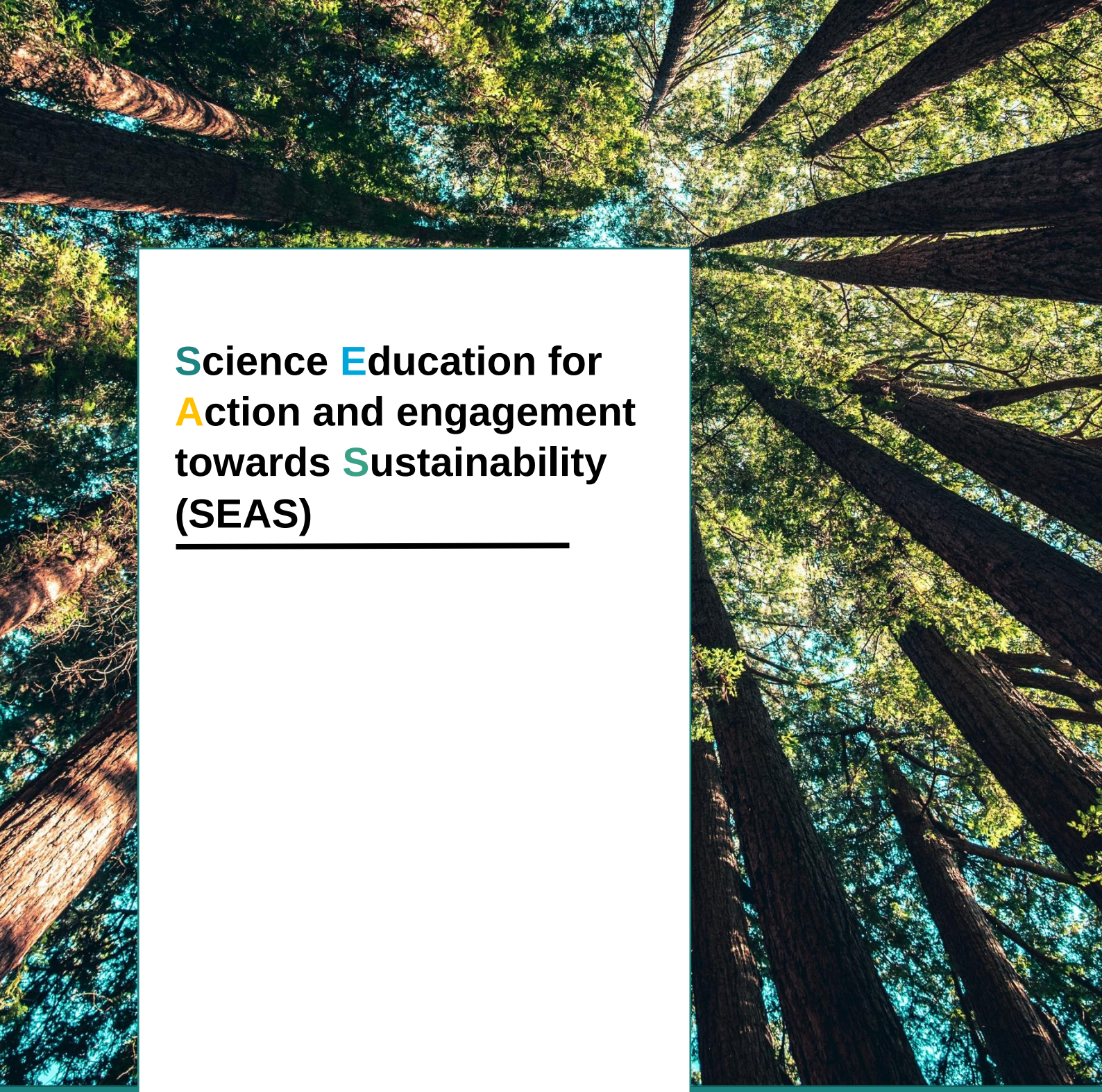


Science Education for Action and engagement towards Sustainability (SEAS)

D4.1.

Updated guideline manual describing the use of each of the SEAS digital tools

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Summary

This deliverable documents the two digital tools to be provided during the first iteration of the SEAS project. Those two tools are LORET and cCHALLENGE.

LORET is a didactical tool that represents a methodology for co-creating locally relevant themes and curricula for open schooling. LORET allows for providing shared reference points for pathways of emerging learning trajectories. Further, as working with LORET involves dialogue and includes stakeholders outside of the school in the process of curriculum development, it is also a tool that facilitates and expands collaboration with partners outside of the school.

cCHALLENGE is an experiential learning tool that facilitates and supports insights and reflections on solutions to environmental problems through a 30-day commitment to one sustainability-related experiment with change. cCHALLENGE can be used to engage teachers, students, families, and communities in individual and collective learning about sustainability issues. By encouraging perspective-taking, it aims to generate learning and activate a greater sense of agency in dealing with complex environmental issues.

Document history, future and authorship

This document has been prepared by the leader of WP4 Stefan Bengtsson, Uppsala University based on texts provided by Leif Östman (EduQuality), Katrien van Poeck (University of Ghent), Leonie Goodwin (cCHANGE), Linda Sygna (cCHANGE), and Karen O´Brien (University of Oslo). Section 2 on LORET was authored by Leif Östman and Katrien van Poeck. Section 3 on cCHALLENGE was authored by Leonie Goodwin, Linda Sygna, and Karen O´Brien.

A first draft of the document was circulated to the project management team on the 1st of November 2019 for input, and to Alfredo Jornet, as leader of WP2 and WP3, for comments and feedback. Based on that input, Stefan Bengtsson, Leonie Goodwin, Karen O´Brien, Leif Östman and Katrien van Poeck prepared a second version of the deliverable. Leonie Goodwin worked on the first draft, including changes based on comments from Erik Knain, provided as documentation for the Tallinn workshop on the 22nd of November 2019. This deliverable was sent to the internal quality control team for vetting on 9th of December.

As with regards to its future, the document will be revised as part of preparation of deliverable D4.2. The revision is to be based on a global assessment of the uptake and use of the tools as well as new tools taken up on by local networks. The revision of this document in deliverable D4.2 will also be combined with the revision and adaptation of the digital tools.

1. Introduction

A main objective for the project Science Education for Action and Engagement towards Sustainability (SEAS) is to develop models for open-schooling implementation that will support schools and out-of-school institutions to collaborate in the promotion of scientific literacy and skills for responsible citizenship among students and citizens in the larger community. SEAS will achieve these ends by establishing, coordinating and evaluating collaboration among six open schooling networks led by universities and science centres with partners in Austria, Belgium, Estonia, Italy, Norway, and Sweden. The open schooling networks consist of partners across formal, non-formal, and informal science education, and include, in addition to researchers and out-of-school centres, local schools, civil society organizations (CSOs), and small and medium-sized enterprises (SMEs). As part of these networks and drawing on principles of inquiry-based science learning for transformative engagement, students in formal schools are given the opportunity to engage in addressing real-life, complex sustainability challenges that are identified and dealt with together with participants and stakeholders in the local community. To enable scientific literacies and skills for responsible citizenship, SEAS develops, explores, and adjusts a set of concepts, digital tools, and methods for enabling and assessing open-schooling science learning collaborations across formal, non-formal and informal settings.

This deliverable "Updated guideline manual describing the use of each of the SEAS digital tools" (D4.1) documents in written form the tools to be utilized in the SEAS project. It includes a brief description of two of the initial tools provided by and to be experimented with in SEAS, their purpose, as well as a more in-depth description of how they can be used. More specifically, this document includes the manuals for the LORET tool as well as the cCHALLENGE tool. As both these tools involve specific methodologies and are made accessible through different digital platforms and channels, the documented ways of using them also include recommendations for facilitators, as well as the different steps to be taken as part of carrying out the methods. While these methodologies specify ways in which the tools were originally designed to be used, how these tools are taken up and implemented in SEAS must be integrated to function within the project and to serve SEAS' overall principles, needs, and purposes. This process of integration and adaptation during the first iteration of the project will be documented in the updated version of this deliverable "Updated guideline manual describing the use of each of the SEAS digital tools" (D4.2). The theories and technical concepts crucial to LORET and cCHALLENGE are accounted for in the deliverable "A document with the shared pool of SEAS' analytical concepts and methods" (D2.2) documenting a shared pool of SEAS' analytical concepts, where these tool-specific concepts and theories, are related to the key concepts and ambitions of SEAS. Further, the actual utilization of and experimentation with the tools during the first iteration of the project is to be aligned with the plans, principles, and milestones documented in the deliverable "A plan and milestones concerning challenge implementation for each local network" (D2.1). The tools are here seen as a means for conducting and structuring inquiry processes in *ChangeLab workshops* as they will be described in deliverable "A guideline document for implementing and following up ChangeLab Workshops" (D2.4).

Initially SEAS will focus on introducing three initial tools: cCHALLENGE, LORET, and SenseMaker. However, this deliverable, documenting the tools utilized in the first iteration of the project, focuses only cCHALLENGE and LORET. SenseMaker, a tool that allows for the analysis of emerging narratives and emerging patterns in learning, is scheduled to be incorporated in the second iteration of the project. Accordingly, its documentation will be provided in the updated version of this deliverable (D4.2). The utilization of SenseMaker in SEAS is aimed to allow for a deepened understanding of the evolving of local networks including which types of tools and how these tools, in general, can be conceived and used to support open schooling initiatives and innovations.

When it comes to meeting SEAS' objective of supporting open schooling initiatives and innovation, the tools described here are differentiated by three distinct needs. First, there is a need for tools that can *account for emerging learning trajectories and changes in existing learning trajectories*. Second, there is a need for tools that *facilitate the management of schoolwork for the innovation of open schooling*. Third, there is a need for tools that *facilitate and expand the collaboration across partners inside and outside the school.*

The function of the two key tools (LORET and cCHALLENGE) within the first iteration of the project is to *facilitate collaboration across partners inside and outside of the school* (cCHALLENGE & LORET) and the *management of learning trajectories* across contexts within and among schools (LORET & cCHALLENGE). They are designed to support the development of scientific literacy, teaching, engagement, and empowerment of open schooling initiatives addressing sustainability challenges.

LORET in particular, is a didactical tool that represents a methodology for co-creating locally relevant themes and curricula for open-schooling. LORET is documented in this deliverable. LORET allows for providing shared reference points for pathways of emerging learning trajectories. Further, as working with LORET involves dialogue and includes stakeholders outside of the school in the process of curriculum development, it is also a tool that facilitates and expands collaboration with partners outside of the school. In addition, the developers of LORET will also provide Acedu, an online database for documenting lesson plans and other educative materials as developed in and generated through SEAS. The data base, which can collect LORET lesson plans but also other outputs of SEAS, is to be developed by the developers of LORET during the second iteration of the project. The development of the online Acedu database will have to adapt and be based on the actual outputs of SEAS. The development of a database is to assist and offer ways to innovate school management in the context of open schooling.

cCHALLENGE is an experiential learning tool that facilitates and supports insights and reflections on solutions to environmental problems through a 30-day commitment to one sustainability-related experiment with change. cCHALLENGE can be used to engage teachers, students, families, and communities in individual and collective learning about sustainability issues. By encouraging perspective-taking, it aims to generate learning and activate a greater sense of agency in dealing with complex environmental issues. cCHALLENGE generates a wide range of stories about change that vary over the 30-day experiment. If deemed desirable, the SenseMaker tool could be employed in later iterations of the project to analyze these narratives and identify emerging patterns.

Although the tools presented in this document serve important functions to enable scientific literacies and skills for responsible citizenship by open schooling, it is inherent in the SEAS methodology that additional tools and resources may be found necessary and useful in the local networks. In particular, the analysis and evaluations coming out of the *ChangeLab* workshops during the first iteration may identify a need to adjust the initial tools as well as additional needs and available tools that can facilitate the innovation of open schooling. This revision will be reported in the updated version of this deliverable (D4.2).

The document is organized in the following main sections:

- Document history, future and authorship
- LORET
- cCHALLENGE

2. LORET – a guideline manual

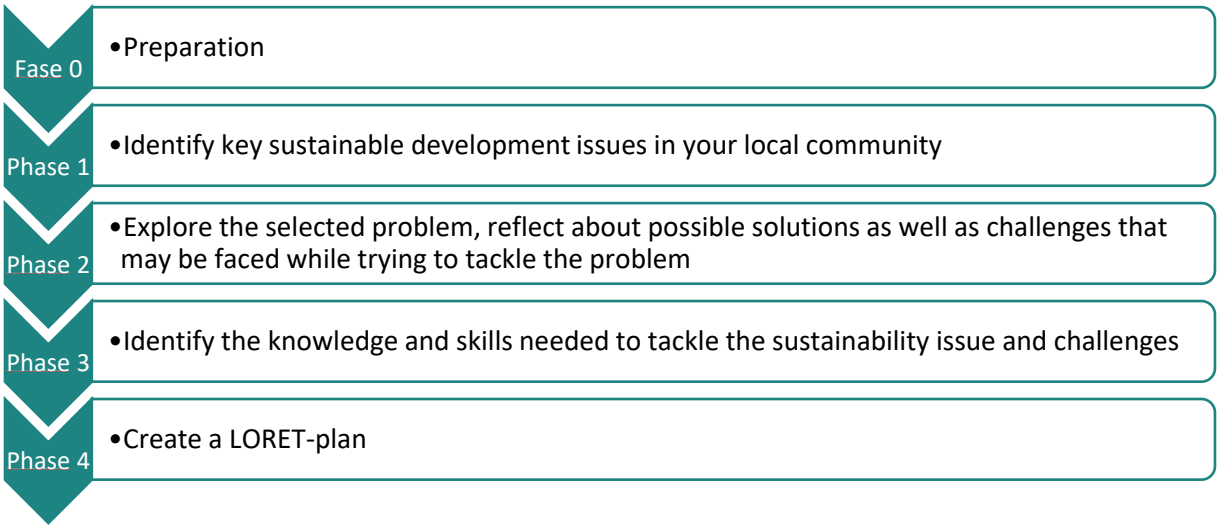
2.1 LORET – Locally Relevant Teaching: Step-by-step plan

LORET (Locally Relevant Teaching) offers teacher teams a phased step-by-step procedure to plan locally relevant sustainable development teaching that is adapted to local needs and conditions while, at the same time, allowing for the teaching of subject knowledge in such a way that the objectives in the curriculum can be realised. The model was created by Leif Östman and Staffan Svanberg in 2004, while working on a project on education for sustainable development in Mongolia[1]. It is well-suited to implementing 'open schooling' initiatives focused on sustainability challenges in collaboration with local community actors[2]. Open schooling connects teaching and learning in schools to practices, concerns and engagement outside the school, in families and communities. In this sense LORET is a tool that addresses the identified need in SEAS for tools that facilitate and expand the collaboration between partners inside and outside the school (see Introduction) as part of democratizing inquiry. Further, as LORET is a tool that generates locally relevant teaching and curricula, it addresses the identified need in SEAS for tools to facilitate management of school work for innovation in open schooling. In this context it addresses primarily teachers as target audience. LORET is currently being used in open schooling initiatives in Belgian and Swedish schools and will be fine-tuned based on the lessons learned in these pilot schools.

In this document, we present the step-by-step plan for working with LORET. After a preparation phase (Phase 0), Phase 1 and 2 are focused on *sustainability in the local community* and, in particular, on selecting a locally relevant sustainability challenge and exploring it in order to get familiar with the issue that will be the focus of the open schooling initiative. With Phase 3 and 4, then, we move to the *classroom context* and focus on designing the education practice.

[1] Östman L., Svanberg S. & Aaro Östman E. 2013. *From Vision to lesson: Education for sustainable development in practice*. Stockholm: WWF.

[2] Östman, L., Van Poeck, K. & Öhman, J. 2019. Principles for sustainable development teaching. In: Van Poeck, K., Östman, L. & Öhman, J. *Sustainable Development Teaching: Ethical and Political Challenges.* New York: Routledge, 40-55.



Below, we briefly describe each phase in the step-by-step plan. For each phase we also add some guidelines for facilitators of LORET-based open schooling initiatives, i.e. people that are supporting schools in implementing LORET or teachers, principals, etc. who want to coordinate it in their own school. This can be done by using LORET at the ChangeLab workshops, where LORET is aimed at offering tailor-made support for open schooling teams (teachers, school management, local stakeholders, etc.). Thus LORET with its particular focus on planning an open schooling project from the school perspective, connects well with the ChangeLab workshops in the planning phase and sets the stage for further ChangeLab workshops after Phase 4.

2.2 Phase 0 - Preparation

This preparatory phase precedes the first LORET workshop and is aimed at planning the implementation of a LORET during the ChangeLab workshops.

Steps:

1. Organise a planning meeting.
2. (Experimenting with school management) Discuss how to gather teachers, preferably from different subjects, and other school staff members for developing a LORET plan: Who should be involved? How to bring them together: In a staff meeting? A training day?, etc.
3. (Expanding collaboration, including with partners outside the school) Discuss how to involve students, parents, local government, entrepreneurs, civil society organisations, etc.: Can this be done directly during a ChangeLab, but also through other activities? And what means can be used to engage and connect to partners outside the school e.g. a survey conducted in advance, collecting ideas through interviews (e.g. in the context of a student assignment), etc.?

Guidelines for facilitators:

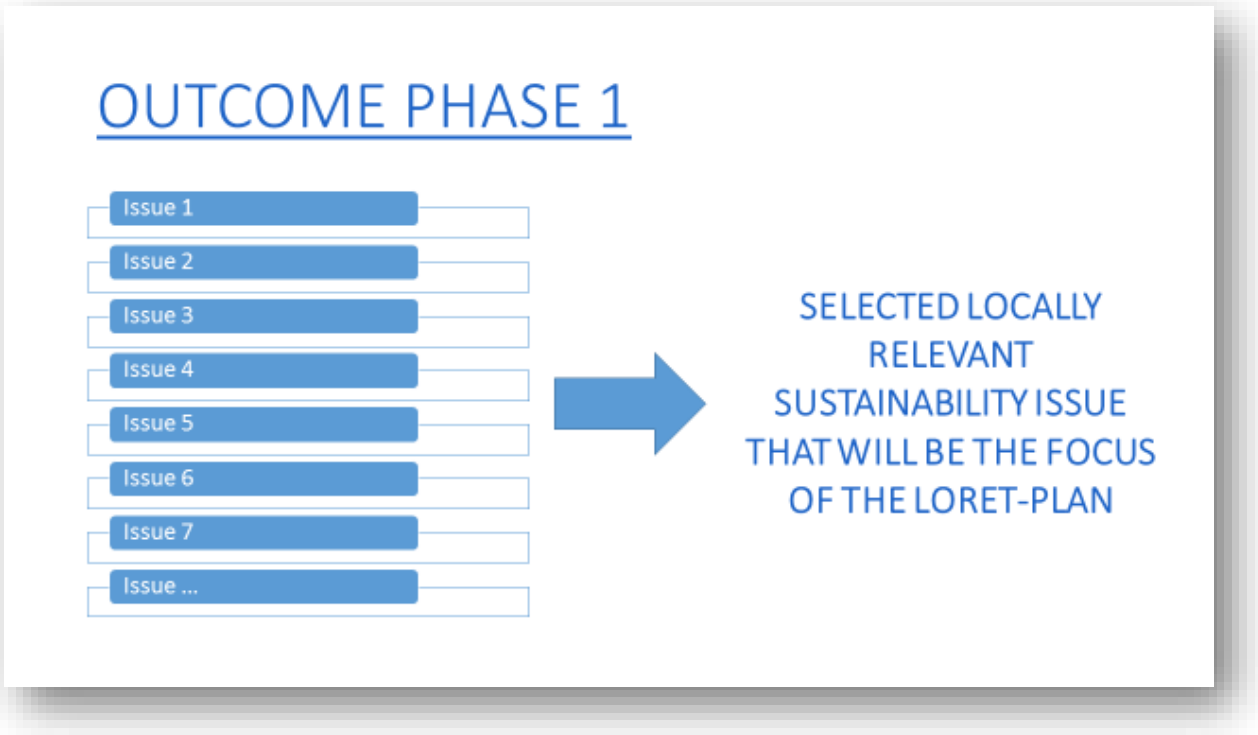
Before organising the first LORET workshop, it is vital to have a preparatory meeting with the people who will take the lead in implementing LORET as part of ChangeLab open schooling initiatives. Answering the questions above will help to optimally organise the meeting(s) with the whole open schooling team. Using LORET as a tool in the ChangeLab workshops and covering LORET phases 1-4 will at least take one full day. However, it is not necessary to go through all the phases during the same day. In fact, our experiences from running LORET indicates that it may be more fruitful to spread the use of LORET over several meetings. For example, a half-day workshop on Phase 1 and 2, a two-hours workshop on Phase 3 and another two-hours workshop on Phase 4. In that way, the participants can take some time in-between meetings to reflect on what has been discussed and to prepare the work to be done in the subsequent meeting.

2.3 Phase 1 - Identify key sustainable development issues in your local community

Phase 1 is aimed at exploring locally relevant sustainability challenges and at selecting the topic that will be the focus of the open schooling initiative.

Steps:

1. Each person lists key issues for sustainable development in the local community (individual work).
2. Discuss the different key issues in the group and choose one to work with in developing one LORET (the excluded key issues can be used in other LORETs).



Guidelines for facilitators:

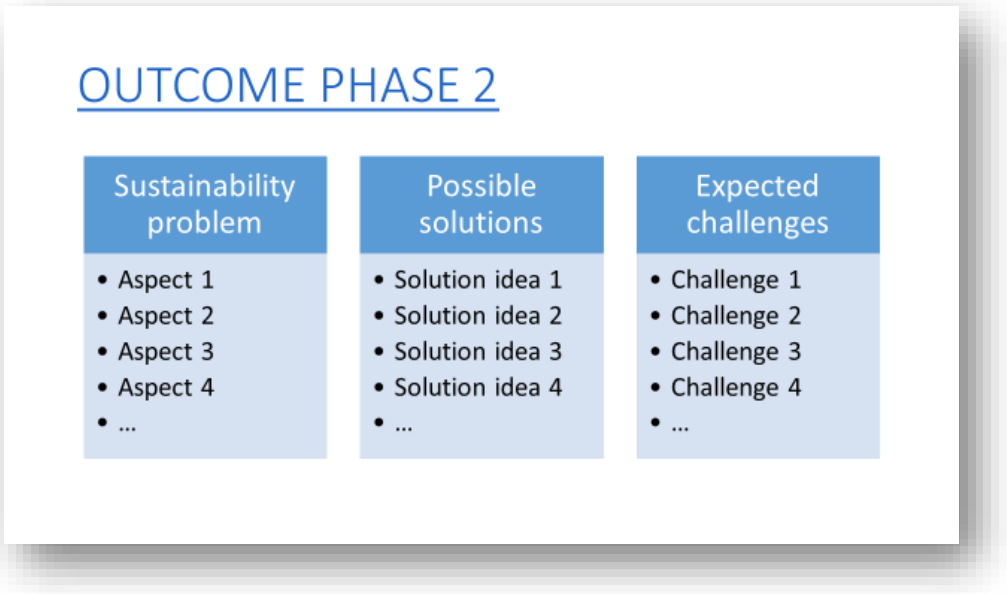
The first ChangeLab workshop to utilize LORET will start with these steps. It is important to take time for individual work before moving on to a whole group discussion. In that way, everybody gets involved and there will be more and more varied ideas raised. Our experience shows that it is often a challenge for the facilitator to keep the participants' attention directed to listing sustainable development issues without already jumping to challenges related to education about the topic, to engaging people in addressing it, etc. Yet, it is very important to insist on first collecting all of the potential individual perspectives and to assure the participants that we will move on to what this means for education practices in the later phases. For groups not yet familiar with sustainable development, a general introduction to the topic might be useful. The Sustainable Development Goals may offer a framework that can widen the scope of what sustainability entails (e.g. more than just environmental problems).

2.4 Phase 2 - Explore the selected problem, possible solutions as well as challenges

In Phase 2, the focus is still on the content of the locally relevant sustainability challenge. It is aimed at **further exploring the problem, reflecting on possible solutions and the challenges the latter may bring about**. When using LORET during ChangeLab workshops in order to explore what challenges exist in an open manner, we will take our students on a very adventurous journey. After all, sustainability problems are often very complex and most of the time we do not have ready-made solutions for tackling them. LORET is designed to offer students opportunities to engage with the complexity of such issues, to experiment with possible solutions and to learn from that. But as a teacher, we want to prepare this adventurous journey a bit; not by deciding everything that can and will happen in detail in advance, but by exploring some of the possibilities and challenges that we might encounter – together with the students – during our journey. Phase 2 is designed to **offer those participating in the ChangeLab workshops the opportunity to familiarise themselves with the selected sustainability issue so that they are well prepared for further inquiry together with the students**.

Steps:

1. Individual work: Make three lists: 1) Explore the selected topic in more detail and list different aspects of it. What is actually the problem? Why is it a problem? For whom is it a problem? (How) do we experience it in the local community?, etc.; 2) List possible ways to tackle the selected sustainability issue. Which ameliorations would you like to achieve? Which actions does this require according to you?; 3) List the challenges you expect to encounter while putting the action ideas into practice.
2. Discuss the individual lists in the group and make common lists.



Guidelines for facilitators:

Phase 2 is very challenging for facilitators of ChangeLab workshops that use LORET. Two potential pitfalls should be avoided. First, as we also explained in Phase 1, participants often tend to 'jump' immediately to the classroom context. It is vital here to keep their attention focused on the content that will be central in the LORET-plan, that is the local sustainability problem. It is our experience that in Phase 2, a facilitator of ChangeLab workshops has to intervene repeatedly in order to keep the attention focused on the task at hand here – i.e. listing aspects of the local sustainability problem, raising ideas for possible solutions and challenges that may be expected when putting these into practice. When it comes to listing solutions and challenges, for example, the participants should be encouraged to look beyond the campus/classroom and think about what could be done in order to solve the sustainability problem. A question that sometimes helps to do this, is "Imagine that you are in power to decide about everything in your local community, what would you do in order to solve the problem we are discussing?". Here too, it will be important to assure the participants that the step towards the classroom/school context will be made in the next phase.

A second potential pitfall is that the participants understand the tasks of Phase 2 in such a way that it closes down the opportunities for the students, later on, to engage in a joint inquiry into the sustainability challenge, possible solutions and the challenges these bring about. As argued, this phase is meant to offer ChangeLab workshops and schools participating in them the opportunity to familiarise themselves with the chosen content before involving the students in this adventurous journey. Journeys that are strictly planned in detail, from hour to hour, are usually not the most interesting ones. It limits the possibility to be surprised by something unexpected, to adapt plans to changing circumstances, to be open for everyone's interests and suggestions, etc. So, rather than planning a detailed journey script, Phase 2 could be compared to exploring possible places to stay, things to do, practical arrangements, etc. while planning your journey so that you have a good view on possibilities, risks, plan B's, etc. while, all the same, remain open for surprises. After all, the whole idea is to take our students along in a joint inquiry where they can discover, experiment and learn from that – not to offer them ready-made solutions that we have decided in advance.

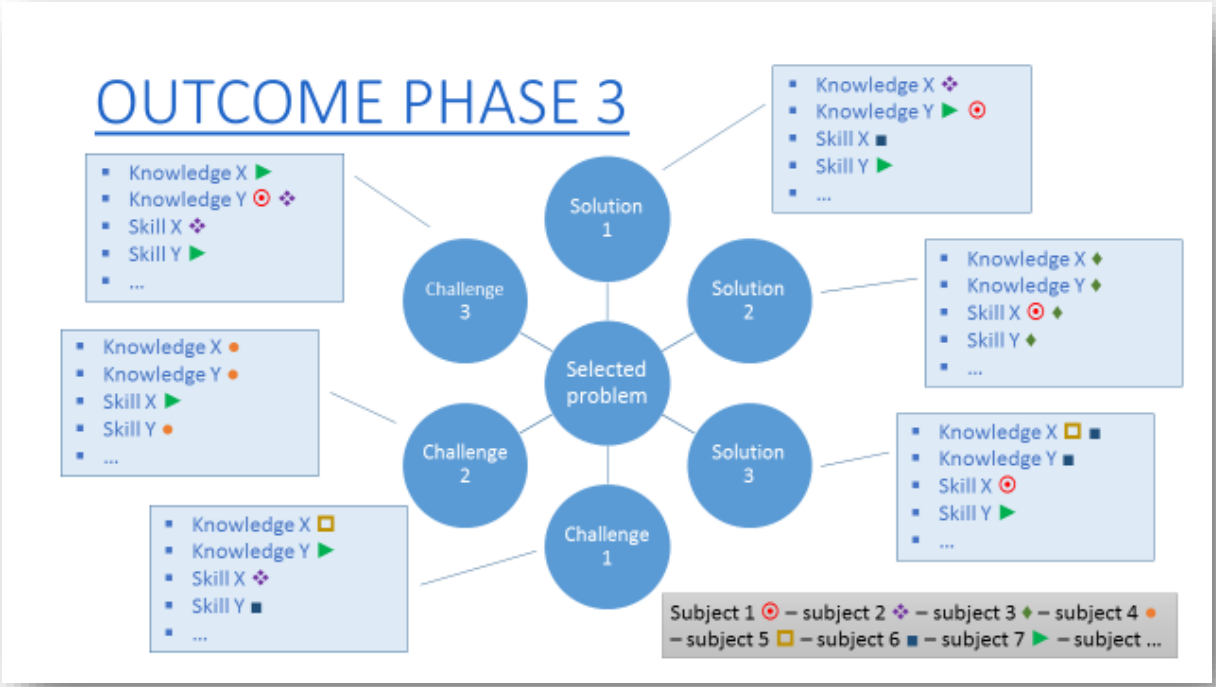
2.5 Phase 3 - Identify the knowledge and skills needed

With Phase 3 we move on to the classroom context and start to design education practices. The aim, here, is to identify relevant knowledge and skills to contribute to the possible solutions and to deal with the potential challenges.

Steps:

1. Individual work: Make a list of the things students need to know about in order to realise the possible solutions and to deal with the potential challenges identified in Phase 2. This can include scientific knowledge, practical skills but also, for instance, ethical and/or democratic competences.

2. Compare the lists in the group.
3. Make a mind map: Construct headlines for the solutions and challenges identified in Phase 2 and sort the necessary knowledge and skills under the headlines.
4. Determine the school subjects that will be needed in order to cover the knowledge areas marked in your mind map. Indicate these on your mind map using different colours for different subjects. You will probably find that several school subjects are necessary.



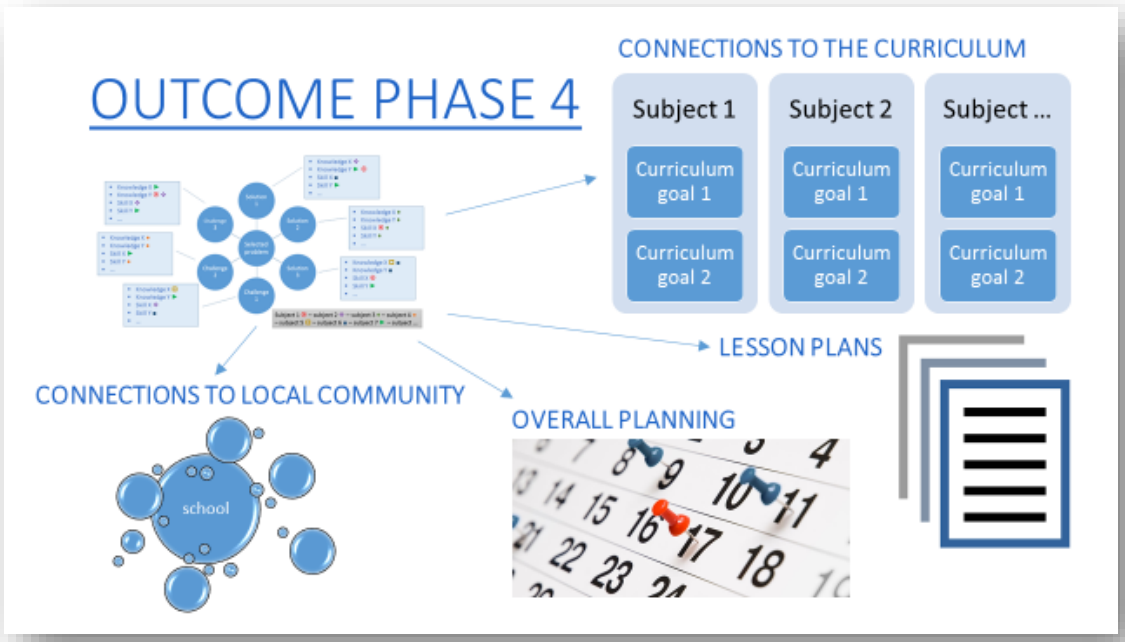
Guidelines for facilitators:

Phase 3, in our experience, benefits from some time for preparation. Therefore, if it is practically possible, we would recommend organizing a second ChangeLab workshop focusing on Phase 3 of LORET, at least a couple of days after going through Phase 1 and 2. You can already tell the participants what will be expected from them in Phase 3 and ask them to prepare this task a bit in advance. It is also important to maintain a wide scope on knowledge and skills. As argued, dealing with sustainability challenges is not only a matter of applying scientific knowledge, but also entails things such as practical skills and ethical and democratic competences.

2.6 Phase 4 - Create a LORET plan

The mind map developed in Phase 3 is to provide a solid basis for creating a teaching plan for locally relevant sustainable development teaching. The key issue you have chosen is the teaching theme. The actions and challenges in the mind map can be regarded as topics for one lesson or a series of

lessons. Thus, a theme can consist of several topics and each topic can embrace one or several lessons.



Steps:

1. Identify connections to the curriculum. Where/how are the identified knowledge and skills (phase 3) addressed in the curriculum.
2. Decide how you will organize the lessons so that the students can effectively integrate the knowledge from the different school subjects.
3. Identify connections to the local community:
    a. Can/should the students gather knowledge in the local community, for example by interviewing a farmer, a parent, etc.?
    b. Can/should the students take any action in the local environment: On the school estate or in the schoolyard? In the local community? At home?
4. Determine the number of lessons that will be needed and the content for each.
5. Identify teaching methods that will help students to get actively involved and learn the required knowledge and skills.
6. Critically examine the plan and revise it as necessary:
    a. Is the teaching content well-chosen?

b. Is something missing? For example: Are ecological as well as economic and social aspects covered? Which sustainable development goals are addressed, and which are not? Are all the relevant subjects included? Will students learn both practical and theoretical knowledge and skills?

c. Are there strong connections to the local community?

7. Write the final LORET plan, preferably in such a way that they can be read and used by other teachers.

Guidelines for facilitators:

Phase 4 also benefits from some time for preparation. You can, if possible, combine it into a workshop together with Phase 3 or organize a third session. Here too, it is fruitful to inform the participants what will be done in advance, so that they can, for example, scrutinize the curriculum, think about possible teaching methods, etc.

3.7 LORET Access and contact

The LORET tool can be accessed via the following web-site:

https://www.acedu.se/guidelines/loret-plans

Main contact for LORET:

Prof. Leif Östman (leif.ostman@edu.uu.se)

3. cCHALLENGE – manual and guidelines

3.1 What is cCHALLENGE?

cCHALLENGE is an experiential learning tool that can serve as an engaging entry point for working with climate change and sustainability issues. It directly addresses the practical, political and personal spheres of transformative change, while also facilitating both individual and collective learning. Through a 30-day personal change experiment, participants gain insights on both environmental issues and change processes. A transformative program and reflection questions help participants gain insights on how and why each person's potential for impact extends beyond behavioral change.

Teachers and schools play an important role in strengthening students' ability to think critically and engage with contemporary social, environmental, and political problems. cCHALLENGE provides a deeper understanding of climate change and sustainability issues by inviting teachers, students, administrators, families, and communities involved in open schooling initiatives to explore, experiment, take perspectives, share stories, and reflect. Through the 30-day experiment with change, participants can gain valuable insights into how to contextualize sustainability issues in their lives, regardless of the subject, level, or area of expertise.

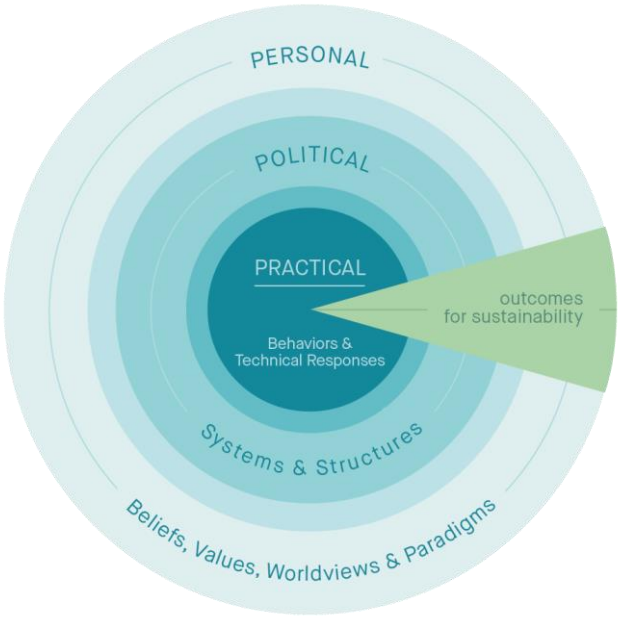
As cCHALLENGE is a tool that facilitates collective learning and connects personal challenges to social and political problems, it addresses the needs identified in SEAS for tools to facilitate and expand the collaboration between partners inside and outside the school (see Introduction) as part of democratizing inquiry. Further, as cCHALLENGE connects personal development and learning in and through different channels and media and can speak to partners outside the school context, it can address the identified need in SEAS for tools to facilitate management of school work for innovation in open schooling by opening up learning processes to communicate and connect learning that normally takes place "inside" schools.

Learning through experience

The core of cCHALLENGE is a 30-day change experiment, where each participant chooses and commits to a personal change project related to sustainability. The project is carried out by a class or several classes, community or group, and insights, experiences, and stories are shared. The individual change experiment is embedded within a larger narrative on social change, which can be emphasized through workshops, trainings, discussions and dialogues. Participants are encouraged to explore how their actions, conversations and engagement influence (and are influenced by) others, as well as how systemic factors can facilitate or impede change.

Participants are also encouraged to share their experiences and insights with others. This approach to experiential learning draws attention to the role of social and cultural norms, structures, and systems in processes of change. It also provides insights into how assumptions, beliefs, and values influence how society is organized and the goals that are prioritized. Over the course of the thirty

days, participants receive research-based information, inspiration and reflection questions based on a heuristic known as The Three Spheres of Transformation.



The Three Spheres of Transformation (O'Brien and Sygna, 2013[3,4,5] Sharma 2007[6]) model is a means for understanding the changing relationship between individual agency, collective agency, and political agency.

Approaching climate change and sustainability issues from multiple perspectives can trigger new conversations among students, teachers, friends and families about both the problems and solutions. It also introduces a practical way for schools to emphasize the connections between sustainability and other interdisciplinary concepts such as citizenship and life mastery. cCHALLENGE is flexible and adaptable to the curriculum, so it can be employed in a variety of school subjects and initiatives.

3.1.1 Why focus on change?

The dominant narratives on climate change and sustainable development highlight the practical actions that individuals, groups, and organizations can take to reduce greenhouse gas emissions, limit pollution, protect biodiversity, save water, and so on. Technical and managerial solutions are emphasized, together with green values and environmentally-friendly behaviors. While such

[3] O´Brien, K. and Sygna, L. (2013) Responding to Climate Change: The Three Spheres of Transformation. *Proceedings of Transformation in a Changing Climate*, 19-21 June 2013, Oslo, Norway. University of Oslo. ISBN: 978-82-570-2000-1

[4] O'Brien, K. (2018) Is the 1.5°C target possible? Exploring the three spheres of transformation. *Current Opinion in Environmental Sustainability (COSUST).* Vol 31: April 2018, 153-160. DOI:10.1016/j.cosust.2018.04.010

[5] IPCC (2014) Chapter 20: Climate-resilient pathways: adaptation, mitigation, and sustainable development. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1122.

[6] Personal to Planetary Transformation by Monica Sharma in Kosmos Journal, 2007. Download at: https://www.kosmosjournal.org/article/personal-to-planetary-transformation/

approaches are important, they tend to be partial and fragmented. Furthermore, they are not producing results and outcomes consistent with the U.N. Sustainable Development Goals (SDGs).

Instead of focusing on what each person does or does not do for the environment, or the size of their ecological footprints, cCHALLENGE focuses on *change* within the wider context of sustainability issues. By approaching change as an experiment, participants are continuously encouraged to explore, reflect and ask questions such as "what if", "why? and "why not?" Many pose critical questions about behavioral changes and begin to question and contextualize the black-and-white perspectives that are frequently offered as solutions to issues like climate change (e.g., no meat, no flying, no consumption, no driving). A shift in perspective and focus can help participants to see things differently, which can help them to identify larger and more meaningful roles for themselves and others in addressing complex social and environmental issues.

CHALLENGE is designed to trigger critical thinking and activate agency, inspiring participants to better understand and engage with change. This is important, as climate change and environmental problems often come across as complex and abstract. They can easily be perceived as overwhelming, and the psychological and emotional dimensions are receiving increased attention. cCHALLENGE encourages participants to investigate and explore change, not just at the individual scale, but also at a societal scale. It does this by focusing on the relationship between individual change, collective change, and systems change.

Experiential learning can help to shift the narrative. By inviting students, teachers, families, and communities to experiment with change, cCHALLENGE contributes to learning and capacity building related to sustainability issues. It creates a space for reflection on the systems and structures, barriers and alternatives needed for sustainable transformation, including how these relate to their own contexts and lives. cCHALLENGE sparks interest and engagement in a gentle, subtle and long-lasting way by emphasizing the following:

Transformative learning: Reflection and critical thinking are key in empowering people of all ages with knowledge, skills, and sense of political agency. Rather than treating people as "objects to be changed" in the name of sustainability, cCHALLENGE helps participants to experience how they can create changes in their own lives, in their families, in their school, in their community, and in politics. Such a shift in perspective can be empowering and have lasting impacts in other areas and domains.

Sharing stories, creating new conversations and inspiring others: When someone makes a change in their own life, it is often sparks either positive or negative reactions from others. By sharing stories and experiences with friends and family, discussing and reflecting with others, participants become aware of the power of social and cultural norms. They also become aware of the power they hold to influence and inspire others through conversations and stories.

Lasting change – from the inside out: Lasting change involves shifts in perspectives that enable people to view problems and solutions in new ways. New insights and "ah-ha" moments can be transferred to other situations and contexts. Making connections and perceiving relationships is critical to active engagement with the types of change needed for sustainability.

3.1.2 A flexible tool for educators

The cCHALLENGE is a tool and learning program that gives educators an opportunity to work with climate change and sustainability in a practical and engaging way. It represents an experience-based, interdisciplinary approach to learning that can be linked to learning outcomes in other subjects, such as history, art, citizenship and health. Finding entry points for exploring sustainability issues in multiple subjects can help both teachers and students to identify interdisciplinary themes and make the links between environmental and social issues.

There are a variety of ways to run a cCHALLENGE in a school or local community. For example, students may choose a change experiment that relates to the sustainability challenge identified in the ChangeLab workshops or by using LORET in these workshops.

In turn the cCHALLENGE round can be connected to one or more curriculum objectives in a single subject, or across several subjects. Competence goals can be addressed in subjects such as Geography, History, Arts and Crafts, Mathematics, Social Studies, Natural Sciences, and Physical Education. For example, a Physical Education challenge could focus on mobility and sustainability. A Social Studies project could focus on a topic such as food waste and explore policy measures to address it. Language subjects (native or foreign) can be used in communicating reflections. For example, students might choose a sustainability-related challenge and then share their reflections in a language subject.

cCHALLENGE can also be used as a social and collaborative tool in the classroom, either within classes, or across classes or subjects. It enables students (and teachers) to get to know each other in new ways and to connect in a deeper way. It is also flexible enough that school administrators, families, stakeholders and the wider community can get involved. Thus, it offers the opportunity to foster new collaborations and generate conversations around climate change and sustainability issues and solutions more broadly.

3.2 How does cCHALLENGE work?

Project design, training and tool box

In the weeks prior to the start of a cCHALLENGE, cCHANGE and the coordinating teacher collaborate on tailoring the project. This includes framing and coordinating practical details such as registrations and consent forms. This co-creation and collaboration part is essential for a successful project.

In this pre-phase, cCHANGE will also provide the educator with support, perspectives, and tools to successfully guide the students throughout the project. This will include:

- A brief (online) training seminar with the coordinating teacher(s) to explain the cCHALLENGE approach, including the research behind it.

- A toolbox with instructions, teaching materials, resources, exercises and a Transformative Program.

Participants register for the cCHALLENGE about one week before the start date.

Choosing the challenge

cCHALLENGE is based on individual challenges selected by participants. Before registering, students, teachers, and other participants should choose one change to experiment with for 30 days. It is important for motivation and ownership that participants choose their own challenge, but it should also align with the topic, themes, and processes chosen by the local network in the ChangeLab workshops.

This process is an opportunity to talk to students about what is possible, what interests them, what is important to the local community, and what they consider to be challenging (and why). Examples of challenges will be given to the students for inspiration, such as:

- Avoid plastic packaging
- No screen usage 1 hour every night
- Experience nature for 30 minutes or 1 hour a day
- Pick up garbage on the way to school
- Talk to someone about climate change every day
- Eat vegetarian meals 3 or 5 days per week
- Bike or walk to school every day
- Do not buy anything new during the project
- Reduce food waste
- Recycle waste

Teachers should encourage students not to choose exercise- and health-related challenges, as this can shift the focus away from climate change and sustainability issues and introduce a competitive element that puts pressure on vulnerable students. Some students may choose unconventional challenges, such as dumpster diving, and any legal and food safety issues related to such experiments should be discussed.

Kick-off workshop

A kick-off workshop with the students and others can be organized to mark the start of the challenge. cCHANGE can provide guidance and potential exercises for running one of these workshops.



Transformative Program

During the 30 days cCHALLENGE, students receive information, inspiration and reflection questions from cCHANGE – we call this the Transformative Program. This content, created by cCHANGE co-founder, Professor Karen O'Brien, gently encourages students to go deeper; asking them to reflect over practical and logistical challenges, social norms, systems and structures, as well as the beliefs and assumptions that hinder or enable change. The content in the Transformative Program provides a valuable foundation for conversations inside and outside of the classroom.

The transformative program content is delivered every three days and can be delivered via SMS, email, or pdf files.

Reflecting and sharing

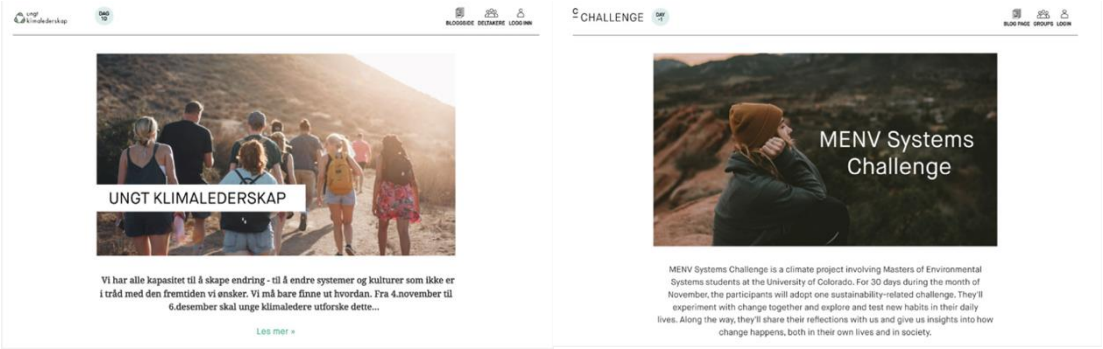
During the cCHALLENGE, participants reflect upon and share their experiences with each other, at school, with family and friends, and the wider community. This includes stories about successes, frustrations, research discoveries, and insights. In the sharing the participants experience how they can engage with the community and influence others and change.

Students can share their stories in a variety of ways during the cCHALLENGE:

1. *Digital Platform*

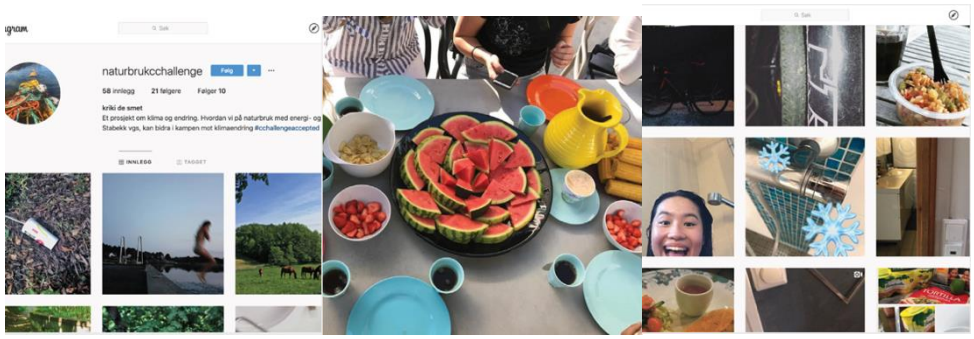
   cCHANGE has developed a digital platform that can serve as the project's home. Each student gets their own profile page and can post experiences and thoughts during the cCHALLENGE. Reflections can be written in text and illustrated with photos or YouTube videos.

   The digital platform can be private or made open to the public. Posts in public rounds can be shared in social media to share stories to a wider community.



2. *On other social media or communication platforms*

Students can post their reflections on Instagram, Canvas, Google Teams, Microsoft Teams, Slack, or in Facebook Groups.



3. *Through hand-written reflections, art, multi-media, or in-class conversations*



Story telling and sharing are at the centre of the cCHALLENGE. This can happen in a mulitude of ways. Educators can explore different methods, such as drawing, painting, multi-media, handwritten diaries, postcards, and dialogues, debates and in-class discussions. These can be nested within the curriculum and the chosen challenge and draw on the Transformative Program and reflection questions as a starting point.

Project reporting

Project reporting can be a valuable exercise to communicate to the school and wider community the impacts and benefits of the project. If desired, cCHANGE can support and work with the project leader/school to analyze and summarize the results of their cCHALLENGE and present it in an informative and interesting way. For example, we can provide participant surveys to distribute and we can assist with analyzing reflections and crafting a narrative. This can be discussed on a project-by-project basis so that the reporting is tailored to the context.

3.3 Running a cCHALLENGE

Below are some tips on how to get the most out of a cCHALLENGE project when running it in open schooling environments.

Integrate inquiry practices into schoolwork and as much as possible: Integrating inquiry processes associated with the cCHALLENGE into classroom activities and the curriculum is a key factor for success. Teachers of the various subjects could, for example, run learning loops and structure learning activities, inquiry practices or lectures on topics such as:

- Citizenship/channels of influence (Social Sciences)
- Resources/renewables (Geography)

- Sustainable development (Natural Sciences)
- or other topics that relate to the various subjects and the various cCHALLENGEs the students have chosen.

The learning loops should ideally take into account which challenges the students have chosen. The cCHALLENGE will ideally exemplify some of the mandatory curriculum criteria associated with various subjects.

The week before: Know Your Why! Before the 30-day cCHALLENGE begins, students should, through ChangeLab workshops, have chosen their challenge and be able to reflect on why they have chosen it. The class should prepare for the project together and build a sense of commitment around it.

This can be done, for example, by signing a "contract" that they undertake to take an active part in the project, or taking a photo, using hashtags and posting to social media. You could also get each student to share what challenge they have chosen and why.

Create a space where all levels of knowledge and engagement are welcome, and all choices validated and equally good. It is not about who reduces the most CO_2.

Ensure participants read and follow the transformative program: During the 30 days, students must try to immerse themselves in the transformative program and discuss it with teachers, fellow students, friends and family. Below is an overview of the weekly goals of the transformative program, to help educators guide students during the process:

Set up a regular forum for the group to check in with each other and share insights: Autonomy, competence and relatedness are basic human needs to sustain changes in habits. cCHALLENGE enables these to emerge, but teachers are key to providing a facilitated, supportive process within the class structure to encourage and help the students and gently push them to explore past the boundaries of their cultural comfort zones.

Teachers can help the students explore their own agency and provide positive feedback through regular sharing forums. This is an important part of the cCHALLENGE. Educators should encourage students to share with each other, but also with those around them both verbally (in class and in their everyday lives) and in writing.

Students will feel seen and heard and experience that their stories have an impact on others in the group and in people who follow the project. Firstly, these are stories that people can recognize and that can inspire others to action. Secondly, the sharing of stories is important to building the sense of community in the group and enhancing the collective learning. Student motivation and engagement will be enhanced if they can connect their learning to a wider context.

Help students explore, inquire, and do research: Students should be encouraged to think critically about their change experiments, address current debates (for example, related to vegetables wrapped in plastic, or recycling) and do research and gather data to identify the environmental

benefits and impacts, advantages, disadvantages, etc. They should also reflect on barriers and alternatives and the factors that promote or impede change. Learning to switch perspectives is important to cultivate to strengthen adaptability, empathy and resilience.

Expect a decrease in motivation around week 3: Experience shows that challenges (regardless of the chosen experiment) tend to become more difficult after a few weeks. This occurs after the initial excitement and novelty wears off, and when the interest of friends and family subsides. Participants may also have experienced some failure and frustration. It is important to discuss these experiences and emphasize that this is a critical stage in change processes. Self-reflection about resistance to change and awareness of "change fatigue" play an important role in succeeding with sustainability experiments.

3.4 Practical Questions

How many can do the cCHALLENGE at one time?

The cCHALLENGE can be run in a single class or year level. A single class is good but many educators have had a good experience with two classes doing it at once - grouping the students into smaller groups where they can read each other's reflections in class. We can discuss different size groups and how to cultivate a culture in which everyone feels seen and heard.

How much time do I need to allocate to this each week?

The cCHALLENGE does not involve a great time commitment if it is well planned and integrated into classwork. Ideally, the cCHALLENGE will align with other educational goals and will not add to the teachers' workloads.

Time needs to be allocated to preparing for the project with the cCHANGE team, including an online training session and check-in calls during the challenge.

Around 30-45 minutes should be allocated for discussion and reflection each week in class during the 30-day period. Some time also needs to be allocated to providing the students with feedback on their reflections.

Is it compulsory for the student to reflect?

We recommend that it be compulsory for the students to reflect on their experiences. Reflection is a very important part of the cCHALLENGE. Verbal reflections in the group are good but written reflections are also powerful.

Ideally, they should write reflections at least three times per week. It is helpful to allocate 30-45 minutes a week in class to discuss the challenge, the transformative program, and write reflections.

Grading

Keeping the cCHALLENGE itself 'evaluation-free' fosters a more collaborative experience. A reflection paper in one or more subjects can be done, after the 30 days is over, to assess what the students learned about how it relates to resource-use, sustainability or citizenship. The cCHALLENGE can then be used to exemplify the learning from various subjects.

If desired, the written reflections can also be part of the assessment, for example if it is part of a language class.

3.5 Guidance on coaching students during a cCHALLENGE

Climate change and sustainability issues can bring up strong feelings and emotions, such as hopelessness, grief, overwhelm, confusion, anxiety, and anger. It is important that students can bring up these emotions and impressions during their reflections, and to support them to feel a sense of agency and constructive hope. cCHANGE will offer some resources regarding how to hold this and support the students through these emotions.

Providing the students with feedback on their reflections is important.

Through feedback they will feel:

- Seen and heard
- Supported
- That their perspective is valued
- That their experiment is important

Giving timely feedback is also a chance to continue bringing them back to the Transformative Program and to encourage them to explore different perspectives on their challenges.

Some tips on feedback:

Avoid judging and criticizing

The goal is to see them, to acknowledge their experience, and to encourage them to reflect more deeply. Avoid telling them they have been bad. cCHALLENGE aims to awaken their own sense of judgement rather than looking to others for approval.

Do not shame them or push them

The 30-day experiment with change is not about being perfect, and the students should not feel guilty about not managing to keep up with their challenge. Instead, encourage students to reflect on why they have not been able to keep to their challenge and to consider under which

circumstances it has been challenging. Perhaps their challenge is too difficult or too easy. Maybe the systems around them are making it too difficult. Raising these issues in the classroom helps students to reflect on what needs to be in place in society to make change possible.

How can you acknowledge the serious of the problem but also give the students hope and engage them?

Recent research has found that people who have a constructive, realistic sense of hope tend to believe individual action against climate change can be effective, support climate policies, and say they will engage politically.[7] Constructive doubt is also associated with support for climate policies and an intention to take political action. The combination of constructive hope and constructive doubt is an especially powerful predictor of political action. "This finding implies that recognizing that we could reduce climate change, but that people are not doing enough and thus we may fail, is highly motivating".[8]

It is important to recognize the scale and the urgency in responding to issues such as climate change. At the same time, is also important to help students to take broader and deeper perspectives that help them to recognize and engage with the potential for transforming society in an equitable and sustainable manner.

Should you emphasize your own opinion?

Transformative learning involves recognizing that there are multiple perspectives and interpretations of environmental issues and moving away from right vs. wrong views. Experiments should provide a safe space for students to reflect and discover things for themselves, at their own pace. Inquiry-based approaches and posing questions for students to reflect upon is preferable to clear advice. It is better to let the students be the researchers, exploring the topic, and 'sowing seeds' for reflection.

3.6 Access and contact

The cCHALLENGE tool is not publicly available in the form of a webpage. Instead it is utilizing different platforms for communication and engagement with tool users. Information about cCHALLENGE is available via the following web-site:

https://www.cchallenge.no/

Main contact for cCHALLENGE: Linda Sygna (linda.sygna@cchange.no).

[7] Ojala, M. (2012) Hope and climate change: the importance of hope for environmental engagement among young people, Environmental Education Research, 18:5, 625-642.

[8] *A little gloom and a little brightness is the best recipe for climate action*
DeWeerdt, S. (2019) "The nuanced dance of hope and doubt in climate change mobilization" Anthropocene. Downloaded at: http://www.anthropocenemagazine.org/2019/05/a-little-gloom-a-little-brightness-is-the-best-recipe-for-climate-action/

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