** 

Deliverable 3.3





D3.3 Ecologies monitoring and reflection final report						
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# 1 Introduction

Deliverable 3.3 provides detailed information on the facilitation and monitoring mechanisms established to support the upscaling of the STE(A)M Learning Ecologies pilot from 10 to over 100 SLEs across 16 countries, which took place from September 2024 to June 2025. It also outlines the opportunities for co-creation that materialized within these pilots, as well as the challenges to coordinating the scale-up of the project. These considerations contribute to the final recommendations, aimed at informing national and international policymakers, agencies and organizations interested in leading and facilitating the diffusion of the SLEs model on a larger (national or international) scale.

**Co-creation** is a core principle of STE(A)M Learning Ecologies (SLEs). It signifies a collaborative and participatory approach where all stakeholders, including educators, students, science centres and industry partners, and community members, contribute at individual or institutional level to the design and implementation of educational activities. This inclusive process ensures that diverse perspectives are accommodated, needs and resources are integrated, to solve a real-life problem, critical for the local community.

**Facilitation** complements co-creation by providing support and guidance to SLEs initiators and stakeholders. It entails sharing good practices, offering guidelines and other support materials, and organizing workshops focused on various aspects of the SLEs methodology. Facilitation ensures that the SLEs stakeholders have all necessary elements at hand to allow them to conduct a smooth and productive co-creation, fostering a collaborative and open culture.

Monitoring becomes crucial in the context of upscaling at national and international levels, as it allows identifying pilots in difficulty even in the absence of the constant support during the small-scale phase of the project. It is also a way to harmonize the data collection mechanisms of SLEs required to be able to compare outcomes, all the while capturing the uniqueness of national and local contexts. Finally, monitoring mechanisms serve also the purpose of facilitation, as they offer guidance on the expected outcomes, and on the steps needed to achieve them. The monitoring templates developed within the project encourage reflection on specific aspects of implementation, including how to achieve effective stakeholder collaboration, co-design activities, and develop learning artefacts aligned with curricular and pedagogical objectives.



#### **National Coordinators and Initiators**

Project partners act as National Coordinators (NCs) and are responsible for the pilot implementation in each country. The SLEs Consortium, through the National Coordinators, actively supported the local SLEs to co-define the visions, thematic foci, action plans, concrete activities, tools, etc. for their development. During the pilot phase, NCs were also initiators of their SLE. With the beginning of the mature phase, they assumed the role of facilitators and guides.

Initiators are defined as actors that initiate and implement SLEs in their respective countries. While the school is the most common initiator of an SLE, the various stakeholders within an SLE can decide who initiates it based on the educational goals of the specific SLE.

# 2 Data collection process

The data collection process for this deliverable combined quantitative and qualitative inputs from National Coordinators. Each coordinator completed a standardized table reporting all co-creation and reflection workshops held in their country, consolidated into Table 4.

Additional evidence was gathered during the April 2025 management meeting, where coordinators presented their approach to coordination of their 10+ SLEs, covering the number and format of meetings held, the perceived benefits of their strategy, and challenges to scaling. A final survey, distributed at the end of the implementation, complemented this information by capturing how facilitation materials were used and adapted, as well as the frequency of facilitation meetings. Challenges were again validated.

Complementary, anecdotal evidence was collected during project biweekly meetings, where national coordinators were asked to regularly provide an update on their progress and share bottlenecks.

# 3 Facilitation, Co-creation and Monitoring Mechanisms

To enable initiators to design and implement their pilots effectively, the project developed a structured support mechanism. This combined (i) facilitation materials tailored for use across diverse contexts, (ii) opportunities for direct exchange and cocreation at both international and national levels, and (iii) a monitoring and reporting mechanism that captured progress and informed improvement.

The following subsections provide more details on these aspects:

- **3.1** describes the facilitation materials made available and how they were adapted to national contexts.
- 3.2 outlines the international facilitation and reflection workshops.
- 3.3 highlights the facilitation strategies used by national coordinators.



• 3.4 explains the monitoring and reporting mechanisms.

#### 3.1 Streamlined Facilitation Materials

During the upscale phase, the SLEs consortium reviewed and updated the major facilitation materials to ensure they would remain relevant in a context where direct national coordination support was reduced due to the growth from 10 to 100 initiatives.

These materials served as ongoing facilitation mechanisms across all phases of implementation, and were either shared during international co-creation workshops (see 3.2) or distributed through national coordinators to initiators and their SLEs stakeholders (3.3).

#### These resources included:

- A practical guideline for initiators, expanding on the Methodology with more tips and practical examples;
- A stakeholder mapping guide, to help initiators identify potential partners and devise appropriate engagement strategies;
- A guideline on learning artefacts, supporting SLEs in defining the learning products students should produce to showcase their progress in developing knowledge and transversal skills.
- The 'Women in STEM' toolkit, to promote gender inclusivity in SLEs.
- The SLEs Checklist, to help initiators identify which documents to consult at each stage of the process.

The paragraphs below detail each of these resources.

#### SLEs Methodology (link1)

The updated SLEs methodology, outlines a comprehensive, step-by-step process for developing SLEs, structured in four stages (initiation, partnership establishment, co-creation and implementation, reflection and results-sharing). The methodology links each step to to specific objectives, such as fostering inclusion, contextualizing learning through partnerships, and encouraging the creation of science opportunities for the whole community. After the small-scale piloting of the project, the methodology was updated to include practical examples from the pilot phase, allowing initiators to see how each step can generate tangible learning outcomes.

#### Pilot Guidelines (link<sup>2</sup>)

Adapted from the version originally designed for national coordinators, the guidelines were reviewed to directly support initiators. They provide step-by-step instructions for planning and executing implementation, enriching the explanations provided in the methodology with tools, tips emerged during the pilot phase, and more concrete substeps for each stage (initiation, partnership establishment etc.). The guidelines also

<sup>&</sup>lt;sup>2</sup> https://www.steamecologies.eu/wp-content/uploads/2025/09/SLE\_Guidelines\_Y2\_final-1-1.pdf



<sup>&</sup>lt;sup>1</sup> https://www.steamecologies.eu/wp-content/uploads/2024/09/D2.2\_SLEs\_Methodology-Updated-Version\_v3\_streamlined.pdf

connect to additional materials created to ensure initiators would have all the materials to advance on their own, such as a guide for stakeholder mapping and engagement strategies. The guidelines also provide an indicative timeline for the various stages of SLEs implementation, as well as a toolkit for the organization of SLEs events.

#### Stakeholder Mapping Guidelines (link3)

Stakeholder Mapping guidelines were devised to support SLE initiators in their search and identification of potential partners for their projects. They were adapted from an existing tool developed by Education First (Link<sup>4</sup>) to the specific SLE methodology, and enriched it with an additional step by guiding users on how to devise different engagement strategies based on stakeholders' potential interest and contributions.

#### Learning Artefacts Guidelines (link5)

Learning artefacts guidelines were refined with examples from the pilot phase, offering practical advice on how to design, create, collect and report artefacts to demonstrate the achievement of certain learning outcomes by students.

The Women in STEM Toolkit was created to support inclusion within SLEs. Introducing the persistent gender gap in STEM and its personal, environmental and organizational causes, the toolkit provides strategies and resources for educators, parents and project coordinators to tackle such factors. It brings together best practices and open resources from across Europe, enabling stakeholders to embed gender-sensitive practices in their pilots based on an analysis of their local contexts.

#### Women in STEM toolkit (link6)

This toolkit was developed to support SLE stakeholders in embedding gender-inclusive practices within their projects. Building on evidence of persistent inequalities in STEM, it brings together examples, strategies, and open resources that have been used in past EU-funded initiatives and projects to address the gender gap. By using the toolkit, both SLE initiators, teachers and partners can design learning environments that engage all learners in science more equitably.

#### Checklist

To help initiators navigate the wealth of materials and resources available, the project produced the SLEs checklist, a tool indicating which resources to consult at each stage of implementation. This allowed initiators to maintain a comprehensive overview of the whole implementation process, while accessing targeted information as needed.

content/uploads/2025/09/SLEs\_Stakeholders\_Mapping\_Guidelines\_Final.pdf

<sup>&</sup>lt;sup>6</sup> https://www.steamecologies.eu/wp-content/uploads/2025/03/SLEs\_Women\_STEM\_Toolkit\_Final.pdf



<sup>3</sup> https://www.steamecologies.eu/wp-

<sup>4</sup> https://www.education-first.com/wp-content/uploads/2023/05/Stakeholder\_Mapping\_Toolkit.pdf

<sup>&</sup>lt;sup>5</sup> https://www.steamecologies.eu/wp-content/uploads/2025/09/WP4-SLEs-Pilot-Guidelines-for-collecting-Learning-Products\_V2-1.pdf

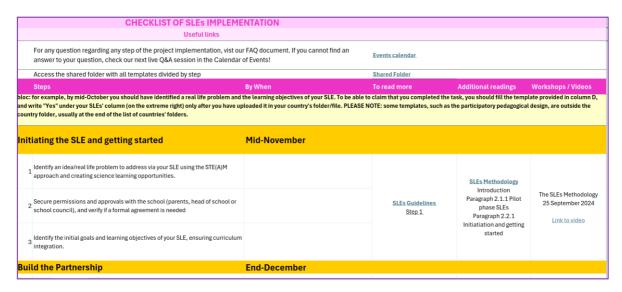


Figure 1. Screenshot of the first step of the SLEs Checklist

# 3.2 Facilitation and Reflection workshops at international level

SLEs organized a series of thematic webinars and reflection workshops open to all initiators internationally and designed to complement the facilitation work of individual NCs. These sessions focused on the essential elements of the SLEs methodology, and leveraged the small-scale pilot experience to share practical tips for the upscale.

The first webinar introduced the updated methodology step by step, contextualized by initiators from the small-scale pilot in Spain and Cyprus.

A second session explored industry-school collaborations through role-play activities and by sharing templates and tools that promote mutual understanding of each other's expectations and interests when entering into a partnership. The event was organized by the German Adlershof Technology and Science Park.

The third webinar focused on gender inclusion, presenting strategies and resources from the Women in STEM toolkit, as well as the practical experience of three experts from Malta, Norway and Serbia implementing gender sensitive strategies at all levels of education.

To ensure peer learning was not limited to the national level, two reflection workshops were organized. The first, delivered in December 2024, used the Scenario Development template to help initiators identify unexploited opportunities in the planning of their SLEs, and discuss strategies for refinement. The second, in June 2025, created a space for representatives of each of the countries involved in the project to reflect on their full journey, and express their needs for policy change at national and international level to support the future of SLEs and open schooling initiatives.

Across all sessions, pilot initiators were invited to share their insights, which gave each event a practical dimension and helped participants exchange strategies, clarify doubts,



and strengthen their sense of belonging to an international community of practice. More information about the workshops is provided in Table 1 below.

Table 1 International facilitation and reflection workshops

Lead	SLEs Community Event	Type of event	Delivery date	Nr Particip ants	Format	Audience	Notes
EUN, EA	SLEs Methodology introduction	Other	10.10.2024	17	Online	SLEs initiators (teachers)	Introduction to the four stages of the SLEs methodology, contextualized by successful initiators who experienced firsthand the benefits and challenges of developing an SLE.https:www.youtube.com.watch?v=IUHYIHI9oLk&t=1s&pp=ygUXbWV0aG9kb2xvZ3kgc2xlcyBlY3NpdGU%3D
EUN, HUB, WISTA	SLEs - Exploring Industry-Schools collaborations	Other	15.10.2024	28	Online	SLEs initiators, teachers, researchers, industry members	Focussed on co-creation, and industry-school relationships., The workshop shared practical tools to facilitate resource gathering and to co-develop learning paths.
EUN	SLEs - Women and Girls in STEM: bridging the Gender Gap	Other	22.01.2025	28	Online	teachers, research, industry members	https:www.steamecologie s.eu.women-and-girls-in- stem-bridging-the-gender- gap-in-science-technology- engineering-and- mathematics.
EA, EUN, UCY	Reflection Workshop 1 - planning and implementing SLEs - experiences and blockages, planning using the scenario development template	on WS	04.12.2024	14	Online	SLEs initiators	An interactive reflection workshop, where initiators were invited to share with their peers the challenges and successes at a stage where most SLEs were starting to cocreate with their stakeholders and designing the learning paths students would have to take. Using the Scenario Development template, they had the chance to explore strategies to improve upon their SLEs initial plans.
EA, EUN, UCY, APRE	Reflection Workshop 2- reflecting on the journey	Reflecti on WS	17.06.2025	13	Online	SLEs initiators	The Reflection WS focussed on identifying challenges and celebrating project successes, reflecting on the elements needed to shape the future of Open Schooling in Europe.



Lead	SLEs Community Event	Type of event	Delivery date	Nr Particip ants	Audience	Notes
						https:www.steamecologie s.eu.reflecting-on-the- journey-2nd-sles-reflection- workshop-mature-phase.

# 3.3 National coordinators' facilitation approach

# **Adaptation of Materials**

To make facilitation tools more accessible and relevant, all coordinators adapted the materials to their national contexts. In some cases, this entailed translation into the local language (Germany, Cyprus, Italy), in others it was simplifying the templates to suit teachers' needs (Malta, Norway). Italy created new supporting tools, such as pedagogical planning templates, formal agreement for stakeholders and monitoring templates whereas Serbia modified existing ones by integrating them into new platforms or formats educators were more familiar with (for example, by moving on Google Sheets the Excel templates). Some coordinators repackaged the guidelines into concise presentations or introductory documents, to filter only the information relevant to a specific stage of the implementation process. Example of adapted materials are available in Annex 1.

### Support strategies by national coordinators

#### Intensity of coordination and engagement

National coordinators supported their pilots through a mix of approaches, combining one-to-one exchanges, group meetings with all initiators, and in some cases meetings that also included stakeholders. The intensity of coordination varied across contexts:

- in decentralized contexts, where National Coordinators assumed the role of facilitators (Italy, EUN, Serbia, Germany, Cyprus, Spain), the number of meetings was lower (4-10)
- in more centralized contexts, such as Greece, Norway, Portugal, Ireland and Malta, where NCs were also initiators, contact points surpassed 11, and could reach over 25 meetings, since NCs were present at every meeting.

Modes of engagement were also varied. Some countries organized bi-monthly meetings with all pilots, supplemented by one-to-one follow-ups for SLEs in need of more support, while others prioritized face-to-face interactions in schools.

#### Complementary channels

Complementary support was also provided through less common channels. In Serbia, Norway, Italy, digital communication platforms such as Viber, Teams, and email groups, as well as dedicated online cloud spaces played an important role in maintaining regular contact and addressing minor doubts. At EUN, a survey was administered to initiators to



gauge their progress, their understanding of the next steps, and whether they required any support with the expected next steps.

#### Challenges

The diversity of support strategies entailed advantages but also challenges. NCs underlined that one-to-ones and small group meetings, while effective in building trust and providing targeted support, were time-consuming to organize and sustain. Differences in pace and expertise among pilots, broader national disruptions in Serbia, and overlapping schedules among stakeholders and initiators were also pointed to as additional barriers in devising a facilitation strategy that could be both effective and time-efficient. Co-creation with partners from different groups of society also presented its challenges, as each stakeholder brought distinct approaches and interests to the project.

#### **Benefits**

On the other hand, coordinators observed that regular meetings sustained motivation, they enabled peer-to-peer learning and created spaces for reflection and improvement. Initiators valued the recognition gained through these opportunities for sharing the work done, and felt more comfortable raising difficulties when they arose. The organization of online meetings allowed for territorial dispersion of SLEs, which could be organized also in remote areas of the country. Likewise, digital tools and surveys allowed for asynchronous coordination and interaction, addressing the issue of overlapping schedules.

Table 2 Types and frequencies of facilitation strategies adopted.

Facilitation Strategy	Frequency
In-person workshops	5
One-to-ones	8
Regular group video calls with initiators	7
Ad-hoc monitoring and feedback templates	4
Online platforms for instant messaging and document sharing (Teams, Viber, Slack, Whatsapp)	4
Surveys	4

Table 3. Frequency of touchpoints with initiators

Frequency of touchpoints with initiators	NCs
Monthly	3
Based on each SLEs needs	1
Weekly	1
Bi-monthly	2
Every 2 weeks	1



Frequency of touchpoints with initiators	NCs
Varied depending on the needs	1
As needed, regular in-person workshops	1

# Co-creation and Facilitation workshops at national level

As mentioned above, the number of co-creation and facilitation touchpoints varied depending on the role of national coordinators. Support was highly personalized, with multiple one-to-one meetings mostly in person, in those countries where NCs were also initiators. Countries where NCs acted as facilitators conducted fewer meetings, often online or in hybrid formats. Group meetings were the preferred approach in this case, with additional, shorter, one-to-ones offered to initiators facing difficulties. These latter occasions were often not reported on the table of facilitation meetings, which explains the difference in the number of meetings, despite similar levels of support being offered.

The scope of co-creation and facilitation meetings also varied significantly, from small gatherings of few initiators to large-scale events of more than a hundred stakeholders. In Serbia, for example, the mature phase was launched during a teachers and education stakeholders' conference that both recruited SLEs and served as a space to share ideas and create partnerships for their initiation. In Norway, and end of project reflection workshop reunited students and industry partners to reflect on their collaboration and its benefits. Table 4 in Annex 1 details the number of co-creation and reflection workshops held in each country, alongside their participation, date, format and audience involved.

Several countries, including Italy, Portugal, Serbia, Malta, Ireland, Cyprus, Spain and EUN's pilots provided more detail on the actual content of their co-creation workshops. Many NCs structured their events to mirror the phases of the SLEs methodology. Orientation and capacity building sessions introduced initiators to the methodology and familiarized them with the available resources, while subsequent workshops supported pilots' co-creation efforts, with discussions centred on defining the real-world problem at the heart of each SLE, and refining the activities to address it. Follow-up sessions often focused on troubleshooting, such as how to engage reluctant stakeholders, secure external funding for additional learning paths, or align activities with curricular objectives, to secure school-wide support for the initiative. Support was given not only by the NC, but also from the other initiators, which exchanged ideas and strategies.

Final events provided opportunities to share the successes and amplify key messages and learning outcomes matured within the SLEs to wider communities. A diverse audience of teachers, students, parents, researchers, local authorities and industry representatives typically participated in these events. In Cyprus, for example, the final event was co-hosted by the Municipality of Pafos and the SEMEP UNESCO network, featuring presentations of the two SLEs that had been granted funding from the Blue Lights programme. The event included reflections on the challenges and opportunities



of open schooling, and created an open forum for dialogue among schools, local authorities and civil society.

Such events are important because they increase the chances of prompting spontaneous collaborations and support from new stakeholders for future iterations of the project. For example, both in Malta and in Greece, some of the mature phase SLEs emerged from the previous year's final co-creation workshop held in both countries. Similar events were held in Spain and Portugal, while further ones are planned in Malta and Serbia in November 2025. In countries where coordination was conducted mostly online due to the geographical dispersion of SLEs (Italy, EUN's SLEs), NCs encouraged individual SLEs to organize local dissemination activities, ensuring that results could be shared with the surrounding communities.

# 3.4 Monitoring and Reporting

The diversity and volume of activities also required a critical review of the pilot-phase reporting processes, driven by the ambition to capture and understand stakeholder experiences across contexts, with the aim of identifying promising practices, and informing future improvements for implementation and recommendations for policy. The result was a more integrated reporting framework, which included fewer templates, but was designed to preserve the richness of local experiences, while still allowing for comparative analysis through harmonized guiding questions.

A key outcome of this effort was the development of the SLE Learning Scenario template, which reflects the core values of the SLE Methodology by emphasizing the learning paths students can take thanks to co-creation with stakeholders. The template places particular importance on contextualizing learning products, which serves as tangible evidence of the skills and attitudes developed by students through these collaborations. In total, 109 learning scenarios were collected and analyzed. Beyond this, reporting requirements also included the collection of learning products for the major activities of each of the SLEs, as well as the maintenance of an Overview File, that acted as a continuous monitoring tool. This file kept track of the number of co-creation events held, as well as implementation activities in each SLE, including when they occurred, who participated and a short description of learning outcomes. The information served as the basis to fill the learning scenarios, ensuring coherence between implementation activities, and final reporting.

National coordinators were responsible for gathering and monitoring these regular updates. In several cases, they resorted to their own templates, sometimes translated, and later transferred the information back in the official formats. While this flexibility allowed for receiving greater information from the pilots, it also represented a major challenge to time efficiency and cost effectiveness. To reduce reporting burden, the Overview file was made an optional tool, seeing as the most important information would be incorporated in the Learning Scenario.

In parallel, a questionnaire of mainly close-ended questions was distributed to project initiators to evaluate the pilot implementation across countries. This explored dimensions such as learning objectives and competences achieved by students, pedagogical methods used, gender inclusion and stakeholder partnerships, as well as



the national and institutional factors that enabled or hindered implementation. A total of 105 were completed and analysed.

Quantitative data from the questionnaires were refined with qualitative insights drawn from the open responses in the learning scenarios. Both qualitative and quantitative data have been analysed, and the main findings are presented in the SLEs Policy Brief, as well as Deliverables 4.3 and Deliverable 4.2.

# STEM Discovery Campaign

The STEM Discovery Campaign 2025, coordinated by Scientix in collaboration with NBS EduWorld, ran from February to April 2025, and it offered an opportunity to engage and motivate initiators throughout the reporting period.

Within the campaign, SLEs sponsored the Scientix Open Doors to Science Award, which recognized teachers whose SLEs were exemplary of the open schooling, STE(A)M, and living labs approaches, embodying all the key principles of the STE(A)M Learning Ecologies methodology. To qualify for the Award, educators were invited to submit the Learning Scenario, using the official template.

With +800,000 participants in the Campaign, the initiative not only boosted the project's visibility, but it also encouraged the SLEs participants to craft comprehensive learning scenarios that documented in full their pilot activities. Overall, more than 35 of the 107 SLEs participated in the campaign, finalizing the reporting way ahead of the deadline.

# 4 Coordination Challenges of Project Scale-up

During upscale, several coordination challenges emerged. The ones most relevant to the project are reported below, and can inform better planning of future iterations of upscaling SLEs or similar initiatives.

#### Personalizing support while maintaining time efficiency

Scaling from 1 to 10 SLEs per country required National Coordinators to rethink their strategies for facilitation. While one-to-one meetings were highly valued by initiators, they proved time-consuming to organize and sustain. Some coordinators overcame this by grouping SLEs according to theme or stage of implementation to organize smaller group meetings. Others met only with the more 'at risk' SLEs, while maintaining broader group meetings with the rest.

#### Unequal engagement in events

Misaligned timelines among stakeholders, initiators and national coordinators complicated the organization of meetings and participation to international workshops. Consequently, it was difficult to maintain the same level of engagement across SLEs and within pilots. Providing recordings and presentations of the national sessions and ensuring at least the presence of one representative per country at international events, allowed to maintain clarity on expected progress and collect outputs that would be representative of national contexts. Some SLEs that could not attend the regular touchpoints eventually dropped out of the project. It was the case of one SLE in Romania and one in Italy.



#### Misaligned Stakeholders' Expectations

Another challenge of scaling SLEs was helping each initiator navigate the complexity of bringing together schools, industry partners, research institutions and community actors around a common initiative. Each group came with its own priorities, timeframes and expectations. In Malta, a school and an aviation center faced incompatible expectations about objectives and responsibilities, ultimately resulting in the end of the SLE after the planning phase. In Italy, coordinators sought to avoid such disruptions by formalizing partnerships through written agreements. However, the administrative procedure delayed the implementation of SLEs in certain cases. Beyond these examples, many SLEs reported that compromises were necessary to balance the different interests of stakeholders, with considerable time invested in aligning schedules and clarifying roles.

#### Heavy reporting workload

The project encountered challenges when it came to balancing comparability of reporting outputs with the flexibility required to accommodate different capacities for filling long templates (due to language barriers, time constraints and staff availability). Ensuring both required compromises in the reporting design, and minimum quality standards were set for the main reports (learning scenario, learning products and questionnaire).

Additionally, National Coordinators had to act as filters to avoid overwhelming initiators and stakeholders. That entailed translating templates in their national languages, reformatting them in more accessible layouts, and translating back to English the outputs before transferring responses in the official formats. This duplication of work reduced cost effectiveness and absorbed significant staff time.

#### Impact of external events

Unforeseen external disruptions, such as teacher and student strikes in Serbia and school closures in Israel demanded National Coordinators and SLEs initiators to adapt their timelines and coordination methods: activities needed to be reviewed and rescheduled for each SLE, some meetings and SLE activities were moved online, others were dropped due to inaccessibility of resources or staff dropout. In Serbia, while the planning was already completed in 2024, 3 SLEs had to reschedule their activities to start in September 2025.

# 5 Recommendations for National Coordinators

The following recommendations draw from the experience matured during the implementation of the scaling of the project to +100 SLEs. They are dedicated to national agencies, authorities, or initiatives wishing to upscale SLEs, or similar Open Schooling initiatives in their territory.

Clarify role of National Coordinators upfront. When National Coordinators are also project initiators, they have more agency in aligning activities to learning objectives, steering stakeholders, and overseeing implementation. However, this model demands more time and staff capacity. Conversely, when national coordinators are solely facilitators, they can concentrate resources on supporting and monitoring implementation.



Balance personalization of support with efficiency. Provide online resources and guidelines, reuse recordings, organize large group meetings and set up online spaces to promote peer-learning. National Coordinators should tailor support for SLEs facing difficulties and invest the remaining time on building a shared knowledge base of recurring issues and solutions accessible to all.

Secure dedicated budget for project scale-up. To establish a dedicated team of facilitators that can support projects, motivate initiators and stakeholders and recognize efforts. Budget lines should also cover adaptation of reporting templates, especially in international projects. Dedicated budget should also be in place to support SLEs in marginalized communities and encourage participation in the project through wider campaigns such as the STEM Discovery Campaign to upkeep motivation.

**Streamline reporting.** Reporting templates should be pre-agreed by all national coordinators, to avoid the need of duplications. The use of Al can reduce translation and formatting workload, but only so long as templates are optimized for digital processing. Future iterations should consider simplifying and adapting templates for Al integration.

Plan for external disruptions. Political, social and organizational disruptions can delay or prevent project implementation. Projects should build time buffers and remain flexible in delivery, including readiness to move selected activities online, or reorganize partnerships to allow for extracurricular delivery of certain parts of the project.

## 6 Conclusions

The facilitation and monitoring mechanisms put in place during the upscale of the STE(A)M Learning Ecologies project have demonstrated clear benefits for initiators. National Coordinators, whether acting as facilitators or initiators, provided support that sustained motivation, enabled peer-to-peer learning, and created safe spaces for reflection and troubleshooting. Monitoring tools ensured comparability across contexts, while at the same time capturing the diversity of local experiences. As a result of this constant dedication, 109 SLEs were finalized, and 105 were reported on in time for the analysis. More detailed analysis of the outcomes of these SLEs is provided in Deliverable 4.27

The materials developed to support the upscaling of this project represent another lasting benefit, as they will continue to contribute to the sustainability of the project way beyond its duration. By making these resources openly accessible through the <a href="https://www.steamecologies.eu/">https://www.steamecologies.eu/</a> website, the project ensures that teachers, coordinators and stakeholders across Europe can continue to rely on them and on the events' videos to design and implement their own SLEs. In this way, the facilitation outputs mentioned in this deliverable will continue to strengthen the community of practice around open schooling for years to come.

<sup>&</sup>lt;sup>7</sup> Deliverable 4.2 – Learning Paths and Interventions fostering learners' science-oriented study and careers. https://www.steamecologies.eu/wp-content/uploads/2025/09/D4.2\_Learning-Paths-and-interventions-fostering-science.pdf



# Annex 1

Table 4 National co-creation, facilitation and reflection workshops

NC	SLEs Community Event	Type of event	Delivery date	Nr Particip ants	Country	Format	Audience
APRE	First (in)formative kick-off meeting and webinar for pilot mature SLEs in Italy (3 hours)	Co-creation	24.07.2024	20	Italy	Online	All pilots stakeholders (teachers, Research centres, Universities, NGOs, training centres, foundations)
APRE	SLEs pilots in ITALY: second reflection, monitoring and facilitation workshop with all pilots (2h)	Reflection WS	30.10.2024	22	Italy	Online	All pilots stakeholders (teachers, Research centres, Universities, NGOs, training centres, foundations)
APRE	Third refletion, monitoring and facilitation workshop with all mature pilots (2h)	Reflection WS	18.12.2024	17	Italy	Online	All pilots stakeholders (teachers, Research centres, Universities, NGOs, training centres, foundations)
APRE	Fourth reflection, monitoring and facilitation workshop with all mature pilots (2h)	Reflection WS	26.02.2025	18	Minor event	Online	Italy



NC	SLEs Community Event	Type of event	Delivery date	Nr Particip ants	Country	Format	Audience
APRE	Fifth reflection, monitoring and facilitation workshop with all mature pilots (2h)	Reflection WS	0 <b>7</b> .0 <b>5</b> .2025	18	Minor event	Online	ltaly
APRE	Sixth reflection, monitoring and facilitation workshop with all mature pilots (2h)	Reflection WS	25.06.2025		Minor event	Online	ltaly
Cienci a Viva	First meeting with the Teachers involved in the mature groups	Reflection WS	16.10.2024	12	Portugal	Online	All pilots stakeholders
Cienci a Viva	First group of mature phase meetings and implementati on	Co-creation	21- 25.10.2024	23+1+1	Portugal	Face-to- face	All pilots stakeholders
Cienci a Viva	Second group of mature phase	Co-creation	04- 08.11.2024	27+1+2	Portugal	Face-to- face	All pilots stakeholders
Cienci a Viva	Third group of mature phase	Co-creation	18- 22.11.2024	20+1+1	Portugal	Face-to- face	All pilots stakeholders
Cienci a Viva	Fourth group of mature phase	Co-creation	25- 29.11.2024	23+1+1	Portugal	Face-to- face	All pilots stakeholders



NC	SLEs Community Event	Type of event	Delivery date	Nr Particip ants	Country	Format	Audience
Cienci a Viva	Fifth group of mature phase	Co-creation	02- 06.12.2024	26+1+1	Portugal	Face-to- face	All pilots stakeholders
Cienci a Viva	Sixth group of mature phase	Co-creation	06- 10.01.2025	23+1+1	Portugal	Face-to- face	All pilots stakeholders
Cienci a Viva	Seventh group of mature phase	Co-creation	20- 25.01.2025		Portugal	Face-to- face	All pilots stakeholders
Cienci a Viva	Eight group of mature phase	Co-creation	03- 07.02.2025		Portugal	Face-to- face	All pilots stakeholders
Cienci a Viva	Ninth group of mature phase	Co-creation	17- 21.02.2025		Portugal	Face-to- face	All pilots stakeholders
Cienci a Viva	Tenth group of mature phase	Co-creation	10- 14.03.2025		Portugal	Face-to- face	All pilots stakeholders
Cienci a Viva	Eleventh group of mature phase	Co-creation	24- 28.03.2025		Portugal	Face-to- face	All pilots stakeholders
CPN	Teachers' conference	Co-creation	16.10.2024	89	Serbia	Face-to- face	Teachers, Industry representantives, Researchers
CPN	Mature phase coordination meeting	Co-creation	25.11.2024	16	Serbia	Online	Teachers
CPN	Follow up on SLEs development	Reflection WS	25.02.2025	12	Serbia	Online	Teachers
CPN	Follow up on SLEs development	Reflection WS	09.05.2025	9	Serbia	Online	Teachers
CPN	SLE conference	Other	20.11.2025		Serbia	Face-to- face	Teachers, Youth worksers, Industry representantives



NC	SLEs Community Event	Type of event	Delivery date	Nr Particip ants	Country	Format	Audience
CURA M	Co-creation workshop - Empathy Detectives Pilot	Co-creation	08.07.2024	9	Ireland	Online	Civil Society: Patient Panel Other: Patient Advocacy Group Non- formal education: IDEAs Lab
CURA M	Showcasing SLEs to Explorium	Co-creation	27.09.2024		Ireland		
CURA M	Co-creation workshop - Youth Academy	Co-creation	04.10.2024	2	Ireland	Face-to- face	EPE Education Officer, Outreach Development Officer
CURA M	Showcasing SLEs to the new Teachers who have signed up to the teachers in residence programme	Co-creation	08.10.2024		Ireland		
CURA M	Co-creation workshop - Youth Academy	Co-creation	22.10.2024	2	Ireland	Face-to- face	EPE Education Officer, Outreach Development Officer
CURA M	Co-creation workshop - Youth Academy	Co-creation	04.11.2024	3	Ireland	Face-to- face	EPE Education Officer, Cardiovascular Researcher, Outreach Development Officer
CURA M	Co-creation workshop - Empathy Detectives Live Phase	Co-creation	11.11.2024	7	Ireland	Face-to- face	Transition Year Students and Science Communicators



NC	SLEs Community Event	Type of event	Delivery date	Nr Particip ants	Country	Format	Audience
CURA M	Co-creation workshop - Teachers in Residence	Co-creation	06.02.2025	25	Ireland	Face-to- face	Teachers, Researchers, Science commmunicator
CURA M	Co-creation workshop - Teachers in Residence	Co-creation	20.02.2025	25	Ireland	Face-to- face	Teachers, Researchers, Science commmunicator
CURA M	Co-creation workshop - Teachers in Residence	Co-creation	05.03.2025	25	Ireland	Face-to- face	Teachers, Researchers, Science commmunicator
CURA M	Co-creation workshop - Empathy Detectives Pilot	Co-creation	24.06.2025	9	Ireland	Online	Civil Society: Patient Panel Other: Patient Advocacy Group Non- formal education: IDEAs Lab
DCM	First Co- creation workshop related to OUR MARITIME HERITAGE THROUGH MATHS.	Co-creation	09.01.2024	7	Malta	Face-to- face	SLE initiators (Maths' Education Officers), Maths' Heads of Department and officers from Heritage Malta.
DCM	Co-creation workshop related to The PLANT IRRIGATION EXPERIMENT	Co-creation	14.02.2024		Malta	Hybrid	SLE initiators, Primary Science Team, SLT, ECOGOZO
DCM	Co-creation workshop related to PLANT IRRIGATION EXPERIMENT	Co-creation	01.03.2024	5	Malta	Face-to- face	SLE initiators, Primary Science team and ECOGOZO.



NC	SLEs Community Event	Type of event	Delivery date	Nr Particip ants	Country	Format	Audience
DCM	Co-creation related to PLANT IRRIGATION EXPERIMENT	Co-creation	06.05.2024	5	Malta	Face-to- face	SLE initiators, Primary science team, ECOGOZO and School leadership team
DCM	Progress Monitoring Meeting Review related to OUR MARITIME HERITAGE THROUGH MATHS.	Co-creation	21.05.2024	8	Malta	Face-to- face	SLE initiators (Maths' Education Officers), Maths' Heads of Department.
DCM	Co-creation workshop related to Tween4STEA M	Co-creation	20.08.2024	14	Malta	Face-to- face	Camp mentors and SLE initiators
DCM	Co-creation workshop related to Thematic STEM Debate	Co-creation	03.09.2024		Malta		ESPLORA (Industry representatives?)
DCM	Reflection and evaluation of OUR MARITIME HERITAGE THROUGH MATHS camp	Reflection WS	18.10.2024	8	Malta	Face-to- face	Maths' education officers and HODs
DCM	Co-creation and launching of the 5th SLE: The plant irrigation experiment	Co-creation	07.11.2024	26	Malta	Face-to- face	SLE initiators, Primary Science team, school SLT, ECOGOZO and Year 4 students



NC	SLEs Community Event	Type of event	Delivery date	Nr Particip ants	Country	Format	Audience
DCM	Final (5th) Co-creation and facilitation workshop related to OUR MARITIME HERITAGE THROUGH MATHS	Co-creation	7.8-9.2024	10	Malta	Face-to- face	SLE initiators (Maths' Education officers), Maths' Heads of Department) and officers from Heritage Malta.
DCM	Co-creation workshop related to Tween4STEA M	Co-creation		14	Malta	Face-to- face	Camp mentors and SLE initiators
DCM	Reflection and evaluation related to Tween4STEA M camp	Reflection WS		8			
DCM	Co-creation workshop related to Globe Air Quality Campaign	Co-creation			Malta		
DCM	Co-creation workshop related to Clear The Air: A Student Led Climate Action Project	Co-creation			Malta		
DCM	Kick-off workshop of Thematic STEM Debate	Co-creation			Malta		
DCM	Evaluation workshop related to Tween4STEA M	Reflection WS		5	Malta	Face-to- face	SLE initiators



NC	SLEs Community Event	Type of event	Delivery date	Nr Particip ants	Country	Format	Audience
DCM	Kick-off workshop of Scientist in the Making	Co-creation			Malta		
DCM	Monitoring Workshop	Reflection WS			Malta		
DCM	Kickoff Animals_360	Co-creation			Malta		
DCM	Reflection workshop	Reflection WS			Malta		
DCM	Monitoring workshop	Reflection WS			Malta		
EA	Co-creation workshop	Co-creation	24.09.2024	12	Greece	Face-to- face	Stakeholders, Teachers, Initiators, Educators, Researchers.Experts
EA	Co-creation workshop	Co-creation	15.10.2024	13	Greece	Face-to- face	Stakeholders, Teachers, Initiators, Educators, Researchers.Experts
EA	Co-creation workshop	Co-creation	19.11.2024	11	Greece	Face-to- face	Stakeholders, Teachers, Initiators, Educators, Researchers.Experts
EA	Co-creation workshop	Co-creation	22.01.2025	10	Greece	Face-to- face	Stakeholders, Teachers, Initiators, Educators, Researchers.Experts
EA	Co-creation workshop	Co-creation	22.01.2025	10	Greece	Face-to- face	Stakeholders, Teachers, Initiators, Educators, Researchers.Experts



NC	SLEs Community Event	Type of event	Delivery date	Nr Particip ants	Country	Format	Audience
EA	Co-creation and monitoring workshop	Co-creation	22.01.2025	10	Greece	Face-to- face	Stakeholders, Teachers, Initiators, Educators, Researchers.Experts
EA	Co-creation and monitoring workshop	Co-creation	18.03.2025	10	Greece	Face-to- face	Stakeholders, Teachers, Initiators, Educators, Researchers.Experts
EA	Reflection workshop	Reflection	27.05.2025	15	Greece	Face-to- face	Stakeholders, Teachers, Initiators, Educators, Researchers.Experts
EUN	Introduction to SLEs	Co-creation	16.07.2024	7	Internati onal	Online	Teachers
EUN	Idea definition and stakeholders reachout	Co-creation	30.10.2024	9	Internati onal	Online	Teachers
EUN	Implementati on and Reporting	Co-creation	04.03.2025	6	Internati onal	Online	Teachers
EUN	Final Reflection	Reflection WS	20.05.2025	5	Internat ional	Online	Teachers
Muse os Cientif icos	Call for teachers to implement SLEs	Co-creation	17.10.2024	15	Spain	Online	Teachers
Muse os Cientif icos	Explaining the SLEs methodology	Co-creation	12.11.2024	13	Spain	Online	Teachers
Muse os Cientif icos	Follow-up on SLEs implementati on	Reflection WS	25.02.2025	13	Spain	Online	Teachers and Industry



NC	SLEs Community Event	Type of event	Delivery date	Nr Particip ants	Country	Format	Audience
Muse os Cientif icos	Follow-up on SLEs implementati on	Reflection WS	25.03.2025		Spain	Face-to- face	Teachers, Researchers, Policy maker, Industry representantives, Municipality)
Muse os Cientif icos	Final meeting for presentation and explanation of SLEs implementati on	Reflection WS	23.04.2025		Spain	Face-to- face	
NTNU	Co-creation workshop - Starting the collaboration between University and Industry	Co-creation	28.08.2024		Norway		
NTNU	Co-creation workshop	Co-creation	28.08.2024	68	Norway	Face-to- face	
NTNU	Online reflection workshop with customers	Reflection WS	09.10.2024	68	Norway	Online	
NTNU	Progress Monitoring Meeting Review	Reflection WS	16.10.2024		Norway		
NTNU	Co-creation workshop related to schools STEM learning activities	Co-creation	21.10.2024		Norway		



NC	SLEs Community Event	Type of event	Delivery date	Nr Particip ants	Country	Format	Audience
NTNU	Final meeting for presentation of the SLEs in collaboration with industry	Other	27.11.2024		Norway		
NTNU	Last presentation	Reflection WS	27.11.2024	68	Norway	Face-to- face	
NTNU	Reflection workshop	Reflection WS	17.01.2025		Norway		
NTNU	Other	Other	24.01.2025		Norway		
NTNU	Follow up on SLEs development	Reflection WS	30.01.2025		Norway		
NTNU	Co-creation workshop - Collaboration with industry parnters	Co-creation	01.07.2025		Norway		
UCY	SCYENCE FAIR - SLE National Representati on Talk	Other	03.04.2024	48	Cyprus	Online	Teachers, Headteachers, Ministry of Education representatives, Students
UCY	Reflection workshop	Reflection WS	20.06.2024	11	Cyprus	Face-to- face	Teachers, Researchers, Policy maker, Industry representantives, Municipality)



NC	SLEs Community Event	Type of event	Delivery date	Nr Particip ants	Country	Format	Audience
UCY	Strengthenin g the SEMEP Network through SLEs.	Co-creation	10.08.2024	23	Cyprus	Online	Teachers and National Lead representative of Unesco funded SEMEP school network.
UCY	Co-creation workshop - Starting the collaboration between UCY and teachers for the mature phase	Co-creation	06.10.2024	13	Cyprus	Online	Teachers
UCY	Supporting SLE schools - BLUE LIGHTS	Co-creation	07.05.2025	100+	Cyprus	Face-to- face	Teachers, Headteachers, Students, Parents, Community, National Semep Network by UNESCO, University, Municipality, Industry stakeholders
UCY	Supporting the SEMEP Network through the SLE programme	Co-creation	02.12.2025	12	Cyprus	Online	Teachers, SEMEP school network by UNESCO national lead, Ministry of Nicosia, Green transition Legal expert



NC	SLEs Community Event	Type of event	Delivery date	Nr Particip ants	Country	Format	Audience
WIST. HUB	Co-Creation workshop	Co-creation	03.10.2025	12	German Y	Face-to- face	Stakeholders, Teachers, indutry partners, University
WISTA .HUB	Co-creation workshop	Co-creation	07.02.2024	20	German y	Face-to- face	Stakeholders, Teachers, indutry partners, University, Community Partners
WISTA .HUB	Co-creation Workshop	Co-creation	12.02.2024	20	German y	Face-to- face	Stakeholders, Teachers, indutry partners, University, Community Partners
WISTA .HUB	Co-creation workshop	Co-creation	22.04.2024	20	German y	Face-to- face	Stakeholders, Teachers, indutry partners, University, Community Partners
WISTA .HUB	Co-creation Workshop	Co-creation	31.03.2025	12	German Y	Face-to- face	Stakeholders, Teachers, indutry partners, University
WISTA .HUB	Co-creation workshop	Co-creation	29.09.2025		German Y	Face-to- face	Teachers, Headteachers, University,Industry stakeholders

# Annex 2

Examples of materials' adaptations by Cyprus, Italy, Serbia

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