Activity 2.4; Pedagogical Design

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FOODSHIFT Pathways

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Executive Summary

This is Foodshift Pathways Pedagogical Design. Introducing activities that interweave technology and critical thinking with climate change successfully can lead to an approach that can be an effective way of helping students to develop their 21st century skills by putting their acquired knowledge directly in use within a meaningful context that is directly linked their lives and societal needs. This will be strongly encouraged in the project's Pedagogical Design. The document outlines the outcomes of the activities towards the definition of the project pedagogical design (Field research and state-of the art review; thus, teachers' needs analysis, review of relevant European Policies; review of Sustainability Competence frameworks. As a second step, the proposed design has been validated with the organisation of focus groups in the 6 partner countries (SE, NL, DK, EL, PT, ES). The process and outcomes of running the focus groups for the design validation are also presented in this document.

1. Introduction

This is Foodshift Pathways Pedagogical Design. The document outlines the relevant methodology of open schooling, the living lab approach, and the final design of the Foodshift Pathways Open Learning scenario (OLS) template that will be used in the project in order to support the implementation in formal, non-formal and informal educational settings. The project envisions that schools can facilitate deeper learning in environmental education and specifically on the topic of sustainable and healthy food systems. True deeper learning is about developing students' competences in order to make maximum use of their knowledge in life also affecting social-emotional factors. Core content is the heart of the learning process and in our case, these are the interactive videos that are produced in the partner countries, the enriched versions of these videos as well as the supportive OLS accompanying them.

Introducing interdisciplinary learning and adopting an approach based on SC can be a very effective step towards creating more meaningful episodes of learning that focus heavily on competences (knowledge, skills, and attitudes). Introducing activities that interweave technology and critical thinking with climate change successfully can lead to an approach that can be an effective way of helping students to develop their 21st century skills by putting their acquired knowledge directly in use within a meaningful context that is directly linked their lives and societal needs. This will be strongly encouraged in the project's Pedagogical Design. Field research and state-of the art review; thus, teachers' needs analysis, review of relevant European Policies; review of Sustainability Competence frameworks have informed the pedagogical design. The proposed design has also been validated with the organisation of focus groups in the 6 partner countries (SE, NL, DK, EL, PT, ES). The process and outcomes of running the focus groups are also presented in this document.

1.1 Scope

This report is related with A2.4 Pedagogical Design and it offers the pedagogical design of the Foodshift Pathways project and outcomes of its validation through the focus groups organised in the partner countries.

1.2 Audience

This report is addressed to project partners and the schoolteachers in the six participating countries and all-around Europe.

1.3 Definitions

Open Schooling (OS): OS is an approach in which purposeful collaborations are built between schools and their wider communities. Families and other external partners collaborate with teachers and students to address relevant local challenges, contribute to community development, and promote an active global citizenship attitude. OS offers

students the opportunity to learn together in the real-life settings and widens their horizons to learn from people other than their teachers.

Open School Culture: An Open School Culture imports external ideas that challenge internal views and beliefs and, in turn, exports its students – and their assets – to the community it serves. Such an engaging environment makes a vital contribution to its community: student projects meet real needs in the community outside of school, they are presented publicly, and draw upon local expertise and experience. The school environment fosters learner independence – and interdependence – through collaboration, mentoring, and through providing opportunities for learners to understand and interrogate their place in the world.

Open Schooling Hub: The development of an Open Schooling Hub (a school-based environment that implements the Open School Culture) demands a root-and-branch rethink, not just in pedagogy, but in every aspect of the way the school is organised: its structure, culture, and the use of space, place, and time. An Open Schooling Hub will be an open, curious, welcoming, democratic environment which will support the development of innovative and creative projects and educational activities. It is an environment which will facilitate the process for envisioning, managing and monitoring change in school settings by providing a simple and flexible structure to follow, so school leaders and teachers can innovate in a way that's appropriate for school local needs. It will provide innovative ways to explore the world: not simply to automate processes but to inspire, to engage, and to connect. OSOS project will create a core network of 100 Open Schooling Hubs in 12 countries. Each one of these schools will develop a network of at least 9 additional schools to form a national network of schools where the Open School Culture is introduced.

Project-Based Learning: Project-Based Learning is the main pedagogical approach of the Open School Culture. Whilst teachers will draw distinctions between project, inquiry, and problem-based learning, in reality the differences are minor – particularly in comparison to more transmissive, lecture or worksheet-based forms of learning. Great projects grow from inquiries to solve problems. Students found them highly engaging because they are conducting work that is meaningful, to them and their families or communities. Learning begins with a problem to be solved, and the problem is posed in such a way that children need to gain new knowledge before they can solve the problem. Rather than seeking a single correct answer, children interpret the problem, gather needed information, identify possible solutions, evaluate options, and present conclusions. They relish the opportunity to make adult-world connections, work across disciplines, and in extended blocks of time.

Living Lab: Living lab is an open-innovation methodology where people participate horizontally in an innovative process to co-create solutions to real problems. In education, living labs are places where students, schools, citizens, and organisations come together to co-create (ideas and tools). Living labs are based on open innovation methods.

Sustainability Competence: the interlinked set of knowledge, skills, attitudes, and values that enable effective, embodied action in the world with respect to real-world sustainability problems, challenges, and opportunities, according to the context.

Sustainable Food Systems (SFS): *"A system of food production, processing, distribution and consumption that is actively seeking to **reduce** Greenhouse Gas Emissions (GHG emissions) and other negative impacts such as food waste, loss of biodiversity and lifestyle related diseases, while **contributing** towards effective food security, fair prices and nutritional wellbeing. Next to **circularity** and **plant-based food**, **cross-sector collaborations**, **citizen involvement** and the **education of future generations** are considered as key principles*."

1.4 Structure

Chapter 1: Gives an overview of this document, providing its scope, the definitions used and its structure.

Chapter 2: presents shortly the initial concepts of **open schooling** and **living labs (in education)** as they are relevant towards definition of the Foodshift Pathways Pedagogical Design.

Chapter 3: describes the Foodshift Pathways **Pedagogical Design** and its principles as outcome of the needs analysis performed and the state-of-the-art review.

Chapter 4: describes the Foodshift Pathways **Open learning scenario (OLS) template** as the outcome of the Pedagogical design. Actual templates following the two approaches (light and deep learning are presented in Annex 1)

Chapter 5: presents the Foodshift Pathways **focus groups** organised in the 6 partner countries as validation means for the pedagogical design and OLS templates. The Guidelines, protocol, Consent form and reporting template for the implementation are presented in the Annexes (2-5) as well as the reports per country in Annex 6.

Chapter 6: presents Conclusions.

2. Initial concepts

2.1 The idea of open schooling

There are currently numerous education reform initiatives in Europe as policy makers try to make schools more effective and provide students an education that prepares them for life in the 21st century. Schools are being asked to increase the quality of education, notably by providing more students than in the past with advanced skills and the ability to be flexible thinkers and problem solvers. These reform initiatives vary from programs to develop educational portals with certified content, to offer professional development opportunities to in-service teachers, to put networked laptop computers into the hands of all students on a routine basis, to equip the classrooms with interactive whiteboards to help make lessons come alive, to install wireless Internet access points in schools (e.g. current governmental initiatives in Greece, Spain, Portugal) to large scale ambitious plans to rebuilt and remodelled schools to create learning environments which inspire all young people to unlock hidden talents and reach their full potential; provide teachers with 21st century work places; and provide access to facilities which can be used by all members of the local community. All these efforts clearly serve – at a different level – the vision of Re-Schooling, towards schools as "Core Social Centres" and "Focused Learning Organisations", strong, dynamic establishments in strong cultures of equity and consensus about their value, following system-wide, root-and-branch reform as it was proposed back in 2004 by the International Schooling for Tomorrow Forum (OECD, 2004). At the core of these reforms is an emphasis on 21st-century teaching and learning in which technology is not merely present but is used in the most effective ways possible. In the OECD re-schooling scenarios, schools are revitalized around a strong "knowledge" agenda, with far-reaching implications for the organization of individual institutions and for the system as a whole. The academic/artistic/competence development goals are paramount; experimentation and innovation are the norm. Curriculum specialists flourish as do innovative forms of assessment and skills recognition. All this takes place in a high-trust environment where quality norms rather than accountability measures are the primary means of control. Professionals (teachers and other experts) would in general be highly motivated and they work in environments characterized by the continuing professional development of personnel, group activities, and networking.

2.1.1 Developing the Open Schooling Culture

The Open Schools for Open Societies (OSOS) project aims to integrate the key principles and characteristics of the re-schooling scenarios to a holistic approach that will facilitate the introduction of an open schooling culture in current school settings. By building on the strengths of the OECD re-schooling scenarios and by implementing a well-tested approach for the introduction of innovation to schools the OSOS consortium aims to demonstrate at scale how schools can become incubators of exploration and invention and accelerators of

innovation in their local communities. The OSOS project will describe and implement at scale a process that will facilitate the transformation of schools to innovative ecosystems, acting as shared sites of science learning for which leaders, teachers, students and the local community share responsibility, over which they share authority, and from which they all benefit through the increase of their communities' science capital and the development of responsible citizenship.

Becoming an Open School cannot be seen as an isolated "project" – it demands a root-and-branch rethink, not just in pedagogy, but in every aspect of the way the school is organised: its structure, culture, and the use of space, place, and time. An Open School will be an open, curious, welcoming, democratic environment which will support the development of innovative and creative projects and educational activities. It is an environment which will facilitate the process for envisioning, managing, and monitoring change in school settings by providing a simple and flexible structure to follow, so school leaders and teachers can innovate in a way that's appropriate for school local needs. It will provide innovative ways to explore the world: not simply to automate processes but to inspire, to engage, and to connect. It will provide a powerful framework for school leaders to engage, discuss and explore how schools need to evolve, transform and reinvent; how schools will facilitate open, more effective and efficient co-design, co-creation, and use of educational content (both from formal and informal providers), tools and services for personalized learning and teaching; how schools can become innovation incubators and accelerators.

2.1.2 Characteristics of the Open Schools

In the framework of the OSOS project participating schools were supported to set forward their innovation agenda with the following characteristics:

- Promotes the collaboration with non-formal and informal education providers, enterprises and civil society enhanced to ensure relevant and meaningful engagement of all societal actors with science and increase the uptake of science studies and science-based careers, employability, and competitiveness. The OSOS project brings together individual schools, the European school headmasters association, science centres and museums, industries, research institutes, universities, national school networks and teacher trainings associations in an innovative collaboration towards the introduction of open schooling approaches in numerous European schools through a bottom-up approach. With the focus on science learning in both primary and secondary education level the project proposes new and diverse models of collaborations between the above-mentioned stakeholders. By building on the best of current practice, the OSOS approach aims to take us beyond the constraints of present structures of schooling toward a shared vision of excellence. Such an innovation programme holds great potential. If we want a powerful and innovative and open culture in schools that is self-sustaining, we have to empower system-aware practitioners to create it, whilst

avoiding simply creating interesting but isolated pockets of experimentation. We have to instil a design-based approach of collaborative learning and inquiry between professional practitioners, thus creating a "pull" rather than "push" approach. To promote such an approach in the current schooling practices, an ecosystemic standpoint should be taken from the side of the remedying initiatives. More specifically, the latter should aim to capture the profiles, needs, contributions and relationships of all these school-related actors and elements towards a sustainable innovation ecosystem that will operate under a holistic framework of organizational learning and promotion of educational innovations.

- Supports Schools to become an agent of community well-being. OSOS aims to support the introduction of an Open Culture to develop projects that are proposing solutions to the needs of their local communities. To do so the OSOS approach will explore the notion of well-being of the school's students (including concepts of equity, gender inclusion and empowerment). By creating a model of collaboration with local stakeholders and by using activities that require the involvement of different actors, the participating schools will be linked with their local communities in a much deeper level. The adaptation of the activities will entail linking their subjects to issues of national interest in connection with the grand challenges as set by the European Commission. Schools will thus aim to "act locally but think globally", a motto developed already a few years now but still far from the reality of the majority of schools in Europe today. In this way, these schools will enrich the science capital of the local communities and will promote responsible citizenship.
- Promotes partnerships that foster expertise, networking, sharing, and applying science and technology research findings and that bringing real-life projects to the classroom. The project partners, both individually and in collaboration, have been developing, testing and promoting innovative educational applications and approaches for European schools (supported by relevant appliances and resources) for many years, which promote sharing and applying of frontier research findings in schools, supporting the developments of 21st century competences through creative problem solving, discovery, learning by doing, experiential learning, critical thinking and creativity, including projects and activities that simulate the real scientific work (e.g. nanotechnology applications in different sectors, organic farming and healthy food, implementing project with aero-space industry, analyse data from large research infrastructures like CERN or networks of robotic telescopes). The aim of the project is to analytically map the process for the effective usage scenarios of the afore-mentioned applications in school environments as part of curriculum-led learning (integrating/embedding them in the everyday school practice) and or extra-curricular activities (e.g., visits to museums, science centres, research centres, field trips), coupled with home- and community-centred (informal) learning experiences. Each open schooling hub will bring together representatives from industry and civil society associations who – in cooperation with school community – will scan the horizons, analyse the school and community needs and will cooperate to design common projects and to propose innovative solutions.

- Focuses on Effective Parental Engagement. The Open Schooling Model builds on the notion of science capital of students' families. Whilst science and technology are often seen as interesting to young adolescents, such interest is not reflected in students' engagement with school science that fails to appeal to too many students. Girls, in particular, are less interested in school science and only a minority of girls pursues careers in physical science and engineering. The reasons for this state of affairs are complex but need to be addressed. (Osborne & Dillon, 2008, p. 15). The OSOS approach is suggesting four courses of action: effective parental engagement in the projects that will be developed by a) Planning: Parental engagement must be planned for and embedded in a whole school or service strategy. The planning cycle will include a comprehensive needs analysis; the establishment of mutual priorities; ongoing monitoring and evaluation of interventions; and a public awareness process to help parents and teachers understand and commit to the Open School Development plan. b) Leadership: Effective leadership of parental engagement is essential to the success of the OSOS Open Schooling Strategies. A parental engagement programme is often led by a senior leader, although leadership may also be distributed in the context of a programme or cluster of schools and services working to a clear strategic direction. c) Collaboration and engagement: Parental engagement requires active collaboration with parents and should be proactive rather than reactive. It should be sensitive to the circumstances of all families, recognise the contributions parents can make, and aim to empower parents. d) Sustained improvement: A parental engagement strategy should be the subject of ongoing support, monitoring and development. This will include strategic planning which embeds parental engagement in whole-school development plans, sustained support, resourcing and training, community involvement at all levels of management, and a continuous system of evidence-based development and review.
- Teaching science for difference: Gender Issues. Instructional methods that foster students' understanding while decreasing competitiveness in science classes might contribute to girls' participation and performance in advanced science classes while also supporting the learning of many boys. The Open Schooling approach recommends replacing the competitive-type classroom environment by more a more girls' friendly instructional approach in which enough time and conditions are given to think, inquire, and understand thoroughly. This could be accomplished by for example sharing ideas, arguing, asking questions, and analysing data in small groups of students who work in collaborative manner.
- Adopt and integrate informal and formal educational experiences that intervene and reverse traditional patterns of low participation; encourage girls' interest, enthusiastic participation, and election of continued study in math and science; increase confidence; and give girls positive images of science learning and careers.

2.1.3 Design Features of the Open School Activities

The OSOS pedagogical framework builds on the essential features of creative learning including exploration, dynamics of discovery, student-led activity, engagement in scientifically oriented questions, priority to evidence in responding to questions, formulations of evidence-based explanations, connection of explanations to scientific knowledge, and communication and justification of explanations. These elements support creativity as a generic element in the processual and communicative aspects of the pedagogy and proposing innovative teaching strategies that will offer students high participation and enable them to generate highly imaginative possibilities. At the same time, the OSOS framework is based on the main principles of Responsible Research and Innovation process: learners' engagement, unlock of their full potential, sharing results and provide access to scientific archives, designing innovative activities for all. Based on that, the OSOS Open Schools will promote a series of educational activities in the form of real-life projects that will utilize innovative ideas and creativity and empowers students to actively engage themselves in the learning process and improve their conceptual understanding in various scientific topics. It is therefore intended that the educational practices and strategies presented will allow science educators and specifically late primary and early secondary school teachers to identify creative activities for teaching science. Furthermore, the proposed pedagogy will aim to enable teachers to either create new creative activities or to properly assemble parts of different educational activities into interdisciplinary learning scenarios. In the framework of the OSOS project the proposed activities will have the following four characteristics. They must be:

- **Placed:** The activity is located, either physically or virtually, in a world that the student recognizes and is seeking to understand.
- **Purposeful:** The activity feels authentic, it absorbs the student in actions of practical and intellectual value and fosters a sense of agency.
- **Passion-led:** The activity enlists the outside passions of both students and teachers, enhancing engagement by encouraging students to choose areas of interest which matter to them.
- **Pervasive:** The activity enables the student to continue learning outside the classroom, drawing on family members, peers, local experts, and online references as sources of research and critique.

These four criteria can provide a useful checklist for teachers formulating their learning scenarios, but also suggest what a science classroom and a school as an organization needs to offer to become more engaging in itself: a place-based curriculum, purposeful projects, passion-led teaching and learning, and pervasive opportunities for research and constructive challenge.

The activities that the project will produce will be based on existing best practices of the partners and will range from collaborative workshops to citizen debates, participatory conferences and more. These activities will be adapted by the Open schooling hub members that will involve representatives from educational providers, industries, civil society

associations and even students themselves. The activities used in the project will promote collaborations and the opening of the classrooms to the society. The participating schools will include both primary and secondary education level and activities will be selected and adapted accordingly to fit the different levels.

In our view the OSOS school environments should provide more challenging, authentic, and higher-order learning experiences, more opportunities for students to participate in scientific practices and tasks, using the discourse of science and working with scientific representations and tools. It should enrich and transform the students' concepts and initial ideas, which could work either as resources or barriers to emerging ideas.

2.1.4 OSOS contribution: Pedagogical Principles in the Design of Open Schooling Activities

The OSOS aims to propose a generic framework for the design, development, implementation, and evaluation of Educational and Outreach activities that can be used to introduce the principles of Responsible Research and Innovation (RRI) in science classrooms. Research on learning science makes clear that it involves development of a broad array of interests, attitudes, knowledge, and competencies. Clearly, learning "just the facts" or learning how to design simple experiments is not sufficient. To capture the multifaceted nature of science learning, the OSOS approach proposes a roadmap that includes a series of "Pedagogic Principles for the design of the Educational and Outreach Activities" and articulates the science-specific capabilities supported by the environment of the Open Schooling Hub. This framework builds on a four-strand model developed to capture what it means to learn science in school settings by adding two additional main strands incorporated for informal science learning, reflecting a special commitment to interest, personal growth, and sustained engagement that is the hallmark of informal settings.

Table 1: *The main Pedagogic Principles and the Educational Objectives for the design and implementation of Educational and Outreach activities for involving students in Research and Innovation (RRI) processes.*

Strands – Pedagogic Principles	**Educational Objectives**
Sparking Interest and Excitement	*Experiencing excitement, interest, and motivation to learn about phenomena in the natural and physical world.*
Understanding Scientific Content and Knowledge	*Generating, understanding, remembering, and using concepts, explanations, arguments, models, and facts related to science.*
Engaging in Scientific Reasoning	*Manipulating, testing, exploring, predicting, questioning, observing, analysing, and making sense of the natural and physical world.*

Reflecting on Science	*Reflecting on science as a way of knowing, including the processes, concepts, and institutions of science. It also involves reflection on the learner's own process of understanding natural phenomena and the scientific explanations for them.*
Using the Tools and Language of Science	*Participation in scientific activities and learning practices with others, using scientific language and tools.*
Identifying with the Scientific Enterprise	*Coming to think of oneself as a science learner and developing an identity as someone who knows about, uses, and sometimes contributes to science.*

These Pedagogic Principles provide a framework for thinking about elements of scientific knowledge, innovation, and practice. This framework describes a series of support functions that have to be deployed for the long-term impact of the proposed activities to be safeguarded. This framework provides a useful reference for helping teachers and outreach groups in the informal science education community articulate learning outcomes as they develop programs, activities, and events, and further explore and exploit the unique benefits of introducing scientific research in schools. Furthermore, such an action asks for knowledge areas integration, effective and closes cross-institutional collaboration, and organizational change in the field of science education.

2.1.5 Models of Open Schooling and School-based Innovation

According with OSOS review the main characteristics of an open schooling project are:

- educational resources generated in school settings according to the local needs,
- holistic school approach and vision,
- effective introduction of RRI principles in the school operation,
- effective partnerships with external stakeholders and
- focused policy support actions.

2.1.6 The OSOS process: 4 steps methodology

The OSOS team adopted the Design for Change (DFC) Model in guiding students to develop their projects. This includes the following four-step process (adopted from the DFC four-step process):

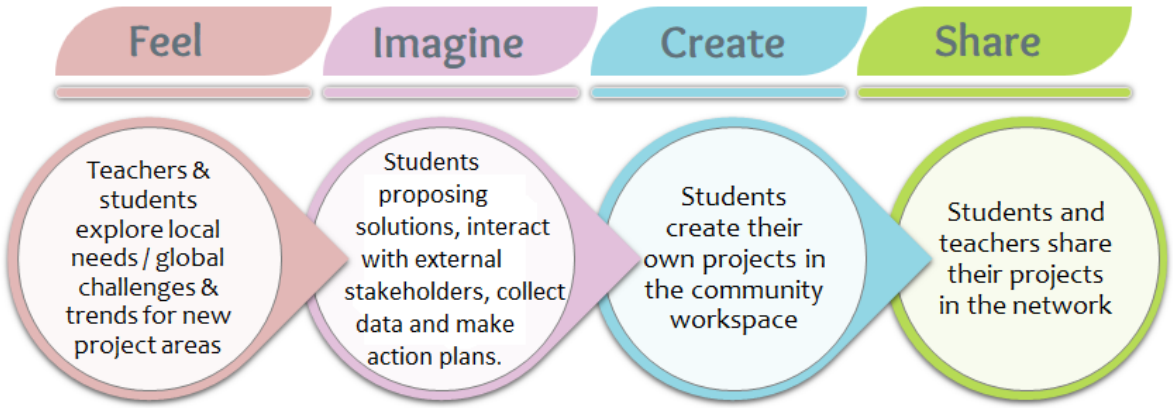


Figure 1 *The OSOS platform offers a simple four step process for the development of projects (based on the DFC model)*

2.2 The schools as Living Labs approach

Living lab is an open-innovation methodology where people participate horizontally in an innovative process to co-create solutions to real problems. In education, living labs are places where students, schools, citizens, and organisations come together to co-create (ideas and tools). Living labs are based on open innovation methods.

2.2.1 Living lab project characteristics

The three characteristics that define a Living Lab project:

- Real issue, real solution, making use of the participants' personal experience.
- Co-creation, involving all impacted societal actors.
- Quick prototyping, with ideas immediately put in practice and tested.

2.2.2 Living lab project structure

The two-phase process of a living lab is the following:

Phase 1: Preparation

Phase 2: Steps of Living lab methodology

1. Conversation
2. Exploration
3. Evaluation
4. Experimentation

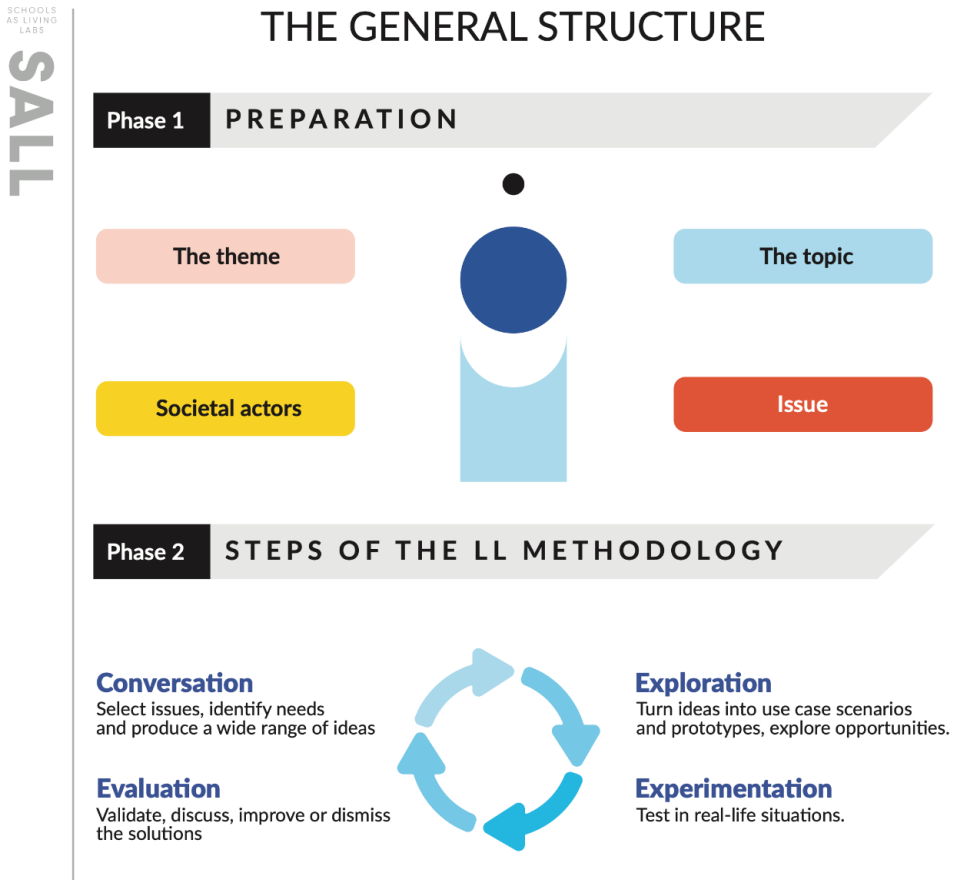


Figure 2 *General structure of the SALL methodology (as presented in the SALL Roadmap).*

Towards the definition of the topic of the project a 4-steps process can be followed for every topic that can lead to a good living lab project.

~~WHAT ARE WE GOING TO MAKE ?~~

WHAT PROBLEM ARE WE GOING TO SOLVE?

YOU CAN USE THIS 4-STEPS PROCESS

EVERY TOPIC CAN LEAD TO A GOOD LIVING LAB PROJECT

HERE ARE A FEW TIPS AND EXAMPLES THAT MAY INSPIRE YOU

START THE PROJECT WITH A SHARED MEAL, WHERE EVERYONE BRINGS A DISH FROM THEIR OWN CULTURE. FIRST OF ALL, IT'S A JOYFUL WAY TO START THAT ALSO BRINGS AWARENESS OF THE MULTICULTURAL ENVIRONMENT IN THE SCHOOL.

IN ADDITION, YOU CAN **ASK EVERYONE TO COME UP WITH AN ANECDOTE** OR AN ACTION THEY DO RELATED TO A THEME IN RDER TO SHARE VARIOUS EXPERIENCES. FOR SURE, THERE IS A LOT OF KNOWLEDGE AND DIVERSE PERSPECTIVES IN THE ROOM!

THE LOCAL CONTEXT MUST BE ANALYSED: THE MAIN CONCERNS AND WHO CAN ACT ABOUT IT? WHICH TOPIC WOULD GET YOU AND YOUR PARTNERS INVOLVED IN A PROJECT?

ALWAYS REMAIN OPEN: THE TOPIC CAN CHANGE TO GET MORE PEOPLE INVOLVED!

PHASE 1 > PREPARATION > HOW TRO CHOOSE A PROJECT

6

SALL

EXAMPLE

STEP 1
CONSIDERING YOUR LOCAL CONTEXT, YOU HAVE TO SELECT A LOCALLY RELEVANT **GENERAL TOPIC**

STEP 2
BY INDIVIDUAL OR GROUP WORK, IDENTIFY SOME SUB-TOPICS (YOUR POSSIBLE **PROJECT TOPICS**) IN THIS LIST SOME TOPICS CAN'T BE CONSIDERED BECAUSE OF FEASIBILITY ISSUES OR LACK OF CONCERNED LOCAL PARTNERS, FOR EXAMPLE

FLOODS, WATER POLLUTION, WATER SAVING, RECREATIONAL ACTIVITIES, WATER SOURCES, DESALINATION, WATER SHORTAGE, DROUGHT

STEP 3
YOU WILL THEN THINK ABOUT THE LOCAL **NEEDS** LINKED TO THE REMAINING TOPICS

- POLICY MAKERS / AUTHORITIES (PUBLIC USE)
- DOMESTIC WATER SUPPLIERS / CIVILIANS / RESIDENTS (DOMESTIC USE)
- TRAVELERS / TRAVEL EQUIPMENT SUPPLIERS (OUTDOOR USE)
- FARMERS (AGRICULTURE)
- INDUSTRIES (FACTORY MANAGERS)

STEP 4
BY COMBINING THESE POSSIBLE PROJECT TOPICS AND LOCAL NEEDS, YOU SHOULD BE ALREADY VERY CLOSE TO DEFINING YOUR **CHALLENGE**.

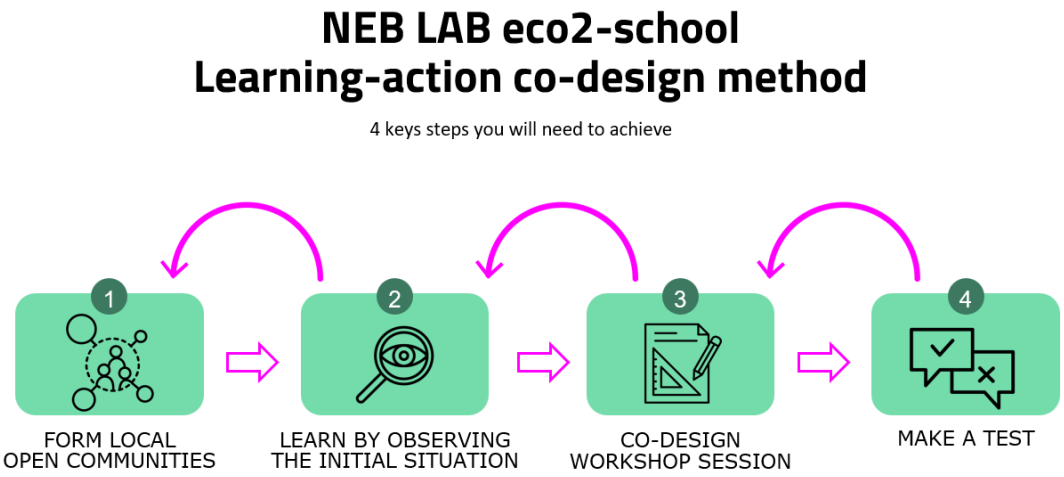
- HOW CAN WE PURIFY WATER WITH A PORTABLE DEVICE?
- HOW CAN WE UTILIZE SEWAGE IN AGRICULTURE?
- HOW TO SELF-CHECK WATER QUALITY?

PHASE 1 > PREPARATION > HOW TRO CHOOSE A PROJECT

7

SALL

Relevant design thinking approaches can be found in settings such as the NEB LAB learning action co-design method depicted below.



2.2.3 Resources and support tools

Examples to present a specific problem on the topic of SFS and a specific school context.

1	2	3
Problem: Food waste Lack of botanic knowledge and outdoor time for children	**Problem:** Non-nutritious diet Lack of knowledge about healthy and unhealthy food	**Problem:** Lack of awareness about environmental issues No collaborative work and local discussions about sustainability
School context: rural area, large outdoor space	**School context:** Small school in a village trying to promote a healthy lifestyle	**School context:** An international school promoting collaborative education with families

Limitation cards

In Figure 3 Societal actors (orange) and solution constraints (blue) are imposed parameters cards. Participants have to create a project implying at least the societal actor (among others of their choice) and the solution picked. Here are some examples relevant for the food system.

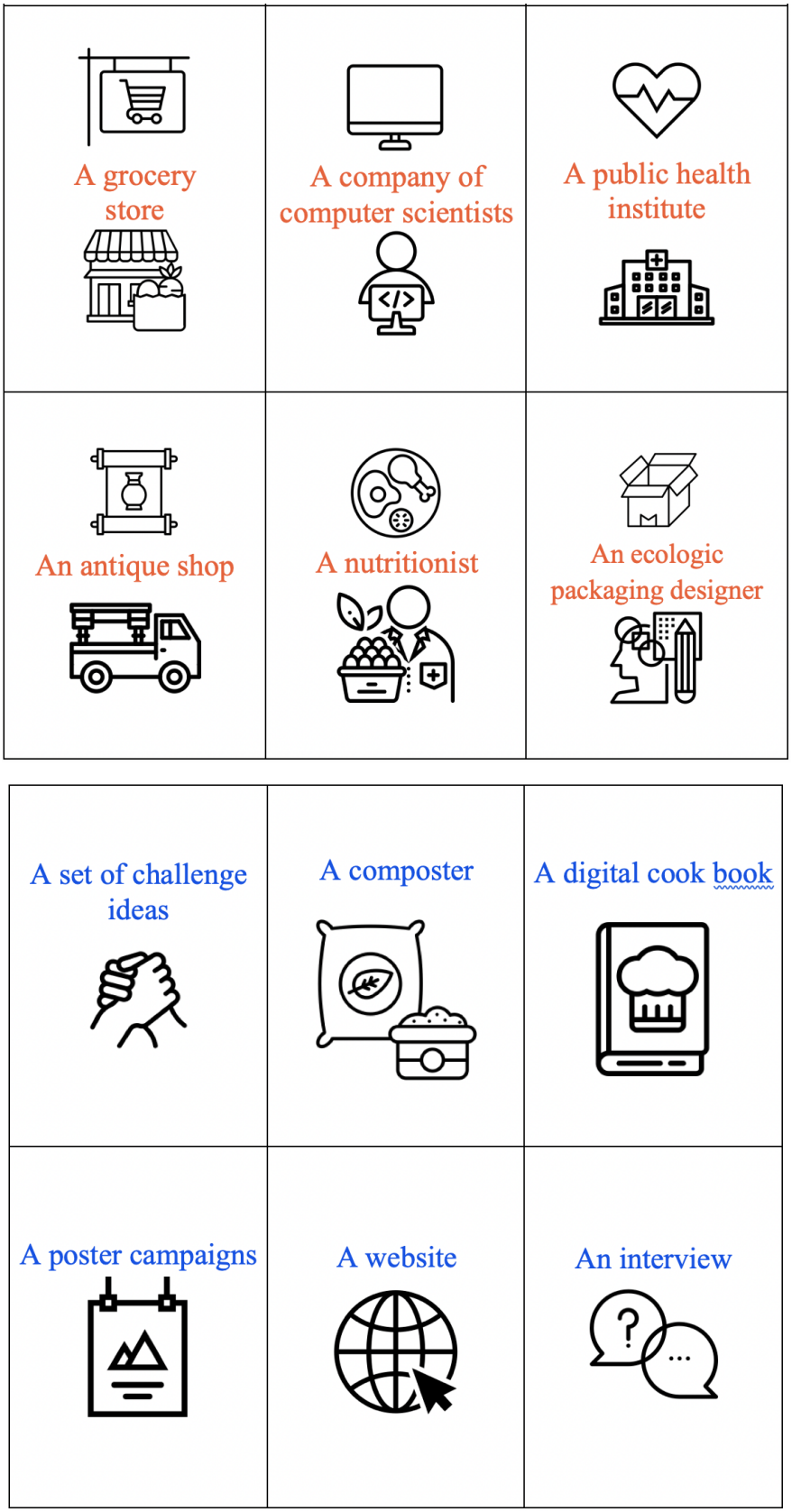
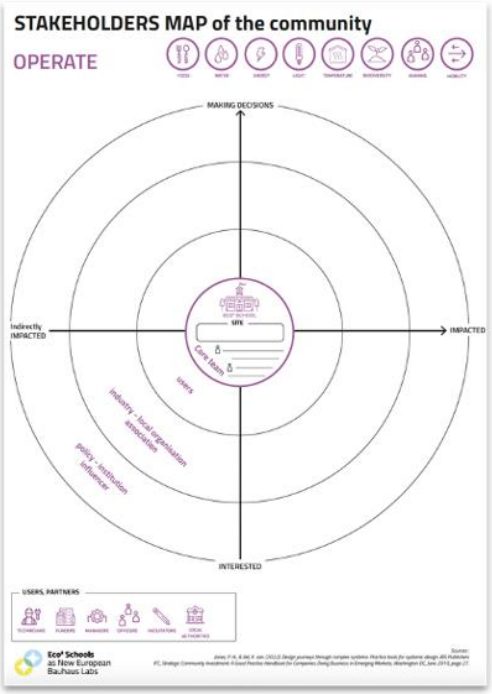


Figure 3 *Societal actors (orange) and solution constraints (blue) towards the implementation of a living lab project on the topic of the food system*

Among other Resources and support tools for implementing living labs projects are the onion model (for stakeholders' engagement), or Stakeholders map of the community, guidelines for

making the initial contact with the stakeholders, maps for brainstorming about problems, guidelines for guiding the reflection process. These materials will be part of the training activities/support materials for educators.



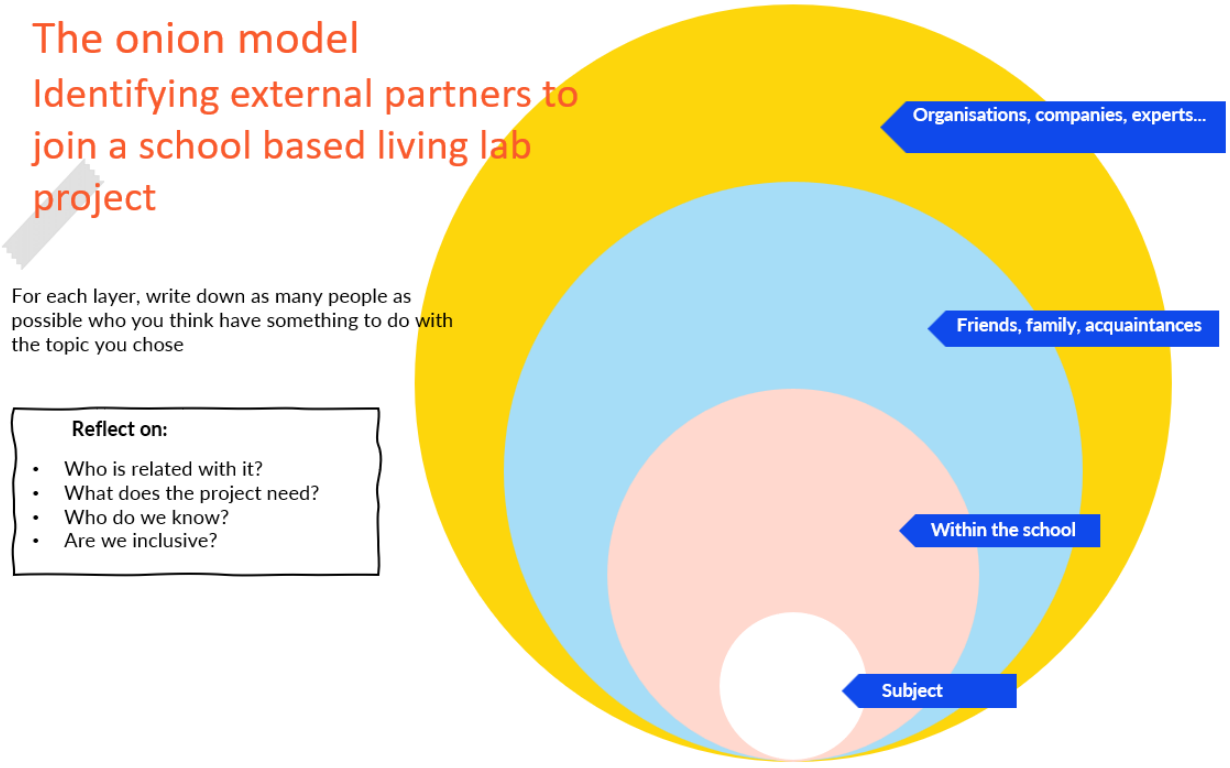


Figure 4 *Supporting tools for the definition of relevant stakeholders (e.g., Stakeholders map of the community & onion model)*

3. The Foodshift Pathways Pedagogical design

The aim of the Foodshift Pathways (FSP) project is to have a positive impact on the development of students' SC through building teachers' capacity. The methods of the project are founded on a holistic view of students learning, personal and social development, going beyond subject boundaries and finding application in a wide spectrum of curriculum subjects.

The project aims to add its contribution towards improvement of the quality of environmental education particularly on the topic of Sustainable and healthy food system (SHFS) by addressing:

1) Teachers' awareness of SC;
2) Teachers' professional skills regarding the didactics of the SC,
3) Students' acquisition of SC and underlying skills of critical thinking, problem solving.

3.1 Relevance from parallel tasks

Here follow the main findings from needs analysis and state-of the art report that are taken under consideration towards definition of the FSP Pedagogical Design.

3.1.1 Sustainability competence

Following up from the review of the GreenComp SC areas and **competences** in the light of (1) food systems and (2) other European and national studies as well as frameworks, we have compiled a SC framework that we consider reflects the different perspectives and the special context of the FoodSHIFT Pathways project. Our guiding principles include:

- A structure that takes up the concept of 1st and 2nd level SCs.
- A terminology that reflects the food system literature and knowledge components as reviewed.
- A description of food-related issues that has the character of a key-word list for helping respondents when filling out the questionnaire.

Table 2. FS Pathways Sustainable Competence framework level 1 and 2 (input to questionnaire)

First Level	Second Level	Key issues
Normative Concepts	Valuing the environment	Principles, goals, measurable targets, thresholds, cultural norms or personal values
	Understanding society	Diversity, cooperation, inclusion, compassion and solidarity, well-being, happiness
	Assessing economic aspects	Job perspectives, profit, food-chain, trade-offs, prices, resource values, competition, up-scaling

System Thinking	Conceptualizing	Dealing with complexity, holistic approach, circularity, resource efficiency, LCA, resilience
	Critical Thinking	Reflexivity, critique, multi-criteria decisions, problem solving, multiple perspectives, out-of-the-box
	Innovative problem solving	Problem-solving capacity various dimensions of food chain (process, product, governance, social)
Forward looking	Envisioning future scenarios	Developing visions, think and act in a forward-looking manner, what-if thinking, different future
	Developing creative solutions	Co-creation, idea of equity in decision-making/planning, power of the visual, maps & media
	Experimenting and testing	Time, uncertainty, probability, test, living labs, exploration, field work, gardening & farming
Strategies & Actions	Navigating politics	Transformative governance, transition management, incentives, food councils, legislation
	Collaborating and connecting	Participation, Interdisciplinary work, instrumentalization & alliance, Identifying connections
	Taking initiative	Social action, engagement, business planning, empowerment, cooking, leadership, blogging
Pedagogical goalsetting	Interpersonal development	Cooperation & empathy, solidarity & ethnocentrism, team dynamics, leadership, trans-cultural understanding, serious gaming, tools

From the Needs analysis review with teachers and food system stakeholders organised in WP2 as well, when asked to select the competences that are considered most important in educating about Sustainable and Healthy Food Systems, the following competences came out on top: Valuing the environment and Critical thinking.

3.1.2 Teacher Needs

Based on the **teacher needs** analysis, 26% of respondents found it somewhat difficult (rated 4 or 5 out of 5) to integrate SFS topics into the current curriculum. Additionally, 24% mentioned that they lack sufficient knowledge about SFS to incorporate it into their teaching. Furthermore, the majority of respondents cited time constraints (83%) and obligations to cover other topics (58%) as the primary barriers to integrating educational activities related to SFS into the curriculum.

3.1.3 Harmonising with European Policies

In the A2.2 report, after reviewing 10 European and 4 non-European policy initiatives from 2011 to 2023, nine key issues for a sustainable food system transition were identified: food waste, food security, innovation, system approach, environment/climate change, health, production, circular economy, and education. Two policy gaps were identified: food security and education, which was aimed to be addressed in the FoodSHIFT Pathways Project. Additionally, four relevant learning approaches were identified: **exploration**, **critical thinking**, **practice**, and **collaboration**. These approaches have played a vital role in shaping the pedagogical design principles that are fundamental to defining the FSP Pedagogical Design.

3.1.4 How FoodShift PATHWAYS corresponds to state-of-the-art

The Foodshift Pathways approach empowers teachers to enhance students' sustainability competence, promoting inclusivity regardless of student backgrounds. The training program focuses on four crucial sustainability competences identified by partner country teachers: Valuing the environment; Critical thinking; Understanding society; and Innovative problem-solving.

A pilot teacher training methodology will be developed to address the needs identified in the teacher needs analysis. This framework will include references to case studies and examples of good practices for designing educational activities that enhance sustainability competences. This modular approach allows adaption in the six implementation countries and beyond, as curriculum context vary.

To address the barriers of time restriction reported by teachers, we've streamlined the project approach and materials for ease of use. Some steps in the living lab application can be skipped, such as defining themes and issues (initially selected in videos and OLS descriptions). Additionally, we provide solutions for prototypes in open learning scenarios and templates to facilitate implementation. Teachers can adapt these to local challenges and student interests, sharing their living lab projects on the respective community of practice available on the SALL Repository.

3.2 FSP Pedagogical design principles and educational objectives

Based on the outcomes of the state-of the art review the following design principles are considered towards the definition of the FSP Pedagogical Design and Open Learning Scenario templates.

- **Whole school/open school approach**: all stakeholders of the school ecosystem need to be involved in open innovation methods as to transform the school to a living lab for the needed food system transformation.
- **Authentic and local food system challenges/issues**: the proposed educational activities/OLS as well as the content of the interactive videos refer to authentic and local food system challenges to spark students' interest and motivation in order to engage and learn about current environmental challenges with a focus on Sustainable and healthy food system (SHFS).

- **Co-creation with multi-actor participation**: the active engagement of societal actors in projects implementation needs to be pursuit.
- **Understanding Scientific Content and Knowledge regarding the SHFS**: with the suggested educational activities the objective is for students to understand the complexity of the food system. Having researchers participating in the interactive videos as well as via enrichment of these videos with the proper hinds, we will address this principle/objective will be addressed.
- **Reflecting on Science/living lab process**: Reflecting on science as well as on the reals solutions/pilot prototypes that students will co-develop. Reflection on the learner's own process of understanding natural phenomena and the challenges as well as the impact of the proposed solutions and potential further iterations of the process.
- **Circular learning**: Quick prototyping, with ideas immediately put in practice and tested as an outcome of the learning process. To address the time barrier suggested solutions will be provided; however, this does not mean that interested teachers and students will not be able to further elaborate or work towards coming up with their own solutions.
- **Interdisciplinarity and trans disciplinarity**: Collaborating and connecting internally and externally of the school ecosystem; collaboration among educators of different disciplines as well as experts of various relevant fields is needed.

The final goal is after developing teachers and students' competences, to empower them in addressing food system related challenges and help them become active and responsible citizens.

3.3 The FSP themes

Based on the analysis of the teacher needs performed, state-of the art review of relevant policies, national curricula, SHFS mapping as well as the themes that the partners have experience, networks and motivation to deal with and after a brainstorming session already during the onsite physical kick-off meeting in Stockholm the 6 themes of the interactive videos (wp3), the Initial OLS (A 3.6) and the training modules (A 3.5) to be developed as support materials for teachers have been defined.

The Foodshift Pathways themes based on the 6 interactive videos are the following:

- Food advertisements
- Land Use for Sustainable food production
- Sustainable food systems for the new generation
- Cooking with Myrtis (Local traditional products)
- Food waste
- More knowledge, better food choices

Based on the themes defined and addressed in the FSP videos, a process has been followed for defining the initial OLS, the suggested issues to be addressed in the living labs projects implementations, the suggested stakeholders, and the suggested solutions/protypes, to make implementation easier in the classroom and address the time barrier that has been reported in all partner countries by teachers.

Table 3. Themes/topics addressed in the videos.

Title	Themes/topics
Food advertisements	• Raising awareness about outdoor food advertisements with regards to healthy and sustainable foods • Raising awareness about digital food advertisements regards to healthy and sustainable foods • Food advertisements in different neighbourhoods with differing socioeconomic status • Food advertisements in your neighbourhood • Local supermarket strategies to promote food within the shop and through product offers
Land Use for Sustainable food production	• Digital tool for sustainable land use choices for food production • Raising awareness about sustainable land use • Digital tool for sustainable food production • sustainable recipes using locally sourced ingredients • Sustainable Food Fair • Transition to alternative proteins
Sustainable food systems for the new generation	• Organic Food • Food transportation
Cooking with Myrtis	• Local and traditional products • Importance of pollinators • Food production methods (honey, olive oil) • Traditional local recipes
Food waste	• Zero waste • Food waste • make biomaterials using organic food scraps
More knowledge, better food choices	• importance of consumption of local produce • Seasonality Calendar • principles of the Mediterranean diet

4 The FSP OLS template

4.1 Principles of the OLS

The primary goal of the Foodshift Pathways Open Learning Scenarios (OLS) is to empower teachers to address various aspects of food system sustainability. Through OLS, we shift from traditional one-way, passive teaching to a multidimensional knowledge-building process that begins with observation and questioning.

In the OLS approach, students take centre stage in the learning process. They actively construct their own knowledge not only within the school community but also by engaging with the broader community and collaborating with diverse stakeholders. OLS also adopts the living-lab methodology, tailored to the specific contexts of schools and school communities. In this approach, students become equal partners with societal actors, collectively co-creating solutions to real-life food system challenges that impact the entire community.

Considering that the project targets students aged 10 to 16 years old, certain topics require multiple OLS variations. These variations vary in terms of task complexity, student autonomy, and the level of involvement of societal actors. Consequently, OLS has been developed for two distinct age groups: students aged 10 to 12 and students aged 13 to 16 years old. This results in two defined difficulty levels for the OLS templates: a simplified version for younger students (10-12 years old) and a more intricate, deep-learning version for students aged 13-16 years old.

The OLS template comprises two sections: one offering background information about the scenario, including the theme, target audience, and the curricula topics where it can be integrated. The other section presents the actual content of the OLS, outlining the steps for its implementation to achieve the proposed pilot or solution. To develop the steps and phases of the OLS template, we have embraced the living lab approach. Below, you will find a brief overview of the different components of the OLS template, table 4.

Table 4. *Overview of the components in the OLS template*

Support information	Description
Aims	A list of the main goals to be achieved with the OLS.
Sustainability Competences	A list of the key competences in sustainability (identified in A 2.3): *Knowledge, Skills, Attitudes*
Societal Actors	A list of the different school and community members engaged in the OLS. (Relevant with the Food system)
Keywords	A list of words that facilitate a quick understanding of the topics covered by the OLS.
Age Range	The target student audience of the OLS, ranging from 10 to 16 years old.
Subject	School disciplines addressed in the OLS, in connection to the country context.
Topics	School topics, within each subject, addressed in the OLS, in connection to the country context.

Set up	The list of locations and the necessary arrangements of each location where the different tasks of the OLS are going to take place.
Material/Resources	List of materials to be used during the implementation of the OLS.
Difficulty	Light/deep approach
Learning steps:	**Description**
Introduction	Contextualization of the OLS starting from the general topic of food systems to the specific topic covered in the OLS.
Phase 1: The issue	A list of steps that help the teacher to trigger discussion and reflection on the food system topic. These steps include watching the video associated with the OLS and identifying the problem(s)/dilemma(s) issued in the video.
Phase 2: Into the community	A list of steps that take students out of the classroom context into the school and/or local community: school, neighbourhood, food markets, restaurants, companies, research centres, etc. Here the students' interaction with one or more societal actors related with the food system begins.
Phase 3: The co-creation process	Detailed work methodology that places students side by side with one or more social actors (including families and the school community) to reflect, discuss and plan solutions that contribute to the resolution of the identified problem(s)/dilemma(s) linked to food systems.
Phase 4: The (suggested) solution	Proposed solution to the identified problem(s)/dilemma(s), through the development of structures, products, services, or campaigns aimed at different sectors of the community, and previously tested by the targeted audience.

5 Focus groups for the validation of the FSP pedagogical design

In this section the methodology (protocol, consent form, reporting template per country) for implementing the focus groups in the 6 partner countries as well as a synopsis of the main outcomes and the analytical reports per country are presented. The presentation takes place by the order of partners/countries as mentioned in the description of work. The total number of participants in the focus groups was 43; thus, the respective indicator was overreached.

5.1 Main outcomes from Sweden

Pedagogical design/pedagogical approach principles:

- Involve parents and other family members through discussions, especially for younger student groups, as parents are primarily responsible for food purchases.
- A great benefit if the projects included practical elements (in the community), e.g., students having to leave the classroom and look at their surroundings or the food sold in the store.

Proposal for activities/content enrichment tools:

- Participants suggested the following topics: environmental issues, meaning of food symbols, comparing countries to each other with respect to different environmental issues or SFS issues, greenwashing, economic/social inequalities in relation to SFS.
- It is very useful to have access to pre-planned projects to work on throughout the semester, as it is difficult to design a project by just one person. It is very valuable to have access to pre-designed materials. data sets (preferably locally adapted), as an additional resource.
- Participants were positive about the use of tools such as Mentimeter and Kahoot to integrate interactive elements.

Barriers:

- Lack of time

Enablers/support:

- The fact that many curricula are already tight and have little opportunity to introduce more new topics.
- Participants suggested talking to teachers and introducing them to the project well in advance before teachers start using it
- Implement projects as part of the curriculum to overcome the time barrier.
- Participants also thought it would be valuable to have someone from the project team whom they could contact in case they needed help, either with technical problems (e.g., if the video does not work) or with general questions.

5.2 Main outcomes from Netherlands

Pedagogical design/pedagogical approach principles/Elements of SC

- The classroom can become a 'living lab' for societal processes in which teachers - by asking pointed questions - can initiate critical thinking… one of the key competences.
- Cross-collaboration needed: "That is why I think that in the first instance you do not have to change so much in the range of your lessons, but that as a school organisation you have to make that choice together with everyone within".

Approval of OLS

- Our participants expressed that they did not really need more teaching materials, as they already know there is a lot, and are able to make their own if they feel something is missing. However, they recognized how the OLS could contribute to the lesson preparation to colleagues who want to teach about sustainability, but do not have the same resources.

Proposal for activities/content enrichment tools

- Led to the need of having a dedicated lecture only on sustainability – hence an extra lesson.

Barriers

- Curriculum is full, and sustainability is not part of the examination or official methods.

Enablers/support

- It would be most helpful if there is a practical session about sustainability, which gives them concrete 'hooks' to relate the topic to their subjects (e.g., sustainable materials in practical subjects, or reading/writing/listening exercises about current events related to sustainability in language subjects)
- Top-down management to implement an integral policy on sustainable practices, so it becomes a more normal and relatable topic, provide the teachers that are open with concrete 'hooks'.
- Can be best be taught in lessons when becoming an integrated part of exams and will be taken up in textbooks.
- The participants agreed that receiving more concrete support for education on sustainability would be useful.
- The HORECA school director and the governmental programme coordinator were clearly more open to consider structural changes and curriculum adaptations for strengthening sustainability teaching. Regarding curricular changes, teachers felt that enforcing this onto the teachers without first consulting them or allowing them to get properly prepared might cause resistance and could create friction.
- Teachers felt that the management needs to take its responsibility: in this case, a top-down approach (from management) was considered necessary to structurally change the daily practise inside the school (e.g., stop selling soda in the machines, make vegetarian options cheaper, change coffee in the machines to fairtrade brand)

5.3 Main outcomes from Denmark

Approval of video/Approval of OLS

- All teachers present would be very interested in working more closely with the developed teaching material from the "Foodshift Pathways" project.
- Especially the described OLS from the "Foodshift Pathways.

Proposal for activities/content enrichment tools

- In a broader sense, everyone had experience dealing with sustainability, but especially in the subjects of biology and food science, "sustainable food production" is more naturally on the agenda.
- The general assessment was that there was a lack of updated digital aids which focused on more concrete parts of sustainability such as "sustainable food production».

Barriers

- Finances were mentioned as the biggest challenge in relation to making excursions.
- Another fundamental problem was that there was generally no money to hire a bus or buy train tickets for whole classes. For that reason alone, field trips were often considered unrealistic.
- In addition, the availability of qualified materials is a challenge if the school does not have the necessary subscriptions and if the material is not available at EMU.

Enablers/support

- A mix of analogue and digital learning tools is needed

5.4 Main outcomes from Greece

Pedagogical design/pedagogical approach principles:

- The participants were familiar with the term of sustainable nutrition/sustainability and sustainable food systems.
- Participants had the opportunity to get to know the Open Schooling methodology & the living labs approach and felt that this is a helpful approach for developing the competences.
- Educational approaches such as living labs/project-based learning, are very interesting and attractive to students.
- Soft skills labs (integrated in the curriculum) are an opportunity for implementing such projects.
- Collaboration with local societal actors/experts very helpful & desirable
- Active involvement of students is an important factor.
- Interdisciplinarity needed

Elements of SC:

- Findings in line with the survey (valuing the environment, critical thinking and understanding society)

Proposal for activities/content enrichment tools:

- Hands on activities, collaborative character, sense of ownership of outcomes by students on the final products.
- Also, activities related with entrepreneurship having also a charitable character have been reported.
- Junior achievement/entrepreneurial activities are proper especially for secondary education level (lower and upper level)
- Have mentioned the importance of integrating activities in which feedback from students is collected e.g., using Mentimeter.
- Also, QR codes have been mentioned as examples of activities for providing additional information to students in an attractive and appealing way.
- Interactive games and Edpuzzle were mentioned for collecting information from students.
- P1 reported and then others agreed that the Network on Theatre on Education (led by Govas) provides nice training activities and collaborates with different environmental centres in the country.
- Expanding the educational materials and implementation to kindergarten level desirable (some of the participants teaching at kindergarten)

Approval of video/scenarios:

- Participants greatly liked the video and mentioned that the scenarios could act as a triggering mechanism for implementing/integrating such activities in their classes.

Barriers:

- Restrictions on the curriculum in terms of time and materials that need to be covered and the priority given to exams (especially in secondary education) – not allowing for easy integration of such transdisciplinary activities in the curriculum.
- Time restrictions, lack of collaboration among colleagues in the schools

- The lack of funds and resources has been also mentioned as restrictive factors.

5.5 Main outcomes from Spain

Pedagogical design

- In order to learn, study needed to be motivating, functional and meaningful.
- Non-formal education is one of the important pillars to consider; non-formal education is an educating agent, as is the family, the first educating agent and the one with the greatest responsibility.
- Experimentation is another pillar.
- Include social actors, families, parents... social actors who participate more passively.
- We know the living lab as citizen science.
- The living labs could involve the students in the most political and social ones, so that they realize that their opinion counts and can change things.

Elements of SC:

- Competence is acquired based on the formation of concepts, for example in the ecosystemic concept, it is not only to say that everything is related, but how it is related, how it is quantified, how we can demonstrate it, and from here the critical spirit emerges.

Approval of OLS/video:

- The teachers commented that they could use it in class.

Suggestions from teachers related to the Video/Suggestions for activities:

- The video should be co-created together with the teachers.
- The video should be local.
- The images (Illustrations) could be made by the students themselves, this way they internalize each action they have to illustrate or describe.
- The language should be more inclusive and in Catalan.
- More activities to make the problem closer to home.
- One activity could be to make composters with digital fabrication.
- Take care of the gender perspective.

Barriers:

- The main barrier was time and teacher training.
- Time restriction on schedule
- Lack of knowledge
- Lack of enthusiasm

Enablers

- The material has to be created with a local language and context, in order to bring the student closer to his or her closest environment.
- The projects must be focused on the search for solutions to the real and daily problems of the student.

5.6 Main outcomes from Portugal

Pedagogical design/pedagogical approach principles:

- Most participants were familiar with the open schooling methodology and the Living Labs approach
- Open schooling is very important, although it is not always easy to implement.
- Involving students in the topics by putting them in the centre of the question/problem and stimulating them to think about the topics instead of being just receptors of the information.
- "I believe that the term sustainable food systems should be integrated into educational activities in a transdisciplinary way".

Elements of SC:

- The 4 competences they considered most important were: Valuing the environment; Critical thinking; Understanding society; Innovative problem solving.

Proposal for activities/content enrichment tools:

- Vegetable garden was a good way to address the 4 competences ("I think that planting and taking care of a vegetable garden is the most complete and urgent activity because kids are not used to put the hands on the soil and touch the animals", P3)
- The majority of participants chose "food systems innovation/circular economy" and "food security" as most important and "health" and "food waste" as least important.

Approval of video:

- Participants considered that if the initial video was not attractive enough it could be difficult to capture the interest of the students.

Barriers:

- The difficulty in involving the community and the lack of time to launch the project were other factors considered.
- Time restrictions in schedules, obligations on other issues and lack of financial resources.

Enablers/support:

- Participants considered it important to hold webinars with the exchange of experiences, to update their knowledge and share good practices and lessons learned from previous similar projects.
- They also considered important the provision of financial resources and collaboration with local social actors/experts such as nutritionists and food producers.

Table 5 *Outcomes from focus groups analysis, (✓= light approval, ✓✓= moderate approval, and ✓✓✓= strong approval)*

	Sweden	**Denmark**	**Netherlands**	**Greece**	**Spain**	**Portugal**	**Total # of participants**
Date	13/6	9/8	19/6	6/7 (during the Summer school 2023)	12/7	16/6	
# of participants	7 (split in 2 groups)	5	4	8	5	14 (split in 2 groups)	43
Profiles (primary, secondary), experience	Teachers	4 x lower secondary classes + 1 x high school (upper secondary classes)	1 dean of a gastronomic school for preparatory profession middle-school level 1 classroom teacher for cooking lectures at preparatory profession middle-school level 1 classroom teacher languages and sport at middle school level 1 programme coordinator Ýoung Learning to East' at governmental entrepreneurial service RVO	Teachers (primary & secondary education)	Mainly teachers, but also other stakeholders (Primary & secondary teachers, in-formal and non-formal educators)	Mainly teachers, but also other stakeholders from the Ministry of Education (policy maker) and a Science Centre (teacher trainer).	
Pedagogical design/pedagogical approach principles	✓✓✓	✓✓✓	✓✓✓	✓✓✓ specifically mentioned: Co-creation; Collaboration among teachers; External stakeholders' engagement	✓✓✓	✓✓✓	
Elements of SC	✓✓✓	✓✓✓	n/a	✓✓✓	✓✓✓	✓✓✓	
Approval of video	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	
Approval of OLS	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	

Proposal for activities/content enrichment tools	Mentimeter and Kahoot to integrate interactive elements. Apart from the videos and the OLS, some participants thought it would be valuable to have access to premade datasets (preferably locally adapted), as an additional resource			QR codes as examples of activities for providing additional information to students; Interactive games and Edpuzzle as tools for content enrichment. Transdisciplinary ones (e.g., combination of arts & environmental topics)			
Barriers	• Obligations to other topics • Time restriction	• Lack of funds • Lack of qualified digital materials	• Obligations to other topics • Lack of knowledge	• Obligations to other topics • Time restriction • Lack of knowledge	• Time restriction on schedule • Lack of knowledge • Lack of enthusiasm	• Obligations to other topics • Time restriction • Lack of funds	
Enablers	• Introduce the project to teachers in good time (allowing for planning/integration) • Propose anchors in the curriculum	Availability of updated digital aids which focus on more concrete parts of sustainability such as "sustainable food production	Top-down management to implement an integral policy on sustainable practices, provide the teachers that are open with concrete 'hooks'	• Interdisciplinarity needed (not so easy to achieve) • Educational approaches such as living labs/project-based learning, are very interesting and also attractive to students. • Soft skills labs (integrated in the curriculum) are an opportunity for implementing such educational activities. • Collaboration with local societal actors/experts very helpful & desirable (although some of participants from secondary education level reported restrictions in internal agreements/arrangements to external actors that they could collaborate as well as getting approval to	Teachers believe that they need to be assigned a coherent amount of time to develop the organisation of the implementation of this type of project; currently, the organisation time given to teachers is minimal compared to the time in the classroom. They are asked to organise several projects in a very short period, which makes them unfeasible.	interdisciplinary approach, a restructuring of the digital resources and financial resources	

				collaborate with these actors • The latter barriers have not reported though in kindergarten level			
Short description	The focus group started with a presentation of the participants and a short presentation of the project. Due to short with time available with the participants the general questions were sent out prior to the discussion using an online questionnaire, in order to be able to focus on more project specific material in during the discussions. During the focus groups discussions, a clip from the Swedish video was shown as well as the example scenarios developed by CV. In general, the participants were very positive about the project the material developed so far. Benefits and barriers as well as ways to overcome the barriers were discussed. The focus group were audio recorded.	The meeting started out with watching a short (Swedish) video produced for the EU project "FoodShift Pathways", and Carsten Meedom talked about the purpose of this focus group meeting. The following courses were represented in the focus group: nature science, geography, biology, physics/chemistry, food science.	The focus group went very well, a good, lively discussion with helpful input	The focus group started with a short presentation of the project; the intro video was shown. The participants were winners of the educational scenario contest (https://foodshift2030.ea.gr/) that we organised before the summer school and were awarded their participation in the it. They initially completed their profile (since they have not participated in the online survey). Participants are coming from different parts of the country (urban & rural areas). During the focus groups discussions, the Swedish video was shown as well as the example scenarios developed by CV. In general, the participants were very positive about the project & the materials developed. Benefits and barriers as well as ways to overcome the barriers were discussed. The focus group was audio recorded.	For the focus group we followed the instructions sent by our activity leader partner EA. At the beginning we started with the introduction of the participants and a brief presentation of the project. This was followed by questions about the definition of concepts such as FSS, sustainability and competences for sustainability. The participants were also asked if it was feasible for them to integrate SF in their teaching/education process. They were also asked if they were familiar with the open school methodology and the Living Labs approach. We then presented the video produced by Spain and explained the OLS	The focus group started with the presentation of the participants and a brief presentation of the project (oral and video). General questions and competencies discussed and written in a board to enhance the main competencies selected. Afterwards we have presented the video produced by the Swedish partners and explained the OLS by CV. Then one of the participants of each group presented their ideas to the other group. The last minutes of the focus group were to discuss the topic about SFS and the importance given by the participants, as well as, the barriers and incentive factors identified by the participants in their daily work to develop them. The	

					by IAAC. In general, there was a lot of interest and participation in the project, and it was corroborated that the educational elements are a necessary support for teachers. The focus group was audio recorded.	focus group was audio recorded.	
Further comments		All teachers present would be very interested in working more closely with the developed materials. Generally more and updated textbooks, but also supplemented with digital teaching aids on the various platforms. Especially the described OLS from the "Foodshift Pathways" were considered something very interesting and useful.	• Sustainability is a broad conceptionally relevant theme that should be part of every lesson/subject – there are enough entry points to approach this theme in all lessons • One of the big barriers to integrating 'sustainability' into lessons is the struggle between routine and innovation/change. Some colleagues are more affected than others. If you leave it only to voluntariness, then there is a good chance that it will often not be picked up. But if it is becoming part of the final exam – then it will change. Therefore, the theme of sustainability	3 of the participants are working in kindergarten (participated in a network about healthy and sustainable diets led by the Centre of Environmental Education in Crete, Greece) & proposed to create materials to be applied in kindergarten too, they had already implemented projects regarding local traditional products (asparagus, apple & olive oils). Positive feedback, fruitful exchanges - Other examples, cases that the participants have integrated the fs in their teaching have been discussed and experiences exchanges among participants. in secondary level entrepreneurship stood out also as a dimension whereas in younger ages scope has been to raise awareness and develop competences in a more joyful way! (SDG0), so as students to overcome frustration as well			

			should play a more explicit role in future curricula and agreements, without hindering teachers in their creative freedoms. • The discussion about whether there is also a need for a special (dedicated) lesson where it should only be about sustainability did not come to a clear result. However, there was agreement that students are not yet able to connect the different dimensions of sustainability in a clear way. For example, to get a picture of the circular economy, it is advantageous if it is also discussed coherently in a lesson – rather than distributed across different lessons only. • Participants agreed that teaching alone cannot be the basis for behaviour change, but that this entails a very long process — perhaps sometimes (change of eating patterns) over years	as social activities. Tools have been suggested to increase interaction with students, and thus might be useful in terms of content enrichment strategies			

			or even generations. Schools should not want to enforce this either, but show what effects one way or another of dealing with food has. • Opinions about the need for extra teaching material (about sustainability) differed: participants did not necessarily think it was necessary but there was also the realization that internet searches are not offering reliable/applicable information. ***So there's a good chance that teachers will benefit from new material.*** • Participants found the video very useful and see an advantage in showing this type of material during lessons. Also, interaction with tools (e.g., MFP) or exchange with experts outside school (visits to farms, butcher shops, etc.) are always a great success with students.				

6 Conclusions

In this document we present the steps towards designing the FSP pedagogical design. After initial teacher needs analysis through interviews and surveys, 6 curricula mappings, analysis of the relevant policies on the theme of the food system, focus groups with teachers and teacher trainers in the partner countries the initial design has been validated. As a final step, the outcomes of the focus groups have been clustered and discussed in a Collaborative Workshop during the consortium meeting in Lisbon (September 2023) and reflections on the ways that the project addresses the findings have taken place. The findings from all these steps have helped us validate the pedagogical design.

The challenge has been to combine an innovative learning by doing pedagogic design/approach, fitting with EU policies on the topic of sustainable and healthy food system and sustainability/green competences; and a "Design thinking" method, such as the living lab approach key to success combining competences-expertise- different national contexts and a user-centred approach (school ecosystem: teachers and students) as well as societal actors related with the food system. For the implementation to take place successfully it is important to appreciate the context in which it will take place and the enablers and inhibitors that exist. What we need to point out is that organizational aspects of open schooling need to be considered, e.g., a new culture, a transition to future-oriented curricula, new collaboration approaches; living lab projects are not just developing materials. We aim to support the implementation in pilot schools in the upcoming two school years expanding learning beyond primary and secondary school levels at non-formal and informal learning settings.

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Annex 1: Focus group guidelines

Qualitative research for in-depth analysis for educators and fs stakeholders on Key Features of Sustainability Competence on the food system and the FSP Pedagogical Design

Target for 90-120 minutes

The overall objective of this study is to explore the participants' perception on Key Features of Sustainability Competence on the food system (FS) and the Pedagogical Design proposed by the FSP project.

The main outcome is to gather unput regarding the competences that participants feel their students need to develop; their perception regarding the targeted pedagogical design and the input/support that the project needs to provide to target groups. Secondary outcomes are related with participants' willingness to collaborate further on project next steps/developments, trainings, etc

Participants: teachers, teacher trainers, policy makers related with education/environmental education.

Questions are numbered (from 0 to 6), while comments for the moderator are reported in Italic grey.

0. Welcoming: individual questionnaire and housekeeping rule

First, the moderator introduces the project, and gives a brief explanation of the objectives of the research. Second, he/she informs the participants that the group interview will be recorded, for better recording on the discussions and the analysis taking place afterwards, that they are free to withdraw at any time; he or she also gives some general directions (e.g., availability of water, using the toilet, turning off cell phones, etc.). The moderator hands participants the informed consent and data processing information and after receiving their consent to participate in the study, hands over the socio-demographic questionnaire for participants to complete (see attached file).

"Icebreaker": round of table with participants introducing themselves (name, professional experience, etc.).

We would like to talk to you about the integration of SFS into educational activities and the pedagogical design suggested by our European initiative FSP, this is not an individual questionnaire but a group discussion, it is important that everyone expresses their opinion freely.

1. General questions

Some preliminary questions:

- Are you aware of the term SFS? If yes, in what way? *(Provide the definition (Annex 2) and initiate discussion).*
- Do you think it is important to integrate the topic in the teaching process?
- Have you tried integrating sfs in your teaching/educational process?

- Are you currently working on an educational project regarding SFS in your school?
- Are you aware if/where do you suggest that the term could be integrated in the curriculum? In which topics and how often/duration? How/in which format would you integrate the topic in the educational process? *(e.g., could be extracurricular programs)*

2. Competences

- Are you familiar with the GreenComp framework and the sustainability competences? (Provide the definition (Annex 2), examples (Annex 3) and initiate discussion).
- To what extent are these 13 competences used in your teaching (on a scale from 1-5, with 1 being not used at all and 5 being a part of the core learning goals).
- Please pick the 3 competences that you consider most important in educating students about Sustainable Food Systems

Eventually we can decide to calculate scores and then discuss the results with them cross-referencing the outcomes of the survey (2 SC came out on top: Valuing the environment and Critical thinking*) and also* Sustainability competence outcomes/country (graph from Report A2.1 – you may also deploy the Miro board for your country). P*ick the survey outcomes regarding sustainability competences that apply for your national context/country and bring them to the discussion*

- Can you think of educational activities that could help develop the 2 latter competences (Valuing the environment and Critical thinking)? Are you aware of existing projects and initiatives that could be used?

3. Pedagogical design

- Are you familiar with the Open schooling methodology and the Living Labs approach? If yes, what does it mean in your opinion in terms of educational projects on the topic of SFS?
- Do you think that you could implement such projects with your students? In which context?

We will now provide you with examples of Living Labs projects already implemented. *Show examples you will select [1](see Annex 2).*

- Considering these examples, do you feel that you could implement such projects? Which ones do you find more interesting/close to your field? Which external stakeholders do you think you could involve?

- Now we ask you to indicate what factors you think could prevent you from implementing such projects *Provide a blank card where participants can write down barriers, you may use post-its or/and Miro*

- In your opinion, what are the major benefits associated with this approach? *Provide a white card where participants can write down these benefits/incentive factors, wait for participants to point them out, then discuss with them you may use post-its or/and Miro*

1 Portfolio_SALLProjects_FoodSystem-January-2023 (1).pdf

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Focus on needed support

- What support would you need from us in order to implement a living lab project on the SFS topic by us? *Be ready to offer examples of support such as provision of educational resources, videos*, methodologies, ready-to-use lesson plans, and teacher trainings, such as *webinars & summer schools and ask participants to prioritise their preferences.*

4. Topics

- If you were to introduce the topic of SFS/healthy eating could you put the following topics in order of importance? From most important (1) to least important (7). You may also add suggestions.

☐ Circular Economy
☐ Innovation in the fs
☐ FS mapping/conceptualisation
☐ Food Security
☐ Food waste
☐ Health
☐ Production
☐ Other suggestion:

Provide the outcomes of the survey – explain that these are the topics mostly addressed in relevant policy documents.

Comment together on your results. *The moderator tries to engage all participants one by one.*

- Why did you indicate…..in the first place? *Mention some of the factors most frequently indicated in the first positions*
- For what reason in the last position did you indicate...? *Mention some of the factors indicated most frequently in the last positions*

Present the topics of the 6 videos to the participants and collect their interest about them
6 topics of the videos

If you have time, you might also want to co-create a living labs approach project with the participants working on two smaller groups on topics of their commonly agreed choice. Be ready to offer some support/hints in the process.

5. Barriers/incentive factors

Do you experience any **barriers** that make it (more) difficult to integrate the topic of SFS in your work? Choose all that apply.

☐ Obligations on other topics
☐ Time restriction on schedule
☐ Lack of knowledge
☐ Lack of enthusiasm
☐ Lack of financial resources

☐ Difficult to measure outcomes
☐ Other, namely:

Please elaborate on your selected barriers

*Pls pick the survey outcomes regarding barriers (***Report A2.1***) that apply for your national context & shortly discuss with participants*

Focus on enablers
(Focus particularly in those (possible ideas/ways to overcome barriers – venues for integrating the topic)

- Can you think of ways/things that would take away/lighten the barriers you are experiencing? Please explain. *Focus particularly on enablers that our project could address (not so much on needed changes in educational curricula, e.g., i*nterdisciplinarity, approaches such as project-based learning, collaboration with local community and experts*)*

6. Final questions and debriefing

We are approaching to the end of the focus group.

- Are there any topics that you think are important in relation to sfs and healthy eating and we have not discussed? If so which ones?

Thank you very much for your cooperation. The same discussion is going on in Sweden, Netherlands, Greece, Spain and Portugal. Brief explanation informing that the study is part of the Foodshift Pathways project co-funded by the European Union. Kindly inform participants about next steps of the project and scout for their interest to participate further (videos release, training events/webinars, summer school 2023 & on).

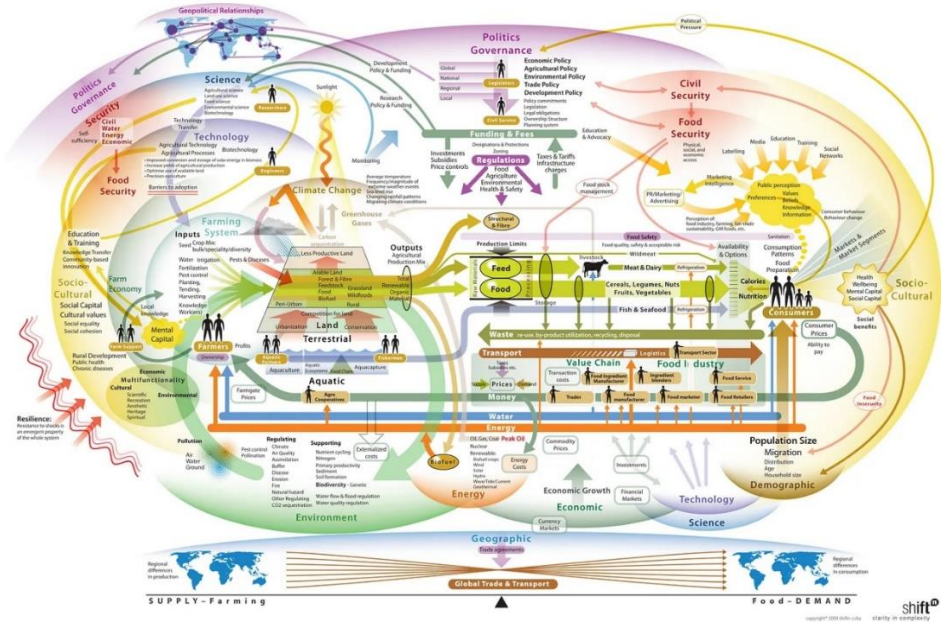
Annex 1: socio-demographic questionnaire

Profession	Teacher Teacher trainer Policy maker (pls specify) Other (pls specify)
Years of experience in this area:	○ 0-5 years ○ 5-10 years ○ 10+ years
In case you are involved in educating students, please specify:	a. Type/level of education: … b. Age group of students: … c. Field of expertise:
Are you familiar with the term “Sustainable Food System”?	○ Yes ○ No ○ Not sure

Annex 2: Definitions

Sustainable Food Systems (SFS):

*“A system of food production, processing, distribution and consumption that is actively seeking to **reduce** Greenhouse Gas Emissions (GHG emissions) and other negative impacts such as food waste, loss of biodiversity and lifestyle related diseases, while **contributing** towards effective food security, fair prices and nutritional wellbeing. Next to **circularity** and **plant-based food**, **cross-sector collaborations**, **citizen involvement** and the **education of future generations** are considered as key principles.”*



Depiction of the Global Food System (SHIFT – Clarity in Complexity)

- What are sustainable competences (SC)?

According to the Joint Research Centre (JRC), SC can be defined as: "the interlinked set of knowledge, skills, attitudes, and values that enable effective, embodied action in the world with respect to real-world sustainability problems, challenges, and opportunities, according to the context"

According to Wiek et al. (2011), the definition of a competence is as "A set of knowledge, skills and attitudes". A **sustainable competence** is therefore a competence that focuses on knowledge, skills and attitudes about sustainability.

Living labs

Pls familiarise yourself with the SALL A roadmap for schools and the example scenarios before the focus group (attached document)

The 3 characteristics that really define a Living Lab project:

1. Real issue, real solution, making use of the participants' personal experience
2. Co-creation, involving all impacted societal actors
3. Quick prototyping, with ideas immediately put in practice and tested.

Living labs projects already implemented examples

Pls pick 2-3 cases that you feel correspond better to your national context for discussion with the participants Portfolio_SALLProjects_FoodSystem-January-2023 (attached document)

Annex 3: Sustainability competences and examples

	Competence	Key issues
Normative	Valuing the environment	Principles, goals, measurable targets, thresholds, cultural norms or personal values
	Example: Students learn how to reduce their ecological footprint related to the food they eat	
	Understanding society	Diversity, cooperation, inclusion, compassion and solidarity, well-being, happiness
	Example: Students organise a cooking event with elderly from a local nursing home	
	Assessing economic aspects	Job perspectives, profit, food-chain, trade-offs, prices, resource values, competition, up-scaling
	Example: Students compare food prices in different outlets and examine reasons for the differences	
System Thinking	Conceptualizing	Dealing with complexity, holistic approach, circularity, resource efficiency, LCA, resilience
	Example: Students compare the life cycle of products that are based on recycling and compare to a product that comes from linear production	
	Critical Thinking	Reflexivity, critique, multi-criteria decisions, problem solving, multiple perspectives, out-of-the-box
	Example: Students have a debate on the topic of land use while taking viewpoints from different stakeholders (farmers, government, wildlife associations)	

	Innovative problem solving	Problem-solving capacity various dimensions of food chain (process, product, governance, social)
	Example: Students learn about new ways of producing protein-rich food from non-meat sources	
Forward looking	Envisioning future scenarios	Developing visions, think and act in a forward-looking manner, what-if thinking, different future
	Example: Students create scenarios of the ideal future and define to what extend this is possible to achieve	
	Developing creative solutions	Co-creation, idea of equity in decision-making/planning, power of the visual, maps & media
	Example: Students design sustainable packaging for a (new) food product	
	Experimenting and testing	Time, uncertainty, probability, test, living labs, exploration, field work, gardening & farming
	Example: Students visit an agricultural farm and learn about the origin of their food by helping the farmer	
Strategies & Actions	Navigating politics	Transformative governance, transition management, incentives, food councils, legislation
	Example: Students talk to city officials to find out what the city is doing to stop food waste or to offer more regional food	
	Collaborating and connecting	Participation, interdisciplinary work, instrumentalization & alliance, Identifying connections
	Example: Students learn to identify local food networks and discuss with the organisers about their experiences	
	Taking initiative	Social action, engagement, business planning, empowerment, cooking, leadership, blogging
	Example: Students make a food blog about their favourite dish from regional origin	
Pedagogical	Interpersonal development	Cooperation & empathy, solidarity & ethnocentrism, team dynamics, leadership, trans-cultural understanding, serious gaming, tools
	Example: Teacher's ability to use different methods for motivating students to eat less meat or grow their own food	

Distribute card /Google form with the 13 SC and ask participants to rank the competences
1 (the most important) to 13 (the least important)

Normative	*System Thinking*	*Forward looking*	*Strategies & actions*	*Pedagogical*
☐ Valuing the environment	☐ Conceptualizing	☐ Envisioning future scenarios	☐ Navigating politics	☐ Interpersonal development
☐ Understanding society	☐ Critical Thinking	☐ Developing creative solutions	☐ Collaborating and connecting	
☐ Assessing economic aspects	☐ Innovative problem solving	☐ Experimenting and testing	☐ Taking initiative	

Sustainability competence outcomes/country (graph from Report A2.1 and/or Miro board)
Pls pick the survey outcomes regarding sustainability competences that apply for your national context/country

References:

- Outcomes of survey (needs analysis by teachers/teacher trainers), https://docs.google.com/spreadsheets/d/1zglAPUPEcYK4fx46NVjy0Ivlco55GJn8L9zEv-eIosc/edit#gid=43260709
- Miro outcomes (qualitative input from survey), https://miro.com/app/board/uXjVPplPktg=/?track=true&utm_source=notification&utm_medium=email&utm_campaign=approve-request&utm_content=open-in-miro
- GreenComp: Bianchi, G., Pisiotis, U. and Cabrera Giraldez, M., GreenComp The European sustainability competence framework, Punie, Y. and Bacigalupo, M. editor(s), EUR 30955 EN, Publications Office of the European Union, Luxembourg, 2022, ISBN 978-92-76-46485-3, doi:10.2760/13286, JRC128040
- UNESCO 2017: Education for Sustainable Development Goals: learning objectives, https://unesdoc.unesco.org/ark:/48223/pf0000247444
- SALL A Roadmap for schools
- Portfolio_SALLProjects_FoodSystem-January-2023 (1)
- Wiek et al. (2011): Key competencies in sustainability: a reference framework for academic program development

Annex 3: Focus group protocol

WP2 –State of the Art & Pedagogical Design

FOCUS GROUP PROTOCOL

Six focus groups (1 per Country) will be performed with a common questionnaire/guideline. This activity will inform the quantitative phase (survey) and the desk research. The sub-themes we'll have to tackle both in the qualitative and quantitative phases, are the following:

- to explore participants' attitudes towards K**ey Features of Sustainability Competence** (with special focus on the food system)
- to gather information about perception, value, and use of the fs topic in the educational activities;
- to evaluate participants' perception and thoughts about the proposed pedagogical design of the project (living labs approach)

1. Recruiting focus group participants

Date of the focus group:

May 2023 – June 2023 (whenever partners find the opportunity – school closure dates need to be taken under consideration).

Participants:

The target is to have 8 to 10 participants in each focus group. A focus group with more than 10 participants is difficult to control. This limits the opportunity of each participant to express his/her opinion. It is important to over-recruit in order to have alternatives in case persons do not show up at last-minute. The rule of thumb is to over-recruit by 20%. For example, for 10 persons expected in the focus group, 12 persons must be recruited.

Our suggestion is to recruit people with heterogeneous characteristics (e.g., different disciplines, grade, etc.) ... Eventually, we could involve persons that will hardly participate in the online quantitative survey. please consider that, in general, heterogeneity is preferred in this kind of activities since it allows to collect different views on the same topic, enriching the discussion.

Method to recruit:

Recruitment should take place, at least, two weeks before the focus group discussion.

The participants could be recruited from a list of contacts, colleagues, participants in the online survey. While recruiting, it's important to describe briefly the importance of the study, what will be done with results. As they agree to participate in the discussion, it will

be useful to send them a personalized email or message to confirm the date, time and the address of the meeting place one week before the session.

Duration of the discussion:

The target will be 90 minutes. Yet experience shows that it will take longer. Probably 2 hours.

2. Conducting the focus group

Role of moderator:

The moderator uses the interview to guide the discussion. He/she must suggest a new topic if necessary, the participants tend to comply. it is necessary to keep in mind what is important for the group. The moderator has to be more directive and enhance the discussion about important themes.

Before the focus group, the moderator should be completely familiar with the introduction and the guide of interview.

The moderator listens carefully with sensitivity and has respect for participants. Empathy and positive attitude are also qualities of the moderator. He/she must be able to communicate clearly in writing and orally. He/she requires ability to listen and self-discipline to control his/her personal views.

Role of the observer:

It is very important in a focus group to write notes, to notice non-verbal responses. Non-verbal aspects are eye contacts, smiles, body postures; they can provide useful information during interpersonal interaction. Interpersonal distance or proximity of participants and its implications for group interaction must receive some attention from researchers.

The observer doesn't participate in the discussion but should help when necessary (e.g., when filling notes by the participants with their names).

Material used:

We strongly suggest you keep at least a digital audio-recording of the discussion. It is necessary to inform participants about the recording and to assure participants that the recording will remain confidential and that its circulation will be limited within the research team (sign the terms of use).

- Digital recorders (check if they work properly and if they have enough batteries/ power) or the recording device of your mobile phone;
- Laptop and projector (it depends if we agree to show images, e.g., of web sites, news, etc.);
- Display unit with name for each participant and for the moderator;
- Bottles of mineral water, glasses;
- Copies of the annexes to be distributed to the participants (e.g. cards, etc.);

- Copies of the agreement (terms of use) for all the participants for the audio recording;
- Questionnaire with demographic information (age, profession, experience, etc.);
- Block notes to write down the nonverbal responses.

When participants arrive:

- We welcome them;
- The participants should sign an agreement (terms of use) for the audio recording, etc., and fill in the questionnaire with demographic information (age, profession, experience, etc.);
- We introduce ourselves;
- We introduce them to one another;
- We offer some refreshments and make some small informal talk.

Discussion:

Before starting the discussion, each participant fills in a sheet with socio-demographic data (age, profession, etc.) and the terms of use.

- The moderator introduces himself/herself and describes briefly the study and the objectives of the focus group. He/she must ensure about anonymity, the value of all opinions.
- Each participant presents himself or herself. They can tell a little about their work, experience.
- The moderator asks the first question to each participant (round of table).
- Keep in mind some rules that are important during the discussion:
  - Only one person can speak at a time;
  - No side conversations among neighbours;
  - No domination on the group but each person participates to the discussion, giving specific attention to age and gender equity
- The moderator ends the focus group thanking the group for participating (debriefing).

3. Data analysis

Since the objective of the focus groups is to provide information than complement the quantitative phase, each Country will prepare a country report, of around 5 pages, with a common structure. EA will provide the structure (template) of the country report. In this first phase we don't believe that each Country should provide a transcript of the discussion. However, please keep the recordings, that eventually could be analysed with a specific software (e.g., NVivo).

Annex 4: Consent form (focus group)

Consent form FOCUS GROUP: Foodshift Pathways - Key Features of Sustainability Competence on the food system and the FSP Pedagogical Design

Dear participant,

the Foodshift Pathways project, funded by the European Union Erasmus+ programme, aims to develop a learning ecosystem where students encounter innovative learning experiences and be supported by scientists, in ways that could lead to future opportunities in academic, professional, and civic realms. It will a) produce interactive digital resources on sustainable Food and Nutrition Systems, b) provide a training programme for school communities and c) develop a validation framework testing students sustainability citizenship and dedication to healthy lives. We aim to consult fs stakeholders and particularly teachers and teacher trainers in partner countries to identify their experiences and needs.

Aim of the focus group interviews

In the focus group interviews, we wish to explore the participants' perception on Key Features of Sustainability Competence on the food system (FS) and the Pedagogical Design proposed by the FSP project.

The main outcome is to gather unput regarding the competences that participants feel their students need to develop; their perception regarding the targeted pedagogical design and the input/support that the project needs to provide to target groups.

Participants: teachers, teacher trainers, policy makers related with education/environmental education.

As part of this study, you will be placed in a group of 8 – 10 individuals. A moderator will ask you several questions while facilitating the discussion.

Use of data and dissemination of research findings to participants

As approved through Ellinogermaniki Agogi Ethical Board, this focus group will be audio-recorded and a note-taker will be present and will take some pictures.

Your personal data will be processed by EA or only within the focus group activities of the Foodshift Pathways project and will not be disclosed to third parties.

Data processing can be carried out both by automated and non-automated tools.

All names and other identifiers (information on country, age, etc.) will be removed to ensure full anonymity. The recordings will be destroyed after they have been

transcribed and/or analysed. The research results will be disclosed in aggregate form and in such a way that the personal identity cannot be identified in anyway.

The audio recording will be used exclusively for the purposes of the research and the images will not spread in anyway.

The findings from the focus group interviews will be analysed, published and made publicly available.

If you do not want to join or want to stop the group conversation

Participation is voluntary.

If you decide to participate, you must sign the attached informed consent form and bring it to the focus group.

If you have agreed to participate but change your mind, you can withdraw at any point (including during the focus group discussions), we would ask you kindly to inform us if this is the case.

Each participant in the focus group interview may at any time demand removal of his/her interview data by a simple request to the coordinator of the study (Katerina Riviou, kriviou@ea.gr) or to the national referent (your name and email here). Data, which have already been published, cannot be removed.

Benefits and risks of participating

The direct benefits of participating in the research are that participants can share experiences and actively bring in and broaden their knowledge. By signing this informed consent form, participants agree to maintain the confidentiality of the information discussed by all participants and researchers during the focus group session.

Supervision

Leading research team:

Katerina Riviou, Research & Development Department, EA, email: kriviou@ea.gr

National referent: … your name here…

Informed consent and confidentiality agreement

Participation is voluntary and participants are free to withdraw from the study at any time and without giving any reason for withdrawing by contacting the study coordinator Katerina Riviou (kriviou@ea.gr) or the national referent … your name and here (email here).

By signing the consent form, you indicate that you are in agreement with all of the statements below:

- I have read the information provided about the study. I have had the opportunity to ask questions and my questions have been sufficiently

answered. I have had enough time to decide whether I would like to participate.

- I am aware that participation in the study is voluntary. I also know that I can decide at any moment to not participate or to withdraw from the study. I do not have to provide any reasons for not participating or terminating enrolment in the study.
- I give consent to the audio recordings of the focus group interview and taking pictures.
- I give consent to the collection and use of my interview data in line with established data protection guidelines and regulations (GDPR).
- I give consent to having the results, as obtained by my interview data disclosed in aggregate form, made publicly available.
- I agree to maintain the confidentiality of the information discussed by all participants and researchers during the focus group session.
- I want to participate in this study.

Date:

Name of the participant in block letters:

Signature of the participant:

Annex 5: Country report template (focus groups)

Qualitative research for in-depth analysis for educators and fs stakeholders on Key Features of Sustainability Competence on the food system and the FSP Pedagogical Design

FOCUS GROUP COUNTRY REPORT

Country:

Authors:

Institution:

1. Composition of Focus Group/General Questions

1.1 Presentation

Date	Location	Number of participants

Comments on:

- Where they took place
- Hours and duration
- Recruitment strategy
- How many persons were recruited
- Any particular issue to be commented in each focus group (e.g., deviations from the guidelines)

1.2. Profile of participants

Short comment about the profiles of participants.

Participants of Focus Group

Part.	Profession	Years of experience	Type/level of education:	Familiar with the term "Sustainable Food System"?

		in this area:	**…** **Age group of students:** **…** **Field of expertise:**	
P1				
P2				
P3				
P.4				
P5				
P6				
P7				
P8				
P9				
P10				

Question in the Socio-demographic questionnaire (Annex 1 of Guidelines)

The comments to the focus groups should be divided in Sections, such as the original guidelines. Remind: this was the warming discussion (i.e. "Section 1. General questions" in the original guidelines).

General recommendation: the reporting of the focus group discussions should be in a narrative form, providing general elements emerged from the discussion, with also reference to specific issues. Including specific sentences (verbatim) from the discussion, indicating also the participant code (e.g., P8), could help the reader to specifically refer to particular situations. For instance:

> "[…] With regard to the profiles, most of the participants had already completed the online survey, (*"I think the term sustainable food systems needs to be integrated in the educational activities in a transdisciplinary way"*, P8;)."

2. Competences

Please, provide here replies to the questions (from the original guidelines in case you actually used these in the focus group- if you used the national outcomes of the survey in the discussion, pls refer to it):

- *Are you familiar with the GreenComp framework and the sustainability competences?*
- *Please pick the 4 competences that you consider most important in educating students about Sustainable Food Systems*
- *Can you think of educational activities that could help develop the 4 latter competences (Valuing the Environment; Critical thinking; Understanding society and Innovative problem solving)? Are you aware of existing projects and initiatives that could be used?*

Text here *[elaborate a little further on the last question]*

3. Pedagogical design

- *Are you familiar with the Open schooling methodology and the Living Labs approach? If yes, what does it mean in your opinion in terms of educational projects on the topic of SFS?*
- *Do you think that you could implement such projects with your students? In which context?*

Text here

- *We will now provide you with examples of Living Labs projects already implemented. Considering these examples, do you feel that you could implement such projects? Which ones do you find more interesting/close to your field? Which external stakeholders do you think you could involve?*

Text here – also mention which examples/OLS you used

- *Now we ask you to indicate what factors you think could prevent you from implementing such projects.*

Text here – also which method you used [paper or digital tool & which]

- *In your opinion, what are the major benefits associated with this approach?*

Text here

- *What support (digital material) would you need from us in order to implement the example project that you saw/a living lab project on the SFS topic?*

Text here

4. Topics

- *If you were to introduce the topic of SFS/healthy eating could you put the following topics in order of importance? From most important (1) to least important (7). You may also add suggestions.*

Text here [the topic you touched upon & whether you presented a demo/video to participants & which]

- *Now, we would like to get your feedback regarding a video enrichment example we are developing, as a way to expand the learning materials that will accompany your video and your pilot in general.*

Text here [mention which example you used]

- *Do you think that such an approach provides students with additional resources, activities and tools that will enrich their learning experience by allowing them to explore concepts more broadly, apply what they learn to real situations, promote critical thinking and foster creativity?*

Text here [in case you touched upon …]

- *If you have time, you might also want to co-create a living labs approach project with the participants working on two smaller groups on topics of their commonly agreed choice.*

Text here [in case you touched upon …]

5. Barriers/incentive factors

- *Do you experience any barriers that make it (more) difficult to integrate the topic of SFS in your work? Choose all that apply.*

☐ Obligations on other topics
☐ Time restriction on schedule
☐ Lack of knowledge
☐ Lack of enthusiasm
☐ Lack of financial resources
☐ Difficult to measure outcomes
☐ Other, namely:

Please elaborate on your selected barriers

- *survey outcomes regarding national barriers (Report A2.1)*

Text here on short discussion outcomes if you touched upon

Focus on enablers

- *Can you think of ways/things that would take away/lighten the barriers you are experiencing? Please explain. Focus particularly on enablers that our project could address (not so much on needed changes in educational curricula, e.g., interdisciplinarity, approaches such as living labs/project-based learning, collaboration with local societal actors/experts)*

Text here *(*Focus particularly in those (possible ideas/ways to overcome barriers – venues for integrating the topic)

6. Final questions and debriefing

Please, indicate shortly any general conclusions of the discussions taking place

Annex 6: Country reports (focus groups)

FOCUS GROUP COUNTRY REPORT

Country: Sweden

Authors: Sofia Spolander

Institution: Karolinska Institutet

1. Composition of each Focus Group/General Questions

Presentation

Focus groups	Date	Location	Number of participants
A	2023.06.13	IEGS (High school)	3
B	2023.06.13	IEGS (High school)	4

Comments on: Where they took place, Hours and duration, Recruitment strategy, How many persons were recruited, Any particular issue to be commented in each focus group (e.g. deviations from the guidelines)

The participants were recruited from a network of teachers that Karolinska Institutet have previously collaborated with. The focus groups took place in the high school IEGS (Internationella Engelska Gymnasiet Södermalm) in downtown Stockholm. Two focus groups were conducted during 13th of July, with seven participants in total. Each focus group lasted approximately 45-50 minutes. The discussion was adapted to the Swedish context and focused on the topics of the Swedish video (food advertisements) and the Portuguese example scenarios (local foods) with some discussions on the other topics. Due to the short time available for the focus group, the background questions were added in a questionnaire that was sent out to the participants prior to the focus groups. Most of the participants did not previously take the online survey (WP2).

Profile of participants

Short comment about the profiles of participants.

The participants were all high school teachers. The teachers were teaching a variety of subjects and had different amount of experience in their field. The details about the participants can be found in the table below.

Table 1: Participants of the Focus Groups

Part.	Profession	Years of experience in this area:	Type/level of education, age of students,	Familiar with the term "Sustainable Food System"?	Do you think it is important to integrate the topic "Sustainable

			field of expertise:		**Food Systems" (SFS) in the teaching process?**
P1	Teacher	5-10	High school, age 16-18, science	Yes	Yes, it should be highlighted from an economic and sustainable point of view. Especially at pedagogical lunch time.
P2	Teacher	5-10	High school, age 16-19, social science, history and law	Not sure	Yes, since children of today seem to be totally unaware of how big impact the food has on the climate change
P3	Teacher	0-5	High school, age 16-19, biology	No answer	No answer
P.4	Teacher	10 +	High school, age 16-19, science, biology, chemistry	Yes	Yes, although I think that we should also work on the political climate to simply change the food requirements in schools to a more sustainable system.
P5	Teacher	0-5	High school, age 16-19, science, biology	Yes	Yes, we need solution focused and innovative ways that we can integrate sustainable practices into our everyday lives.
P6	Teacher	0-5	High school, age 16-19, religion, history, international relations	Yes	Yes, i think so. It's important from environmental point of view and socio-economic point of view.
P7	Teacher	5-10	High school, age 15-19, civics, international relations, English	Not sure	Sustainability in all of it's forms should be integrated into the teaching process. Living in a sustainable way is vital on the personal as well as societal level.

[a] Question in the Socio-demographic questionnaire (Annex 1 of Guidelines)

The comments to the focus groups should be divided in Sections, such as the original guidelines. Remind: this was the warming discussion (i.e. "Section 1. General questions" in the original guidelines).

General recommendation: the reporting of the focus group discussions should be in a narrative form, providing general elements emerged from the discussion, with also reference to specific issues. Including specific sentences (verbatim) from the discussion, indicating also the participant code (e.g. P8), could help the reader to specifically refer to particular situations. For instance:

> "[…] With regard to the profiles, most of the participants had already completed the online survey, (*"I think the term sustainable food systems needs to be integrated in the educational activities in a transdisciplinary way"*, P8;)."

2. Competences

Please, provide here replies to the questions (from the original guidelines in case you actually used these in the fg- did you use the national outcomes in the discussion, pls refer to it):

- *Are you familiar with the GreenComp framework and the sustainability competences?*
- *Please pick the 4 competences that you consider most important in educating students about Sustainable Food Systems*
- *Can you think of educational activities that could help develop the 4 latter competences (Valuing the Environment; Critical thinking; Understanding society and Innovative problem solving)? Are you aware of existing projects and initiatives that could be used?*

Due to shorter time available with the teachers in the Swedish focus groups, only on the national outcomes from the online survey was discussed (i.e., the competences that were ranked as most important when it comes to educating students about sustainable food systems (SFS) by the respondents in the online survey). In the questionnaire that was send out to the focus group participants prior to the discussion, the participants were asked to rate the 5 competences that were selected as most important in the online surveys from Sweden from 1 to 5, based on how important they think they are when it comes to educating students about SFS (where 1 means not important at all and 5 means very important). The competencies and the average score received by the focus group participants can be found below.

Critical thinking = 4,7

Innovative problem solving = 4,5

Valuing the Environment = 4,5

Understanding society = 4,3

Developing creative solutions = 3,8

In line with the results from the previous online surveys, the focus group participants found these competences important when it comes to education students about SFS. Unfortunately, there was not enough time to discuss educational activities that could help develop the competences.

3. Pedagogical design

- *Are you familiar with the Open schooling methodology and the Living Labs approach? If yes, what does it mean in your opinion in terms of educational projects on the topic of SFS?*
- *Do you think that you could implement such projects with your students? In which context?*

- *We will now provide you with examples of Living Labs projects already implemented. Considering these examples, do you feel that you could implement such projects? Which ones do you find more interesting/close to your field? Which external stakeholders do you think you could involve*

In the Swedish focus group, the participants got to discuss the already prepared examples of open learning scenarios developed by CV for the Swedish and the Portuguese videos. First, the participants got to watch a 1 minute long clip from the Swedish video. Secondly, the participants got to read through four open learning scenarios, one simple and one more complex about food advertisements (example from Sweden) and one simple and one more complex about local foods (example from Portugal). The participants thereafter discussed the projects and whether or not they thought they could implement such projects with their students and in which context.

The participants liked the design of the projects/open learning scenarios and thought that it would be very helpful to get access to already planned projects such as the examples used in the focus group. One participant described it as a nice teaching resource that could be used when planning what the students would do in class that semester, since it is sometimes difficult to come up with interesting and suitable tasks or projects yourself.

> *"It's like a lesson plan already done, it's absolutely perfect. PX"*

> *"We can put these in as the activities instead of something else and still sort of like meet the requirements. So actually, is for me, I think these are brilliant tools. PX"*

> *"Yeah, it's almost like, ohh I wanna do this or there is this topic, but I'm bored of what I did last year, and I don't think the kids got that much out of it. Let me have a quick flick through [the different projects] and then it's like oh, this would be nice. PX"*

The participants thought that projects on these topics would be easier to implement in some courses than in others, since some courses already naturally cover these topics. However, most of the participants could find opportunities to implement some of the projects/topics in their courses, even if the topic is not embedded in the curriculum. The participants mentioned that the school used to have project weeks, but unfortunate they had recently been cancelled, and therefore the projects would have to be integrated as part of the subject courses.

> *"Some of this we do naturally cover in ecology units and sustainability and climate change. PX"*

> *"I mean from social science point of view, obviously we don't, we might not have this embedded in our curriculum, but there's definitely opportunities to talk about it both in international relations which I teach, and I guess to an extent even in in in history. PX"*

The participants appreciated the fact that the scenarios were long but saw it as an opportunity to pick and choose the parts that suited them best and, in such way, adapt the project after their own needs, rather than having to execute all the steps.

> *"You can adapt it. The thing is, because you have so much in here, the teacher can't adapt it like, okey, I'm not going to do this thing, but I'm going to do this. PX"*

However, they thought the age ranges set on the projects was slightly low (their students were between the age 15- 19, and they found the projects suitable for them as well) and unnecessary and thought that having projects with different length that they could choose from, without the age recommendation, would be enough.

Regarding specific stakeholders, the participants did not have many suggestions. Several of the participants thought that involving parents and other or family members through discussions would be important, especially for younger student groups, since parents are the ones who mainly take care of the food purchases etc at home.

- *Now we ask you to indicate what factors you think could prevent you from implementing such projects.*

The main barriers discussed in the focus groups were lack of time and the fact that many curriculums are already tight with little opportunity to introduce new/more topics. Another barrier that was discussed was that some schools, for example in more socioeconomically disadvantaged areas, might have other priorities such as getting the students to pass and might therefore not have the resources to implements these types of projects.

The participants also discussed that some of the elements in the example projects might not be feasible to perform with their students. For example, one participant was worried that bringing a large group of students to a local supermarket (both when it comes to taking pictures of food and to interview customers) might not be appreciated by the store owners or by other visitors/customers. Also, in smaller cities/communities there might not be many options for markets or grocery stores. The participants suggested that parts of the scenarios could also be introduced as home assignments, e.g., to look at products in the local market/grocery store.

> *"I think the barrier that I've already mentioned is in fact a barrier. And that is anytime you're going into a public place, there is a risk that you're going to be getting into trouble by getting into someone's face. PX"*

- *In your opinion, what are the major benefits associated with this approach?*

When asked this question the participants mainly thought about the benefits it would bring to the students when getting to reflect on the topics of sustainable food systems and health.

> *"I think that just getting them to think critically about where things are coming from and being more sustainable. Mindset is what we need, and I think this is like a good step for it. PX"*

One participant thought it was a great benefit that the projects include practical elements (into the community) e.g., that the students have to go out of the classroom and actually look at their surroundings or at the food sold in the store. The participant thought this would be a good way of creating awareness among the students.

> *"I really like the actually making them look at things, you know. Like making them look for the country of origin of the material. Because I think that if you've never done that before, you've never noticed it before. But once they've done it once, then they will always notice that every time they go to the grocery store. Their eyes are going to be attracted to that. PX"*

- *What support (digital material) would you need from us in order to implement the example project that you saw/a living lab project on the SFS topic?*

Apart from the videos and the open learning scenarios, some participants thought it would be valuable to have access to premade datasets (preferably locally adapted), as an additional resource. This could be useful in for example science classes if the class did not have the time to actually collect the data themselves, but still wanted to perform the later steps of the projects.

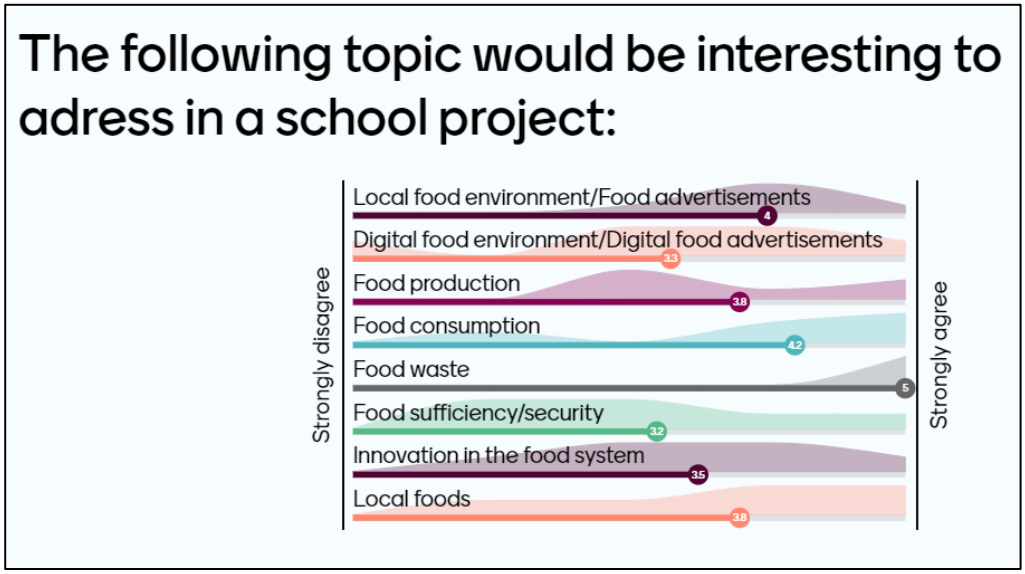
> *"Data sets that you could work with that are already available. I think particularly for certain groups that would be really helpful. PX"*

The participants also thought it would be valuable to have someone from the project team that they could reach out to in case they needed help, either with technical issues (for example if the video isn't working) or with general questions. If feasible the participants also thought it could be helpful to have someone from the project team coming to kick-start the project or demonstrate how it should be done, after which the teacher could take over and continue.

4. Topics

- *If you were to introduce the topic of SFS/healthy eating could you put the following topics in order of importance? From most important (1) to least important (7). You may also add suggestions.*

During the focus group interview, the participants were asked to rank (from 1 to 5, where 1 means not very interesting and 5 means very interesting) 8 different topics, related to SFS, based on how interesting they thought it would be to address in them a school project. The average from all participants can be found below.



The participants were also given the opportunity to suggest other topics related to SFS, that they thought would be interesting to address. The following topics were suggested by the participants: Environmental issues, meaning of food symbols, comparing countries with each other in regard to different environmental issues or SFS issues, green washing, economic/social inequalities in relation to SFS.

- *Now, we would like to get your feedback regarding a video enrichment example we are developing, as a way to expand the learning materials that will accompany your video and your pilot in general.*
  https://docs.google.com/document/d/1V86gQhEt2YZqMUYC0QaGpRbDIAwHZ5Nu/edit
- *Do you think that such an approach provides students with additional resources, activities and tools that will enrich their learning experience by allowing them to explore concepts more broadly, apply what they learn to real situations, promote critical thinking and foster creativity?*

Potential tools or resources to enrich the videos and the projects in general were discussed in this section. The participants were positive to the use of tools such as the Mentimeter and Kahoot to integrate interactive elements. They did not have any additional suggestions for additional resources apart from the premade datasets mentioned earlier.

- *If you have time, you might also want to co-create a living labs approach project with the participants working on two smaller groups on topics of their commonly agreed choice. Be ready to offer some support/hints in the process.*

N/A

5. Barriers/incentive factors

- *Do you experience any barriers that make it (more) difficult to integrate the topic of SFS in your work? Choose all that apply.*

X	Obligations on other topics
X	Time restriction on schedule
	Lack of knowledge
	Lack of enthusiasm
	Lack of financial resources
	Difficult to measure outcomes
	Other, namely:

See point 3 pedagogical design.

Focus on enablers

- *Can you think of ways/things that would take away/lighten the barriers you are experiencing? Please explain. Focus particularly on enablers that our project could address (not so much on needed changes in educational curricula, e.g., interdisciplinarity, approaches such as living labs/project-based learning, collaboration with local societal actors/experts)*

To overcome the berries of time restriction the participants suggested to talk to the teachers and introduce the project in good time before the teachers are thought to start using them. In such way the teachers will have time for planning (how to fit the projects into the curriculums) and see how they can benefit from using the projects. The participants also suggested to present the projects to the teachers with excitement, as something that is already done and ready to implement, and something that will not require any additional work from them, to overcome this barrier.

"Introduce a project a bit more and like, sort of like lay it out like very significant like clearly for the teachers and it's like, listen, there's no work for you to do, it is literally the lesson plans here. You just have to figure out where do you want to put it in your curriculum. PX"

The participant also suggested that it would be helpful to find sections in the actual curriculums in that would be covered by the project, and point this out to the teachers to make it even more attractive to them.

6. Final questions and debriefing

Please, indicate shortly any general conclusion of the discussions gathered across the three focus groups in your country.

All the participants thought that it is important to teach students about SFS. In general, all participants were positive to all of the elements discussed and seemed positive about implementing these type of projects/scenarios with their classes. Some teachers thought that time and already tight curriculums could potentially be a barrier and suggested that introducing the projects to teachers far in advance and to find parts in the curriculums that could be covered by the different projects, could help overcoming the barriers. Even though the participants liked the whole design of the open learning scenarios, they saw the length of the scenarios as an opportunity to pick and choose the parts that suited them, rather then having to perform all of the steps.

It is important to note that all teachers participating in the focus group were working in a private school in a socially advantaged area and that these teachers might have access to more resources compared to teachers in many other schools. All teachers were also high school teachers and teachers of younger students might have other opinions or experiences.

Focus group meeting on sustainability and food systems

Strøby School on 9/8, at 1 - 3 pm

Present: Helen Andersen, Kirsten Søgaard, Jens Hansen, Arni Dalsgaard, Christina Wagner

Hosted by Carsten Meedom

The meeting started out with watching a short (Swedish) video produced for the EU project "FoodShift Pathways", and Carsten Meedom talked about the purpose of this focus group meeting. The following courses were represented in the focus group: nature science, geography, biology, physics/chemistry, food science.

- Educational level: 4 x lower secondary classes + 1 x high school (upper secondary classes)

The topics we talked about:

Sustainability

1 - Give examples of where "sustainability" and "sustainable food production" is part of your teaching.

Answers:

The concept of "sustainability" was treated in a broader sense and also more specifically within food production. In a broader sense, everyone had experience of dealing with sustainability, but especially in the subjects of biology and food science, "sustainable food production" is more naturally on the agenda. All the teachers related first and foremost to what is written in the syllabus statements about "sustainability" and followed the instructions for the individual courses.

For "food science" it was mentioned that the teachers could bring organic ingredients into the classroom. One teacher mentioned that she often brought seasonal fruits and vegetables from her own green garden to show students what you can grow yourself. Another element that had everyone's attention is waste sorting! Again, the starting point was the students' everyday life / reality, where you looked at the generated waste in for example, "food science".

2 – What types of teaching materials support your teaching?

Answers:

For all the subjects, analogue teaching aids were mainly used in the form of a textbook that deals with sustainability interdisciplinary. Digital teaching aids were used when there was an opportunity, but the general assessment was that there was a lack of updated digital aids which focused on more concrete parts of sustainability such as "sustainable food production".

3 – What types of teaching materials would you like to have more of? What would support the teaching better?

Answers:

Generally more and updated textbooks, but also supplemented with digital teaching aids on the various platforms. Especially the described OLS from the “Foodshift Pathways” were considered something very interesting and useful.

Note: In Denmark, teachers have different options. The individual schools decide for themselves which educational publishers they wish to subscribe to (there are two publishers who cover all subjects in primary school and upper secondary schools and a number of publishers who offer materials for specific courses only). Depending on the school's subscription, teachers therefore only have access to the portals that the relevant subscription offers. However, all teachers and students have access to a unified and free portal (EMU), which has materials for all teaching levels. This portal is owned and administered by the Ministry of Education and Culture and has several materials dealing with sustainability in a broader sense. The challenge in practice is that teachers mainly use the portal associated with the school in question. EMU is often used in practice as an occasional supplement. Common to all portals is that they use both analogue and digital teaching aids.

Types of teaching

1 – How do you teach "sustainability"? Is it only classroom teaching, or do you also go on excursions outside the house? And where could it possibly be?

Answers (for the lower secondary classes):

All teaching takes place in the classroom, with occasional trips in the neighbourhood as an exception. It was mentioned that the local water plant was visited regularly and a small lake near a school was used in biology lessons. Although the teaching at this level is planned interdisciplinary, there is rarely the opportunity to go on longer excursions that last an entire school day. In practice, none of the teachers present made use of the opportunity to go on excursions outside the building. Another fundamental problem was that there was generally no money to hire a bus or buy train tickets for whole classes. For that reason alone, field trips were often considered being unrealistic.

Answers (for high schools):

There is a better opportunity to make excursions. Both because of a general better economy for these kinds of activities and because of the students' own transport possibilities in the form of bicycles or commuter cards for the public transport system.

2 – Which type of teaching works best in your eyes?

Answers: Definitely a mix of analogue and digital learning tools. The general view is that digital teaching materials can rarely stand alone. In the context of digital material and a book / written material, the processes become more effective in the cognitive learning process. Basic books on "sustainability" will, on the other hand, be strengthened if you have a video or other interactive digital material that focuses on a topic that the students must work with specifically on, for example, an excursion.

3 – And what types of teaching aids would support field trips?

Answers: Again, digital (video) materials will be optimal, as it puts images on themes and locations that the students must work with in practice. Subsequently, however, it will be the analogue materials that the students must work with when they are back in the classroom.

Student's receptivity to the subject

1 – Are the students generally interested in learning about "sustainability" and "food systems"?

Answers (for lower secondary classes):

There is generally an interest in learning about sustainability, but as far as the education is concerned, only a few of the students are able to work independently with the subject and form their own attitudes on that basis. For most students, it is only the attitudes of their parents or home base that they express when the subject is discussed in the classroom. As a teacher, you can see a socio-economic pattern in the students' attitude towards sustainability.

Answers (for upper secondary classes):

In upper secondary school, students are much better at expressing their own views on the subject, which must be seen in the light of their general maturity and ability to relate critically to subjects.

2 – What are the biggest barriers in teaching?

Answers:

- Finances were mentioned as the biggest challenge in relation to making excursions.

- In addition, the availability of qualified materials is a challenge if the school do not have the necessary subscriptions and if the material is not available at EMU.

- As far as schooling is concerned, the students' socio-economic backgrounds were most often decisive for what they immediately thought about a specific subject. But that does not mean that you should not teach and influence them professionally.

3 – What effect does the teaching have on the students? Can we expect a change in attitude and behavior "just" by teaching about the subject? Or is it something that happens over a longer period of time that extends beyond school hours?

Answers: The effect was not expected to come until the students were out of the school system and were active participants in the business world. There is, of course, the possibility that students take home input from their lessons and talk to their parents about it, and in that way help shape the general perception of sustainability in various contexts.

As far as upper secondary schools are concerned, the teachers have a better opportunity to enter a dialogue with the students in terms of their greater maturity and growing independence.

Concluding remarks:

All teachers present would be very interested in working more closely with the developed teaching material from the "Foodshift Pathways" project.

Qualitative research for in-depth analysis for educators and fs stakeholders on Key Features of Sustainability Competence on the food system and the FSP Pedagogical Design

FOCUS GROUP COUNTRY REPORT

Country: Netherlands

Authors: Merel Dubbeldam & Dirk Wascher

Institution: SUSMETRO

1. Composition of Focus Group/General Questions

1.1 Presentation

Date	Location	Number of participants
19-6-2023	Rooi Pannen, Tilburg	4

Comments on:

- Where they took place
  - Rooi Pannen is a school for hospitality students age 16-2 based in Tilburg
- Hours and duration
  - 90 minutes, 14.00 – 15.30
- Recruitment strategy
  - From personal network
  - Previous respondents from questionnaire (that indicated they were interested in further participation in the project)
- How many persons were recruited
  - 4
- Any particular issue to be commented in each focus group (e.g., deviations from the guidelines)
  - Not all educational levels and age groups were represented

1.2. Profile of participants

Short comment about the profiles of participants.

Participants of Focus Group

Part.	**Profession**	**Years of experience in this area:**	**Type/level of education:** … **Age group of students:** … **Field of expertise:**	**Familiar with the term "Sustainable Food System"?**
P1	Director		MBO, 16+, hospitality	Yes
P2	Teacher Cooking		MBO, 16+, hospitality	Yes
P3	Teacher Languages (English & Dutch)	20+	MBO, 12-16, language	In principle – FS Pathways definitions not discussed
P.4	Program coordinator		All types, all ages, healthy food habits	Yes

Question in the Socio-demographic questionnaire (Annex 1 of Guidelines)

The comments to the focus groups should be divided in Sections, such as the original guidelines. Remind: this was the warming discussion (i.e. "Section 1. General questions" in the original guidelines).

General recommendation: the reporting of the focus group discussions should be in a narrative form, providing general elements emerged from the discussion, with also reference to specific issues. Including specific sentences (verbatim) from the discussion, indicating also the participant code (e.g., P8), could help the reader to specifically refer to particular situations. For instance:

> "[…] With regard to the profiles, most of the participants had already completed the online survey, (*"I think the term sustainable food systems needs to be integrated in the educational activities in a transdisciplinary way"*, P8;)."

2. Competences

Please, provide here replies to the questions (from the original guidelines in case you actually used these in the focus group- if you used the national outcomes of the survey in the discussion, pls refer to it):

- *Are you familiar with the GreenComp framework and the sustainability competences?*
- *Please pick the 4 competences that you consider most important in educating students about Sustainable Food Systems*
- *Can you think of educational activities that could help develop the 4 latter competences (Valuing the Environment; Critical thinking; Understanding society and Innovative problem solving)? Are you aware of existing projects and initiatives that could be used?*

We discussed the outcomes of the questionnaire shortly. Overall, the participants agreed that having something to be able to more concretely implement measure the education about sustainability is a good measure. The competences given were therefore well received. Participants discussed what would be the best way to integrate more sustainability into the lessons, but also into the day-to-day practise of the school. Some said that a top-down approach (from management) was necessary to structurally change the daily practise inside the school (e.g., stop selling soda in the machines, make vegetarian options cheaper, change coffee in the machines to fairtrade brand), but others said that enforcing it onto the teachers before they are ready causes resistance, creating a gap, but starting some practices yourself and demonstrating positive outcome inspires teachers and allows them to be more open-minded.

The participants agreed that a great way sustainability will be consistently taught in lessons is when it will be part of examination and published into method books. (“I would like to immediately have a framework then. They just say, this is how we do, this is what we expect from you when you join the method. It would be so nice if it's one name, one company. Something where you connect, where this is also in.”, P2). Until then, only the teachers that are intrinsically motivated will make the time and effort to include activities and material about sustainability (e.g., visiting a farm, talking about issues on the news, etc.). The teachers also mentioned that among students, sustainability is not a popular topic. E.g., when mentioning sustainability, they are met with rolled eyes. They suspect that this is because it has become a ‘buzz word’, that has lost its value because it can be heard everywhere. ("They already hear about it so much, and then teachers start talking about it too. better to talk about where vegetables come from and show them by going by”, P2). They also noticed there is a strong bias against diets like vegetarian, as this is often a minority practising it. (“But often it is still the one who deviates from the norm, who has to answer. Vegetarians are always asked why you don’t eat meat. A carnivore is never asked why you eat meat. And I want to turn that around a bit in the discussion in my classes. Why does the one who deviates have to answer? That's why I would just love a picture of the fridge like this. With the sensitivities out there. Because there are some people who just don't have a penny to spare. And as the vegetarian in the class, I almost speak that in the singular for nothing. Because there are so few of them. If that one actually dares not speak up. Then we are a long way to go from where we are at.”, P3).

3. Pedagogical design

- *Are you familiar with the Whole School Approach If yes, what does it mean in your opinion in terms of educational projects on the topic of SFS?*

P4 considered the Whole School Approach as a way to take many different aspects into account, e.g. policy, business operations but also the role of parents > taken into account all points. The discussion led to the need of having a dedicated lecture only on sustainability – hence an extra lesson. The school director felt that there is a principle need for such a lecture. Currently it is often in the hands of the biology or geography teachers , but “no one understands the big connection” While the cooking teacher (P2) considered theoretical background as too complex to deal with, the director (P1) raised the point that somewhere it is necessary to provide a coherent narrative of sustainability. Though the integration of sustainability into the wide range of lessons is desirable, not all teachers are flexible and creative enough to follow up on this. The programmer

commented: “this is a challenge for organisational innovation. The participants pointed at the example of the Leeuwarden Agile Craftsmanship – there they have consciously chosen to go for a school-wide approach. This means to build integrally from the bottom up, “then you are really working on an innovation”. P2 “that agility of hooking up with the whole school, you can't frame everything – that's very much in the teacher's abilities. That is why I think that in the first instance you do not have to change so much in the range of your lessons, but that as a school organisation you have to make that choice together with everyone within which frameworks you will all work.”

- *Do you think that you could implement such projects with your students? In which context?*

Both teachers (P2 & P3) feel quite comfortable to approach their part of a Whole School Approach themselves: “Nowadays, there is a lot to find - this means I would have to work without a book now. If I have a week of preparation time and can make it all year. Because everything can be found. And knowing the own class is also an advantage for choosing the appropriate materials. Colleagues regularly need sustainability to be discussed at school.” The Dutch/English teacher (P3) organised workshops for them. Perhaps that should be done again about sustainability. And then the practical teachers look at the materials you use. You need that. P4 points at the learning line of SLO (Dutch Curriculum Organisation) addressing basic education for which a layer of deepening or a theme has been added. However, this has not been converted one-on-one into the curriculum. The Ministry of Education is reluctant to take that on board, arguing with the freedom of education. At the schools, directors and boards decide themselves how to give substance to that. But the sustainability goal has been put on hold again. The cooking teacher sees the need to look at the reflection of society and *then* to adjust the frameworks around it. So as Rooie Pannen we will be working with new suppliers as of next year.

P3: “You're talking about the geography teacher, Havo Atheneum, who knows what subjects to cover, because they are reflected in the exam. And if he doesn't have time to spare, then the chances are pretty slim that he'll do something like sustainability. At the time of the prescribing, next year is in the central geography exam, sustainability is a part, then.”; P4: “In the meantime, we can make those brackets. That you mention a starting point of that theme for all courses, and view that excursion or that nearby.” P2: “As a practical school, you have to set an example there”, P4: “Yes, it is very nice here, that you also just decorate the environment in such a way that it becomes self-evident.”

- *We will now provide you with examples of Living Labs projects already implemented. Considering these examples, do you feel that you could implement such projects? Which ones do you find more interesting/close to your field? Which external stakeholders do you think you could involve?*

We showed the example OLS and video from Sweden about food advertisement. We did not show (other) examples of Living Labs projects as it was not clear this was part of the focus group session. Our participants expressed that they did not really need more teaching materials, as they already know there is a lot, and are able to make their own if they feel something is missing. However, they recognized how the OLS could contribute to the lesson preparation to colleagues who want to teach about sustainability, but do not have the same resources. (“I think it is very good for a colleague who is looking for more information and inspiration. At the same time, I think it works best if the colleague makes it himself, because then you have ownership, just as we ask our students to do. Whether I'd

rather prefer just useful resources then? I find it difficult. Looking at myself, I don't really need anything. But I guess it could be much better. Yes, I think it could be nice for colleagues who don't know where to start. A basis, start-up for lessons with digital information, assignments etc. ", P2;). They did express that it would be easier to use if the OLS were incorporated in methods from suppliers of teaching materials.

- *Now we ask you to indicate what factors you think could prevent you from implementing such projects.*

  See above

- *In your opinion, what are the major benefits associated with this approach?*

  See above

- *What support (digital material) would you need from us in order to implement the example project that you saw/a living lab project on the SFS topic?*

  See above

4. Topics

- *If you were to introduce the topic of SFS/healthy eating, could you put the following topics in order of importance? From most important (1) to least important (7). You may also add suggestions.*

See below

- *Now, we would like to get your feedback regarding a video enrichment example we are developing, as a way to expand the learning materials that will accompany your video and your pilot in general.*

See below

– Also, question @Katerina: what do you mean with 'your pilot'? The teachers in the session are not part of a pilot, they just do their work in different schools and did not know each other previous to the session.

- *Do you think that such an approach provides students with additional resources, activities and tools that will enrich their learning experience by allowing them to explore concepts more broadly, apply what they learn to real situations, promote critical thinking and foster creativity?*

Participants liked the video; however, they expressed their hesitations whether they feel the need for more learning materials. They mentioned they use the methodology provided, and if they feel something is missing there is a lot of material out there already. The teachers in the group also said that they make their own material if they want to discuss a certain topic, but they recognized not all teachers will do this, especially if they do not prioritise sustainability as a topic. For them, it would be most helpful if there is a practical session about sustainability, which gives them concrete 'hooks' to relate the topic to their subjects (e.g., sustainable materials in practical subjects, or reading/writing/listening exercises about current events related to sustainability in language subjects). ("I think you could also turn to methods English and Dutch very well. If you can get a chapter there, I would do that too. Because they need texts, And then you can offer sustainability a bit more directly. Then it's more about them just seeing a lot of texts in the language. And that you're busy talking about the language. More than the topic, but just letting them read something. Not just pure practice. English and Dutch all follow them. And the exams are generic exams, which are difficult to put together. Because students from all directions have to be able to take them. These kinds of topics are important for everyone. Doesn't matter what direction you do.", P3;)

- *If you have time, you might also want to co-create a living labs approach project with the participants working on two smaller groups on topics of their commonly agreed choice.*

Did not have time, was not relevant in this session

5. Barriers/incentive factors

- *Do you experience any barriers that make it (more) difficult to integrate the topic of SFS in your work? Choose all that apply.*

☐	Obligations on other topics
☐	Time restriction on schedule
☐	Lack of knowledge
☐	Lack of enthusiasm
☐	Lack of financial resources
☐	Difficult to measure outcomes
☐	Other, namely:

Please elaborate on your selected barriers

We did not explicitly discuss these barriers during the session, as most participants had previously filled in the questionnaire. The barriers they experience have been mentioned above: curriculum is full, and sustainability is not part of the examination or official methods, so only the teacher that find

it important will make time for it. There is resistance, mainly because they feel they are being told what to do and they don't feel like changing their ways of teaching.

- *survey outcomes regarding national barriers (Report A2.1)*

Text here on short discussion outcomes if you touched upon

Focus on enablers

- *Can you think of ways/things that would take away/lighten the barriers you are experiencing? Please explain. Focus particularly on enablers that our project could address (not so much on needed changes in educational curricula, e.g., interdisciplinarity, approaches such as living labs/project-based learning, collaboration with local societal actors/experts)*

See above – top-down management to implement an integral policy on sustainable practices, so it becomes a more normal and relatable topic, provide the teachers that are open with concrete 'hooks' that directly relate to their subject and lessons, so as little adaptation as possible is needed for them. Idea to discuss with publishers of teaching methods to integrate more sustainability topics and lessons into their methods.

("Approaching from top down, I am not always in favour of that. But those frameworks around it, you have to skim them, I think. And then quietly work inwards", P2)

6. Final questions and debriefing

Please, indicate shortly any general conclusions of the discussions taking place

See above.

Qualitative research for in-depth analysis for educators and fs stakeholders on Key Features of Sustainability Competence on the food system and the FSP Pedagogical Design

FOCUS GROUP COUNTRY REPORT

Country:

Authors:

Institution:

1. Composition of Focus Group/General Questions

1.1 Presentation

Date	Location	Number of participants
6/7/2023	Golden Coast Hotel, Marathon in the context of the Summer school 2023	7

The duration of the focus group was approximately 1.5 hours.

Participants were Greek competition winners (educational project on food system transformation) of the summer school. They were from different grades and different geographical regions of Greece (urban and rural). More specifically, regarding the profile of participants more info on following table.

The guidelines were followed

Comments on:

- Where they took place
- Hours and duration
- Recruitment strategy
- How many persons were recruited
- Any particular issue to be commented in each focus group (e.g., deviations from the guidelines)

1.2. Profile of participants

Short comment about the profiles of participants.

Participants of the Focus Group

Part.	Profession	Years of experience in this area:	Type/level of education: … Age group of students: … Field of expertise:	Familiar with the term "Sustainable Food System"?
P1	teacher	20years	Secondary school 12-15 years old Music teacher	Yes
P2	teacher	31 years	Secondary school Home economics (PE80)	Yes
P3	teacher	10+ years	High school (16-18 years old) Economics	No
P4	teacher	23 years	Kindergarten 4-6 years old	Yes
P5	teacher	10+ years	Kindergarten 4-6 years old	Yes
P6	teacher	18 years	Kindergarten 4-6 years old	Yes
P7	teacher	5-10 years	Secondary school Biologist	Yes
P8	teacher	5-10 years	Primary school (Master degree) 6-12 years old	Yes

Question in the Socio-demographic questionnaire (Annex 1 of Guidelines)

The comments to the focus groups should be divided in Sections, such as the original guidelines. Remind: this was the warming discussion (i.e. "Section 1. General questions" in the original guidelines).

General recommendation: the reporting of the focus group discussions should be in a narrative form, providing general elements emerged from the discussion, with also reference to specific issues. Including specific sentences (verbatim) from the discussion, indicating also the participant code (e.g., P8), could help the reader to specifically refer to particular situations. For instance:

> "[…] With regard to the profiles, most of the participants had already completed the online survey, (*"I think the term sustainable food systems needs to be integrated in the educational activities in a transdisciplinary way"*, P8;)."

Regarding the profiles, none of the participants had completed the online survey – they have all implemented/or planning to implement projects /educational activities regarding the food system/sustainability with their students; so, in principle they were familiar with the term of sustainable nutrition/sustainability and sustainable food systems.

2. Competences

Please, provide here replies to the questions (from the original guidelines in case you actually used these in the focus group- if you used the national outcomes of the survey in the discussion, pls refer to it):

- *Are you familiar with the GreenComp framework and the sustainability competences?*
- *Please pick the 4 competences that you consider most important in educating students about Sustainable Food Systems*
- ***Can you think of educational activities that could help develop the 4 latter competences (Valuing the Environment; Critical thinking; Understanding society and Innovative problem solving)? Are you aware of existing projects and initiatives that could be used?***

Text here *[elaborate a little further on the last question]*

Participants were not exactly familiar with the Greencomp framework, before its presentation during earlier session of the summer school & the focus group itself.

They were all familiar with competences as mentioned in the National Curriculum.

Regarding the competences that they considered as important in educating students about SFS, their choices have been in line with the outcomes coming from the national quantitative survey (the outcomes have been shown to them after they stated their preferences).

Regarding the educational activities that they mentioned as relevant for developing the 4 competencies they mentioned different options/opportunities based on the grade they teach. More specifically:

P3: Junior achievement contest (after school clubs) for high school – they have been awarded in the past.

Example: Local herbs and herb teas (also having a charitable character)

P3: Junior achievement/entrepreneurial activities are proper especially for secondary education level (lower and upper level)

P1 reported and then others agreed that the Network on Theater on Education (led by Govas) provides nice training activities and collaborates with different environmental centers in the country, providing nice ideas for including the topic in education, collaboration among students etc. (in a STEAM approach)

	Valuing the environment	Understanding society	Assessing economic aspects	Conceptualizing	Critical Thinking	Innovative problem solving	Envisioning future scenarios	Developing creative solutions	Experimenting and testing	Navigating politics	Collaborating and connecting	Taking initiative	Interpersonal development
Total all	**48**	**18**	**7**	**7**	**43**	**15**	**13**	**14**	**16**	**2**	**15**	**9**	**8**
Denmark	6	0	0	1	6	2	1	0	4	0	1	0	0
Greece	5	5	3	0	7	3	3	3	3	0	3	1	0
Netherlands	7	4	1	3	5	2	2	1	1	1	1	1	1
Portugal	14	3	2	0	9	1	2	5	6	1	4	2	4
Spain	8	3	0	0	9	1	4	0	0	0	4	3	1
Sweden	8	3	1	3	7	6	1	5	2	0	2	2	2

	Valuing the environment	Understanding society	Assessing economic	Conceptualizing	Critical Thinking	Innovative problem solving	Envisioning future scenarios	Developing creative	Experimenting and testing	Navigating politics	Collaborating and connecting	Taking initiative	Interpersonal development
Percentage all	**67.6 %**	**25.4 %**	**9.9 %**	**9.9 %**	**60.6 %**	**21.1 %**	**18.3 %**	**19.7 %**	**22.5 %**	**2.8 %**	**21.1 %**	**12.7 %**	**11.3 %**
Greece	41.7 %	41.7 %	25.0 %	0.0 %	58.3 %	25.0 %	25.0 %	25.0 %	25.0 %	0.0 %	25.0 %	8.3 %	0.0 %

3. Pedagogical design

- *Are you familiar with the Open schooling methodology and the Living Labs approach? If yes, what does it mean in your opinion in terms of educational projects on the topic of SFS?*
- *Do you think that you could implement such projects with your students? In which context?*

Participants had the opportunity to get to know the Open Schooling methodology & the living labs approach – through their participation in the competition before the summer school & during the summer school (the focus group took place in the 5th day of the summer school) and felt that this is a helpful approach for developing the competences mentioned above.
It was mentioned the active involvement of students as important factor (not being passive learners) that might have actual impact on their behaviour and the collaboration needed in order to implement such activities, as important for developing students' soft skills (collaboration and connecting).

- *We will now provide you with examples of Living Labs projects already implemented. Considering these examples, do you feel that you could implement such projects? Which ones do you find more interesting/close to your field? Which external stakeholders do you think you could involve?*

  The scenarios developed to accompany the Swedish video have been presented to participants and circulated in written format to participants so as to have the necessary time to go through them.

  P1 mentioned as an extension of the materials produced, Jamie Oliver's activity on the students' nutritional habits.
  Regarding factors that influence the dietary habits of students p1 and p7 mentioned as important factors the families (influence of parents & dependence particularly in younger ages).
  Discussing on |influencers, they also mentioned as an interesting relevant activity, the engagement of the presidents of the 15-member student boards in activities organised by the Environmental Centre of Aridaia, since these students are usually very popular among students and can have influence.

- *Now we ask you to indicate what factors you think could prevent you from implementing such projects.*

  Text here – also which method you used [paper or digital tool & which]

Time restrictions, lack of collaboration among colleagues in the schools

- *In your opinion, what are the major benefits associated with this approach?*

  Text here – hands on activities, collaborative character, sense of ownership of outcomes by students on the final products

- *What support (digital material) would you need from us in order to implement the example project that you saw/a living lab project on the SFS topic?*

  Participants mentioned that the scenarios could act as a triggering mechanism for implementing/integrating such activities in their classes (even if not applied per se after adaptation; depending also on the educational level (3 participants working in Kindergarten)).

4. Topics

- *If you were to introduce the topic of SFS/healthy eating could you put the following topics in order of importance? From most important (1) to least important (7). You may also add suggestions.*

Text here [the topic you touched upon & whether you presented a demo/video to participants & which]

The scenarios developed to accompany the Swedish video have been presented to participants and circulated in written format to participants so as to have the necessary time to go through them.

Also, the EL storyboard and the topics of local traditional products has been presented in order to collect feedback – almost all of the participants had already implemented activities regarding local traditional products and the health/environmental benefits of their consumption and mentioned that it is a very important topic to be addressed.

Also, activities related with entrepreneurship having also a charitable character have been reported (p2) (olive oil production coming from the olive trees of the school yard (1 school year before) and the tomato sauces produced by students (last school year) have been donated to the social grocery store of the Municipality.

- *Now, we would like to get your feedback regarding a video enrichment example we are developing, as a way to expand the learning materials that will accompany your video and your pilot in general.*

Text here [mention which example you used]

5 of the participants of the focus group working on Kindergarten and the High school (2 colleagues) have shown excerpts from the videos they have produced after implementing activities with their students on the topic and have mentioned the importance of integrating activities in which feedback from students is collected e.g. through the use of Mentimeter.

Also, QR codes have been mentioned as examples of activities for providing additional information to students in an attractive and appealing way.

Interactive games and Edpuzzle were mentioned for collecting information from students.

- *Do you think that such an approach provides students with additional resources, activities and tools that will enrich their learning experience by allowing them to explore concepts more broadly, apply what they learn to real situations, promote critical thinking and foster creativity?*

Text here [in case you touched upon …]

Positive affirmations received. The tools mentioned in order to increase interaction with and joy of students, and thus might be useful in terms of content enrichment strategies.

- *If you have time, you might also want to co-create a living labs approach project with the participants working on two smaller groups on topics of their commonly agreed choice.*

Text here [in case you touched upon …]

This activity did not take place during the focus group per se; however, they were asked to design such activities as the final outcome of their participation in the summer school and upload them in digital format on the Summer school online community so as to be shareable among summer school participants and beyond. Outcomes are available on SALL Repository and the FOODSHIFT Summer

5. Barriers/incentive factors

- *Do you experience any barriers that make it (more) difficult to integrate the topic of SFS in your work? Choose all that apply.*

- ☐ Obligations on other topics
- ☐ Time restriction on schedule
- ☐ Lack of knowledge
- ☐ Lack of enthusiasm
- ☐ Lack of financial resources
- ☐ Difficult to measure outcomes
- ☐ Other, namely:

Please elaborate on your selected barriers

- *survey outcomes regarding national barriers (Report A2.1)*

The participants selections on barriers were in line with the outcomes of the online survey -the most important ones mentioned have to do with restrictions on the curriculum in terms of time and materials that need to be covered and the priority given to exams (especially in secondary education) – not allowing for easy integration of such transdisciplinary activities in the curriculum.

The lack of funds and resources has been also mentioned as restrictive factors (e.g., for the creation of a school garden for which support by the municipality would be vital but not easy to get (P7) and the case has been reported taking place in another school where equipment has been transferred from one school to another when low engagement was noticed.

Experienced barriers. The numbers represent the percentage of respondents that selected this barrier. The orange cells highlight all scores above 50%, while the red highlights the top 2 barriers overall.

	Obligations to other topics	Time restriction	Lack of knowledge	Difficult to measure outcomes	Lack of funds	Lack of enthusiasm	Other
Percentage all	**58%**	**83%**	**37%**	**21%**	**34%**	**11%**	**7%**
Percentage Greece	58.3%	91.7%	41.7%	33.3%	50.0%	16.7%	8.3%

Focus on enablers

- *Can you think of ways/things that would take away/lighten the barriers you are experiencing? Please explain. Focus particularly on enablers that our project could address (not so much on needed changes in educational curricula, e.g., interdisciplinarity, approaches such as living labs/project-based learning, collaboration with local societal actors/experts)*

- Interdisciplinarity needed (not so easy to achieve internally in the schools due to difficulties in collaboration with colleagues)
- Educational approaches such as living labs/project-based learning, are very interesting and also attractive to students.
- Soft skills labs (integrated in the curriculum) are an opportunity for implementing such educational activities.
- Collaboration with local societal actors/experts very helpful & desirable (although some of participants from secondary education level reported restrictions in internal agreements/arrangements to external actors that they could collaborate as well as getting approval to collaborate with these actors (from principals/parents), among restrictions reported in 3 cases was the requirement for the externals to be certified by the Ministry of Education; thus making their engagement in educational activities quite difficult
- Such barriers have not reported though in kindergarten level (3 participants), since typically there is only 1 teacher responsible and is easier to engage externals without having to agree with other colleagues.

6. Final questions and debriefing

Please, indicate shortly any general conclusions of the discussions taking place

Vivid discussions/exchanges among participants, positive feedback on the project outcomes so far, enthusiasm and prompts on expanding the educational materials and implementation to kindergarten level (fairy tales where the heroes are e.g., initiating the topic of advertisements, e.g. “Magissa Froufrou kai o Mikros Nikolas” (fairy tale on healthy nutrition)

It was also mentioned that from such activities parents can also learn from their children.

In secondary level entrepreneurship stood out also as a dimension, whereas in younger ages scope has been to raise awareness and develop competences in a more joyful way! (SDG0), so as students to overcome frustration (a specific case of a Kindergarten student has been mentioned who after wild forest fires in the region where he resided/of the school he mentioned that the “planet now has burns”) as well as social activities. Tools have been suggested in order to increase interaction with students, and thus might be useful in terms of content enrichment strategies.

Qualitative research for in-depth analysis for educators and fs stakeholders on Key Features of Sustainability Competence on the food system and the FSP Pedagogical Design

FOCUS GROUP COUNTRY REPORT

Country: Spain

Authors: Gabriela Pérez

Institution: IAAC / FAB LAB Barcelona

1. Composition of Focus Group/General Questions

1.1 Presentation

Date	Location	Number of participants
12 Julio 2023	IAAC / FAB LAB Barcelona	5 participants

Comments on:

- Where they took place Pujades 102, Barcelona, Spain
- Hours and duration 2hr 13 min.
- Recruitment strategy invitation via email
- How many persons were recruited 5
- Any particular issue to be commented in each focus group (e.g., deviations from the guidelines)

1.2. Profile of participants

Short comment about the profiles of participants.

Participants of Focus Group

Part.	Profession	Years of experience in this area:	Type/level of education: … Age group of students: … Field of expertise:	Familiar with the term "Sustainable Food System"?

P1	Teacher		Primary school and high school	Yes, they are familiar with the term
P2	Teacher		Primary school and high school	Yes, they are familiar with the term
P3	Teacher		Primary school and high school	Yes, they are familiar with the term
P.4	Teacher		Primary school and high school	Yes, they are familiar with the term
P5	Teacher		Primary school and high school	Yes, they are familiar with the term
P6				
P7				
P8				
P9				
P10				

Question in the Socio-demographic questionnaire (Annex 1 of Guidelines)

Participants:

Name	Organisation	Role
Isabel Nadal	Consorci de Educació	Implementation of the pedagogical program of the digital fabrication athenaeums in Barcelona. Interdisciplinary teacher training. Pedagogical coordinator of the Barcelona World Capital of Sustainable Food 2021 program.
Anna Amat	Escola Mestre Moreira	Primary and secondary school teacher, psycho-pedagogical coordinator.
Vicente Albiñana	Aimerigues	High complexity secondary school teacher implementing Erasmus project on sustainable entities for 3 years (air and noise pollution sensors) 4th Eso to 1st Bachillerato.
Claudio Torassa	Learnlife	Cooking Workshop, sustainable cooking

Julia Leirado	Fab Lab Barcelona	Schools' area, implementation of digital fabrication and maker culture in schools.
Alessandra Schmidt	Fab Lab Barcelona	Coordinator Foodshift Pathways
Gabriela Perez	Fab Lab Barcelona	Coordinator Foodshift Pathways

The comments to the focus groups should be divided in Sections, such as the original guidelines. Remind: this was the warming discussion (i.e. "Section 1. General questions" in the original guidelines).

General recommendation: the reporting of the focus group discussions should be in a narrative form, providing general elements emerged from the discussion, with also reference to specific issues. Including specific sentences (verbatim) from the discussion, indicating also the participant code (e.g., P8), could help the reader to specifically refer to particular situations. For instance:

> "[…] With regard to the profiles, most of the participants had already completed the online survey, (*"I think the term sustainable food systems needs to be integrated in the educational activities in a transdisciplinary way"*, P8;)."

Questions and Answers

- Are you familiar with the term FSS? If yes, in what way? (Provide the definition (Annex 2) and start the discussion).

Isabel Nadal: I disagree with the definition shown here. Human rights are at the core of the education system. The priority is to try to feed everyone and at the same time be sustainable, more than reducing CO2 emissions, it is a social justice issue. Effective food security, nutritional well-being for all and that is constant over time.

Julia Leirado: The word sustainable encompasses many more things, not just food.

Vicente Albiñana: Global health, climate change and sustainability are social issues, everything is sustainable in some way, big brands comply with the concept of sustainability in their business model but do not take into account social justice and that is why this is an abstract concept that can be complicated in the earliest grades of study (infant and primary).

Another point is that we are accustomed to take the issue of sustainability from the scientific field, and when we put it into practice and the time comes to put a solution has to leave the academic discipline, we will have to leave the academic context and that for a center can be very difficult although it is an opportunity, there are cultural differences of each student, at the time of put structure, it is necessary to think very well the theory to be introduced.

Isabel Nadal : The line is very fine, but I think it can be taken from the youngest grades, for example in the city project "Barcelona world capital of sustainable food 2021, a literary

pedagogical suitcase was developed with 150 books on sustainable food designed for infant and primary school students. A kind of itinerant pedagogical guide that travels from school to school.

Vicente Albiñana:It is not that this concept cannot be included in the earliest grades of study, but it is complicated, it is very difficult to create a sense of urgency, we have to take into account that they have been hearing about sustainability all their lives, but with very little implementation.

Ana Amat: I agree, there is a lot of incoherence between elite schools and high complexity schools (High complexity schools are centers that due to the social composition of the students and their location in neighborhoods where the economic crisis has a strong impact need supplementary mechanisms (more resources, more professionals, more specialists)) to avoid ghettos and school segregation, For example in the elite schools they have a sustainable menjador, everything is organic, ie sustainable food has an elite point, and it is a difficult topic to convey and discuss in class, we are not prepared individually and collectively for social and food justice and it is outrageous.

- Do you think it is important to integrate the topic into the teaching process?
- Have you tried to integrate sfs into your teaching/education process?
- Are you currently working on an educational project related to sfs in your school?
- Do you know if the term could be integrated into the curriculum? In what topics and how often/duration? How/in what format would you integrate the topic into the educational process (e.g., could be extracurricular programs)?

Isabel nadal:Yes it is important, in fact, food has been in the curriculum for many years, especially with the theme of the SDGs (transversal global justice) food has gone from learning to feed yourself from nutrition, to learning social and global justice, that is to say, it has gone from teaching the food pyramid to learning food as something more social.

The handicap is that teachers have an education more focused on the balanced food pyramid than on a fairer food.

The educational project must be coherent, must mark the values and must be public. The management must be committed and must propose projects that link not only a classroom teacher, but that link the school community, in key system, the school must facilitate this look and should not depend on the classroom teacher, but must be of the center.

Vicente Albiñana: The SDGs have already touched on this issue. In the baccalaureate there are also optional subjects such as social justice and ecology. We do projects at the end of the trimester and these topics are included. In high school it is a hidden curriculum with no electives.

Ana Amat: it is a kind of hidden curriculum, for infant, primary and secondary grades and it is more structured in baccalaureate

Julia Leirado: the baccalaureate is more structured than in the earlier grades.

2. Competences

Please, provide here replies to the questions (from the original guidelines in case you actually used these in the focus group- if you used the national outcomes of the survey in the discussion, pls refer to it):

- Are you familiar with the GreenComp framework and the sustainability competences?
- Please pick the 4 competences that you consider most important in educating students about Sustainable Food Systems
- Can you think of educational activities that could help develop the 4 latter competences (Valuing the Environment; Critical thinking; Understanding society and Innovative problem solving)? Are you aware of existing projects and initiatives that could be used?

Text here *[elaborate a little further on the last question]*

Claudio Torrassa: Some of the pillars that we manage in a cooking workshop environment are food reuse and proximity products. The high school where I work is an institute that has optional subjects and one of them is the cooking workshop, where they are not only taught creativity in cooking but also to reuse food and sustainability.

Isabel Nadal: Extracurriculars cannot be ignored, it is a 360-degree education, an open school, permeable, open to the territory, colonies for example, is a good time to experiment.

Non-formal education is one of the important pillars to take into account.

Non-formal education is an educating agent, as is the family, the first educating agent and the one with the greatest responsibility.

So is the city, which is an educating city, formal education are the schools, or cultural institutions and the non-formal ones such as the colonies, the casales.

Classical pedagogues used to say that in order to learn, study needed to be motivating, functional and meaningful.

First, motivational meant that if they were obliged to be in the classroom, this stay had to be motivational. Second, functional, meaning that what they do has to serve a purpose,

Thirdly, meaningful, meaning that it makes sense and is appropriate to their cognitive development.

Julia Leirado: We have sometimes done the exercise of asking students where they learn, with the idea of knowing if they understand that learning does not only take place in the classroom. Talking about sustainability competencies, we could remove the last name and stay with just competencies, competencies for life. Critical thinking is basic, that is meaningful and functional, working with the immediate environment, trying to work on education through the impact on others, on what surrounds us, the impact on the environment, not only in the classroom, but in the environment, in the end everything is so transversal that staying only with sustainability is a mistake.

Ana Amat: non-formal education is given in a different way to students because it works through experiences, and meaningful experiences are remembered throughout life where values and ways of doing, ways of thinking enter in a less formal way than the academy.

Experimentation is everything, in primary and secondary more and more work is done with experimentation.

Experimentation is another pillar. Working with others through the real needs and problems of the students. I need to learn how to solve it, then where it becomes motivating and functional. Bringing together many disciplines from the need to solve problems.

As key competencies in terms of sustainability and being human I have pointed out

Critical thinking, in terms of attitude, perceptive, and in terms of ability to not only believe and investigate beyond, out of the idea of sheep society.

Values of social justice, which encompasses all the axes diversity, gender and cultural, human being, and the human being.

And then the competence of Creativity, to imagine solutions to new problems that we may have,

The challenges we face now are only a speculation, so we need minds capable of going further.

Vicente Albiñana: In these terms I always disagree, what I find is that I agree with this perspective but it seems to me that the practical part is always much more difficult than what the theory states. For example, in a field where I am, it means to be working 80 hours a day, precisely if you want to be linked to the context, what it is about in a center like mine is to expand the context. In the whole issue of sustainability, it is very important to base very complex concepts, such as the ecosystemic concept, this is what makes it complex to introduce certain concepts before secondary school or high school, because they are difficult to deal with, if there are ways such as art, representations of data, but one of the competences that I see as basic to dismantle resistance is to base concepts such as ecosystemic concepts and they cannot be limited to what the student feels as close, you have to make the student see the environment, even if it does not seem close to him, for example, air pollution, you have to make him see that here on the terrace 80 people die every year due to air pollution, and who says so? Well, to investigate, from the scientific point of view there is a lot of weaving and handling.

There is a very big problem around the climate emergency communication problem, we all agree that there is an emergency but we practically do nothing, and that comes from the institutions and from the day to day. For example in the elite schools that we mentioned before, people think they are very sustainable, they buy sustainable food, but on the other hand they have two cars, they have all kinds of appliances at home and that makes their impact greater.

Addressing the climate emergency from a health point of view, that gives you a platform to go in from various points and show teenagers that it is a close thing that is affecting them. One of the biggest problems is to make them see that there is a problem and that it affects them. So I do not see a critical spirit if there is not a good basis for the information, then with the knowledge we use creativity.

Competence is acquired based on the formation of concepts, for example in the ecosystemic concept, it is not only to say that everything is related, but how it is related, how it is quantified, how we can demonstrate it, and from here the critical spirit emerges.

Since we are talking about social, for example, a student who has been listening to certain beliefs all his life, and a teacher who comes to see him 3 times a week and wants to change his beliefs is not that easy.

Isabel Nadal: I agree, anything that is done, in order to be truly critical, has to be based. You cannot lower the level of knowledge. Fighting with the conception of the world. It has to be grounded before and after experimentation and then we have to put value on the knowledge acquired and foster the hope that we can make a change. That if we intervene things happen, because there are many children who have little hope for change and have a catastrophic idea of the future.

3. Pedagogical design

- Are you familiar with the Open schooling methodology and the Living Labs approach? If yes, what does it mean in your opinion in terms of educational projects on the topic of SFS?
- Do you think that you could implement such projects with your students? In which context?

  Isabel Nadal: Include social actors, families, parents... social actors who participate more passively.

  Everyone: We know the living lab as citizen science

  Isabel Nadal: I would add the merchants in the 4th pillar. Because in Barcelona they talk about contact with the field and with distributors. And on the subject of living labs, the evaluation part is missing.

  Ana amat: The living labs could involve the students in the most political and social ones, so that they realize that their opinion counts and can change things.

- We will now provide you with examples of Living Labs projects already implemented. Considering these examples, do you feel that you could implement such projects? Which ones do you find more interesting/close to your field? Which external stakeholders do you think you could involve?

  They were shown the video made by FAB LAB Barcelona, to which the teachers commented that they could use it in class.

- Now we ask you to indicate what factors you think could prevent you from implementing such projects.

  The main barrier was time and teacher training.
- In your opinion, what are the major benefits associated with this approach?

  It allows experimenting theoretical concepts and creating new hypotheses and solutions to emerging problems.

- What support (digital material) would you need from us in order to implement the example project that you saw/a living lab project on the SFS topic?

  The material has to be created with a local language and context, in order to bring the student closer to his or her closest environment.

The projects must be focused on the search for solutions to the real and daily problems of the student

4. Topics

- If you were to introduce the topic of SFS/healthy eating could you put the following topics in order of importance? From most important (1) to least important (7). You may also add suggestions.

Text here [the topic you touched upon & whether you presented a demo/video to participants & which]

- Now, we would like to get your feedback regarding a video enrichment example we are developing, as a way to expand the learning materials that will accompany your video and your pilot in general.

Students and teachers should participate in the creation of this type of tools to make them truly theirs and that they can be of use to other teachers and students.

- Do you think that such an approach provides students with additional resources, activities and tools that will enrich their learning experience by allowing them to explore concepts more broadly, apply what they learn to real situations, promote critical thinking and foster creativity?

Students and teachers should participate in the creation of this type of tools to make them truly theirs and that they can be of use to other teachers and students.

- If you have time, you might also want to co-create a living labs approach project with the participants working on two smaller groups on topics of their commonly agreed choice.

there was no time for this activity

5. Barriers/incentive factors

- *Do you experience any barriers that make it (more) difficult to integrate the topic of SFS in your work? Choose all that apply.*

	Obligations on other topics
x	Time restriction on schedule
x	Lack of knowledge
x	Lack of enthusiasm
	Lack of financial resources

☐ Difficult to measure outcomes

☐ Other, namely:

Please elaborate on your selected barriers

- **Isabel Nadal**: The handicap is that teachers have an education more focused on the balanced food pyramid than on a fairer food
- **Vicente Albiñana**:It is not that this concept cannot be included in the earliest grades of study, but it is complicated, it is very difficult to create a sense of urgency, we have to take into account that they have been hearing about sustainability all their lives, but with very little implementation.
- **Ana Amat**: I agree, there is a lot of incoherence between elite schools and high complexity schools (High complexity schools are centers that due to the social composition of the students and their location in neighborhoods where the economic crisis has a strong impact need supplementary mechanisms (more resources, more professionals, more specialists)) to avoid ghettos and school segregation, For example in the elite schools they have a sustainable menjador, everything is organic, ie sustainable food has an elite point, and it is a difficult topic to convey and discuss in class, we are not prepared individually and collectively for social and food justice and it is outrageous.

Text here on short discussion outcomes if you touched upon

Focus on enablers

- Can you think of ways/things that would take away/lighten the barriers you are experiencing? Please explain. Focus particularly on enablers that our project could address (not so much on needed changes in educational curricula, e.g., interdisciplinarity, approaches such as living labs/project-based learning, collaboration with local societal actors/experts)

Teachers believe that they need to be assigned a coherent amount of time to develop the organisation of the implementation of this type of project; currently, the organisation time given to teachers is minimal compared to the time in the classroom.

They are asked to organise several projects in a very short period of time, which makes them unfeasible.

6. Final questions and debriefing

Julia Leirado: If the educational project as a center does not want to invest in this topic, it is very difficult to have any impact, at the end you can have an anecdote, within a subject but...

Isabel Nadal: Lack of teamwork. It is necessary to have more mandatory programs and projects, that is, within the curriculum. And lack of motivation

Vicente Albiñana: Lack of time, at the end I try to put the Erasmus projects in some subjects.

Ana Amat: The teacher should have a time allotted for class time and more time for organization and creation.

The school or the department of education, decides the line of work, the department does not contemplate that with one hour of meeting a week of coordination, you can coordinate 4 departments and decide 5 projects in different sets, for 4 different courses, if for each project itself, you have 3 or 4 hours of weekly coordination.

Isabel Nadal: I agree, also with a very segmented view of education, another need is precisely the preparation of teachers.

How could we approach interdisciplinarity from this project, contact with social actors and what resources are needed to integrate a project.

Ana Amat: We teachers are a group with a very high motivational level, however if we are asked to change the way we work, it would have to be accompanied by resources, taking into account that until recently we had a book that told us what to see in class and everything started from there. In other words, this change must be made little by little, you can't expect that all of a sudden all teachers are motivated to invest a lot of time, you have to start laying seeds.

Suggestions from teachers related to the Video:

- The video should be co-created together with the teachers.
- Involve other educational institutions such as audio and video schools or food school.
- The video should be more local.
- The images (Illustrations) could be made by the students themselves, this way they internalize each action they have to illustrate or describe.
- Offload the blame from the final consumer.
- The language should be more inclusive and in Catalan.
- Criticize the lack of public criticism.
- More activities to make the problem closer to home.
- Each activity should include a section on how to learn, what to learn and how to expose the final product of the activity.
- Learning how to learn how to program feed.
- One activity could be to make composters with digital fabrication.
- Take care of the details in the activities in concepts such as the food bank, because there are limitations at the legal level. Remember that there are health issues that create walls, such as the issue of vegetable protein consumption and the incidence of anemia.
- Take care of the gender perspective.

Qualitative research for in-depth analysis for educators and fs stakeholders on Key Features of Sustainability Competence on the food system and the FSP Pedagogical Design

FOCUS GROUP COUNTRY REPORT

Country: Portugal

Authors: Inês Almas, Gisela Oliveira, Joana Vieira

Institution: Ciência Viva

1. Composition of Focus Group/General Questions

1.1 Presentation

Date	Location	Number of participants
16.06.2023	Pavilion of Knowledge – Ciência Viva, Lisbon	14

The focus group took place in the library of the Pavilion of Knowledge, in the city of Lisbon. It had a duration of 2 hours, between 2 p.m. and 4 p.m. We sent invitation emails to 14 teachers that participated in SALL project and to 3 stakeholders related to education. We divided the participants in two groups for part of the Focus Group.

Comments on:

- Where they took place
- Hours and duration
- Recruitment strategy
- How many persons were recruited
- Any particular issue to be commented in each focus group (e.g., deviations from the guidelines)

1.2. Profile of participants

Short comment about the profiles of participants.

Participants were mostly teachers of scientific areas, with more than 10 years of experience in teaching. Most of them had previously completed the online survey and were already familiar with the term “Sustainable Food System”.

Participants of Focus Group

Part.	**Profession**	**Years of experience in this area:**	**Type/level of education:** … **Age group of students:** … **Field of expertise:**	**Familiar with the term "Sustainable Food System"?**
P1	Teacher	+ 10	Grade 9, 10-16 years old, Natural Sciences	No
P2	Teacher	+ 10	High school and university, 15-18 and 18-50 years old, Sport	Yes
P3	Teacher	+ 10	Level 4 and 5 of professional education, 15-20 years old, Natural sciences and Biology	Yes
P.4	Teacher	+ 10	Middle school, 10-12 years old, Mathematics and Natural Sciences	Not sure
P5	Teacher	+ 10	High School, 15-20 years old, Physics and Chemistry	Yes
P6	Teacher	+ 10	Middle school, 10-12 years old, Mathematics and Natural Sciences	Yes
P7	Teacher	+ 10	Kindergarten	Yes
P8	Teacher	+ 10	Grade 9 to 12, 14-18 years old, Natural sciences and Biology	Yes
P9	Teacher	+ 10	Grade 1 to 4, 6-10 years old, Mathematics and robotics	Yes
P10	Senior Officer - Public Administration	+ 10	Doesn't apply	Yes
P11	Teacher	+ 10	Grades 7 to 9, 12-15 years old, Natural Sciences	Yes
P12	Executive director of a Science Centre	+ 10	Doesn't apply	Yes

P13	Teacher	+ 10	Middle school, 10-12 years old, Mathematics and Natural Sciences	Yes
P14	Teacher	+10	Professional education, Computer Sciences	Didn't say

Question in the Socio-demographic questionnaire (Annex 1 of Guidelines)

The comments to the focus groups should be divided in Sections, such as the original guidelines. Remind: this was the warming discussion (i.e. "Section 1. General questions" in the original guidelines).

General recommendation: the reporting of the focus group discussions should be in a narrative form, providing general elements emerged from the discussion, with also reference to specific issues. Including specific sentences (verbatim) from the discussion, indicating also the participant code (e.g., P8), could help the reader to specifically refer to particular situations. For instance:

> "[…] With regard to the profiles, most of the participants had already completed the online survey, (*"I think the term sustainable food systems needs to be integrated in the educational activities in a transdisciplinary way"*, P8;)."

2. Competences

Please, provide here replies to the questions (from the original guidelines in case you actually used these in the focus group- if you used the national outcomes of the survey in the discussion, pls refer to it):

- *Are you familiar with the GreenComp framework and the sustainability competences?*
- *Please pick the 4 competences that you consider most important in educating students about Sustainable Food Systems*
- *Can you think of educational activities that could help develop the 4 latter competences (Valuing the Environment; Critical thinking; Understanding society and Innovative problem solving)? Are you aware of existing projects and initiatives that could be used?*

Text here *[elaborate a little further on the last question]*

We presented the national outcomes of the survey (in Portugal the 4 competences considered most important were *Valuing the Environment; Critical thinking; Experimenting and testing; Developing creative solutions*). As the participants had previously answered the questionnaire, we didn't ask again which were the 4 competences they considered most important. Instead, we analyse their answers to the questionnaire the 4 competences they considered most important were *Valuing the environment; Critical thinking; Understanding society Innovative problem solving*.

Regarding the debate about the educational activities, participants agreed that planting a vegetable garden was a good way to address the 4 competences ("I think that planting and taking care of a vegetable garden is the most complete and urgent activity because kids are not used to put the hands on the soil and touch the animals", P3).

Another activity suggested by them was catching garbage from the floor, namely, to address the competence *Value the environment*. Participants also mentioned the importance of involving students in the topics by putting them in the centre of the question/problem and stimulate them to think about the topics instead of being just receptors of the information.

3. Pedagogical design

- *Are you familiar with the Open schooling methodology and the Living Labs approach? If yes, what does it mean in your opinion in terms of educational projects on the topic of SFS?*
- *Do you think that you could implement such projects with your students? In which context?*

Text here

Most participants were familiar with the Open schooling methodology and the Living Labs approach. Some pointed they could implement such projects in the school science club or integrated in the school subject. They consider open schooling very important, although not always easy to implement.

- *We will now provide you with examples of Living Labs projects already implemented. Considering these examples, do you feel that you could implement such projects? Which ones do you find more interesting/close to your field? Which external stakeholders do you think you could involve?*

Text here – also mention which examples/OLS you used

We showed to the participants the short video from Sweden and OLS "Food advertisement around us", which they found very interesting and possible to use with their students.

- *Now we ask you to indicate what factors you think could prevent you from implementing such projects.*

Text here – also which method you used [paper or digital tool & which]

We asked the teachers to write the factors in post-its and then put them in a general cardboard (where they also put the post-its with the benefits and the support needs).

Participants considered that if the initial video was not appealing enough it could be difficult to catch student's interest. The difficulty to involve the community and the lack of time to put the project in action were other factors considered.

- *In your opinion, what are the major benefits associated with this approach?*

Participants considered that the major benefits were the involvement of the students and of their family, the promotion of environmental literacy, health and circular economy, the civic consciousness and the promotion of food waste awareness.

- *What support (digital material) would you need from us in order to implement the example project that you saw/a living lab project on the SFS topic?*

Participants considered important to have webinars with sharing of experiences, in order to have an update on their knowledge and to share good-practices and lessons learnt from previous similar projects. They also considered important the provision of financial resources and the collaboration with local societal actors/experts such as nutritionists and food producers.

4. Topics

- *If you were to introduce the topic of SFS/healthy eating could you put the following topics in order of importance? From most important (1) to least important (7). You may also add suggestions.*

Most participants chose as most important "innovation in food systems/circular economy" and "food security" and as least important "health" and "food waste".

Text here [the topic you touched upon & whether you presented a demo/video to participants & which]

We presented the short video from Sweden to the participants in topic 3.

- *Now, we would like to get your feedback regarding a video enrichment example we are developing, as a way to expand the learning materials that will accompany your video and your pilot in general.*

Text here [mention which example you used]

- *Do you think that such an approach provides students with additional resources, activities and tools that will enrich their learning experience by allowing them to explore concepts more broadly, apply what they learn to real situations, promote critical thinking and foster creativity?*

Text here [in case you touched upon …]

- *If you have time, you might also want to co-create a living labs approach project with the participants working on two smaller groups on topics of their commonly agreed choice.*

5. Barriers/incentive factors

- *Do you experience any barriers that make it (more) difficult to integrate the topic of SFS in your work? Choose all that apply.*

- ☐ Obligations on other topics
- ☐ Time restriction on schedule
- ☐ Lack of knowledge
- ☐ Lack of enthusiasm
- ☐ Lack of financial resources
- ☐ Difficult to measure outcomes
- ☐ Other, namely:

Please elaborate on your selected barriers

- *survey outcomes regarding national barriers (Report A2.1)*

Text here on short discussion outcomes if you touched upon

In the questionnaires that the participants answered, the most referred barriers were time restriction on schedule, obligations on other topics and lack of financial resources. In the focus group discussion, they emphasized again these barriers.

Focus on enablers

- *Can you think of ways/things that would take away/lighten the barriers you are experiencing? Please explain. Focus particularly on enablers that our project could address (not so much on needed changes in educational curricula, e.g., interdisciplinarity, approaches such as living labs/project-based learning, collaboration with local societal actors/experts)*

Text here *(*Focus particularly in those (possible ideas/ways to overcome barriers – venues for integrating the topic)

We didn't discuss about this topic. However, in the questionnaire, participants considered important an interdisciplinary approach, a restructuring of the digital resources and financial resources.

6. Final questions and debriefing

Please, indicate shortly any general conclusions of the discussions taking place

The participants referred to the SFS topic as one of the emergent issues nowadays and that should be developed with the students.

The participants were very interested in the OLS approach and considered the video a good way to start a discussion on sustainable food systems with the students. Overall, they found the OLS a good support for the development of activities related to the video.