Activity 2.1; Needs Analysis

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FOODSHIFT Pathways

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Executive Summary

The Erasmus+ project FoodShift Pathways, Work Package 2 on 'State of the Art & Pedagogical Design' is meant to address – next to the expected Sustainability Competence levels of teachers – also the relevant needs analysis in support of a transition towards a more sustainable food system. Using our network of teachers, teacher trainers and relevant food actors, we have studied the position of education about Sustainable Food Systems (SFS) and the barriers that prevent further integration into the current education system.

The report starts with a review on relevant subjects related to SFS as well as the national education system in general, highlighting the position of SFS education in the current education systems of the 6 participating countries. This is followed by a questionnaire among our network of relevant stakeholders, to collect insights from the classroom on sustainable competences (SCs), viewpoints on SFS education and input on experienced barriers and possible solutions for implementation of SFS education.

From both the curriculum review and the analysis of the questionnaire, we were able to conclude that the current curricula have little mention of SFS education, yet are packed with material, leaving little time and space for the integration of other topics. Time restriction and obligation to other topics are barriers to integrate new or different topics like SFS education. Also, there is little to no focus on interdisciplinarity, which is suggested by the respondents to be one of the main issues with the current education system.

After receiving input from 71 stakeholders, two SC came out on top: **Valuing the environment** and **Critical thinking** were picked by a majority of the respondents as both best represented in their work, as well as considered most important. These two competences were identified as the Design Principles, the baseline that will be used for the Pedagogical Design. Finally, an analysis of possible solutions, that can be used as inspiration for the Pedagogical Design process was conducted.

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1 Introduction

1.1 Task

Within the Erasmus+ project Foodshift Pathways, Work Package 2 on 'State of the Art & Pedagogical Design', has mainly the goal to perform a teacher training needs analysis to better understand the type of skills and knowledge base of teachers at middle schools (age group 11 – 16) for addressing the topic of sustainable food in class or during extra-curricular sessions such as field trips and site visits. This needs analysis addresses the review of curricula of relevant subjects related to Sustainable Food Systems (SFS) as well as the national education system in general. It also provides an insight into the experiences of teachers, teacher trainers and food actors in relation to teaching about SFS, Sustainable Competences and the degree of freedom in choice of topic and methodology. Using these inputs, we are looking to identify barriers we could tackle in the next phase of Pedagogical Design.

1.1.1 Work package objectives

The results of the needs analysis will feed directly into the 'pedagogical design' addressing deeper and interdisciplinary learning as the ultimate goals of this work package. The description of WP2 specifies:

- Perform a needs analysis on the basis of a user-driven incubation process with the key stakeholders;
- Start from the premise that schools can facilitate deeper learning in environmental education (emphasis on rigorous core content and the development of competences needed for university and career);
- Introduce interdisciplinary learning and adopt an approach based on Sustainability Competences as an effective step towards creating more meaningful episodes of learning that focus heavily on skills;
- Interweave technology and critical thinking with climate change as an effective way of putting the acquired knowledge directly in use within a meaningful context;
- Guide the project's Pedagogical Design to help students imagine new ideas in the field of SFS; to shift from "what is" to "what might be".

The analyses in this report are key in the first objective mentioned above and the outcomes therefore take a central role in the follow-up of the project. The identification of gaps and barriers in the curricula and the education system in general are essential to successfully put forward a pedagogical design – an undertaking which is at the heart of the project.

1.1.2 Definition

According to the Food and Agriculture Organization of the United Nations (Nguyen & FAO, 2018), a Sustainable Food System can be defined as: "A sustainable food system (SFS) is a food system that delivers food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future

generations are not compromised". To align with the purpose of the task and our audience, we have edited the FAO's definition into: "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." This definition has been used as the base for the analysis, to ensure all participants had the same understanding on the questions.

1.2 Goal and approach

This report draws mainly on two resources, namely (1) a desktop study reviewing curricula of relevant subjects related to SFS as well as the national education system in general, and (2) a questionnaire among teachers and other educational experts in the six participating countries. The purpose of the curriculum review was to get an impression of the current position of SFS in education, which could serve as a basic guidance for the questionnaire. The underlying motivation for this approach was to make sure that the FoodShift Pathways approach builds upon the existing knowledge base, while at the same time allowing participant to specify and add other competences.

We would like to point at the intersection with Key Features of Sustainable Competences (described in the report on WP2.3) and Harmonising with European Policies (described in the report on WP 2.2), as these reports give extensive background information from literature review that has been used as the foundation of the analysis and results described in this report.

2 Curriculum Survey

2.1 Method

All partners were asked to review the national curricula of relevant subjects related to SFS as well as the education system in general and to collect their findings in a survey. In the survey, questions on the occurrence as well as the integration of some topics relevant to SFS education were given to review the curricula. The goal of the assessment was to inventory the current level of occurrence and inclusion of SFS education and the relevance in the different national school systems. While our survey offers certainly insightful information on the role of SFS in current curricula, it should be acknowledged that there has not been a rigorous method for collecting these data in place, and that the researchers carrying out this survey are of different scientific background with only two institutes (CV and EA) having a long-standing expertise in researching school education in their countries.

As part of the curricula survey on the presence of education addressing SFS, we paid special attention to a pre-selected set of relevant sustainable competences (SC) that are considered to be important when teaching about SFS in class. More about the rationale and method of identifying the SC can be found in the report on WP2.3: Key features of Sustainable Competences.

2.2 Findings

All partners have shared the survey(s) of their findings on their respective curricula with Susmetro, who then undertook the analysis. In total, 25 different curricula have been reviewed. Table 1 and 2, at the end of this paragraph, show an overview of the contents of the reviewed curricula. In the next paragraph, a short summary per country is given. The curricula, along with the input from all partners in the surveys, can be found in the annex (A1-A7).

A first attempt to compare surveys from curricula from different countries shows that there is no universal structure for the setup of a curriculum and/or competences. Because of this, the level of scale and abstraction between the surveys varied greatly. This put certain limits on comparing the surveys from different countries. While some countries' curriculum mainly focused on the development of (general) competences and skills (Netherlands, Spain, Greece), other countries had subject-specific curricula with more clearly defined topics (Denmark, Portugal, Sweden). The analysis of the occurrence and level of representation of SFS in these documents therefore also needed to be done at different levels, as some would explicitly mention relevant topics and others would merely mention skills that were used when learning in general, without mentioning any specific topics.

A first observation that stands out, are the different scales and abstraction levels of each country: some countries (e.g., Spain, Greece) have a curriculum based on the (general) secondary school system, others (e.g., Denmark, Portugal) have a curriculum that is broken down to separate subjects. As a result, the level of detail addressed in these curricula is very

different. Where the subject-based curricula offer much more specific topics (e.g., biodiversity in the Portuguese subject Natural Science), the system-based curricula do not mention topics but rather focus on methods and approaches like integration of knowledge.

It is notable that both types of curricula barely mention food in a sustainable context. When food is mentioned at all, it is mostly related to health or nutrition. In some cases, a specific course includes the preparation or cooking of food. A broader approach on the food system or food production is not mentioned. This can be explained by the approaches of the curricula: a subject-specific curriculum is too narrow to include a system-wide approach, and a general skill-based curriculum, however approaching learning in a more integrated way, does not include specific topics to include in the teaching.

As can be read in the report of WP2.2: Harmonising with European Policies, the issue on Education is largely underrepresented in most policy documents. This could be an explanation to why the inclusion in curricula is fairly scarce.

What also seems to be missing overall, is a tangible suggestion for implementation: it is unclear how policies, competences and topics are related and how these aspects are to be integrated during classes. By way of explanation, an abstract on the structure of Dutch resources can be found in the annex (A.7).

In some curricula (e.g., Sweden), there is mention of field studies and experiments as part of the compulsory program, but there are no specific requirements regarding what these field studies/experiments should include. However, it shows there is some possibility to include projects with a focus on SFS.

Another interesting observation on teaching about SFS in (secondary level) education is the general positioning towards the topic: if anything about SFS is being taught at all, it is most often done through extracurricular projects or activities; it is seldom (with the exception of some elective tracks or subjects) integrated into (compulsory) lesson plans or exam programmes.

The subject-specific curricula have at least a short reference to collaboration or integration between the subjects and the “outside world”, creating narrowly defined lesson programs with little room for exploration or field work and therefore (extracurricular) education on SFS.

As outcomes from the questionnaire (see chapter 3) show that there is a limited knowledge of teachers about SFS and also hesitance to teach about unfamiliar topics, hence expressing a need for more training or teaching materials. There is no mention on teacher training in the reviewed documents, with exception of the Greek curriculum, which is the most SFS-integrated education program of all. It is important to take note of this inclusive approach and use the Greek program as an inspiration going forward.

In order to allow profound teaching addressing key aspects of SFS, there needs to be a combination of integrated/overarching approach and topic specification. Teacher training on new topics must be included in this approach, as well as clear suggestions for implementation of the learning goals, for example with tools or learning materials.

Table 1. *Overview of contents of reviewed curricula. The check marks indicate the extent of presence in the reviewed curricula; ✓ = barely present /not concretely described; ✓✓ = present; ✓✓✓ = well represented/concretely described.*

	Denmark				Greece	Netherlands			Portugal			Spain	Sweden			
Name of curriculum	Biology	Biotechnology	Geoscience	Natural Science	Environment and Education for Sustainable	Exam programme HAVO/VWO	Exam programme VMBO	Advisory document New Curriculum	Biology	Biology & Geology	Natural Sciences	Compulsory primary and secondary basic	Biology	Geography	Home and Consumer studies	Natural Science
Issue date	2017	2017	2017	2017	2022	2022	2022	2019	2006	2018	2018	2017/19	2023	2023	2023	2023
Scale level	School	School	School	School	National	National	National	National	National	National	National	National	National	National	National	National
Curriculum on general/broader topic	-	-	-	-	yes	yes	yes	yes	-	-	-	yes	-	-	-	-
Curriculum on specific subject	yes	yes	yes	yes	-	yes	yes	-	yes	yes	yes	yes	yes	yes	yes	yes
Curriculum specified per year	-	-	-	-	yes	-	-	-	yes	yes	yes	-	yes	yes	yes	yes
Mentions skills/competences	yes	yes	yes	yes	yes	yes	yes	yes	-	-	yes	yes	yes	yes	yes	yes
Sustainable competences	✓✓	✓✓	✓✓	✓✓	✓✓✓	✓	✓	✓	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓✓	✓✓
Assessment tools	✓✓	✓✓✓	✓	✓✓✓	✓✓✓	✓	✓	✓✓	✓	✓	✓	✓✓	✓	✓	✓✓	✓
Interdisciplinarity	✓✓	✓✓	✓✓	✓✓✓	✓✓✓	✓	✓	✓✓	✓	✓	✓	✓✓	✓	✓✓	✓✓	✓✓✓
Relevant extracurricular projects	✓✓	✓✓	✓	✓	✓✓	✓	✓	✓✓	✓✓	✓	✓	✓✓✓	✓✓✓	✓	✓	✓
Relevant electives	Green School	Green School	Green School	Green School	-	-	Green Production	-	-	-	-	-	-	-	-	-
Mention of concrete learning objectives	✓	✓✓	✓✓	✓✓	✓✓✓	✓	✓	✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓✓	✓✓✓

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Table 2. *Representation of relevant topics in reviewed curricula*

	Name of curriculum	- SFS as a topic	- Topics on food	- Topics on sustainability	- Topics on health
Denmark	Biology	Biological production, Biotechnology, Sustainability, Environmental protection	Health	Biodiversity, Sustainable Development, Environmental protection	Health, Disease, Medicine
	Biotechnology	Energy flows and production, Examples of interactions between species and between species and their surrounding environment, Biodiversity	Production, Processing	Sustainable production, Energy and chemical substances, Biotechnological use of plants, Animals and microorganisms, Environmental technology, Environmental protection	-
	Geoscience	Human living conditions, Resource utilization, Impact on nature, Sustainable development	Production, Technological development, Resources	Resources, Planning, Population relations, Global division of labour	-
	Natural Science	Resource utilization, Production, Technology	-	Resource utilization, Environment, Sustainability	Health and living conditions
Greece	Environment and Education for Sustainable Development	Food, agriculture, livestock	Health, Agriculture, Livestock	Pollution, Contamination, Quality of Air	Water, food, clothing, etc. not all related to SFS
Netherlands	Exam programme HAVO/VWO	Living systems, Ecological thinking, Ecosystems and organisms, Sustainability in ecosystems	Nutrition, Food production, Food relations	Energy, Resource utilization, Biodiversity	Medical, Sports
	Exam programme VMBO		Food safety, Human influence on surroundings, Nutrition, Production and sales	Resource utilization, Sustainable production	Safety regulations, History of healthcare, Animal health, Lifestyle
	Advisory document New Curriculum	-	-	-	-
Portugal	Biology	Disease control, consequences of human activities	Increasing food production, improving nutrients preservation	Natural resources, Ways to preserve the environment	Reproduction and genetic heritage
	Biology & Geology	Systematics, Geology	-	-	-
	Natural Sciences	Impact/reduction use natural resources, Biodiversity	Nutrition, Human Body	Sustainable development	Individual and community health, Human body, Nutrition and disease prevention
Spain	Compulsory primary and secondary basic education curriculum	-	-	Respect for the environment	-
Sweden	Biology	Relationship between living conditions, health and illness	-	Nature management, Sustainable development	Well-being, Quality of life, Medicine
	Geography	Spatial patterns, Processes on local, regional and global scale	Production patterns	Sustainable development, Effect on landscape and habitats, Climate change, Natural resources	Reproductive health
	Home and Consumer studies	Effect on people's health, economy and environment of production, transport and recycling	Consumption choices, Cooking meals, Seasonality, Leftovers	-	Well-being, Finances, Shared resources
	Natural Science	Ecosystem impact, Resource distribution	Diet, Consumption, Lifestyle	Energy, Climate, Sustainable development	Exercise, Diet, Drugs

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3 Questionnaires

3.1 Method

All partners were asked to collect input from stakeholders through a questionnaire, aiming for at least 10 respondents per country. In total, 71 teachers, teacher trainers, policy writers and (relevant) food actors were polled on their level of familiarity with Sustainable Competences (as mentioned in the report on WP2.3: Key features of Sustainable Competences) and the priority of teaching about SFS. Table 3 shows an overview of the background of the respondents.

***Table 3**. Background of respondents*

	Total	Denmark	Greece	Netherlands	Portugal	Spain	Sweden
Number of respondents	71	7	12	10	17	11	14
Number of teachers 10-16 y	65	7	10	8	16	11	13
Online questionnaire		✓	✓	✓	✓	✓	✓
Live interview				✓[1]			
Languages		English	English	English	Portuguese	Spanish	Swedish

The questionnaire was made by Susmetro and provided to the partners as a digital form (in English) and an editable document. The partners were tasked to distribute the questionnaire among their network of teachers or otherwise relevant stakeholders for the project. Some of the partners (Denmark, Greece, the Netherlands) used the digital form in English to collectively gather their input, while others (Portugal, Spain, Sweden) translated the questions into a digital questionnaire in Portuguese, Spanish and Swedish, respectively, and documented their input in a separate file first before translating the answers to English and returning them to Susmetro. The setup of the questionnaire can be found in the annex (B.1), as well as the input from the respondents (B.2).

The respondents provided their experiences on the Sustainable Competences, the current curriculum and the presence and possibilities for SFS education. In addition, they were asked to indicate whether they experienced any barriers towards teaching about SFS and what could help lift these barriers.

[1] Persons interviewed also filled in the online survey; input from the interview was mainly used as confirmation of the results.

The main goal of this activity was to identify challenges and opportunities for the project framework and the Pedagogical Design and to understand the practical concerns for implementation in the context of the education system.

The input from the open-ended questions was collected into a Digital board (using the digital co-working platform Miro), where insights were grouped into overarching themes (see figure 1 below for an impression of the setup of the board). These themes were based on the input, and therefore somewhat different from the categories mentioned in the questionnaire.

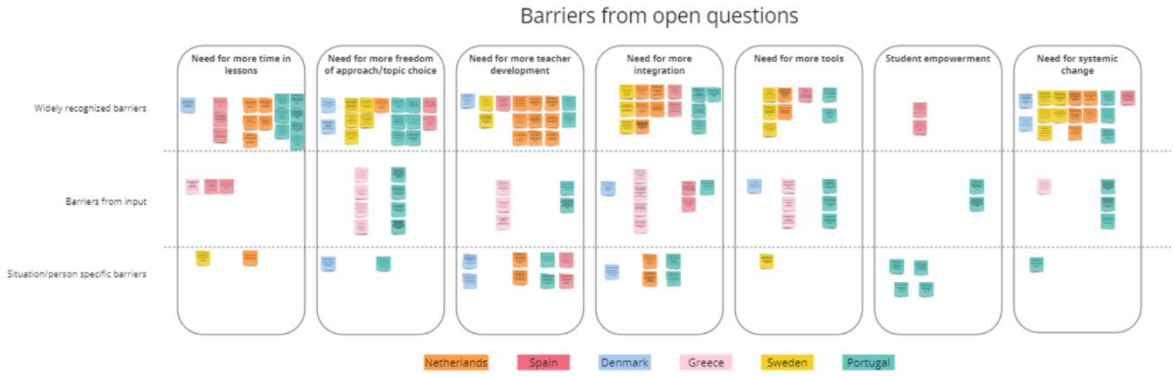

***Figure 1**. Setup of Miro board*

Also, existing initiatives that were mentioned in both the questionnaires and the curriculum surveys were added to the board, to see if solutions were already available, perhaps in other countries. A complete overview of the Miro board can be found in the annex (B.6). Lastly, a selection of possible solutions was made to fit the feasibility within either the FS Pathways project or the already existing curriculum. The inputs to the multiple-choice questions were analysed through graphs and discussed during the physical team meetup in March (M05).

While we were able to collect information on the level of knowledge on SFS and the experience about Sustainable Competences and obstructing barriers, a large part of the respondents did not elaborate on their (multiple choice) answers, leaving some room for interpretation about the underlying reasoning. As we know now, lack of time is seen as one of the biggest barriers, so therefore it is understandable why not all participants could find the time to be very elaborate in their answering.

3.2 Sustainability Competences

Key competences in sustainability are interlinked and facilitate achieving successful performance and positive outcomes towards sustainability, while working on specific challenges. The goal of the activity was harmonisation with the existing definitions of sustainability, identification of green skills and development of a SC framework.

More about the establishment of the SC can be found in the report on WP2.3: Key features of Sustainable Competences.

3.3 Findings

In the questionnaire, the respondents were introduced to the definition of Sustainable Food Systems (SFS). 79% of the respondents indicated that they were familiar with the term of SFS already, 15,5% weren't sure and 5,5% indicated that they were not familiar with SFS yet (4 people, of which one was a primary school teacher, i.e., not directly within the target group). A short explanation of the definition was provided to ensure that all respondents had the same understanding for the continuing of the questionnaire.

When asked about the level of awareness on the current curriculum of their work field and the level of freedom to bring in personalized material, a majority of the respondents (79 %) agreed they were very aware of the contents of the curriculum. Most of them (54 %) did not see difficulties integrating topics like SFS into the current curriculum, as they experienced having some freedom on the topics that were taught (62 %). However, the respondents were more divided upon whether teaching SFS would be best done through extracurricular programs (31 % agreed, 25 % neutral, 44 % disagreed). 50 % of the respondents indicated they are teaching SFS to their students already. However, most respondents (54 %) stated they did not know enough about SFS to include it in their teachings, but a large majority of respondents (86 %) agreed that knowledge about SFS should be obligatory for all students.

When asked about sustainable competences, respondents were given the set of 13 competences (including a short description) and asked to what extent these competences were represented in their work on a 5-point scale, 1 scoring “not represented at all” to 5 scoring “very well represented”. The response per country can be seen in table 4 and figure 2a and 2b below. An extensive overview including the number of respondents can be found in the annex (B.3 and B.4).

In general, most competences were represented quite well in most countries (average score 3 or higher). On average, “Critical thinking” and “Valuing the environment” are best represented in the current education system, with most countries scoring 3,5 or higher. However, the competences “Navigating politics”, “Assessing economic aspects” and “Collaborating and connecting” score under or barely a score of 2,75. It is notable that respondents from Denmark and the Netherlands score much lower on most competences compared to the average of all respondents and Portugal, Sweden and Spain score well above average for nearly all competences.

It is unclear whether these results reflect socio-cultural differences along attributes such as modesty/honesty, optimism/pessimism or objectivity/bias, or if these competences are actually less represented in the respective countries.

***Table 4**. Representation of competences. The numbers represent the percentage of respondents that selected this competence. The competences are grouped in different skillset categories, as described in report on WP2.2. The orange cells highlight all scores above 40%, while the red highlights the top 2 competences overall.*

	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
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%**
Denmark	85.7%	0.0%	0.0%	14.3%	85.7%	28.6%	14.3%	0.0%	57.1%	0.0%	14.3%	0.0%	0.0%
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%
Netherlands	70.0%	40.0%	10.0%	30.0%	50.0%	20.0%	20.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%
Portugal	82.4%	17.6%	11.8%	0.0%	52.9%	5.9%	11.8%	29.4%	35.3%	5.9%	23.5%	11.8%	23.5%
Spain	72.7%	27.3%	0.0%	0.0%	81.8%	9.1%	36.4%	0.0%	0.0%	0.0%	36.4%	27.3%	9.1%
Sweden	57.1%	21.4%	7.1%	21.4%	50.0%	42.9%	7.1%	35.7%	14.3%	0.0%	14.3%	14.3%	14.3%

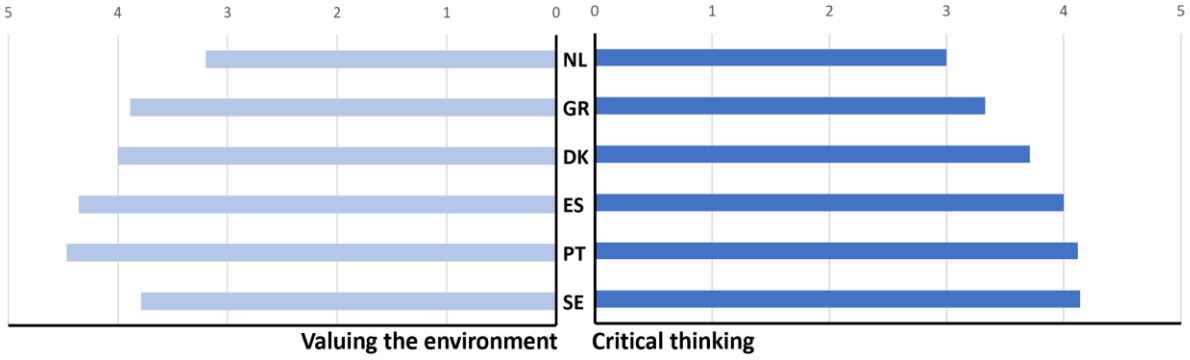

***Figure 2a**. Representation of Sustainability Competences, averages per country. Scoring results of the two highest Sustainability Competences.*

PT	Valuing the environment	4.47
ES	Valuing the environment	4.36
SE	Critical Thinking	4.14
PT	Critical Thinking	4.12
DK	Valuing the environment	4.00
ES	Critical Thinking	4.00
PT	Understanding society	4.00
PT	Interpersonal development	3.94
SE	Understanding society	3.93
GR	Valuing the environment	3.89
PT	Innovative problem solving	3.88
PT	Conceptualizing	3.82
SE	Valuing the environment	3.79
DK	Critical Thinking	3.71
ES	Understanding society	3.64
ES	Interpersonal development	3.64
ES	Collaborating and connecting	3.64
SE	Developing creative solutions	3.57
ES	Taking initiative	3.55
PT	Envisioning future scenarios	3.53
PT	Developing creative solutions	3.53
SE	Interpersonal development	3.50
ES	Innovative problem solving	3.45
GR	Developing creative solutions	3.42
PT	Experimenting and testing	3.41
GR	Critical Thinking	3.33
NL	Understanding society	3.30
SE	Taking initiative	3.29
ES	Conceptualizing	3.27
SE	Envisioning future scenarios	3.21
NL	Valuing the environment	3.20
ES	Envisioning future scenarios	3.18
PT	Taking initiative	3.18
GR	Envisioning future scenarios	3.17
DK	Innovative problem solving	3.14
DK	Envisioning future scenarios	3.14
DK	Experimenting and testing	3.14
SE	Experimenting and testing	3.14
ES	Assessing economic aspects	3.09

GR	Interpersonal development	3.08
GR	Conceptualizing	3.08
SE	Innovative problem solving	3.07
PT	Assessing economic aspects	3.06
PT	Navigating politics	3.06
ES	Developing creative solutions	3.00
NL	Critical Thinking	3.00
SE	Assessing economic aspects	3.00
PT	Collaborating and connecting	2.88
SE	Conceptualizing	2.86
GR	Experimenting and testing	2.83
GR	Collaborating and connecting	2.83
NL	Interpersonal development	2.80
NL	Innovative problem solving	2.80
SE	Collaborating and connecting	2.79
GR	Innovative problem solving	2.75
GR	Taking initiative	2.75
ES	Experimenting and testing	2.73
ES	Navigating politics	2.73
DK	Conceptualizing	2.71
NL	Envisioning future scenarios	2.70
NL	Taking initiative	2.70
SE	Navigating politics	2.64
NL	Experimenting and testing	2.60
GR	Assessing economic aspects	2.50
NL	Conceptualizing	2.50
DK	Developing creative solutions	2.43
GR	Understanding society	2.42
NL	Developing creative solutions	2.30
NL	Assessing economic aspects	2.30
DK	Interpersonal development	2.29
NL	Collaborating and connecting	2.20
DK	Understanding society	2.14
DK	Assessing economic aspects	2.14
GR	Navigating politics	2.00
DK	Collaborating and connecting	1.86
NL	Navigating politics	1.70
DK	Taking initiative	1.57
DK	Navigating politics	1.57

Figure 3b. *Representation of Sustainability Competences, averages per country. Scoring results as sequential table from high to low scores. The colours indicate different categories of competences (as explained in report 2.2)*

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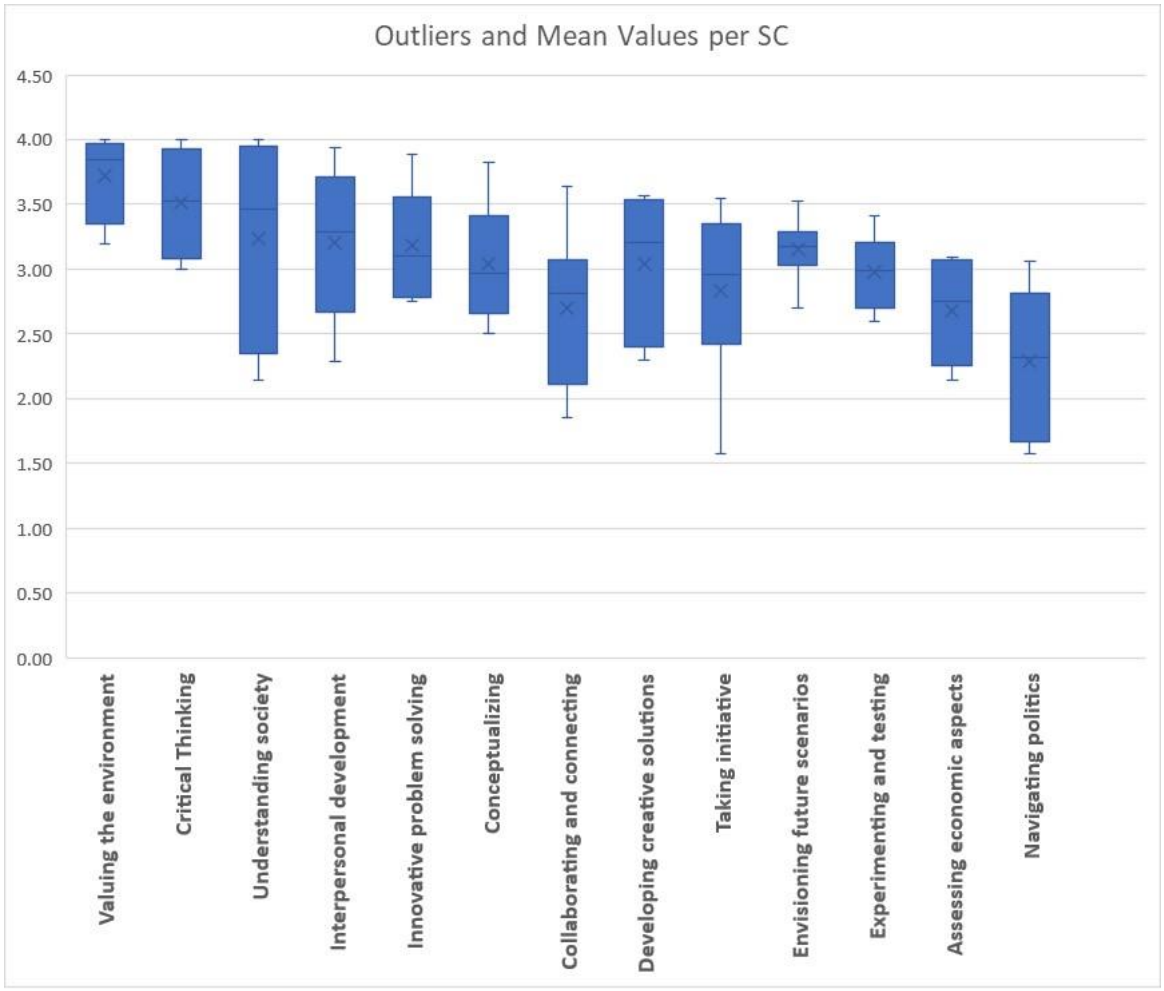


Figure 4. *Outliers and mean values per SC. Scoring is done by assessing the extent of work on* a 5-point scale: 1 = "fully disagree, 2 = somewhat disagree, 3 = undecided, 4 = somewhat agree, 5 = fully agree, plus indication for 'relevant or not relevant'.

This project has received funding from the European Union Erasmus+ programme under grant agreement No 2022-1-SE01-KA220-SCH-000089962.

3.4 Barriers

Out of 6 possible barriers, it is notable to see that 59 out of 71 respondents (83% of all respondents) selected "time restriction" as one of the barriers that make it (more) difficult to integrate SFS into the competences in their work. For all countries, this barrier was chosen most often. Following the lack of time, "Obligations to other topics" came out as another big factor that respondents experience as limiting factors (58% of respondents, and in 5 of 6 countries selected by at least 50% of respondents). Table 5 shows an overview of the responses. An extensive overview including the number of respondents can be found in the annex (B.5).

***Table 5**. 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 competences overall.*

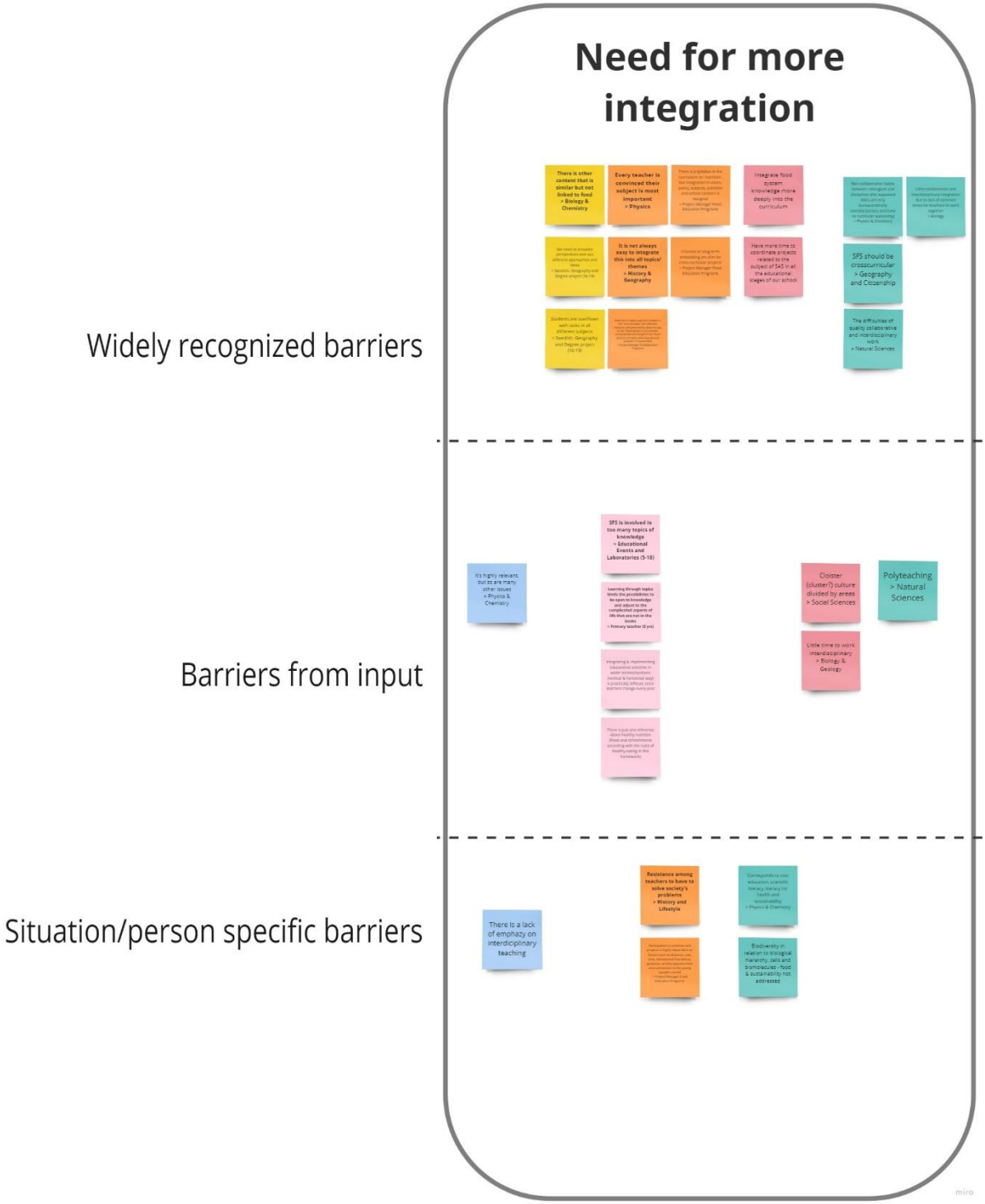
	Obligations to other topics	Time restriction	Lack of knowledge	Difficult to measure outcomes	Lack of funds	Lack of enthusiasm	Other
Percentage all	**58%**	**83%**	**37%**	**21%**	**34%**	**11%**	**7%**
Percentage Denmark	71.4%	85.7%	57.1%	14.3%	0.0%	0.0%	0.0%
Percentage Greece	58.3%	91.7%	41.7%	33.3%	50.0%	16.7%	8.3%
Percentage Netherlands	50.0%	50.0%	70.0%	20.0%	40.0%	20.0%	10.0%
Percentage Portugal	58.8%	76.5%	11.8%	23.5%	41.2%	5.9%	17.6%
Percentage Spain	72.7%	90.9%	27.3%	9.1%	18.2%	9.1%	0.0%
Percentage Sweden	35.7%	92.9%	35.7%	21.4%	35.7%	14.3%	0.0%

It turns out that a lack of time and obligations to other topics can be related to an overflowing curriculum. To quote some of the respondents:

- "There is a big battle of themes for attention"
- "Course plans and matrices must be followed, and different knowledge goals are tested, and there is not a lot of space left to squeeze in this theme"
- "The central content is already too extensive, we must prioritise"
- "The compulsory curriculum is overloaded"

Figure 4 below shows a part of the Miro board where the open answers to the questionnaire were collected. A complete version of the Miro boards can be found in the annex (B.6).

Figure 5 Barriers received from open questions in questionnaire, collected and categorized in Miro.



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The inputs were sorted collectively by the project partners into two sections in the Miro board: widely recognized barriers and barriers that are situation- or person-specific, to ensure we could treat the input as more widely recognized issues. Overall, it is notable that many respondents mention that they see a need for more interdisciplinarity and flexibility. Whether it is cross-course collaborations, project-based learning or integration of local communities and experts, it is stated that this approach would be appropriate to rightfully cover all aspects of SFS. However, most respondents express that they feel unable to take this approach, as there are many hindering factors in the current education system (e.g., a subject-based exam program/defined curriculum, separated course curricula, very little time outside of classrooms to do extra projects).

Also, the lack of flexibility was mentioned by a majority of respondents, often also linked to the full and defined curriculum programs. In other remarks, respondents also indicated that they are not confident enough with their level of knowledge about SFS to be able to integrate the topic into their teachings. Some mentioned that they felt limited because of the lack of collaboration between other teachers or other subjects.

3.5 Possible solutions

When asked about solutions that could potentially lift these barriers, some mentioned that it would help them if more teaching-tools, -materials or -methodologies or teacher trainings were available. Others suggested that ready-to-use lesson plans would help them with integrating SFS in their work. Some also mentioned that teacher training or a refreshment course would be helpful/appropriate. Figure 5 shows an impression of the input that was received from the questionnaire (a larger version can be found in the annex ((B6)). It clearly shows that participants have ideas on how to improve the current situation, especially teacher development and integration were mentioned often. Interestingly, it seems participants have trouble finding solutions to create more time in lessons, which is concerning since this is also perceived as one of the biggest barriers by a large majority of the participants.

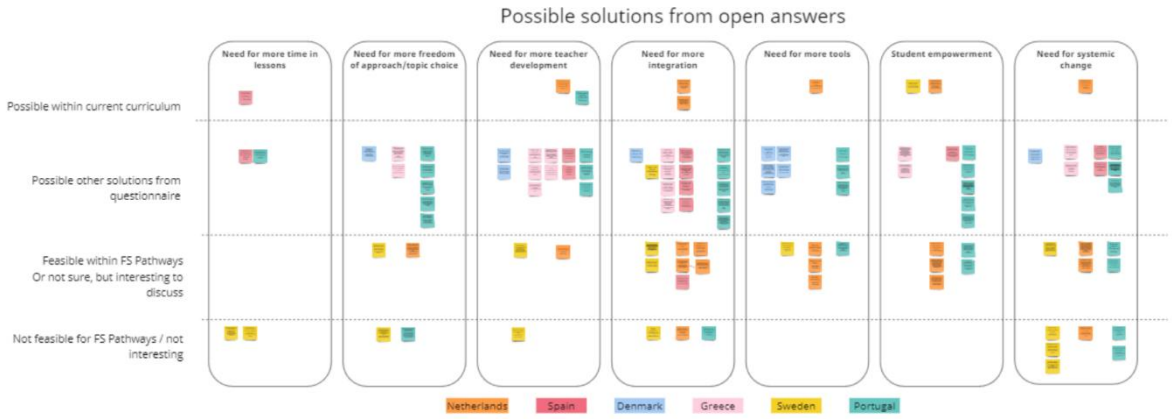

Figure 6. Possible solutions as mentioned by participants.

Also, already existing initiatives and projects were mentioned, both from the questionnaire and the curriculum reviews. It is interesting to see if these initiatives could be a possible

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solution for a barrier in another country or education system. These initiatives are bundled in the annex (B.6) and an impression is shown in figure 6 below. Especially for freedom of method or topic choice, but also around integration and tools, some interesting initiatives were mentioned. For example, project theme days with a focus on a relevant topic in society, organized by teachers of multiple disciplines on a weekly basis.

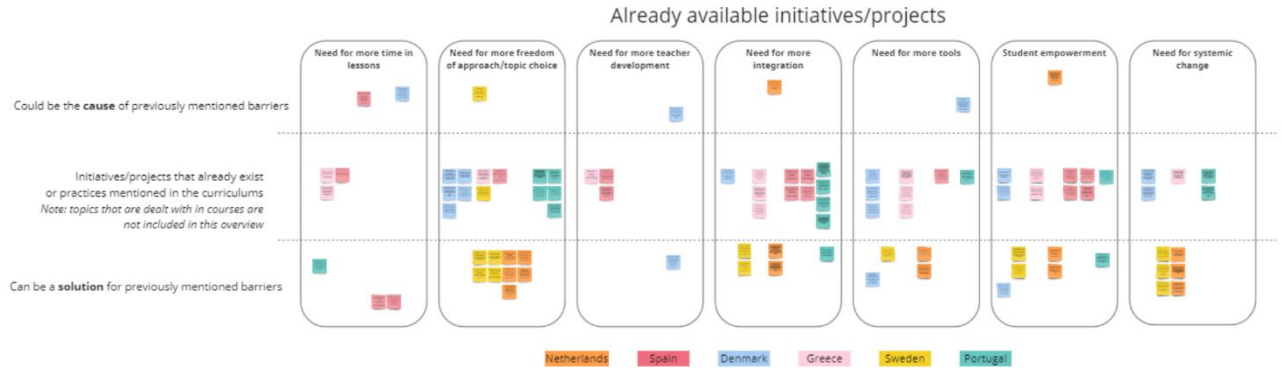


Figure 7. Already available initiatives/projects from participants and curriculum reviews.

The project partners were asked to review the inputs on the board and move the statements if they thought it would either be a possible solution to a previously mentioned barrier or a potential cause. Interestingly, the inputs that were placed as potential cause for barriers are mostly interconnected to multiple barriers, increasing the complexity.

To ensure full integration of SFS education into the education system, a system change from an overarching (curricular) level (e.g., national, regional, school wide) is needed where the importance of knowledge about SFS and interdisciplinary learning is acknowledged and emphasised. This would require a complete redesign of the education system in some cases, which is not feasible within FS Pathways. However, we can use above mentioned insights as a starting point to start finding solutions that are within the possibilities of this project.

4 Recommendations for Pedagogical Design

This section intends to translate the findings from the above needs analysis to a set of 'design principles' when addressing pedagogical challenges and opportunities when addressing the transition towards a more sustainable food system.

4.1 Design principles

Based on previously mentioned insights, the project partners have decided to take the Sustainable Competences "Valuing the environment" and "Critical thinking" as design principles for the continuing of the project. This means that during the implementation of further activities, the development of these two competences must be present, however, the inclusion of other competences is possible and highly appreciated. The report on Key features of Sustainable Competences (A2.3) gives an extensive explanation of the contents of these competences, including the intersection and relation between different food issues. The Pedagogical Design (A2.4) will use these design principles during focus group sessions, where stakeholders (teachers, teacher trainers and relevant food actors) come together to cocreate usable methods and solution. The input on possible solutions and existing projects and initiatives can be used as a starting point of the session.

4.2 Further actions

Looking ahead, there are multiple actions on the planning to further utilize the obtained insights. These actions are planned to be done during the remaining time of the project.

- Multiplier events aim to inform and inspire stakeholders (teachers, teacher trainings, relevant food actors) to take up food education into their practice. During these events, the stakeholders will be provided with useful information and practical examples, and discussions and knowledge exchange will be encouraged.
- Interactive videos (WP3) will transform the learning material about the design principles (and other competences, if any) into engaging teaching tools that can be used by teachers in the classroom.

Conclusions

The project partners conducted a curriculum review to assess the level of presence and inclusion of Sustainable Food Systems (SFS) education in national curricula. The findings showed that SFS is barely mentioned in most curricula, with limited teacher knowledge and hesitancy to teach unfamiliar topics. To integrate SFS into teaching, an integrated/overarching approach and topic specification are required. Furthermore, there is a lack of tangible suggestions for implementation and underrepresentation of education in policy documents.

The questionnaire, which polled 71 teachers, teacher trainers, policy writers, and relevant food actors for the six countries, aimed to identify challenges and opportunities for the project framework and the Pedagogical Design, and to understand practical concerns for implementation in the education system. Respondents were generally aware of the curriculum but experienced little freedom or possibility in integrating SFS into their teaching. In addition, most respondents stated that they did not know enough about SFS to include it in their teachings, and there was division on whether SFS should be taught through extracurricular programs. Nevertheless, a large majority agreed that knowledge about SFS should be obligatory for all students.

The competences "Critical thinking" and "Valuing the environment" were best represented in the current education system, while "Navigating politics," "Assessing economic aspects," and "Collaborating and connecting" were least represented. Respondents from Denmark and the Netherlands scored lower on most competences, while Portugal, Sweden, and Spain scored well above average for nearly all competences.

In the questionnaire, the majority of respondents (83%) identified time restrictions as the most significant barrier to integrating Sustainable Food Systems (SFS) into their work. Obligations to other topics (58%) were also identified as a limiting factor. The lack of time and obligations to other topics were related to an overloaded curriculum, as confirmed by some respondents. Many respondents called for more interdisciplinary and flexible approaches to teaching SFS, including cross-course collaborations, project-based learning, and the integration of local communities and experts. The lack of confidence in knowledge and limited collaboration between teachers or subjects were also identified as potential barriers. Possible solutions mentioned included more teaching tools, materials, methodologies, and teacher training, as well as ready-to-use lesson plans. The importance of existing initiatives and projects was also highlighted. Overall, the results suggest that a more interdisciplinary and flexible approach to teaching SFS, combined with teacher training and the availability of teaching resources, could help to overcome the identified barriers.

The project partners identified "Valuing the environment" and "Critical thinking" as key design principles to be implemented in further activities. The Pedagogical Design will use these design principles during focus group sessions to co-create usable methods and

solutions. The project also plans to organize multiplier events and create interactive videos to disseminate information and practical examples to stakeholders. These recommendations provide a valuable framework for addressing the complex challenges of transitioning towards a sustainable food system.

Key takeaways

- Sustainable Food Systems (SFS) education is barely mentioned in most national curricula.
- There is a lack of teacher knowledge and hesitancy to teach unfamiliar topics related to SFS.
- An integrated/overarching approach and topic specification are required to integrate SFS into teaching.
- There is a lack of tangible suggestions for implementation and underrepresentation of education in policy documents.
- The questionnaire showed limited freedom or possibility in integrating SFS into their teaching due to time restrictions, obligations to other topics, and an overloaded curriculum to be the main barriers.
- Interdisciplinary and flexible approaches, cross-course collaborations, project-based learning, and the integration of local communities and experts can help overcome the identified barriers to integrating SFS.
- "Valuing the environment" and "Critical thinking" were identified as key design principles to be implemented in further activities.
- Teacher training, teaching resources, and ready-to-use lesson plans can help overcome the lack of confidence in knowledge and limited collaboration between teachers or subjects.

Existing initiatives and projects are important in the development of solutions for teaching SFS.

References

Nguyen, H. N. & FAO. (2018). Sustainable food systems: Concept and framework. Https://Www.Fao.Org/3/Ca2079en/CA2079EN.Pdf. https://CA2079EN/1/10.18

Annex A: Curriculum survey

A.1 Curricula surveys from Denmark

Meedom Kommunikation

WP2 Curriculum Survey

please fill out one template per identified area

(I) Curricula identification

1. Which curricula did you find? Please give an overview specifying the following:
   Name: EQF4 – Biology: General Programmes, Three Years (ISCED 344)
   a. Level: ◯ national ◯ regional ◯ city/school level
   b. Learning system/education level (Please see attached schematic view of the school systems for your country)
      i. Please use attached chart to indicate the institutional setting of the curriculum.
      ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
   c. Please share the curricula with us (web page/link/attachment)

Please comment on your choice:

C
The following link is to the general overview of all the courses in the General Programme:

https://www.uvm.dk/gymnasiale-uddannelser/fag-og-laereplaner/laereplaner-2017/stx-laereplaner-2017

Attached is a specific pdf covering the curricula of biology.

(II) Coverage of target competence

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document):

a. Food
b. Nutrition
c. Agri(culture)
d. Health
e. Related (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

General Programmes, three years / Gymnasium (Stx)

Biology

The general educational purpose of biology A is gaining knowledge and insight into the importance of biology and the importance of biodiversity, **sustainable development and environmental protection**. The students gain insight into the human being as a biological organism and factors that are important for **health**. In addition, students gain the professional background to deal with local and

global issues within **health**, biotechnology, **sustainability**, and the environment, and to contribute **innovatively and responsibly to society's development.**
Supplementary material:
The students also need to investigate subjects like **health**, disease and medicine; **biological production**; biotechnology; **sustainability** and environmental protection.

(III) Profile/relevance of target competence
In what way is sustainability & food addressed in the curricula? Pick from the options below and elaborate briefly:

a. **Fragmented/separate/isolated**
b. **Repeatedly but incoherent**
c. **Addressed in whole paragraphs**
d. **Integrated in wider context/sections**
e. **Key competence throughout curriculum**

Please elaborate on your answer:

In <u>biology</u> **sustainability** is addressed on level C / D. One can argue that sustainability is a key competence in this course. Food (level A) is only mentioned specifically in the supplemental material and is therefore not part of the core substance.

(IV) Explicit learning objectives
Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)?

Food systems are not mentioned specifically in the core substance of the curricula.

(V) Extra-curricular dimension
Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)?

There is not any extracurricular focus on Food & Sustainability specifically.

(VI) Practical examples
If you came across practical examples/insights that are illustrating the situation, please describe them here:

No practical examples.

(VII) Additional comments
Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

Altinget, 25th of November 2021 (article about the necessity of having sustainability written into all curricula)

"Therefore, in upper secondary school, we must have interdisciplinary projects with sustainability as a hallmark, and sustainability must be written into all curricula - and thus included in relevant contexts in all subjects. We must collaborate with the local community on our educations, and we must expand our horizons for the education's sustainable potential."

https://www.altinget.dk/verdensmaal/artikel/gymnasieelever-bekendtgoerelsen-skal-skrives-ind-i-alle-laereplaner

Altinget is the leading political news site in Denmark.

Green School, Fall 2022
Free workshop: "Grow Like Tomorrow"
"We give students at 16 youth programs a free workshop with the most inspiring role models in Denmark within green entrepreneurship.

For the workshop, a concept has been developed, and we start with the book "Grow Like Tomorrow - The way to the future's sustainable food systems" by TagTomat.

The students get an inspiring presentation by three committed green entrepreneurs who, as role models, pass on experiences in, for example, mushroom cultivation in food waste, vertical farming, insect farms and urban agriculture. Role models have got "the good idea" on the basis of deep scientific knowledge within their respective fields.

The goal of the workshop is to strengthen the development of the subjects and the students' courage in green entrepreneurship within food, circular energy flows and green products.

https://groenskole.dk/grow
"Grøn Skole / Green School" is the Outdoor Council's program for education in sustainable development with nature, the environment and outdoor life as central focal points.

Bilag 85

Biologi A – stx, august 2017

1. Identitet og formål

1.1. Identitet

Biologi er læren om det levende og om samspillet mellem det levende og det omgivende miljø. Biologi beskæftiger sig med de egenskaber, sammenhænge og processer, der karakteriserer biologiske systemer på alle niveauer, det molekylære niveau, celle, individ, population og økosystem. Biologisk viden anvendes inden for en række områder som bioteknologisk produktion, sundhedsvidenskab og miljøbeskyttelse.

Biologi er et naturvidenskabeligt fag med vægt på eksperimentelle arbejdsmetoder, såvel i laboratoriet som i naturen. I det almene gymnasium tager faget udgangspunkt i videnskabsfaget, og det er præget af udviklingen inden for moderne biologisk forskning og bioteknologi.

1.2. Formål

Biologi bidrager til uddannelsens almendannende og studieforberedende formål, ved at eleverne opnår viden og kundskaber indenfor biologi, forberedes til videreuddannelse og udvikler ansvarlighed for sig selv, for natur og samfundsudvikling.

Biologiundervisningens almendannende formål tilgodeses, ved at eleverne får viden og indsigt i biologiens betydning for verdensbilleder og får faglig baggrund for at forstå betydningen af biodiversitet, bæredygtig udvikling og miljøbeskyttelse. Eleverne får indsigt i mennesket som biologisk organisme og faktorer med betydning for sundhed. Desuden opnår eleverne faglig baggrund for at forholde sig til lokale og globale problemstillinger inden for sundhed, bioteknologi, bæredygtighed og miljø, og for selv at bidrage innovativt og ansvarligt til samfundets udvikling.

Det studieforberedende formål i biologi A opnås i særlig grad gennem faglig viden, indsigt og fordybelse i biologiens områder, faglig argumentation, faglig kommunikation, metoder og arbejdsformer. Eleverne opnår omfattende viden, kundskaber og kompetencer, som kan danne grundlag for videre uddannelse især inden for naturvidenskabelige og sundhedsvidenskabelige fagområder. Eleverne får indsigt i, hvordan biologi anvendes i det omgivende samfund og i de videre uddannelses- og karrieremuligheder, som faget peger frem imod.

2. Faglige mål og fagligt indhold

2.1. Faglige mål

Eleverne skal kunne:

- anvende fagbegreber, fagsprog, relevante repræsentationer og modeller til beskrivelse og forklaring af iagttagelser og til analyse af biologiske problemstillinger
- tilrettelægge og udføre eksperimenter og undersøgelser i laboratoriet og i felten under hensyntagen til sikkerhed og til risikomomenter ved arbejde med biologisk materiale
- bearbejde data fra kvalitative og kvantitative eksperimenter og undersøgelser og dokumentere eksperimentelt arbejde hensigtsmæssigt
- anvende relevante matematiske repræsentationer, modeller og metoder til beregning, beskrivelse, analyse og vurdering
- analysere og diskutere data fra eksperimenter og undersøgelser med inddragelse af faglig viden, fejlkilder, usikkerhed og biologisk variation
- anvende relevante digitale værktøjer, herunder matematiske, i en konkret faglig sammenhæng
- indsamle, vurdere og anvende faglige tekster og informationer fra forskellige kilder
- formulere sig struktureret såvel mundtligt som skriftligt om biologiske emner og give sammenhængende faglige forklaringer
- demonstrere forståelse af sammenhænge mellem fagets forskellige delområder
- demonstrere viden om fagets identitet og metoder
- anvende fagets viden og metoder til vurdering og perspektivering i forbindelse med samfundsmæssige, teknologiske, miljømæssige og etiske problemstillinger med biologisk indhold og til at udvikle og vurdere løsninger
- behandle problemstillinger i samspil med andre fag.

2.2. Kernestof

Gennem kernestoffet skal eleverne opnå faglig fordybelse, viden og kundskaber.

Kernestoffet bygger overordnet på sammenhæng mellem biologisk information, struktur og funktion på alle organisationsniveauer og på levende organismers vækst og dynamiske opretholdelse af ligevægt. Kernestoffet er:

- cellebiologi: opbygning af pro- og eucaryote celler, eucaryote celletyper og membranprocesser
- mikrobiologi: vækst og vækstfaktorer, infektionsbiologi og resistens
- virus: opbygning og formering
- makromolekyler: opbygning og biologisk funktion af carbohydrater, lipider og nucleinsyrer og proteiners struktur, specifikke egenskaber og funktioner
- enzymer: opbygning, funktion, enzymatiske hovedklasser og faktorer, der påvirker enzymaktiviteten
- biokemiske processer: fotosyntesens overordnede delprocesser, respiration og gæring, herunder carbohydraternes intermediære stofskifte
- genetik og molekylærbiologi: nedarvningsprincipper, genregulering, replikation, proteinsyntese, mutation, mitose, meiose genteknologi og bioinformatik
- evolutionsbiologi: biologisk variation, naturlig selektion og artsdannelse
- fysiologi: oversigt over kroppens organsystemer, åndedrætssystem, blodkredsløb, muskler, arbejdsfysiologi, immunsystem, nervesystem, hormonel regulering og forplantning
- populationsbiologi: vækstmodeller, populationsgenetik og Hardy-Weinberg-loven
- økologi: samspil mellem arter og mellem arter og deres omgivende miljø, energistrømme, C-, N- og P-kredsløb, økotoksikologi og biodiversitet
- eksperimentelle metoder: celledyrkning, transformation, PCR, elektroforese, DNA-sekventering, ELISA, spektrofotometri, arbejdsfysiologiske målemetoder, bestemmelse af populationsstørrelse og af netto- og bruttoproduktion.

2.3. Supplerende stof

Eleverne vil ikke kunne opfylde de faglige mål alene ved hjælp af kernestoffet. Kernestoffet og det supplerende stof udgør tilsammen en helhed. Det supplerende stof uddyber og perspektiverer kernestoffet, men kan også omfatte nye emneområder. Det supplerende stof skal sammen med kernestoffet uddybe problemstillinger og emner, hvor biologi spiller en væsentlig rolle, og vælges, så følgende områder omfattes:

- sundhed, sygdom og medicin
- biologisk produktion
- bioteknologi
- bæredygtighed
- miljøbeskyttelse
- biologiske databaser og big data
- bioetik
- biologi som videnskabsfag.

Der skal indgå aktuelle eksempler med relation til elevernes hverdag, den aktuelle debat og med lokale og globale perspektiver. Dele af det supplerende stof vælges i samarbejde med eleverne. Der skal indgå materiale på engelsk samt, når det er muligt, på andre fremmedsprog.

2.4. Omfang

Forventet omfang af fagligt stof er normalt svarende til 450-600 sider.

3. Tilrettelæggelse

3.1. Didaktiske principper

Undervisningen skal tage udgangspunkt i et fagligt niveau svarende til elevernes biologifaglige viden og kompetencer fra grundskolen.

Undervisningen er tematisk og tager udgangspunkt i problemstillinger med biologisk indhold og aktuel, samfundsmæssig eller videnskabelig relevans. Temaerne vælges, så de tilsammen dækker kernestof og supplerende stof, og så der er en klar progression i arbejdet med faglige mål og selvstændighed. Temaerne suppleres med systematiske opsamlinger med henblik på elevens faglige overblik.

Det teoretiske og eksperimentelle arbejde skal støtte hinanden og integreres, således at eleverne opøves i at kombinere iagttagelser og faglige forklaringer, og inspireres til selv at kunne foreslå relevante undersøgelsesmetoder og problemløsninger. Der lægges vægt på varierende undervisningsformer, på elevens aktive rolle gennem dialog, undersøgelse, dokumentation og formidling og på at styrke elevernes mundtlige og skriftlige formidlingsevne.

3.2. Arbejdsformer

Undervisningen tilrettelægges med:

- individuelle og kollaborative arbejdsformer

- faglig læsning, artikellæsning og kritisk informationssøgning
- mundtlig formidling med vægt på struktur, faglige forklaringer, argumentation og fagsprog
- arbejde med udvikling af løsninger
- udadrettede aktiviteter eller samarbejde med eksterne partnere, som eksemplificerer fagets anvendelser og karrieremuligheder.

Eksperimentelt arbejde

Elevernes eget eksperimentelle arbejde skal udgøre ca. 20 pct. af fagets undervisningstid. Eksperimentelt arbejde:

- står centralt i undervisningen
- vælges bredt og varieret, omfatter både laboratoriearbejde og feltundersøgelser og både kvalitativt og kvantitativt eksperimentelt arbejde
- omfatter både eksperimenter med fokus på fagets problemstillinger og anvendelse af fagets metoder til undersøgelse af problemstillinger med afsæt udenfor faget
- tilrettelægges med både lærerstyret og mere selvstændigt tilrettelagt eksperimentelt arbejde.

Det eksperimentelle arbejde kan suppleres med andet empiribaseret arbejde, hvor eleverne f.eks. indhenter data fra databaser, og andre aktiviteter af eksperimentel karakter, f.eks. virtuelle eksperimenter. Dette indgår dog ikke i de 20 pct. afsat til elevernes eget eksperimentelle arbejde.

Skriftligt arbejde

Skriftlighed i biologi A omfatter arbejde med fagets forskellige skriftlige genrer med sigte på læreproces og faglig formidling. Det skriftlige arbejde omfatter blandt andet følgende:

- journaler og rapporter over eksperimentelt arbejde
- forskellige opgavetyper, blandt andet med henblik på træning af faglige elementer og samspil med andre fag
- besvarelse af opgaver, der tydeliggør kravene ved den skriftlige prøve
- andre produkter, f.eks. præsentationer, posters og video.

Det skriftlige arbejde i biologi A skal give eleverne mulighed for at fordybe sig i biologiske problemstillinger og styrke tilegnelsen af fagets viden, tankegang, arbejdsmetoder og kommunikationsformer.

Det skriftlige arbejde tilrettelægges, så der er progression i fagets skriftlighed og sammenhæng til skriftligt arbejde i andre fag som bidrag til udviklingen af den enkelte elevs skriftlige kompetencer.

3.3. It

Digitale værktøjer indgår som en integreret del af undervisningen, bl.a. til formidling, kommunikation, dataopsamling, databehandling, modellering, visualisering, simulering, bioinformatik og informationssøgning. Digitale værktøjer inddrages desuden til træning til de skriftlige prøver og til kollaborative skriveprocesser.

3.4. Samspil med andre fag

Dele af kernestof og det supplerende stof vælges og behandles, så det bidrager til styrkelse af det faglige samspil mellem fagene i studieretningen. I tilrettelæggelsen af undervisningen inddrages desuden elevernes viden og kompetencer fra andre fag, som de hver især har, så de bidrager til perspektivering af emnerne og belysning af fagets almendannende sider. Biologi A kan desuden indgå i de flerfaglige forløb, der forbereder eleverne til arbejdet med studieretningsprojektet.

Når biologi A er studieretningsfag, skal der efter grundforløbet tilrettelægges forløb sammen med andre fag, som uddyber, anvender eller perspektiverer biologi. Der skal indgå et forløb, som omfatter et samarbejde med det andet studieretningsfag.

4. Evaluering

4.1. Løbende evaluering

Elevernes udbytte af undervisningen skal evalueres jævnligt, bl.a. på baggrund af elevens skriftlige arbejde, så der er grundlag for en fremadrettet vejledning af den enkelte elev i arbejdet med at nå de faglige mål og opnå viden og kundskaber samt for justering af undervisningen.

4.2. Prøveformer

Der afholdes en centralt stillet skriftlig prøve og en mundtlig prøve.

Den skriftlige prøve

Skriftlig prøve på grundlag af et centralt stillet opgavesæt, som består af opgaver stillet indenfor kernestoffet i pkt. 2.2. og problemstillinger i tilknytning hertil.

Prøvens varighed er fem timer.

Den mundtlige prøve

Der afholdes en mundtlig prøve på grundlag af en opgave udarbejdet af eksaminator. Opgaven tager udgangspunkt i en problemstilling, som har sammenhæng med et eller flere af undervisningens temaer og inddrager eksperimentelt arbejde eller andet empiribaseret arbejde fra undervisningen. Opgaven indeholder en overskrift og en kort præciserende tekst samt bilag i form af en artikel eller en case, som ikke er behandlet i undervisningen, og supplerende materiale i form af figurer, forsøgsdata og lignende. Bilagsmaterialet skal kunne danne basis for faglig uddybning og perspektivering ved inddragelse af faglige metoder, kernestof og supplerende stof. Bilagsmaterialet skal have et omfang, så hele materialet kan forventes inddraget under eksaminationen.

Opgaverne, der indgår som grundlag for prøven, skal tilsammen i al væsentlighed dække de faglige mål, kernestof og supplerende stof. Hver opgave må bruges højst to gange på samme hold. Bilag må genbruges i forskellige opgaver efter eksaminators valg. Opgaverne uden bilagsmateriale skal være kendte af eksaminanderne inden prøven.

Eksaminationstiden er ca. 30 minutter. Der gives ca. 24 timers forberedelsestid, dog ikke mindre end 24 timer. Bilagsmaterialet knyttet til den udtrukne opgave udleveres ved forberedelsens start. Eksaminationen indledes med eksaminandens fremlæggelse med udgangspunkt i bilagsmaterialet, som varer op til ti minutter. Eksaminationen former sig herefter som en samtale mellem eksaminand og eksaminator, som inddrager øvrige relevante dele af kernestof og supplerende stof.

4.3. Bedømmelseskriterier

Bedømmelsen er en vurdering af, i hvilken grad eksaminandens præstation opfylder de faglige mål, som de er angivet i pkt. 2.1.

Ved skriftlig prøve

Ved den skriftlige prøve lægges vægt på eksaminandens evne til at:

- anvende fagbegreber og fagsprog og relevante repræsentationer og modeller til beskrivelse, forklaring og analyse
- formulere sig struktureret om biologiske emner, inddrage relevant faglig viden og give sammenhængende faglige forklaringer
- vurdere eksperimentelt arbejde og dets tilrettelæggelse
- bearbejde, præsentere og vurdere data fra kvalitative og kvantitative eksperimenter og undersøgelser med anvendelse af relevante modeller, beregninger, metoder og repræsentationer
- analysere og diskutere data og eksperimentelle resultater under inddragelse af relevant faglig viden
- benytte relevante fagspecifikke digitale værktøjer hensigtsmæssigt.

Der gives én karakter ud fra en helhedsvurdering af eksaminandens præstation.

Ved mundtlig prøve

Ved den mundtlige prøve lægges der vægt på eksaminandens evne til at:

- anvende relevant faglig viden, fagbegreber og fagsprog til beskrivelse, forklaring og analyse af bilagsmaterialets problemstilling
- uddybe og vurdere eksperimentelt arbejde og dets tilrettelæggelse
- analysere og diskutere data og eksperimentelle resultater under inddragelse af relevant faglig viden
- give sammenhængende faglige forklaringer og argumentationer og indgå i en faglig dialog
- demonstrere forståelse af sammenhænge mellem fagets forskellige delområder
- perspektivere til samfundsmæssige, teknologiske, miljømæssige eller etiske problemstillinger.

Der gives én karakter ud fra en helhedsvurdering af eksaminandens mundtlige præstation.

Ved prøve, hvor faget indgår i fagligt samspil

Ved prøve, hvor faget indgår i fagligt samspil med andre fag, lægges der vægt på eksaminandens evne til at:

- behandle problemstillinger i samspil med andre fag
- demonstrere viden om fagets identitet og metoder.

4.4. Selvstuderende

Selvstuderende skal aflægge skriftlig og mundtlig prøve. En selvstuderende skal have gennemført laboratoriekursus i biologi A (Bek. om de gymnasiale uddannelser § 49) med attestation fra den institution, der afholdt kurset, for at kunne indstilles til prøve. Hvis den selvstuderende kan dokumentere gennemførelse af eksperimentelt arbejde i et omfang svarende til niveauets eksperimentelle arbejde fra tidligere biologiundervisning, f.eks. i form af rapporter eller journaler, kan den selvstuderende indstilles til prøve uden at gennemføre laboratoriekursus. Det tidligere gennemførte eksperimentelle arbejde indgår på samme måde som grundlag for prøven, som eksperimentelt arbejde i en almindelig undervisningssammenhæng. Lederen af den skole, hvor prøven finder sted, beslutter, om tidligere eksperimentelt arbejde kan udgøre et tilstrækkeligt grundlag for den selvstuderendes prøve.

Meedom Kommunikation

WP2 Curriculum Survey

please fill out one template per identified case

General comments:
Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

1. Which curricula did you find? Please give an overview specifying the following:
   Name: EQF4 – Biotechnology: General Programmes, Three Years (ISCED 344)
   a. Level: ◯ **national** ◯ regional ◯ city/school level
   b. Learning system/education level (Please see attached schematic view of the school systems for your country)
      i. Please use attached chart to indicate the institutional setting of the curriculum.
      ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
   c. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:

C:
The following link is to the general overview of all the courses in the General Programme:

https://www.uvm.dk/gymnasiale-uddannelser/fag-og-laereplaner/laereplaner-2017/stx-laereplaner-2017

Attached is a specific pdf covering the curricula of biotechnology.

(II) Coverage of target topics
Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

a. **Food**
b. **Nutrition**
c. **Agri(culture)**
d. **Health**
e. **Related** (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

General Programmes, three years / Gymnasium (Stx)

Biotechnology

Biotechnology has its roots in the application of chemical and biological research to improve **traditional production and processing of foods based on plants, animals and microorganisms**. Biotechnology can contribute with **sustainable and innovative solutions to societal challenges**, but also raises **ethical questions** and challenges the understanding of ourselves and other living organisms.

The core substance is a.o.:

Basic ecological concepts: energy flows and production, examples of interactions between species and between species and their surrounding environment, biodiversity

Supplementary material:

The students also need to investigate subjects like **sustainable production of food**, energy and chemical substances; biotechnological use of plants, animals and microorganisms; environmental technology and **environmental protection**.

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

a. **Fragmented/separate/isolated**
b. **Repeatedly but incoherent**
c. **Addressed in separate learning objectives**
d. **Integrated in wider context/sections**
e. **Key competence throughout curriculum**

Please elaborate on your answer: ...

In biotechnology **food processing** is a key competence in both the core substance and in the supplementary material and is therefore on level E.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)?

Biotechnology:

Biotechnology has its roots in the application of chemical and biological research to improve traditional production and processing of foods based on plants, animals and microorganisms. Biotechnology has also become applicable in health sciences, disease treatment and medicine due to the emergence of microbiology and chemical research.

The teaching is organized with:

- student-activating, individual and collaborative working methods,

- oral communication with an emphasis on structure, professional argumentation and professional language,
- professional reading, article reading and critical information search,
- use of relevant digital tools.

Digital tools form an integral part of the teaching for dissemination, communication, data collection, data processing, modelling, visualization, simulation, bioinformatics and information retrieval. The teaching includes relevant digital tools for training for the written tests, carrying out the experimental work and for collaborative writing processes.

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements.

N/A

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

N/A

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

See Survey for biology

Bilag 88

Bioteknologi A – stx, august 2017

1. Identitet og formål

1.1 Identitet

Bioteknologi er teknologisk udnyttelse af biologiske systemer. Bioteknologien har rødder i anvendelse af kemisk og biologisk forskning til forbedring af traditionel produktion og forarbejdning af fødevarer baseret på planter, dyr og mikroorganismer. Bioteknologien har ligeledes baggrund i de muligheder, mikrobiologiens fremkomst og den kemiske forskning åbnede indenfor sundhedsvidenskab, sygdomsbehandling og medicin.

Moderne bioteknologi integrerer en række natur-, sundhedsvidenskabelige og tekniske forskningsområder. Molekylærbiologi, biokemi, kemi og systembiologi spiller en stadig vigtigere rolle inden for udvikling af medicin, forædling af afgrøder, miljøbeskyttelse og bæredygtig kemisk produktion og energiproduktion. Bioteknologi kan bidrage med bæredygtige og innovative løsninger på samfundsmæssige udfordringer, men rejser også etiske spørgsmål og udfordrer forståelsen af os selv og andre levende organismer.

Faget bioteknologi integrerer og anvender biologisk og kemisk viden, metoder og teknikker og omfatter fagdiscipliner som biologi, kemi, biokemi, molekylærbiologi og bioteknologi. Der arbejdes teoretisk og praktisk med bioteknologi i relation til både lokale og globale forhold.

1.2. Formål

Bioteknologi A bidrager til uddannelsens almendannende og studieforberedende formål ved, at eleverne opnår viden og kundskaber indenfor biologi, kemi, biokemi, molekylærbiologi og bioteknologi. Faget giver grundlag for at forstå og vurdere bioteknologiens betydning for den teknologiske udvikling, det enkelte menneske og for lokale og globale problemstillinger. Faget giver eleverne forudsætninger for kritisk stillingtagen til anvendelse og udvikling af bioteknologi.

Elevernes studiekompetencer udvikles gennem faglig fordybelse og arbejde med faglig teori, eksperimentelt arbejde, faglig argumentation og varierede arbejdsformer. Eleverne opnår viden, kundskaber og kompetencer, som kan danne grundlag for videre uddannelse især inden for naturvidenskabelige, sundhedsvidenskabelige og tekniske uddannelser, og de får indsigt i karrieremuligheder, som faget peger frem imod.

2. Faglige mål og fagligt indhold

2.1. Faglige mål

Eleverne skal kunne:

- anvende fagbegreber, fagsprog, relevante repræsentationer og modeller til beskrivelse og forklaring af iagttagelser og til analyse af bioteknologiske problemstillinger
- tilrettelægge og udføre eksperimenter og undersøgelser under hensyntagen til laboratoriesikkerhed og til risikomomenter ved arbejde med biologisk materiale
- bearbejde data fra kvalitative og kvantitative eksperimenter og undersøgelser og dokumentere eksperimentelt arbejde hensigtsmæssigt
- analysere og diskutere eksperimentelle data med inddragelse af faglig teori, fejlkilder, usikkerhed og biologisk variation
- gennemføre, vurdere og dokumentere beregninger ved behandling af problemstillinger med bioteknologisk indhold
- anvende relevante matematiske repræsentationer, modeller og metoder til analyse og vurdering
- anvende digitale værktøjer, herunder fagspecifikke og matematiske, i en konkret faglig sammenhæng
- indsamle, vurdere og anvende faglige tekster og informationer fra forskellige kilder
- formulere sig struktureret såvel mundtligt som skriftligt om bioteknologiske emner og give sammenhængende faglige forklaringer
- demonstrere forståelse af sammenhænge mellem fagets forskellige delområder
- demonstrere viden om fagets identitet og metoder
- anvende fagets viden og metoder til vurdering og perspektivering i forbindelse med samfundsmæssige, teknologiske, miljømæssige og etiske problemstillinger med bioteknologisk indhold og til at udvikle og vurdere løsninger
- behandle problemstillinger i samspil med andre fag.

2.2. Kernestof

Gennem kernestoffet skal eleverne opnå faglig fordybelse, viden og kundskaber.

Kernestoffet er:

- kemiske bindingstyper, tilstandsformer, opløselighedsforhold, struktur- og stereoisomeri
- uorganisk kemi: opbygning og egenskaber for udvalgte uorganiske forbindelser, herunder ionforbindelser
- organisk kemi: stofkendskab, herunder navngivning, opbygning, egenskaber og isomeri, og anvendelse for stofklasserne alkoholer, carboxylsyrer og estere, samt opbygning af og relevante egenskaber for stofklasserne carbonhydrider, aldehyder, ketoner, aminer, amider og aminosyrer
- makromolekyler: opbygning, egenskaber og biologisk funktion af carbohydrater, lipider, nucleinsyrer og proteiner, herunder enzymer, transportproteiner og receptorer
- mængdeberegninger i relation til reaktionsskemaer og opløsninger
- homogene kemiske ligevægte og fordelingsligevægte, herunder forskydning af disse på kvalitativt og simpelt kvantitativt grundlag
- syre-basereaktioner, herunder beregning af pH for vandige opløsninger af syrer, baser, blandinger af disse og puffersystemer samt bjerrumdiagrammer
- redoxreaktioner, herunder anvendelse af oxidationstal
- organiske reaktionstyper: kondensation og hydrolyse
- enzymer: enzymatiske hovedklasser og enzymkinetik
- biokemiske processer: fotosyntesens overordnede delprocesser, respiration og gæring, herunder carbohydraternes intermediære stofskifte
- virus: opbygning og formering
- celler: opbygning af pro- og eucaryote celler, eucaryote celletyper, stamceller og membranprocesser
- mikrobiologi: vækst, vækstmodeller og vækstfaktorer
- genetik og molekylærbiologi: nedarvningsprincipper, mitose, meiose, replikation, proteinsyntese, genregulering, mutation, genteknologi, anvendt bioinformatik og evolutionsmekanismer
- fysiologi på organismeniveau og biokemisk niveau: hormonel regulering, nervesystem, forplantning og immunsystem
- økologiske grundbegreber: energistrømme og produktion, eksempler på samspil mellem arter og mellem arter og deres omgivende miljø, biodiversitet
- eksperimentelle metoder: celledyrkning, kloning, transformation, PCR, elektroforese, DNA-sekventering, ELISA, separation, titrering, spektrofotometri og chromatografi.

2.3. Supplerende stof

Eleverne vil ikke kunne opfylde de faglige mål alene ved hjælp af kernestoffet. Kernestoffet og det supplerende stof udgør tilsammen en helhed. Det supplerende stof uddyber og perspektiverer kernestoffet, men kan også omfatte nye emneområder. Det supplerende stof skal sammen med kernestoffet uddybe emner og problemstillinger, hvor bioteknologi spiller en væsentlig rolle. Det supplerende stof vælges, så følgende områder omfattes:

- sundhed, sygdom og medicin, herunder udvikling af medicin, fremstilling og virkemåde
- bæredygtig produktion af fødevarer, energi og kemiske stoffer
- bioteknologisk anvendelse af planter, dyr og mikroorganismer
- miljøteknologi og miljøbeskyttelse
- ny forskning og nye bioteknologiske metoder
- bioetik.

Der skal indgå områder med relation til elevernes hverdag og samfundsmæssige, teknologiske eller miljømæssige problemstillinger med bioteknologisk indhold. Områderne skal endvidere vælges således, at både lokale og globale perspektiver berøres. Dele af det supplerende stof vælges i samarbejde med eleverne.

Der skal indgå materiale på engelsk samt, når det er muligt, på andre fremmedsprog.

2.4. Omfang

Forventet omfang af fagligt stof er normalt svarende til 500-700 sider.

3. Tilrettelæggelse

3.1. Didaktiske principper

Undervisningen skal tage udgangspunkt i et fagligt niveau svarende til elevernes biologi- og kemifaglige viden og metodekendskab fra grundskolen.

Undervisningen opbygges ud fra tematiske forløb, der f.eks. tager udgangspunkt i bioteknologiske problemstillinger, der viser eleverne bioteknologis betydning for forståelse af deres hverdag og omverden, herunder bioteknologiske problemstillinger af teknologisk og samfundsmæssig betydning. Der indgår såvel kernestof som supplerende stof i de enkelte tematiske forløb, og de tematiske forløb kan suppleres med kortere perioder, hvor faglig viden læres systematisk.

Temaerne tilrettelægges med varierede arbejdsformer. Det teoretiske og eksperimentelle arbejde skal støtte hinanden og integreres, således at eleverne opøves i ikke blot at kombinere iagttagelser og teori, men inspireres til selv at kunne foreslå relevante undersøgelsesmetoder og problemløsninger.

3.2. Arbejdsformer

Undervisningen tilrettelægges med:

- elevaktiverende, individuelle og kollaborative arbejdsformer
- mundtlig formidling med vægt på struktur, faglig argumentation og fagsprog
- faglig læsning, artikellæsning og kritisk informationssøgning
- anvendelse af relevante digitale værktøjer
- arbejde med udvikling af løsninger
- udadrettede aktiviteter eller samarbejde med eksterne partnere, som eksemplificerer fagets anvendelsesområder og karrieremuligheder.

Eksperimentelt arbejde

Elevernes eget eksperimentelle arbejde i laboratoriet skal udgøre ca. 20 pct. af fagets . Eksperimentelt arbejde:

- skal stå centralt i undervisningen
- skal vælges bredt og varieret og omfatter både kvalitativt og kvantitativt eksperimentelt arbejde
- omfatter både eksperimenter med fokus på fagets problemstillinger og anvendelse af fagets metoder til undersøgelse af problemstillinger med afsæt udenfor faget
- skal tilrettelægges med både lærerstyret og mere selvstændigt tilrettelagt eksperimentelt arbejde.

Det eksperimentelle arbejde kan suppleres med andet empiribaseret arbejde, hvor eleverne f.eks. indhenter data fra databaser, og andre aktiviteter af eksperimentel karakter, f.eks. virtuelle eksperimenter. Dette indgår dog ikke i de 20 pct. afsat til elevens eget eksperimentelle arbejde.

Skriftligt arbejde

Skriftlighed i bioteknologi A omfatter arbejde med fagets forskellige skriftlige genrer med sigte på læreproces og faglig formidling. Det skriftlige arbejde omfatter blandt andet følgende:

- journaler og rapporter over eksperimentelt arbejde
- forskellige opgavetyper, blandt andet med henblik på træning af faglige elementer og samspil med andre fag
- besvarelse af opgaver, der tydeliggør kravene ved den skriftlig prøve
- andre produkter som f.eks. præsentationer og video.

Det skriftlige arbejde i bioteknologi A skal give eleverne mulighed for at fordybe sig i bioteknologiske problemstillinger og styrke tilegnelsen af fagets viden, tankegang og arbejdsmetoder. Det skriftlige arbejde tilrettelægges, så der er progression i fagets skriftlighed og sammenhæng til skriftligt arbejde i andre fag som bidrag til udviklingen af den enkelte elevs skriftlige kompetencer.

3.3. It

Digitale værktøjer indgår som en integreret del af undervisningen blandt andet til formidling, kommunikation, dataopsamling, databehandling, modellering, visualisering, simulering, bioinformatik og informationssøgning. Ved tilrettelæggelsen af undervisningen skal der lægges vægt på at inddrage relevante digitale værktøjer til træning til de skriftlige prøver, gennemførelse af det eksperimentelle arbejde og til kollaborative skriveprocesser.

3.4. Samspil med andre fag

Dele af kernestof og det supplerende stof vælges og behandles, så det bidrager til styrkelse af det faglige samspil mellem fagene og i studieretningen. I tilrettelæggelsen af undervisningen inddrages desuden elevernes viden og kompetencer fra andre fag, som eleverne hver især har, så de bidrager til perspektivering af emnerne og belysning af fagets almendannende sider. Bioteknologi A kan desuden indgå i de flerfaglige forløb, der forbereder eleverne til arbejdet med studieretningsprojektet.

I bioteknologi A skal der tilrettelægges forløb sammen med andre fag, som uddyber, anvender eller perspektiverer bioteknologi. Der skal være et forløb, som omfatter et samarbejde med matematik.

4. Evaluering

4.1. Løbende evaluering

Elevernes udbytte af undervisningen evalueres jævnligt, bl.a. på baggrund af det skriftlige arbejde, så der bliver grundlag for en fremadrettet vejledning af den enkelte elev i arbejdet med at nå de faglige mål og for justering af undervisningen.

4.2. Prøveformer

Der afholdes en centralt stillet skriftlig prøve og en mundtlig prøve.

Den skriftlige prøve

Skriftlig prøve på grundlag af et centralt stillet opgavesæt, som består af opgaver stillet inden for kernestoffet i pkt. 2.2. og problemstillinger i tilknytning hertil.

Prøvens varighed er fem timer.

Den mundtlige prøve

Der afholdes en mundtlig prøve på grundlag af en opgave udarbejdet af eksaminator. Opgaven tager udgangspunkt i en problemstilling, som har sammenhæng med et eller flere af undervisningens temaer og inddrager eksperimentelt arbejde eller andet empiribaseret arbejde fra undervisningen. Opgaven indeholder en overskrift og en kort præciserende tekst samt bilag i form af en artikel eller en case, som ikke er behandlet i undervisningen, og supplerende materiale i form af figurer, forsøgsdata og lignende. Bilagsmaterialet skal kunne danne basis for faglig uddybning og perspektivering ved inddragelse af faglige metoder, kernestof og supplerende stof. Bilagsmaterialet skal have et omfang, så hele materialet kan forventes inddraget under eksaminationen.

Opgaverne, der indgår som grundlag for prøven, skal tilsammen i al væsentlighed dække de faglige mål, kernestof og supplerende stof. Hver opgave må bruges højst to gange på samme hold. Bilag må genbruges i forskellige opgaver efter eksaminators valg. Opgaverne uden bilagsmateriale skal være kendte af eksaminanderne inden prøven.

Eksaminationstiden er ca. 30 minutter. Der gives ca. 24 timers forberedelsestid, dog ikke mindre end 24 timer. Bilagsmaterialet knyttet til den udtrukne opgave udleveres ved forberedelsens start. Eksaminationen indledes med eksaminandens fremlæggelse med udgangspunkt i bilagsmaterialet, som varer op til ti minutter. Eksaminationen former sig herefter som en samtale mellem eksaminand og eksaminator, som inddrager øvrige relevante dele af kernestof og supplerende stof.

4.3. Bedømmelseskriterier

Bedømmelsen er en vurdering af, i hvilken grad eksaminandens præstation opfylder de faglige mål, som de er angivet i pkt. 2.1.

Ved skriftlig prøve

Ved den skriftlige prøve lægges der vægt på eksaminandens evne til at:

- anvende fagbegreber og fagsprog og relevante repræsentationer og modeller til beskrivelse, forklaring og analyse
- formulere sig struktureret om bioteknologiske emner, inddrage relevant viden og give sammenhængende faglige forklaringer
- vurdere eksperimentelt arbejde og dets tilrettelæggelse
- bearbejde data fra kvalitative og kvantitative eksperimenter og undersøgelser og vurdere resultaterne herfra
- analysere og diskutere data og eksperimentelle resultater under inddragelse af relevant faglig viden
- gennemføre og præsentere relevante beregninger ved korrekt brug af fagsprog, herunder anvende relevante matematiske modeller og metoder
- benytte relevante fagspecifikke digitale værktøjer hensigtsmæssigt.

Der gives en karakter på baggrund af en helhedsvurdering af eksaminandens præstation.

Ved mundtlig prøve

Ved den mundtlige prøve lægges der vægt på eksaminandens evne til at:

- anvende relevant faglig viden, fagbegreber og fagsprog til beskrivelse, forklaring og analyse af bilagsmaterialets problemstilling
- uddybe og vurdere eksperimentelt arbejde og dets tilrettelæggelse
- analysere og diskutere data og eksperimentelle resultater under inddragelse af relevant faglig viden
- give sammenhængende faglige forklaringer og argumentationer og indgå i en faglig dialog
- demonstrere forståelse af sammenhænge mellem fagets forskellige delområder
- perspektivere til samfundsmæssige, teknologiske, miljømæssige eller etiske problemstillinger.

Der gives én karakter på baggrund af en helhedsvurdering af eksaminandens mundtlige præstation.

Ved prøve, hvor faget indgår i fagligt samspil

Ved prøve, hvor faget indgår i fagligt samspil med andre fag, lægges der vægt på eksaminandens evne til at:

- behandle problemstillinger i samspil med andre fag
- demonstrere viden om fagets identitet og metoder.

4.4. Selvstuderende

En selvstuderende skal have gennemført laboratoriekursus i bioteknologi A (stx) (Bek. om de gymnasiale uddannelser § 49) med attestation fra den institution, der afholdt kurset, for at kunne indstilles til prøve. Hvis den selvstuderende kan dokumentere gennemførelse af eksperimentelt arbejde i et omfang svarende til niveauets eksperimentelle arbejde fra tidligere undervisning i bioteknologi A (stx), f.eks. i form af rapporter eller journaler, kan den selvstuderende indstilles til prøve uden at gennemføre laboratoriekursus. Det tidligere gennemførte eksperimentelle arbejde indgår på samme måde som grundlag for prøven, som eksperimentelt arbejde i en almindelig undervisningssammenhæng. Lederen af den skole, hvor prøven finder sted, beslutter, om tidligere eksperimentelt arbejde kan udgøre et tilstrækkeligt grundlag for den selvstuderendes prøve.

FOODSHIFT Pathways

FOODSHIFT Pathways

WP2 Curriculum Survey

please fill out one template per identified case

General comments:
Do not worry about exact translation of the entire document; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

1. Which curricula did you find? Please give an overview specifying the following:
   Name: Compulsory primary and secondary basic education curriculum
   a. Level: x national x regional x city/school level
   b. Learning system/education level (Please see attached schematic view of the school systems for your country) Secondary level (6 ages to sixteen)
      i. Please use the attached chart to indicate the institutional setting of the curriculum. General education programas
      ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
   c. Please share the curricula with us (web page/link/attachment).

      I attach the original files:
      - Original archive of the primary school curriculum
      - Original secondary school curriculum file

Please comment on your choice:

While doing my research, I found out that here in Spain, a new decree has just been launched regarding the curriculum, which is already in force and is undergoing a 2-year evaluation period by public education teachers.

Three courses are available to progressively implement the new curricula, with the support of the Educational Inspectorate and the necessary training.

I have summarised the basic structure of the Spanish curriculum for basic education (primary and secondary) in this document
I would like to mention that the new structure favours project-based education and the STEAM methodology

I also add a summary of the basic curriculum of Primary and the basic curriculum of secondary

(II) Coverage of target topics
Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

a. **Food**
b. **Nutrition**
c. **Agri(culture)**
d. **Health**
e. **Related** (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

In the case of the curriculum for both primary and secondary schools in the Spanish system, there is an area called "Environment" and another called "Education in values" which are focused on the theme of sustainability and respect for the environment.

Both areas are transversal to all subjects and it is recommended to work on global projects.

In the documents previously mentioned as basic curriculum of Primary and the basic curriculum of secondary , you will be able to find the information marked in yellow

If none of the above can be found, please provide insights on why:

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

a. **Fragmented/separate/isolated**
b. **Repeatedly but incoherent**
c. **Addressed in separate learning objectives**
d. **Integrated in wider context/sections**
e. **Key competence throughout curriculum**

Please elaborate on your answer: …

In the case of the curriculum for both primary and secondary schools in the Spanish system, there is an area called "Environment" and another called "Education in values" which are focused on the theme of sustainability and respect for the environment.

Both areas are transversal to all subjects and it is recommended to work on global projects.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)?

Characteristics of learning assessment:

- They have a global meaning.
- It is associated with competencies.
- Measures and educational support are provided when a student requires it.
- The learning of the students, the teaching processes and the teacher's practice are evaluated.
- It allows us to identify advances, difficulties and errors.
- Enables making timely decisions to meet the objectives set
- promotes the widespread use of diversified assessment strategies and instruments
- Take parents into account.

the qualification of the learning of the areas, subjects or fields in relation to the evaluation criteria corresponding to the specific competences.

The qualification of the fields, in case they are programmed, can be done in an integrated way, while, in this case, the qualification obtained will be common to the areas or subjects that are part of it.

globalizing projects of a transversal nature, such as the field of the environment, will consist of an independent area or subject and the specific competencies and the corresponding evaluation criteria will have to be defined in order to carry out the qualification

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements.

Yes, within the project-based learning system, the extracurricular approach is contemplated in the design of educational projects, this information can be found in this document specifically in section number 3.- The fields

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

Currently the Government of Catalonia is working on specific projects in the field of basic education on sustainable food specifically.

For more information here
Educational projects | Sustainable Food | Ajuntament de Barcelona (alimentaciosostenible.barcelona)

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

Meedom Kommunikation

WP2 Curriculum Survey

please fill out one template per identified case

General comments:
Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

1. Which curricula did you find? Please give an overview specifying the following:
   Name: EQF4 – Geoscience: General Programmes, Three Years (ISCED 344)
   a. Level: ◯ **national** ◯ regional ◯ city/school level
   b. Learning system/education level (Please see attached schematic view of the school systems for your country)
      i. Please use attached chart to indicate the institutional setting of the curriculum.
      ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
   c. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:

C:
The following link is to the general overview of all the courses in the General Programme:

https://www.uvm.dk/gymnasiale-uddannelser/fag-og-laereplaner/laereplaner-2017/stx-laereplaner-2017

Attached is a specific pdf covering the curricula of geoscience.

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

a. **Food**
b. **Nutrition**
c. **Agri(culture)**
d. **Health**
e. **Related** (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

Geoscience

Geoscience deals with man's attempt to develop descriptions, interpretations and explanations of geological and physical phenomena on Earth. Observations and experiments in interaction with

theories and models lead to the development of a natural scientific insight that contributes to an understanding of human living conditions, **resource utilization** and **impact on nature**, and which at the same time points towards opportunities for **sustainable development**. The subject is based on current events and puts geoscientific issues into a local, regional and global societal perspective. Through work with concrete and current geoscientific issues, students gain a fundamental understanding of the importance of the natural basis for life on Earth and for man's impact on nature. Emphasis is placed on students gaining knowledge of the **natural and resource base of different societies** with a focus on **sustainable development**.
Academic goals:

- The student's must deal with issues relating to **sustainability**, **resources**, planning, population relations and global division of labor using geotechnical knowledge.
- **Production** and its dependence on technological development and resource base. **Significance for people and society locally and globally.**

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

a. **Fragmented/separate/isolated**
b. **Repeatedly but incoherent**
c. **Addressed in separate learning objectives**
d. **Integrated in wider context/sections**
e. **Key competence throughout curriculum**

Please elaborate on your answer: ...

In geoscience **sustainability** and **resource utilization** are key competences on level E. **Food** is not mentioned.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)

N/A

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements.

N/A

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here: N/A
(VII) Additional comments Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles: See Survey for Biology

Bilag 101

Geovidenskab A – stx, august 2017

1. Identitet og formål

1.1 Identitet

Det naturvidenskabelige fag geovidenskab omhandler menneskets forsøg på at udvikle beskrivelser, tolkninger og forklaringer af geologiske og fysiske fænomener på Jorden. Observationer og eksperimenter fører i samspil med teorier og modeller til udvikling af en naturvidenskabelig indsigt, der bidrager til en forståelse af menneskets livsvilkår, ressourceudnyttelse og påvirkning af naturen, og som samtidig peger frem mod muligheder for en bæredygtig udvikling.

Faget tager udgangspunkt i aktuelle begivenheder og sætter geovidenskabelige problemstillinger ind i et lokalt, regionalt og globalt samfundsmæssigt perspektiv.

1.2 Formål

Geovidenskab A giver eleverne fortrolighed med væsentlige naturvidenskabelige metoder og synsvinkler, der sammen med kendskab til geofaglige fænomener og teorier åbner for en naturvidenskabelig tolkning af verden. Dette bidrager til elevernes almendannelse og kvalificerer deres studievalg ved, at de opnår viden og kundskaber inden for fagområdet.

Gennem eksperimenter, feltarbejde og arbejde med modeller opnår eleverne kendskab til opstilling og anvendelse af teorier som middel til kvalitativ og kvantitativ forklaring af fænomener og processer.

Med afsæt i en rumlig og dynamisk opfattelse af Jorden og det fysiske landskab bliver eleverne i stand til at forstå naturressourcer og deres forvaltning samt stofkredsløb og energistrømme i en geovidenskabelig kontekst set i relation til menneskets anvendelse heraf.

Gennem arbejdet med konkrete og aktuelle geovidenskabelige problemstillinger opnår eleverne en fundamental forståelse for naturgrundlagets betydning for livet på Jorden og for menneskets tilbagevirkning på naturen.

Der lægges vægt på, at eleverne får kendskab til forskellige samfunds natur- og ressourcegrundlag med fokus på bæredygtig udvikling.

2. Faglige mål og fagligt indhold

2.1 Faglige mål

Eleverne skal kunne:

- forholde sig til aktuelle geovidenskabelige problemstillinger inden for kernestofområdet
- identificere, klassificere og fortolke rumlige og tidslige mønstre i geovidenskabelige sammenhænge blandt andet på baggrund af kort, geografiske informationssystemer og satellitdata
- tilrettelægge, beskrive og udføre observationer og eksperimenter såvel i felten som i laboratoriet
- analysere en geovidenskabelig problemstilling ud fra forskellige repræsentationer af informationer og formulere en løsning af problemet ved brug af en relevant model og herunder anvende matematiske værktøjer
- behandle empiriske data med henblik på at opstille og diskutere matematiske sammenhænge mellem variable
- analysere og fortolke strukturer og udviklingsprocesser i naturen og menneskets omgivelser
- opstille og anvende et bredt udvalg af modeller til kvalitativ eller kvantitativ forklaring af geovidenskabelige fænomener samt diskutere modellers gyldighedsområde og forholde sig kritisk til deres samfundsmæssige anvendelse
- forholde sig til problemstillinger vedrørende bæredygtighed, ressourcer, planlægning, befolkningsforhold og global arbejdsdeling ved anvendelse af geofaglig viden
- analysere og vurdere geovidenskabelige problemstillinger i en bredere samfundsmæssig og teknologisk sammenhæng med inddragelse af viden og kompetencer opnået i andre fag
- behandle problemstillinger i samspil med andre fag
- demonstrere viden om fagets identitet og metoder
- anvende fagets metoder i innovative sammenhænge
- formidle faglig viden, analyser, resultater og diskussioner, mundtligt og skriftligt henvendt til specifikke målgrupper samt kunne deltage på en kvalificeret måde i den aktuelle samfundsdebat om geovidenskabelige emner.

2.2. Kernestof

Gennem kernestoffet skal eleverne opnå faglig fordybelse, viden og kundskaber.
Kernestoffet er:

Jordens og landskabernes udviklingsprocesser og udviklingshistorie

- Planeten Jorden som en del af solsystemet samt grundtræk af den fysiske beskrivelse af universet og dets udviklingshistorie
- Jordens geologiske opbygning og den pladetektoniske model
- Elementær seismologi, herunder jordskælv og vulkaner
- Bølgefænomener og deres elementære egenskaber, herunder bølgelængde, frekvens, udbredelsesfart, interferens og brydning
- Kinematisk beskrivelse af bevægelse i én dimension
- Landskabers udviklingsprocesser, herunder istids- og kystlandskaber
- Grundtræk af Jordens og livets udvikling med eksempler på geologiske begivenheder
- Absolut datering og relativt tidsbegreb, herunder stratigrafi
- Radioaktivitet, herunder henfaldstyper, aktivitet og henfaldsloven med henblik på datering
- Energiforhold ved kerneprocesser

Vejr, klima og klimaændringer. Natur- og samfundsmæssige faktorer, der påvirker klimaet

- Klimasystemet, det globale vindsystem, havstrømme og disses betydning for det regionale vejr
- Teorier om klima og klimaændringer, herunder Jordens strålingsbalance og det elektromagnetiske spektrum
- Atomare systemers emission og absorption af stråling og spektre
- Klimaændringer på forskellige tidsskalaer, herunder effekter af Jordens bevægelse
- Gravitationsloven og bevægelse om et centrallegeme
- Energiforhold ved temperatur- og faseændringer
- Kraftbegrebet og Newtons love, herunder tryk, opdrift og gnidning

Vand, vandressourcer og deres udnyttelse

- Vandets kredsløb, vandbalanceligningen og modellering af grundvandsstrømme
- Kinetisk energi og potentiel energi i tyngdefeltet nær Jorden
- Elementære elektriske kredsløb og geofaglig anvendelse af elektriske metoder

Produktion, teknologi og energiressourcer

- Produktionen og dens afhængighed af teknologisk udvikling og ressourcegrundlag. Betydning for mennesker og samfund lokalt og globalt
- Nutidens og fremtidens energiteknologi og energiforsyning
- Energiomsætning samt effekt og nyttevirkning.
- Det globale kulstofkredsløb samt vedvarende og fossile energiressourcer.

2.3. Supplerende stof

Eleverne vil ikke kunne opfylde de faglige mål alene ved hjælp af kernestoffet. Det supplerende stof udgør ca. 20 pct. og omfatter emner eller problemstillinger, som uddyber, aktualiserer og perspektiverer kernestoffet, og som bidrager til opfyldelse af de faglige mål.

Det supplerende stof skal give mulighed for samspil med studieretningsfagene. Eleverne skal have væsentlig indflydelse på valg af supplerende stof.

Der skal indgå materiale på engelsk samt, når det er muligt, på andre fremmedsprog.

2.4. Omfang

Forventet omfang af fagligt stof er normalt svarende til 450-600 sider.

3. Tilrettelæggelse

Undervisningen i faget geovidenskab A tilrettelægges som et samlet forløb. Undervisningen skal endvidere tilrettelægges således, at det er muligt i 3.g sideløbende at følge et forløb som løfter fra fysik B til fysik A.

3.1. Didaktiske principper

Undervisningen i geovidenskab A tager udgangspunkt i aktuelle, tematiske forløb med et samfundsorienteret og teknologisk perspektiv, så eleverne får mulighed for at opleve faget som relevant og interessant. Enkelte systematiske indslag kan tydeliggøre overfor eleverne, hvordan de faglige begreber finder anvendelse i forklaringen af forskellige geovidenskabelige fænomener.

I undervisningen skal vægten lægges på arbejdsformer, der fremmer elevernes selvstændige arbejdsprocesser. Som led i undervisningen besøges et antal geotoper, hvor forskellige landskaber og geovidenskabelige processer studeres. I løbet af studieretningsforløbet udarbejder eleverne en projektopgave i relation hertil.

Der skal tilrettelægges mindst et længerevarende forløb, hvor eleverne i mindre grupper arbejder i felten eller i laboratoriet med en selvvalgt eksperimentel geovidenskabelig problemstilling.

Der skal tilrettelægges mindst et forløb, som giver eleverne lejlighed til at udvikle og demonstrere deres innovative kompetencer.

Ved tilrettelæggelsen skal der lægges vægt på samarbejdet med matematik, samtidig med at undervisningen i geovidenskab bygger på realistiske forudsætninger om elevernes matematiske kompetencer. I geovidenskab A benyttes matematik blandt andet i beskrivelsen af sammenhænge og modeller.

3.2. Arbejdsformer

Undervisningen skal tilrettelægges, så der er variation og progression i de benyttede arbejdsformer under hensyntagen til de faglige mål, der ønskes nået med det enkelte forløb. Projektarbejder, hvor der tages udgangspunkt i elevernes egne problemformuleringer, og som har en undersøgende eller innovativ tilgang, skal være en naturlig del af undervisningen.

Elevernes eksperimentelle arbejde omfatter såvel feltarbejde som arbejde i laboratoriet. Det eksperimentelle arbejde og feltarbejdet indgår som en integreret del af undervisningen og skal sikre eleverne fortrolighed med metoder og brugen af udstyr, herunder it-baseret udstyr til dataopsamling og databehandling.

De eksperimentelle aktiviteter tilrettelægges, så der er progression i kravene til elevernes selvstændighed fra simple registreringer og observationer over arbejde med mere komplekse sammenhænge til selvstændige, åbne eksperimentelle undersøgelser og feltarbejder.

Omfanget af elevernes selvstændige eksperimentelle arbejde og feltarbejde udgør mindst 20 pct. af undervisningstiden.

Mundtlig fremstilling og skriftligt arbejde indgår som en væsentlig del af arbejdet med faget. Det skriftlige arbejde omfatter blandt andet følgende:

- rapportering og efterbehandling af eksperimentelt arbejde og feltarbejde
- løsning af geofaglige problemer, herunder træning i anvendelse af faglige begreber, metoder og modeller
- formidling af faglig indsigt i form af tekster, præsentationer, projektrapporter og lignende.

Det skriftlige arbejde i geovidenskab A skal sikre elevernes fordybelse i geovidenskabelige problemstillinger, styrke tilegnelsen af geofaglig viden og arbejdsmetoder samt sikre udviklingen af elevernes skriftlige kompetencer.

Arbejdet med løsning af skriftlige opgaver skal tydeliggøre kravene til elevernes beherskelse af de faglige mål i forbindelse med den skriftlige prøve i geovidenskab A. Det skriftlige arbejde tilrettelægges, så der er progression og sammenhæng til skriftligt arbejde i andre fag, især matematik og kemi.

Eleverne skal arbejde med mundtlig fremstilling, hvor de inddrager faglig argumentation og beskrivelse af geovidenskabelige fænomener og modeller. Eleverne skal have lejlighed til at udforme oplæg, der kan danne udgangspunkt for en selvstændig præsentation af et geovidenskabeligt emne.

Inddragelse af private og offentlige virksomheder og institutioner kan bidrage til at tydeliggøre studie- og karrieremuligheder for eleverne og belyse relevante geovidenskabelige problemstillinger.

3.3. It

I undervisningen skal der lægges vægt på inddragelse af it-værktøjer, såvel i forbindelse med feltarbejde og eksperimentelt arbejde som ved elevernes arbejde med det faglige stof. Eleverne skal benytte it-baserede hjælpemidler til dataopsamling og databehandling. Eleverne skal endvidere arbejde med geografiske informationssystemer, satellitdata og -billeder samt it-baserede modeller til simulering af geovidenskabelige fænomener.

3.4. Samspil med andre fag

Geovidenskab A er omfattet af det generelle krav om samspil mellem fagene. Dele af kernestof og supplerende stof vælges og behandles, så det bidrager til styrkelse af det faglige samspil mellem fagene og i studieretningen. I tilrettelæggelsen af undervisningen inddrages desuden elevernes viden og kompetencer fra andre fag, som eleverne hver især har, så de bidrager til perspektivering af emnerne og belysning af fagets almendannende sider. Geovidenskab A kan desuden indgå i de flerfaglige forløb, der forbereder eleverne til arbejdet med studieretningsprojektet.

I studieretningen med geovidenskab A skal undervisning i studieretningsfagene samordnes, hvor det er fagligt relevant. Der skal i undervisningen indgå forløb, hvor der i samspil mellem geovidenskab A og matematik A arbejdes med modellering af empiriske data fra egne undersøgelser og med geovidenskabelige matematiske modeller. Der skal endvidere indgå forløb, hvor samspillet med kemi B er tydeligt og skal omfatte såvel uorganisk som organisk stofkemi.

4. Evaluering

4.1. Løbende evaluering

Der gennemføres løbende evaluering, herunder med henblik på arbejde med teori, empirisk arbejde inkl. databehandling samt problemløsning. Herved sikres, at eleverne jævnligt får mulighed for at vurdere deres udbytte, blive vejledt i det videre arbejde samt medvirke ved evaluering og justering af undervisningen.

4.2. Prøveformer

Der afholdes en centralt stillet skriftlig prøve og en mundtlig prøve.

Den skriftlige prøve

Skriftlig prøve på grundlag af et centralt stillet opgavesæt. Prøvens varighed er fem timer.

Den mundtlige prøve

Mundtlig prøve på grundlag af en opgave udarbejdet af eksaminator/eksaminatorerne. Opgaven omhandler en problemstilling i tilknytning til et eller flere af de i undervisningen behandlede temaer. Opgaven inddrager teoretisk stof og så vidt muligt relevant feltarbejde, eksperimentelt arbejde eller andet empiribaseret arbejde samt indeholder ukendte bilag i tilknytning til opgavens problemstilling. Anvendt apparatur kan inddrages under prøven.

Opgaverne, der indgår som grundlag for prøverne, skal i alt væsentlighed dække de faglige mål, kernestoffet og det supplerende stof.

Opgaverne uden bilag skal være kendt af eksaminanderne inden prøven.

Den enkelte opgave må anvendes højst tre gange på samme hold. Bilag må genbruges i forskellige opgaver efter eksaminators valg. Opgaverne med bilag sendes til censor inden prøven.

Eksaminationstiden er ca. 30 minutter per eksaminand. Opgaven med bilag udleveres ved lodtrækning, og der gives 60 minutters forberedelsestid. I forberedelsestiden udarbejder eksaminanden til eget brug en disposition for besvarelsen af den stillede opgave inklusiv det materiale, der tænkes inddraget i opgavens besvarelse. Eksaminationen tager udgangspunkt i eksaminandens fremlæggelse af besvarelsen. Eksaminationen former sig som en faglig samtale mellem eksaminand og eksaminator/eksaminatorer.

For begge prøveformer gælder, at korte fremmedsprogede figurtekster, signaturforklaringer m.v. kan indgå i opgaverne, såfremt tilsvarende har været anvendt i undervisningen.

4.3. Bedømmelseskriterier

Bedømmelsen er en vurdering af, i hvilken grad eksaminandens præstation opfylder de faglige mål, som de er angivet i pkt. 2.1.

Ved den skriftlige prøve lægges der vægt på, at eksaminanden:

- har et sikkert og bredt kendskab til fagets begreber, modeller og metoder som grundlag for en faglig analyse og argumentation
- kan analysere et geovidenskabeligt problem, løse det gennem brug af en relevant model og formidle analyse og løsning klart og præcist
- kan opstille en model og diskutere dens gyldighedsområde
- kan beskrive og perspektivere et geologisk udviklingsforløb samt tolke strukturer og rumlige mønstre.

Der gives én karakter ud fra en helhedsvurdering af eksaminandens præstation.

Ved den mundtlige prøve lægges der vægt på, at eksaminanden ved både præsentationen og den efterfølgende faglige samtale:

- har et sikkert kendskab til fagets begreber, modeller og metoder som grundlag for en faglig analyse og underbygning af den faglige argumentation
- kan reflektere over samspillet mellem teori og empiri
- kan perspektivere faglig indsigt til relevante samfundsmæssige forhold.

Der gives én karakter ud fra en helhedsvurdering af eksaminandens mundtlige præstation.

Ved en prøve, hvor faget indgår i fagligt samspil med andre fag, lægges der vægt på, at eksaminanden kan:

- demonstrere viden om fagets identitet og metoder
- behandle problemstillinger i samspil med andre fag.

4.4. Selvstuderende

En selvstuderende skal have gennemført laboratoriekursus i geovidenskab A (stx) (Bek. om de gymnasiale uddannelser § 49) med attestation fra den institution, der afholdt kurset, for at kunne indstilles til prøve. Hvis den selvstuderende kan dokumentere gennemførelse af eksperimentelt arbejde i et omfang svarende til niveauets eksperimentelle arbejde fra tidligere undervisning i geovidenskab A (stx), f.eks. i form af rapporter eller journaler, kan den selvstuderende indstilles til prøve uden at gennemføre laboratoriekursus. Det tidligere gennemførte eksperimentelle arbejde indgår på samme måde som grundlag for prøven, som eksperimentelt arbejde i en almindelig undervisningssammenhæng. Lederen af den skole, hvor prøven finder sted, beslutter, om tidligere eksperimentelt arbejde kan udgøre et tilstrækkeligt grundlag for den selvstuderendes prøve.

Meedom Kommunikation

WP2 Curriculum Survey

please fill out one template per identified case

General comments:
Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

1. Which curricula did you find? Please give an overview specifying the following:
   Name: EQF4 – Natural Science (HF): General Programmes, Two Years (ISCED 344)
   a. Level: ◯ **national** ◯ regional ◯ city/school level
   b. Learning system/education level (Please see attached schematic view of the school systems for your country)
      i. Please use attached chart to indicate the institutional setting of the curriculum.
      ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
   c. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:

C:
The following link is to the general overview of all the courses in the General Programme (HF):

https://www.uvm.dk/gymnasiale-uddannelser/fag-og-laereplaner/laereplaner-2017/hf-laereplaner-2017

Attached is a specific pdf covering the curricula of Natural Science (HF)

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

a. **Food**
b. **Nutrition**
c. **Agri(culture)**
d. **Health**
e. **Related** (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

General Programmes, two years / HF, conditioned by completion of tenth grade in Lower Secondary Programmes)

Natural Science

The subject group uses scientific methods, where knowledge and conceptual understanding are developed in interaction between, on the one hand, observations and experiments and, on the other hand, theories and models. This forms the starting point for recognizing and understanding phenomena in nature and for understanding the **interaction between man and his surroundings, locally and globally**.

The students gain a nuanced and complex understanding of the world around them, so that they can understand the importance of **sustainable development** as a principle and can participate in the democratic debate with the acquired natural science competences.

Academic goals:

- To put local natural and social conditions into a regional or global context and understand the **local consequences of global processes**.

The core substance:

Work is carried out with at least three joint academic themes, which are chosen within or across the following areas:

- science in students' everyday life
- **health** and living conditions
- **environment and sustainability**
- **resource utilization, production and technology**

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

a. **Fragmented/separate/isolated**
b. **Repeatedly but incoherent**
c. **Addressed in separate learning objectives**
d. **Integrated in wider context/sections**
e. **Key competence throughout curriculum**

Please elaborate on your answer: ...

In natural science (HF) **sustainability** and **resource utilization** are key competences in the core substance and therefore on level E. **Food** is not mentioned.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)

N/A

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements. N/A
(VI) Practical examples If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here: N/A
(VII) Additional comments Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles: See Survey for Biology

Bilag 18

Naturvidenskabelig faggruppe – toårigt hf, august 2017

1. Identitet og formål

1.1 Identitet
Faggruppen omfatter fagene biologi, geografi og kemi.

Faggruppen benytter sig af naturvidenskabelige metoder, hvor viden og begrebsforståelse udvikles i vekselvirkning mellem på den ene side observationer og eksperimenter og på den anden side teorier og modeller. Dette danner udgangspunkt for erkendelse og forståelse af fænomener i naturen og for forståelse af samspillet mellem mennesket og dets omgivelser, lokalt og globalt.

Faggruppen har en anvendelsesorienteret dimension og inddrager biologisk, geografisk og kemisk viden til at skabe en sammenhængende indsigt i problemstillinger med naturvidenskabeligt indhold. Faggruppen giver endvidere indsigt i, hvordan fagene anvendes erhvervs- og uddannelsesmæssigt.

Faggruppen giver faglig baggrund for stillingtagen og problemløsning i forbindelse med aktuelle samfundsmæssige og globale problemstillinger med naturvidenskabeligt indhold.

1.2 Formål
Den naturvidenskabelige faggruppe bidrager til hf-uddannelsens overordnede målsætning ved, at eleverne opnår kundskaber om og indsigt i naturvidenskabelige metoder og fagområder og deres praktiske anvendelser.

Gennem arbejdet med naturvidenskabelige redskaber og metoder skal eleverne videreudvikle såvel almene som studie- og karriereforberedende kompetencer. De skal herunder opnå erfaring med, hvordan man systematisk indsamler, behandler og formidler naturvidenskabelig information, og de skal udvikle evne til at forholde sig kritisk og konstruktivt til anvendelse af naturvidenskab.

Undervisningen giver eleverne viden og kundskaber i biologi, geografi og kemi gennem arbejde med kernestoffet samt gennem uddybning og perspektivering af dette. I arbejdet med virkelighedsnære, fællesfaglige emner skal eleverne blive i stand til at se helheder og sammenhænge mellem fagene og få forståelse for relationerne mellem naturvidenskab, teknologi og samfund. Undervisningen har fokus på lokale, regionale og globale problemstillinger og sammenhænge.

Eleverne får herved baggrund for en nuanceret og kompleks omverdensforståelse, således at de kan forstå betydningen af bæredygtig udvikling som princip og kan deltage i den demokratiske debat med de opnåede naturvidenskabelige kompetencer. Eleverne skal tillige opnå viden om faggruppens professionsrettede perspektiver.

2. Faglige mål og fagligt indhold

2.1 Faglige mål
Eleverne skal kunne:

- beskrive enkle problemstillinger af såvel enkel- som fællesfaglig karakter ved anvendelse af viden, modeller og metoder fra biologi, geografi og/eller kemi
- gennemføre og dokumentere empiribaseret arbejde af kvalitativ og kvantitativ karakter under hensyntagen til sikkerhed i laboratoriet og i felten
- præsentere, vurdere og formidle data fra empiribaseret arbejde, herunder beskrive og forklare enkle sammenhænge mellem det empiribaserede arbejde og viden, modeller og metoder fra fagene
- indsamle, vurdere og anvende biologi-, geografi- og kemifaglige tekster og informationer fra forskelige typer af kilder
- udtrykke sig mundtligt og skriftligt ved brug af fagenes begreber og repræsentationer
- sætte lokale natur- og samfundsmæssige forhold ind i en regional eller global sammenhæng og forstå globale processers lokale konsekvenser
- undersøge problemstillinger samt udvikle og vurdere løsninger, hvor fagenes viden og metoder anvendes.

2.2 Kernestof
Gennem kernestoffet skal eleverne opnå faglig fordybelse, viden og kundskaber.

Kernestoffet omfatter fællesfaglige temaer og fagenes kernestof.

Der arbejdes med mindst tre fællesfaglige temaer, som vælges inden for eller på tværs af følgende områder:

- naturvidenskab i elevernes hverdag
- sundhed og levevilkår
- miljø og bæredygtighed
- ressourceudnyttelse, produktion og teknologi
- stoffer, materialer og produkter.

Kernestoffet og supplerende stof inddrages i fællesfaglige temaer. Fagenes kernestof er:

Biologi
Kernestoffet er udvalgte områder inden for hvert af følgende:
- biologiske makromolekyler og deres biologiske betydning
- cellers opbygning, celleorganellernes funktion, cellulære processer og enzymer
- genetik og DNA's rolle
- bioteknologiske metoder og deres anvendelse
- organsystemers opbygning og funktion
- økologi, herunder samspil mellem arter, mellem arter og deres omgivende miljø samt biodiversitet.

Geografi
Kernestoffet er udvalgte områder inden for hvert af følgende:
- vejrforhold, klima, klimaændringer og vandressourcer
- Jordens og landskabernes processer
- natur- og menneskeskabte stofkredsløb og energistrømme
- naturbetingede ressourcer, produktion, teknologi og bæredygtighed
- befolkningsforhold, byudvikling og erhverv i en globaliseret verden.

Kemi
Kernestoffet er udvalgte områder inden for hvert af følgende:
- grundstoffernes periodesystem
- stofmængdeberegninger i relation til reaktionsskemaer, herunder stofmængdekoncentration
- kemiske bindingstyper, tilstandsformer og blandbarhed
- organiske og uorganiske molekylers og ionforbindelsers opbygning, navngivning, egenskaber og anvendelse
- kemiske reaktioner, herunder simple redox- og syre-basereaktioner.

2.3 Supplerende stof
Eleverne vil ikke kunne opfylde de faglige mål alene ved hjælp af kernestoffet. Kernestof og supplerende stof udgør tilsammen en helhed. Det supplerende stof uddyber og perspektiverer kernestoffet, men kan også omfatte nye emneområder.

Dele af det supplerende stof kan vælges i samarbejde med eleverne.

Der kan indgå materiale på engelsk samt, når det er muligt, på andre fremmedsprog.

2.4 Omfang
Forventet omfang af fagligt stof er normalt svarende til 300-500 sider.

3. Tilrettelæggelse

3.1 Didaktiske principper
Undervisningen skal tage udgangspunkt i et fagligt niveau svarende til elevernes biologi-, geografi- og kemifaglige viden og metodekendskab fra grundskolen.

Undervisningens temaer tager afsæt i virkelighedsnære og konkrete fællesfaglige problemstillinger med naturvidenskabeligt indhold.

De faglige mål nås som et resultat af det fællesfaglige arbejde i kombination med kortere opsamlinger af det enkeltfaglige indhold i biologi, geografi og kemi.

Elevernes praktiske arbejde omfatter eksperimentelt arbejde, feltarbejde og andet empiribaseret arbejde. Det praktiske arbejde skal stå centralt i undervisningen. Der lægges i undervisningen vægt på, at det praktiske arbejde og teoretisk stof knyttes sammen med henblik på størst mulig integration.

Endvidere skal eleverne arbejde med at udvikle og forholde sig til foreliggende og egne løsningsforslag. Undervisningen skal tillige belyse faggruppens professionsrettede perspektiver.

3.2 Arbejdsformer
Undervisningen tilrettelægges med:

- fælles tilrettelagt progression i forhold til de faglige mål
- mindst tre fællesfaglige temaer, hvor alle fag er ligeligt repræsenterede
- projektarbejdsforløb inden for de fællesfaglige temaer
- opsamlinger, der tydeliggør de enkeltfaglige krav til den enkeltfaglige prøve
- ligelig fordeling af undervisningstiden mellem biologi, geografi og kemi
- systematisk arbejde med faglig læsning samt mundtlig og skriftlig formidling
- forskellige former for skriftlighed med fokus på læring og på fagenes repræsentationsformer og formidling
- forløb med fokus på udvikling af løsningsforslag til aktuelle problemstillinger
- aktiviteter som eksemplificerer faggruppens uddannelses- og karrieremuligheder.

Elevernes eget praktiske arbejde udgør mindst 45 timer af undervisningstiden, ligeligt fordelt mellem biologi, geografi og kemi. Den afsatte tid til dette arbejde skal i de tre fag benyttes til laboratorie- og feltarbejde, dog kan det i geografi i mindre omfang også omfatte andet empiribaseret arbejde. Elevernes eget praktiske arbejde skal vælges bredt og varieret og skal omfatte både kvalitativt og kvantitativt eksperimentelt arbejde. Der kan suppleres med andre aktiviteter af eksperimentel karakter, f.eks. demonstrationsforsøg og virtuelle eksperimenter, som dog ikke indgår i den afsatte tid til elevernes eget praktiske arbejde.
I slutningen af det samlede undervisningsforløb udarbejder lærerne en liste til eleverne med titlerne på det eksperimentelle arbejde, feltarbejde og andet empiribaseret arbejde, der kan inddrages i den eksterne mundtlige prøve i henholdsvis biologi, geografi og kemi. Listen offentliggøres for eleverne senest ved afslutningen af det samlede undervisningsforløb og indgår som en del af undervisningsbeskrivelsen.

Skriftlighed i faggruppen omfatter arbejde med faggruppens forskellige skriftlige genrer med fokus på læreproces og faglig formidling. Det skriftlige arbejde omfatter blandt andet følgende:

- journaler og rapporter over det praktiske arbejde
- forskellige opgavetyper blandt andet med henblik på træning af faglige elementer
- andre produkter, herunder det afsluttende skriftlige produkt.

Det skriftlige arbejde i faggruppen skal give eleverne mulighed for at fordybe sig i udvalgte naturvidenskabelige problemstillinger og styrke tilegnelsen af naturvidenskabelig viden og arbejdsmetoder. Det skriftlige arbejde tilrettelægges, så der er progression i faggruppens skriftlighed og sammenhæng til skriftligt arbejde i andre fag i udviklingen af den enkelte elevs skriftlige kompetencer.

Det afsluttende skriftlige produkt
Inden den interne mundtlige prøve, udarbejder eleven et afsluttende skriftligt produkt, som er grundlag for prøven. Det afsluttende skriftlige produkt udarbejdes på baggrund af en opgave, som lærerne stiller. Den stillede opgave skal tage

udgangspunkt i en faglig problemstilling, som har tilknytning til mindst et af de fællesfaglige temaer. Opgaven skal give eleven mulighed for at inddrage biologi, geografi og kemi i besvarelsen. Lærerne kan stille mere end en opgave til samme hold, og i så fald vælger den enkelte elev, hvilken opgave der skal besvares.

Det afsluttende skriftlige produkt udarbejdes individuelt eller i mindre grupper. Lærerne skal godkende sammensætningen af eventuelle grupper. Det skriftlige produkt har et omfang på ca. fem sider, uanset om det udarbejdes individuelt eller i grupper. Det skriftlige produkt indeholder titel, den faglige problemstilling der er arbejdet med, relevante modeller og begreber fra fagene, korte tekstafsnit og udvalgte kommenterede figurer, grafer, tabeller, kort eller resultater fra eksperimentelt arbejde, feltarbejde eller andet empiribaseret arbejde. Dele af det skriftlige produkt kan være i stikordsform.

Der gives ca. ni undervisningstimer og fire timers fordybelsestid til arbejde med den stillede opgave samt til udarbejdelse af det skriftlige produkt. Eleverne vejledes i forbindelse med deres arbejde med besvarelsen af den stillede opgave.

Det skriftlige produkt afleveres til skolen senest en uge før afholdelse af den interne mundtlige prøve. Hver elev skal aflevere et skriftligt produkt som besvarelse på den stillede opgave. Lærerne kommenterer ikke det afsluttende skriftlige produkt overfor eleven, før afholdelse af den interne mundtlige prøve.

3.3 It

Digitale værktøjer anvendes i forbindelse med elevernes behandling af eksperimentelt arbejde, feltarbejde og andet empiribaseret arbejde, samt deres skriftlige og mundtlige formidling. Endvidere inddrages digitale værktøjer, hvor det er muligt, i forbindelse med arbejde med databaser, visualisering, modellering og kollaborative arbejdsprocesser.

3.4 Samspil med andre fag

Faggruppen kan indgå i samspil med andre fag med det formål at støtte elevernes udvikling af færdigheder i skriftlig og mundtlig formidling og arbejde med databehandling fra eksperimentelt, felt- og andet empiribaseret arbejde.

4. Evaluering

4.1 Løbende evaluering

Elevernes udbytte af undervisningen evalueres jævnligt, så der bliver grundlag for en fremadrettet vejledning af den enkelte elev i arbejdet med at nå de faglige mål og for justering af undervisningen. Den løbende evaluering har fokus på både fællesfaglige og enkeltfaglige elementer.

4.2 Prøveformer

Der afholdes en intern mundtlig flerfaglig prøve og efter udtræk en ekstern mundtlig prøve i ét af de tre fag biologi, geografi og kemi.

4.2.1 Intern flerfaglig mundtlig prøve

Skolen afholder den interne mundtlige prøve i slutningen af det samlede undervisningsforløb i naturvidenskabelig faggruppe, dog senest således, at der efterfølgende kan afholdes et kortere forløb i undervisningen, der tydeliggør de enkeltfaglige krav til den eksterne mundtlige prøve.

Den interne mundtlige prøve afholdes på baggrund af det afleverede afsluttende skriftlige produkt. Lærerne orienterer sig i elevernes skriftlige produkt inden den interne prøve. Prøven er individuel.

Eksaminationstiden er ca. 24 minutter, og der gives ikke forberedelsestid. Ved prøven medvirker holdets faglærere, samt en fagperson fra skolen, som ikke har undervist den pågældende elev i faggruppen. Prøven indledes med elevens korte præsentation og former sig derefter som en faglig samtale mellem elev og holdets faglærere. Prøven tager udgangspunkt i det fællesfaglige perspektiv, og eleven skal samtidig inddrage hvert af de tre fag til belysning af den fællesfaglige problemstilling.

Der gives én karakter på baggrund af en helhedsvurdering af elevens mundtlige præstation.

4.2.2 Ekstern mundtlig prøve

Der afholdes en mundtlig prøve på grundlag af en opgave udarbejdet af eksaminator i det udtrukne fag.

Opgaven indeholder en overskrift, angivelse af eksperimentelt arbejde, feltarbejde eller andet empiribaseret arbejde, der skal inddrages, en kort præciserende tekst samt bilagsmateriale i form af figurer, forsøgsdata og lignende. Bilagsmaterialet skal kunne danne basis for faglig uddybning og perspektivering ved inddragelse af undervisningens kernestof og supplerende stof og feltarbejdet, det eksperimentelle eller andet empiribaseret arbejde. Bilagsmaterialet skal have et omfang, så hele materialet kan forventes inddraget under eksaminationen.

Opgaverne skal tilsammen i al væsentlighed dække de faglige mål, kernestof og supplerende stof indenfor det udtrukne fag. Det enkelte eksperimentelle arbejde, feltarbejde eller andet empiribaserede arbejde kan danne udgangspunkt for flere opgaver og kombineres med forskelligt bilagsmateriale. Hver opgave må anvendes tre gange. Der inddrages eksperimentelt arbejde, feltarbejde eller andet empiribaseret arbejde i alle opgaver.

Opgaverne uden bilag skal være kendte af eksaminanderne inden prøven.

Eksaminationstiden er ca. 24 minutter. Der gives ca. 24 minutters forberedelsestid. Opgaven med bilagsmateriale udleveres ved forberedelsestidens start. Prøven indledes med eksaminandens korte præsentation og former sig dernæst som en samtale mellem eksaminand og eksaminator. Bilagsmaterialet og det til opgaven knyttede eksperimentelle arbejde, feltarbejde eller andet empiribaserede arbejde skal inddrages i eksaminationen.

4.3 Bedømmelseskriterier
Den interne mundtlige prøve

Bedømmelsen er en vurdering af, i hvilket omfang eleven lever op til de faglige mål, som de er angivet i pkt. 2.1.

Der lægges vægt på, at eleven gennem sit arbejde med den fællesfaglige problemstilling kan:

- beskrive enkle problemstillinger af fællesfaglig karakter ved anvendelse af viden, modeller og metoder fra biologi, geografi og kemi
- præsentere og forklare data fra empiribaseret arbejde under inddragelse af viden, modeller og metoder fra fagene
- indhente, vurdere og anvende biologi-, geografi- og kemifaglige informationer fra forskelige typer af kilder
- udtrykke sig mundtligt ved brug af fagenes repræsentationer og fagbegreber
- perspektivere til natur- og samfundsmæssige forhold
- udvikle og vurdere løsninger, med anvendelse af fagenes viden og metoder, hvis dette indgår i den stillede opgave.

Der gives én karakter på baggrund af en helhedsvurdering af elevens mundtlige præstation.

Den eksterne mundtlige prøve

Bedømmelsen er en vurdering af, i hvilket omfang eksaminanden lever op til de faglige mål, som de er angivet i pkt. 2.1. Der lægges der vægt på, at eksaminanden i det udtrukne fag kan:

- anvende fagets viden, modeller og metoder til beskrivelse af enkle problemstillinger af enkelfaglig karakter
- beskrive udførelsen af eksperimentelt arbejde, feltarbejde og/eller andet empiribaseret arbejde
- præsentere og vurdere data fra eget praktisk arbejde, herunder beskrive og forklare simple sammenhænge mellem det empiribaserede arbejde og viden, modeller og metoder fra faget
- udtrykke sig mundtligt ved brug af fagets repræsentationer og begreber.

Der gives én karakter på baggrund af en helhedsvurdering af eksaminandens mundtlige præstation.

A.2 Curriculum survey from Greece

WP2 Curriculum Survey

please fill out one template per identified case

General comments:
Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

1. Which curricula did you find? Please give an overview specifying the following:
   Name: ……
   a. Level: ◯ **national** ◯ regional ◯ city/school level
   b. Learning system/education level (Please see attached schematic view of the school systems for your country)
      i. Please use attached chart to indicate the institutional setting of the curriculum.
      ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
   c. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:

The following link is to the quite recent curriculum that has been integrated on the topic of "Environment and Education for Sustainable Development" (June 2022-2023), that refers not to a particular subject topic (in Greek)

https://www.alfavita.gr/sites/default/files/2022-06/fek-perivallon-programma-spoudwn.pdf

The references to food (τροφή), agriculture (γεωργία) or livestock (κτηνοτροφία) have been highlighted.

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

a. **Food**
b. **Nutrition**
c. **Agri(culture)**
d. **Health**
e. **Related** (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

If none of the above can be found, please provide insights on why:

The terms have been highlighted in the text

Environment and Health (Pollution, Contamination, Quality of Air, water, food, clothing, etc.) are also mentioned not in all cases related with the food system
There is just one reference about healthy nutrition (7. Food and refreshments according with the rules of healthy eating /7. Τρόφιμα και αναψυκτικά σύμφωνα με τους κανόνες υγιεινής διατροφής) in this framework

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

a. **Fragmented/separate/isolated**
b. **Repeatedly but incoherent**
c. **Addressed in separate learning objectives**
d. **Integrated in wider context/sections**
e. **Key competence throughout curriculum**

Please elaborate on your answer: …

It used to be Fragmented/separate/isolated in the past in the different curricula but with the new curriculum framework there is the option of implementing educational activities in a vertical & horizontal way (**Integrated in wider context/sections**) (however practical difficulties arise, since teachers change every year…

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)?

Evaluation is a necessary process, in order to give feedback or to improve the achievement of the purpose and main objectives of the Curriculum Framework. Therefore, that needs to be determined are the criteria for formative, predictive or comprehensive / final evaluation, as well as the corresponding tools.

In terms of the criteria and according to the organizers, as mentioned in the section Environmental Literacy and Education for Sustainable Development, these criteria are:

1.Building of fundamental knowledge, developing skills and competences, shaping positive attitudes and behaviours of the students towards themselves, the team, the environment.
2. The methodology followed during the implementation of the work plan.
3. The originality of addressing the issue/problem.
4. The interdisciplinary approach.
5. The number, heterogeneity and quality of the sources selected.
6. The ability to organize and process data, information and data collected.
7. The extraction/documentation of the conclusions obtained from the data, the measurements and the diagrams.
8. The degree of utilization of ICT.
9. The degree of difficulty of the subject.

10. Other criteria that the teacher considers necessary for the specific subject.

As far as the assessment tools are concerned, they are those that are generally used in training process, such as journaling, performance and performance tests of a task, questionnaires, interviews, observation techniques, videotaping and recording.
A classic model for evaluating work plans is the "Before-After" model, where the students fill in an appropriately structured questionnaire with open or closed questions, which concern knowledge, skills, attitudes and behaviours, "Before" and "After" completion of the work plan.
This model is the simplest and at the same time reliable way to evaluate the expected learning outcomes.

Learning objectives (Προσδοκώμενα Μαθησιακά Αποτελέσματα) are defined per topic and in 3 levels
The first level is fundamental knowledge, the 2nd level is Find/define issue/problem/challenge, the 3rd level is Investigate issue/problem and the 4th is Activities/Projects

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements.

It is possible to organize extracurricular activities in collaboration with the Centers of Environmental Education that exist in different parts of the country (there is a specific procedure for it – each Center of Environmental Education has a pool of educational activities on different topics and interested schools after implementing a project on environmental education can apply to visit and attend it (after declaring the exact number of students)

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

Sustainability hackathons/challenges is a nice idea

Open days in schools in which students present the outcomes of their multidisciplinary projects in the end of the school year is something that our school is implementing (e.g., students of 4th primary grade implement a project on nutrition)

Writing “scientific articles” around a specific topic is another option

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

The "Environment and Education for Sustainable Development" Study Program of Kindergarten of the 1st - 6th grades of Primary School and the 1st, 2nd and 3rd grade of secondary education school students is set in place only in 6th June 2022

The Study Program/curriculum «Environment and Education for Sustainable Development" () provides the appropriate framework for education about climate change, promotes a systematic and interdisciplinary understanding of its causes and consequences, proposes learning approaches that foster critical thinking and problem solving, fosters the skills that enable individuals and communities to make informed and responsible decisions.

The specific Curriculum serves this basic aim, vertically regarding all levels of education and horizontally with regard to all the academic subjects of each class. It is not a subject curriculum in the sense of being part of the timetable, but it is a valuable tool/status of teachers for the achievement of goals oriented towards sustainable development in the entire range of courses of the primary & secondary programs. This Curriculum will be implemented in all Kindergartens, Primary and High Schools in the country from the 2022-2023 school year. The curriculum is in line with the official texts of UNECE, UNESCO and UNEP.

Currently teacher trainings take place around the topic.

A.3 Curricula surveys from the Netherlands

WP2 Curriculum Survey

please fill out one template per identified case

General comments:

Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

2. Which curricula did you find? Please give an overview specifying the following:

Name: **Regeling Examenprogramma's Voortgezet Onderwijs, Bijlage 1 HAVO/VWO**

a. Level: X **national** ◯ regional ◯ city/school level

b. Learning system/education level (Please see attached schematic view of the school systems for your country)

i. Please use attached chart to indicate the institutional setting of the curriculum. **HAVO/VWO**

ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know

c. Please share the curricula with us (web page/link/attachment).

https://wetten.overheid.nl/BWBR0022061/2022-08-01#Bijlage1

Please comment on your choice:

In this document is stated the desired level on the final exams on several domains within each topic/course

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

f. Food – 30 times, mostly as 'food production' in terms of energy production (for cell production etc), not directly related to SFS

g. Nutrition – 7 times, all in the biological sense (to describe the workings of an organism)

h. Agri(culture) – agrarisch – 6 times, all history related

i. Health – 62 times either medical or sports related, or as "impact on health" (chemical) (none are lifestyle/food)

1. **NLT (Natuur, Leven & Technologie) subject has one domain (Subdomain D1) about health&sickness including lifestyle**

j. **Related** (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

1. **Sustainability – 34 times, mostly meaning "not using too much material" (not environment related)**
2. **Environment – 10 times, one subdomain (G2) in Chemistry is on effects on environment and one (G4) is on environmental requirements for materials. In Geography is a subdomain (C2) about the global environmental issue and one (D2) on the use of natural resources and its link to natural disasters**
3. **System – 56 times, in Physics the subdomain (G1) Biophysics focuses on living systems and Biology has a subdomain (A12) on ecological thinking and the consequences of change on ecosystems and one (B8/C2/C3) on selfregulation of ecosystems and organisms. In subdomain D5 deals with food relations, food production and sustainability in ecosystems. Subdomain F3 focuses on biodiversity. Geography addresses in subdomain C1 the earth as natural system and in C3 the local effects**

If none of the above can be found, please provide insights on why:
Words are mainly mentioned within Chemistry, Biology, NLT, Geography. Remarkable: Physics and Social Studies (maatschappijleer) mention barely anything, if at all

Note: there is a separate description for HAVO and VWO topics/courses, but description is mostly the same, so search terms are representing both levels.

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

f. Fragmented/separate/isolated

g. Repeatedly but incoherent

h. Addressed in separate learning objectives

i. **Integrated in wider context/sections**

j. Key competence throughout curriculum

Please elaborate on your answer: **Here and there is a subdomain that gives opportunity to include food systems, but the specific topic is not explicitly addressed**

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)?

Not present

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements.

No mention of extracurricular activities at all

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

WP2 Curriculum Survey

please fill out one template per identified case

General comments:

Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

3. Which curricula did you find? Please give an overview specifying the following:

Name: **Regeling examenprogramma's voortgezet onderwijs - VMBO**

a. Level: X **national** ◯ regional ◯ city/school level

b. Learning system/education level (Please see attached schematic view of the school systems for your country)

   i. Please use attached chart to indicate the institutional setting of the curriculum. **VMBO-all levels**

   ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know

c. Please share the curricula with us (web page/link/attachment).

https://wetten.overheid.nl/BWBR0022061/2022-08-01#Bijlage2

Please comment on your choice:

This is the program for the final exams of the VMBO levels. There is a distinction of topics present in levels BB, KB or GL/TL

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

k. **Food – 4 times, 2 about food safety (profielvak groen, module green production, no levels?), 2 on food production and the influence of humans on their surroundings (biology, all levels)**

l. **Nutrition – 8 times, in profile healthcare & wellbeing, module man and health, module green, module between production and sales (about handling food products)**

m. **Agri(culture) – 2 time, in module on green production (only BB & KB) and in module vergroening stedelijke omgeving (only GL/TL)**

n. **Health – 27 times, in several topics: Physics/Chemistry (combined course for GL/TL, mainly on safety regulations), Biology (cell structures), Geometry (healthcare, GL/TL), History (healthcare development over time, GL/TL), PE (sports and health, GL/TL), module green production (health of animals, BB & KB), module zorg & welzijn (healthy lifestyle, healthcare), module mens & gezondheid (lifestyle, food), profile maritieme techniek (safety)**

o. **Related** (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

Sustainable/sustainability -27 times, mainly in context of materials/economical – environmental context: Service & Products (mentions People Planet Profit), profile Groen (kringloop – circular) > green production (related to food (production), Profile Horeca, Bakkerij & Recreatie (using materials – but here that's food)

If none of the above can be found, please provide insights on why:

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

k. **Fragmented/separate/isolated**

l. **Repeatedly but incoherent**

m. **Addressed in separate learning objectives**

n. **Integrated in wider context/sections**

o. **Key competence throughout curriculum**

Please elaborate on your answer: **Some courses/modules have strong focus on sustainability&food/food&healthy lifestyle/production&food but these are mostly electives and do not specifically combine sustainability and food production**

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)?

Only in module "Green" – this is an elective profile so not everyone will learn this

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements.

Nvt

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

Nvt

General comments:
Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

https://drive.google.com/file/d/1YwL-EgH-mRtxHO1-Oa2OsNZZqZUlPLdw/view?usp=share_link link to the document (PDF)

(I) Curricula identification

4. Which curricula did you find? Please give an overview specifying the following:
   Name: Adviesdocument Nieuwe Curriculum
   a. Level: X **national** ◯ regional ◯ city/school level
   b. Learning system/education level (Please see attached schematic view of the school systems for your country)
      i. Please use attached chart to indicate the institutional setting of the curriculum. **Primary, secondary level and special education**
      ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know **nvt**
   c. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:
This document is commissioned by the Ministry of Education. Developed by teachers and school leaders, to suggest a new curriculum.

(II) Coverage of target topics
Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

p. Food
q. Nutrition
r. Agri(culture)
s. Health
t. Related (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

If none of the above can be found, please provide insights on why:
(p. 18) 4 collective themes that are considered relevant for the future: Sustainabiity, Technology, Globalization and Health. These themes are elaborated in the learning areas (where it's fitting), always from their own professional perspective.

(p. 34) relevant expertise centres are involved into the development teams (of developing the curriculum), f.e. De Gezonde School

Besides these, there are no specific topics mentioned in the document;
- **Building blocks per theme/learning area contain principles & fundamental insights and essential knowledge and skills**
- **5 Learning areas: man and nature // man and society // art and culture // movement and sports // personal development**
- **No concrete mentions of integration into courses, mainly setup and approach**

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

- **p.** Fragmented/separate/isolated
- **q.** Repeatedly but incoherent
- **r.** Addressed in separate learning objectives
- **s.** **Integrated in wider context/sections**
- **t.** Key competence throughout curriculum

Please elaborate on your answer:

There are opportunities to integrate the topic into courses & lessons, but it is up to the individual to do this. The document does not say anything about the level of basic knowledge that needs to be transferred.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)?

No concrete ways of measuring in this document, but themes "sustainability" and "health" could be integrated into learning areas "mens en natuur", "mens en maatschappij", "bewegen en sport" and "persoonsvorming", athough it does not say how this should take shape

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements.

Not explicitly mentioned, however the involvement of experts from the field is encouraged

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

nvt

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

This document is not the official curriculum – it was a suggestion and (parts of it) are slowly integrated into the education system

A.4 Curricula surveys from Portugal

WP2 Curriculum Survey

please fill out one template per identified case

General comments:
Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

5. Which curricula did you find? Please give an overview specifying the following:
   Name: **Biology programme - last year of EQF3 (ISCED 344)**
   a. Level: ◯ **national** ◯ regional ◯ city/school level
   b. Learning system/education level (Please see attached schematic view of the school systems for your country)
      i. Please use attached chart to indicate the institutional setting of the curriculum.
      ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
   c. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:

The following link is to the curricula of Biology (last year of EQF3):
https://www.dge.mec.pt/sites/default/files/Secundario/Documentos/Documentos_Disciplinas_novo/Curso_Ciencias_e_Tecnologias/biologia_op_12.pdf

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

u. **Food**
v. **Nutrition**
w. **Agri(culture)**
x. **Health**
y. **Related** (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

If none of the above can be found, please provide insights on why:

The central theme of this programme is “Biology and the present challenges” and it is subdivided in three chapters: Reproduction and genetic heritage; Disease control and biotechnology; Natural resources and sustainability.
Therefore, sustainable development has a strong coverage in this programme, with students addressing sustainable use of natural resources, how to increase food production and improve nutrients preservation, consequences of human activities on the planet and ways to preserve the environment.

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

u. **Fragmented/separate/isolated**
v. **Repeatedly but incoherent**
w. **Addressed in separate learning objectives**
x. **Integrated in wider context/sections**
y. **Key competence throughout curriculum**

Please elaborate on your answer: …

Option D is the most suitable as sustainability and natural resources is the focus of one section (out of three) in the curricula. It addresses ways to increase food reserves and alternative methods to pesticides. It also addresses sustainable measures to adopt considering human population growth and environmental degradation.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)?

There are concrete learning objectives (for example, evaluate advantages and disadvantages associated with hormones in the development of plants and animals) but is not mentioned ways for these to be measured.

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements.

It is suggested that students organize activities, such as workshops and expositions, so that they have occasions to discuss and justify opinions and where they can share their learnings with the local community.

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

N/A

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

https://ciencias.ulisboa.pt/pt/noticia/26-07-2022/aprender-com-as-maos-na-massa
"Young researchers" is a school project that allows students to establish a close relation with researchers and university teachers in the areas of Biology and Chemistry. One of the topics chosen in 2022 was food additives.

https://ecoescolas.abae.pt/
"Eco-schools" is a program that aims to encourage actions and acknowledge quality work developed by schools in the scope of Environmental Education for Sustainability. It has a strong participation of Portuguese schools.

WP2 Curriculum Survey

please fill out one template per identified case

General comments:

Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

6. Which curricula did you find? Please give an overview specifying the following:
   Name: **Essential learnings – Biology and Geology (first year of EQF3)**
   a. Level: ◯ **national** ◯ regional ◯ city/school level
   b. Learning system/education level (Please see attached schematic view of the school systems for your country)
      i. Please use attached chart to indicate the institutional setting of the curriculum.
      ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
   c. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:

Link to the curriculum:
http://www.dge.mec.pt/sites/default/files/Curriculo/Aprendizagens_Essenciais/10_biologia_e_geologia.pdf

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

z. **Food**

aa. **Nutrition**
bb. **Agri(culture)**
cc. **Health**
dd. **Related** (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

If none of the above can be found, please provide insights on why:

The themes addressed in this programme are geology, the geosphere, biodiversity, and the processes involved in collecting and distributing matter by living beings.
In this way, food, sustainability and related themes are not addressed in this curriculum. Even biodiversity is addressed in relation to biological hierarchy, cells and biomolecules.

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

z. **Fragmented/separate/isolated**
aa. **Repeatedly but incoherent**
bb. **Addressed in separate learning objectives**
cc. **Integrated in wider context/sections**
dd. **Key competence throughout curriculum**

Please elaborate on your answer: …

Sustainable and healthy food systems are not addressed in this curriculum.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)?

No.

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements.

No.

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

N/A

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

N/A

WP2 Curriculum Survey

please fill out one template per identified case

General comments:

Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

7. Which curricula did you find? Please give an overview specifying the following:
   Name: **Essential learnings – Biology and Geology (second year of EQF3)**
   a. Level: ◯ **national** ◯ regional ◯ city/school level
   b. Learning system/education level (Please see attached schematic view of the school systems for your country)
      i. Please use attached chart to indicate the institutional setting of the curriculum.
      ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
   c. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:

Link to the curriculum:
http://www.dge.mec.pt/sites/default/files/Curriculo/Aprendizagens_Essenciais/11_biologia_e_geologia.pdf

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

ee. Food
ff. Nutrition
gg. Agri(culture)
hh. Health
ii. Related (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

If none of the above can be found, please provide insights on why:

The themes addressed in this programme are cells, reproduction, biological evolution, systematics and geology.
In this way, food, sustainability and related themes are not addressed in this curriculum.

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

- **ee. Fragmented/separate/isolated**
- **ff. Repeatedly but incoherent**
- **gg. Addressed in separate learning objectives**
- **hh. Integrated in wider context/sections**
- **ii. Key competence throughout curriculum**

Please elaborate on your answer: …

Sustainable and healthy food systems are not addressed in this curriculum.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)?

No.

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements.

No.

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

N/A

(VII) Additional comments
Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

N/A

WP2 Curriculum Survey

please fill out one template per identified case

General comments:
Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

8. Which curricula did you find? Please give an overview specifying the following:
   Name: **Essential learnings – Natural Science (Basic education – First year of EQF 2)**
   a. Level: ◯ **national** ◯ regional ◯ city/school level
   b. Learning system/education level (Please see attached schematic view of the school systems for your country)
      i. Please use attached chart to indicate the institutional setting of the curriculum.
      ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
   c. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:

Link to the curricula:
http://www.dge.mec.pt/sites/default/files/Curriculo/Aprendizagens_Essenciais/3_ciclo/ciencias_naturais_3c_7a_ff.pdf

(II) Coverage of target topics
Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

jj. Food
kk. Nutrition
ll. Agri(culture)
mm. Health
nn. Related (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

If none of the above can be found, please provide insights on why:

The focus of this programme is “Earth on transformation” and students gain a global vision of planet Earth, approaching geological dynamics in a multidimensional perspective. Sustainability is briefly mentioned regarding life on earth, some diseases and geological environment, but not related to food.

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

- **jj. Fragmented/separate/isolated**
- **kk. Repeatedly but incoherent**
- **ll. Addressed in separate learning objectives**
- **mm. Integrated in wider context/sections**
- **nn. Key competence throughout curriculum**

Please elaborate on your answer: …

The entire curricular year is dedicated to geology (rock formation, plate tectonic theory, volcanic activity) so there is no mention on sustainable and healthy food systems.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)?

No.

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements.

No.

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

N/A

(VII) Additional comments
Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

N/A

WP2 Curriculum Survey

please fill out one template per identified case

General comments:
Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

9. Which curricula did you find? Please give an overview specifying the following:
   Name: Essential learnings – Natural Science (2nd cycle, year 1)
   a. Level: ◯ **national** ◯ regional ◯ city/school level
   b. Learning system/education level (Please see attached schematic view of the school systems for your country)
      i. Please use attached chart to indicate the institutional setting of the curriculum.
      ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
   c. Please share the curricula with us (web page/link/attachment).

   Please comment on your choice:

Link to the curricula:
https://www.dge.mec.pt/sites/default/files/Curriculo/Aprendizagens_Essenciais/2_ciclo/5_ciencias_naturais.pdf

(II) Coverage of target topics
Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

oo. Food
pp. Nutrition
qq. Agri(culture)
rr. Health
ss. Related (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

If none of the above can be found, please provide insights on why:

This programme approaches the characteristics and dynamics of planet earth, including biodiversity and human health. It does not include topics on nutrition or agriculture.

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

- **oo. Fragmented/separate/isolated**
- **pp. Repeatedly but incoherent**
- **qq. Addressed in separate learning objectives**
- **rr. Integrated in wider context/sections**
- **ss. Key competence throughout curriculum**

Please elaborate on your answer: …

Option **a.** is the most suitable. The reference to sustainable and healthy food systems only occurs in one chapter (that approaches the importance of water to human health and sustainable management of water exploitation).

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)?

No.

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements.

No.

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

N/A

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

N/A

WP2 Curriculum Survey

please fill out one template per identified case

General comments:
Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

10. Which curricula did you find? Please give an overview specifying the following:
    Name: **Essential learnings – Natural Sciences (2nd cycle, year 2)**
    a. Level: ◯ **national** ◯ regional ◯ city/school level
    b. Learning system/education level (Please see attached schematic view of the school systems for your country)
        i. Please use attached chart to indicate the institutional setting of the curriculum.
        ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
    c. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:

Link to the curricula:
http://www.dge.mec.pt/sites/default/files/Curriculo/Aprendizagens_Essenciais/2_ciclo/6_ciencias_naturais.pdf

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

tt. Food
uu. Nutrition
vv. Agri(culture)
ww. Health
xx. Related (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

If none of the above can be found, please provide insights on why:

This programme is divided in two chapters: life processes common to living beings; aggressions and integrity of the human body. Food, nutrition and human health are approached in the first chapter.

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

tt. Fragmented/separate/isolated
uu. Repeatedly but incoherent
vv. Addressed in separate learning objectives

ww. **Integrated in wider context/sections**

xx. **Key competence throughout curriculum**

Please elaborate on your answer: …

Option D is the most suitable as healthy food and nutrition are a considerable part of the first chapter. Students gain insight into the function of nutrients in the human body and on the composition of balanced menus. They interpret food labels and analyse advantages and disadvantages regarding food additives. The importance of science and technology in the evolution of food is also approached.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)?

There are concrete learning objectives (for example, elaborate some balanced menus and discuss risks and benefits of the ingredients to human health) but is not mentioned ways for these to be measured.

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements.

No, although it is suggested to implement field trips in a broader way (not specifically on any subject).

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

N/A

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

N/A

WP2 Curriculum Survey

please fill out one template per identified case

General comments:

Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

11. Which curricula did you find? Please give an overview specifying the following:

Name **Essential learnings – Natural Science (Basic education – Second year of EQF 2)**

a. Level: ◯ **national** ◯ regional ◯ city/school level

b. Learning system/education level (Please see attached schematic view of the school systems for your country)
   i. Please use attached chart to indicate the institutional setting of the curriculum.
   ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
c. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:

Link to the curriculum:
http://www.dge.mec.pt/sites/default/files/Curriculo/Aprendizagens_Essenciais/3_ciclo/ciencias_naturais_3c_8a_ff.pdf

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

yy. Food
zz. Nutrition
aaa. Agri(culture)
bbb. Health
ccc. Related (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

If none of the above can be found, please provide insights on why:

The central theme of this programme is "Earth, a planet with life" and, among other themes, is addressed the recognition of the importance of scientific knowledge in promoting the sustainability of the planet Earth.
In this way, the themes of food, nutrition and agriculture are not addressed but sustainable development is, linked to "Discuss the impacts of the exploitation/transformation of natural resources and propose measures to reduce them and promoting its sustainability".

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

yy. Fragmented/separate/isolated
zz. Repeatedly but incoherent
aaa. Addressed in separate learning objectives
bbb. Integrated in wider context/sections
ccc. Key competence throughout curriculum

Please elaborate on your answer: …

Sustainable and healthy food systems are not addressed in this curriculum.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)?

No.

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements.

No.

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

N/A

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

N/A

WP2 Curriculum Survey

please fill out one template per identified case

General comments:

Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

12. Which curricula did you find? Please give an overview specifying the following:
    Name: **Essential learnings – Natural Science (Basic education – Third year of EQF 2)**
    a. Level: ◯ **national** ◯ regional ◯ city/school level
    b. Learning system/education level (Please see attached schematic view of the school systems for your country)
        i. Please use attached chart to indicate the institutional setting of the curriculum.
        ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
    c. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:

Link to the curriculum:
http://www.dge.mec.pt/sites/default/files/Curriculo/Aprendizagens_Essenciais/3_ciclo/ciencias_naturais_3c_9a_ff.pdf

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

ddd. Food
eee. Nutrition
fff. Agri(culture)
ggg. Health
hhh. Related (pick most relevant, e.g. sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own)

If none of the above can be found, please provide insights on why:

The central theme of this programme is "Live better on Earth" and includes the goal of helping students to "understand different aspects of individual and community health".
Although this curriculum is mainly focused on exploring the human body and the causes and consequences of heath unbalances, there is a section about "Relate healthy eating to the prevention of contemporary diseases, recognizing the importance of the Mediterranean diet in health promotion".

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

ddd. Fragmented/separate/isolated
eee. Repeatedly but incoherent
fff. Addressed in separate learning objectives
ggg. Integrated in wider context/sections
hhh. Key competence throughout curriculum

Please elaborate on your answer: …

Option A is the most suitable as there is only one section addressing the Mediterranean diet and the importance of healthy eating habits, among the general theme of the human body.

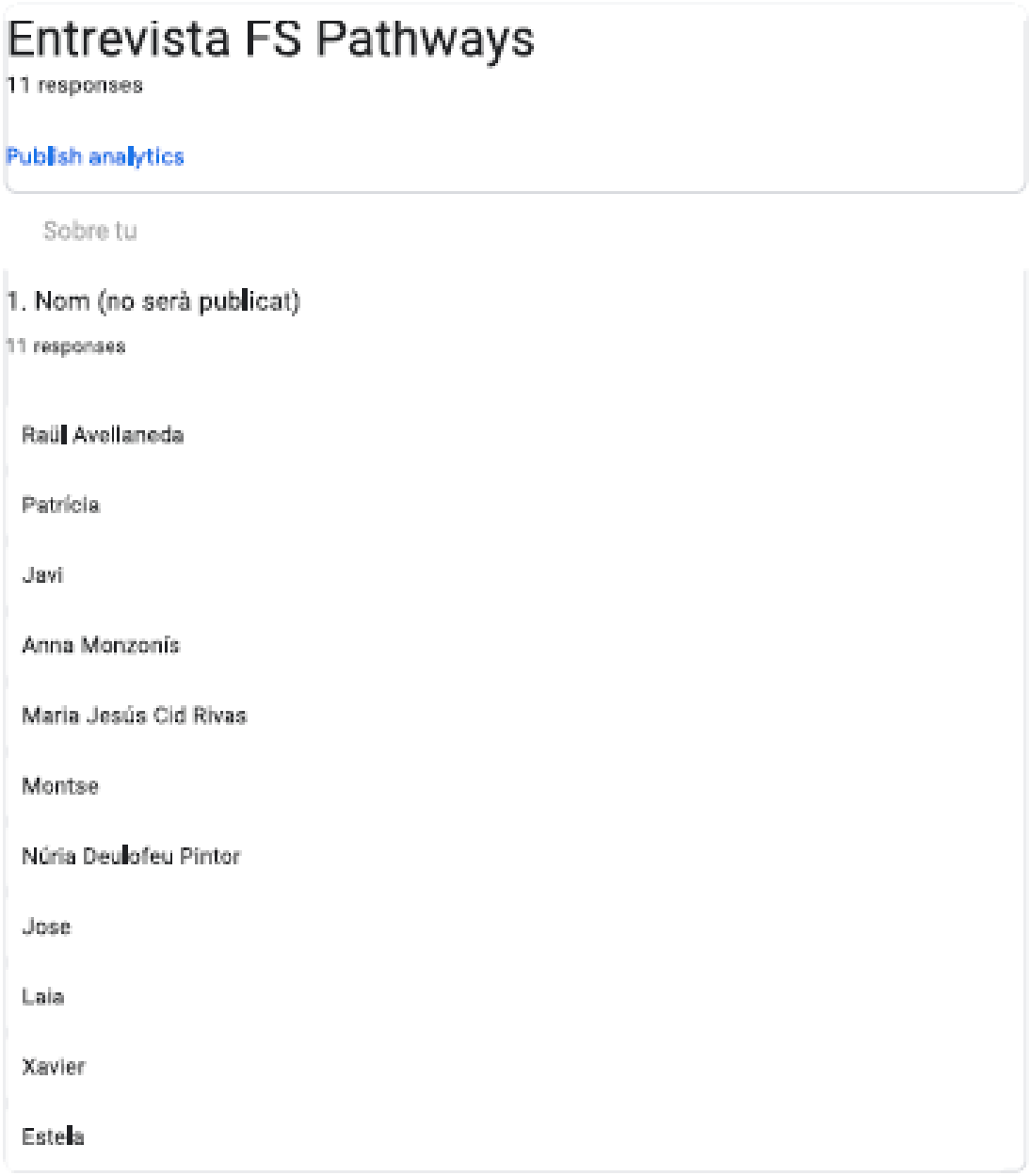
(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g. by testing or handouts during lessons)?

There is a concrete learning objective – relate healthy eating habits with disease prevention - but is not mentioned ways for these to be measured.

(V) Extra-curricular dimension Is there any mentioning of extracurricular focus on Food & Sustainability (e.g. field trips, excursions)? Also consider nonformal and informal communications and statements. No.
(VI) Practical examples If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here: N/A
(VII) Additional comments Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles: N/A

A.5 Curriculum survey from Spain



Entrevista FS Pathways

11 responses

Publish analytics

Sobre tu

1. Nom (no serà publicat)

11 responses

Raül Avellaneda

Patrícia

Javi

Anna Monzonís

Maria Jesús Cid Rivas

Montse

Núria Deulofeu Pintor

Jose

Laia

Xavier

Estela

5/4/23, 14:06 Entrevista F8 Pathways

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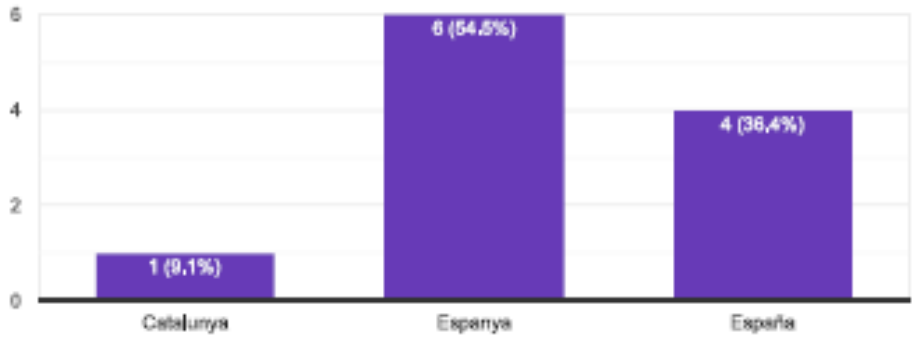
2. País d'ocupació

11 responses



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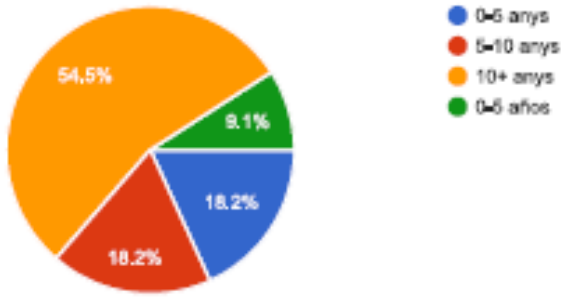
3. Anys d'experiència en aquesta àrea:

11 responses



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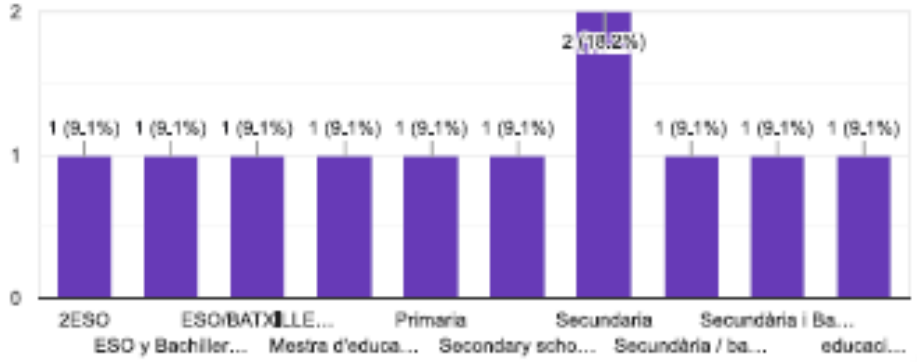
4. En cas que participi en l'educació dels estudiants, especifiqui:

a. Tipus/nivell d'educació

11 responses



b. Grup d'edat dels estudiants

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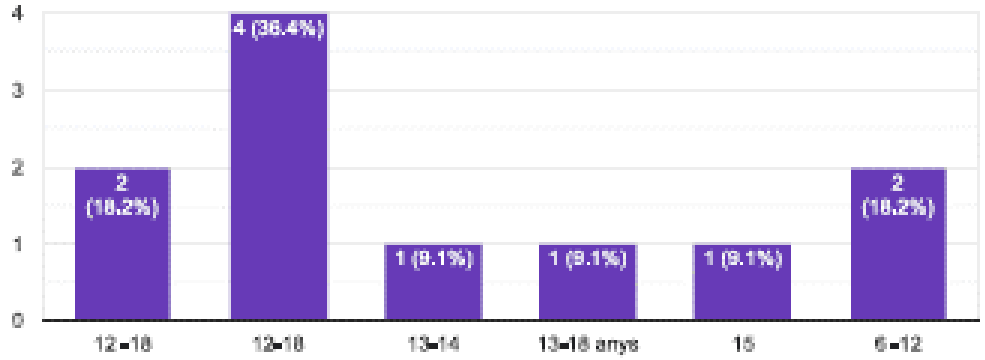
11 responses



C. Camp d'experiència

11 responses

Matemàticas y tecnología

Biologia i Geologia

Ciències socials

English language | Science

CIÈNCIES, TECNOLOGIA, MATEMÀTIQUES

professora llengües

Llicenciada Educació física

Biologia

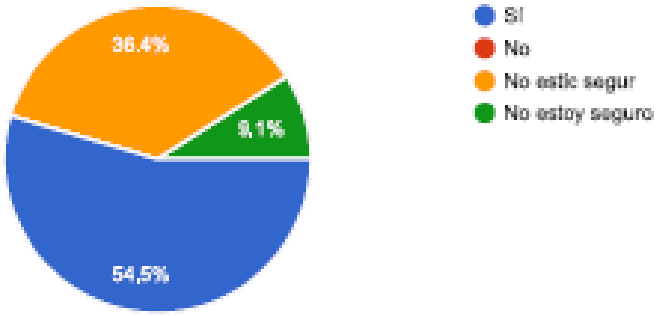
Ciencias Sociales

Matematicas

Ciencia, tecnología y matematicas

Està familiaritzat amb el terme "Sistemes alimentaris sostenibles"? Copy

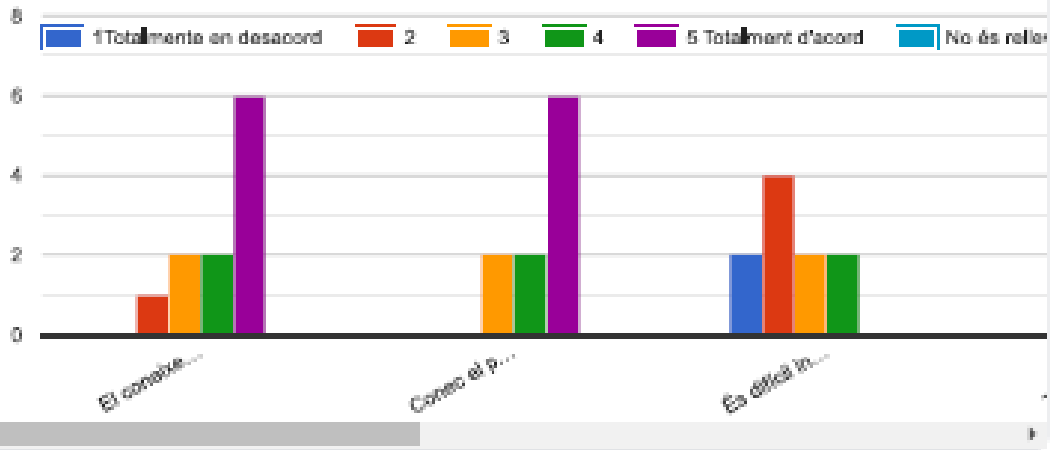
11 responses



Educació sobre el tema de Sistemes Alimentaris Sostenibles (SAS)

Les següents preguntes li preguntaran sobre l'educació sobre el tema dels sistemes alimentaris sostenibles. Abans de respondre a aquestes preguntes, consulti a continuació la definició de Sistemes alimentaris sostenibles (SFS):

5. Indiqui si les següents afirmacions s'apliquen a vostè (en una escala de 1 a 5, amb 1 totalment en desacord): Copy



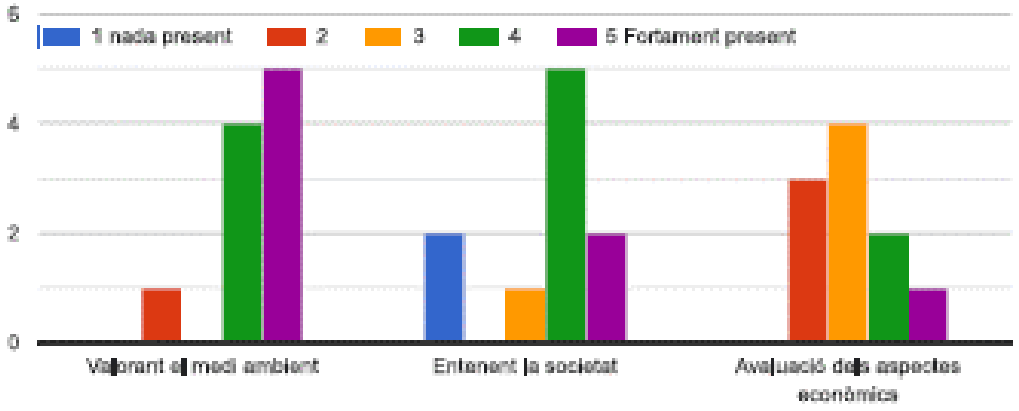
Si té declaracions addicionals que són rellevants per a vostè respecte a l'educació sobre SAS, senti's lliure de compartir-les aquí:

0 responses

No responses yet for this question.

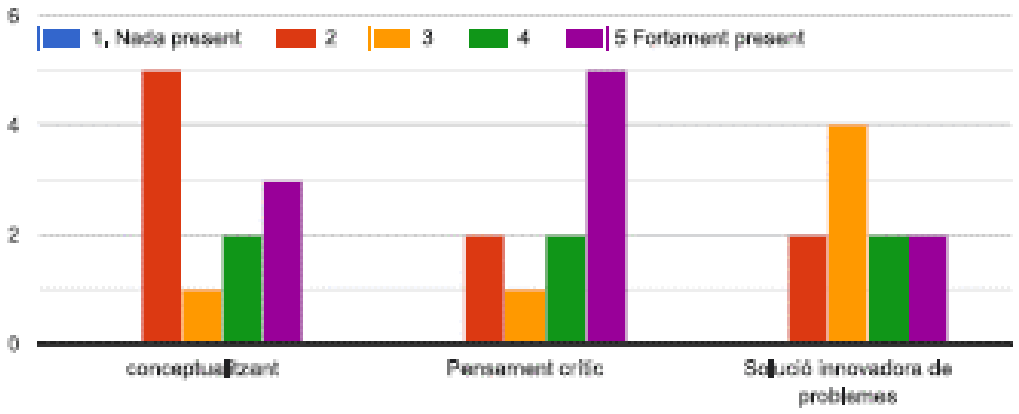
Indiqui en quina mesura aquestes competències estan representades en el seu treball (en una escala de l'1 al 5, on 1 no és present en absolut)

Copy



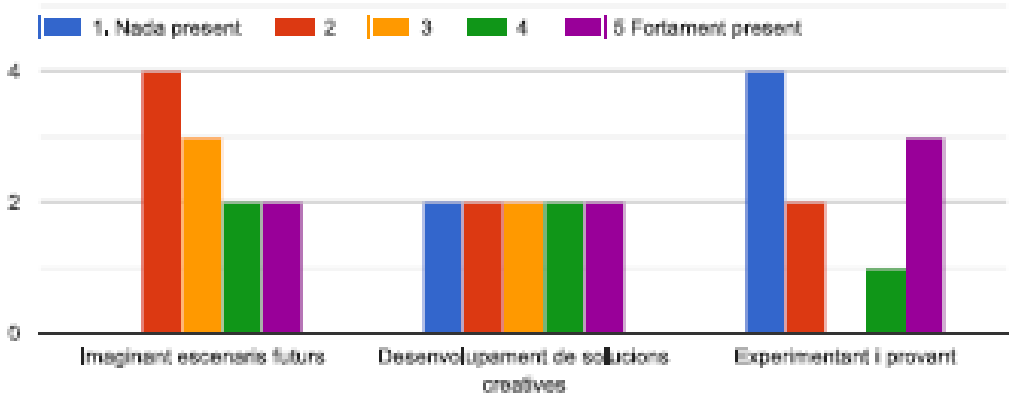
Indiqui en quina mesura aquestes competències estan **representades** en el seu treball (en una escala de l'1 al 5, on 1 no és present en absolut)

Copy



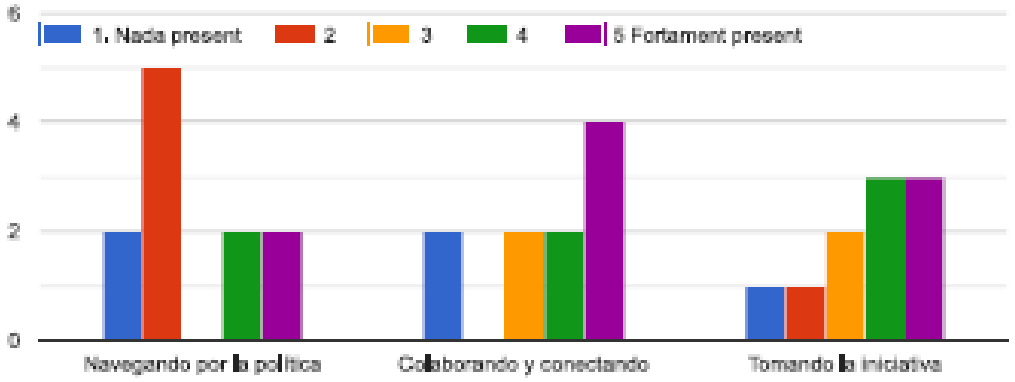
Indiqui en quina mesura aquestes competències estan **representades** en el seu treball (en una escala de l'1 al 5, on 1 no és present en absolut)

Copy



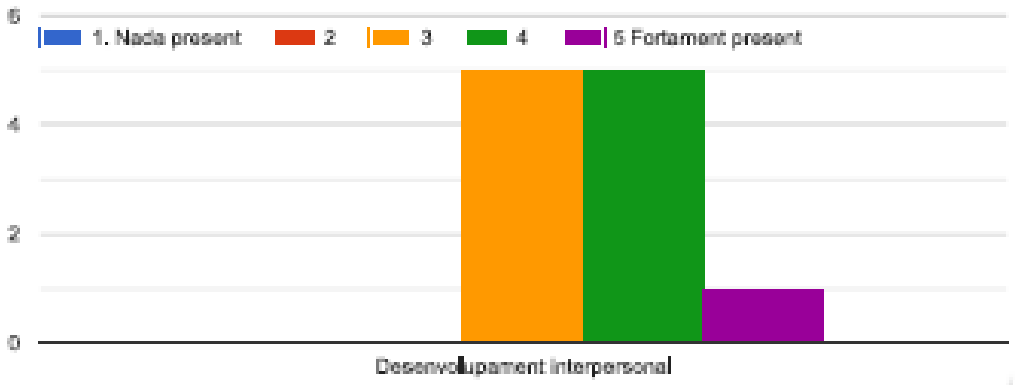
Indiqui en quina mesura aquestes competències estan **representades** en el seu treball (en una escala de l'1 al 5, on 1 no és present en absolut)

Copy



Indiqui en quina mesura aquestes competències estan **representades** en el seu treball (en una escala de l'1 al 5, on 1 no és present en absolut)

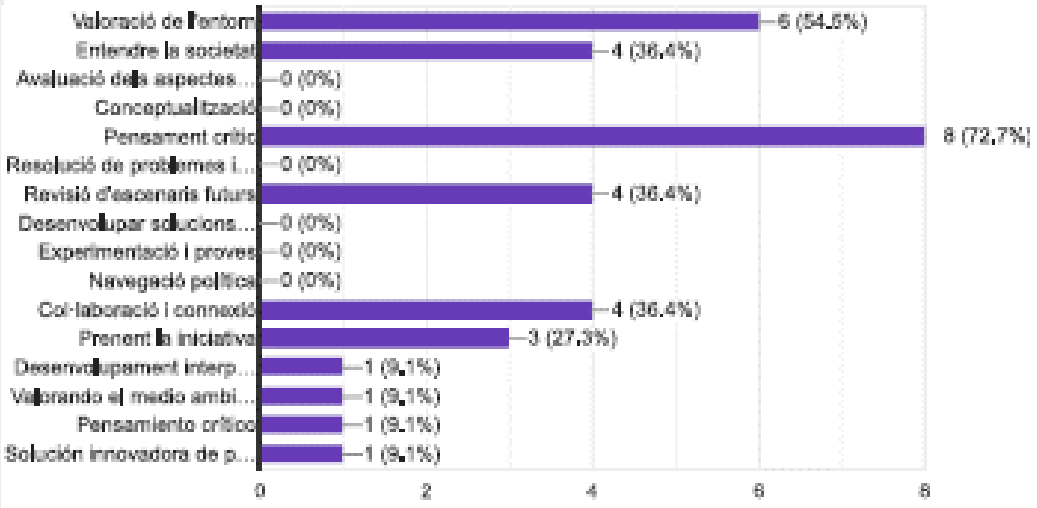
Copy



7. Trieu les 3 competències de la llista anterior que considereu **més importants** per educar els estudiants sobre els sistemes d'aliments sostenibles:

Copy

11 responses



Expliqui les seves opcions:

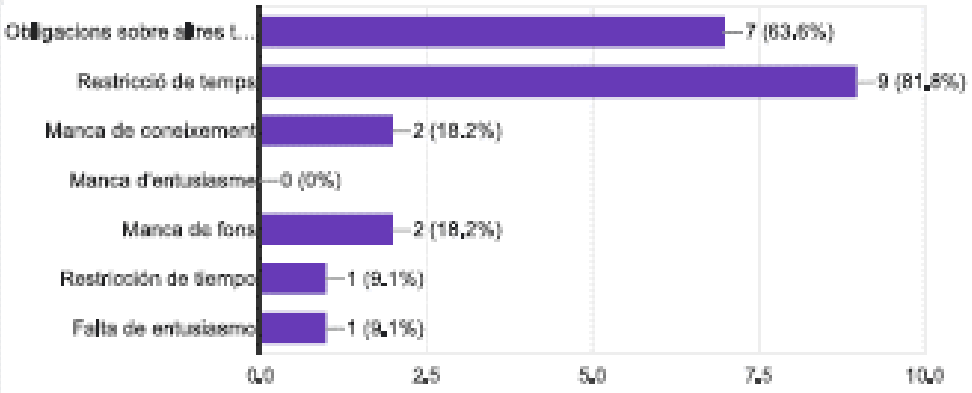
1 response

Es difícil escoger los ámbitos, pero hay que tener consciencia de lo que nos rodea para poder crear soluciones

8. Experimenta alguna barrera que dificulti (més) la integració de SAS en aquestes competències en el seu treball? Trii tots els que corresponguin.

Copy

11 responses



Si us plau, detalli les seves barreres selecciona:

2 responses

Temps escàs per treballar SAS interdisciplinàriament i temps escàs per treballar-ho com cal dins la pròpia matèria. Afegiria també, grups molt nombrosos (30) que sovint fan que dediquem més temps a la gestió d'aula que no pas a les diferents matèries

Disposo de poques hores lectives per tractar el tema de SAS

10. Nom els factors més importants que estan causant aquestes barreres (màxim de 3):

11 responses

Motivación, múltiples prioridades, tiempo

Horaris, ràtios en grups

Cultura de claustre seccionat per àmbits, manca de coneixement, altres prioritats obligatòries en l'àmbit de la formació

Necessitat de seguir el currículum

Restricció de temps i també de recursos econòmics

falta de temps dins la programació

El currículum i el temps dedicat: 1h setmanal

Manca de coneixement

lack of time

Falta de tiempo

Falta flexibilidad en el curriculum

11. Pots pensar en formes/coses que eliminarien/alleugeririen les barreres que estàs experimentant? Si us plau expliqui.

11 responses

Mayor número de profesionales e incentivos

Modificació de rang horari, treball amb grups menys nombrosos

Canvi de cultura docent, què entenem per educació?

Incorporar SAS a l'hora de treballar Hàbits Saludables

Disposar de més temps per coordinar els projectes relacionats amb el tema de SAS en totes les etapes educatives de la nostra escola

treballar més per projectes interdisciplinaris

Interdisciplinari

provide specialized training to teachers

Dar mayor prioridad al desarrollo de habilidades relacionadas con los hábitos

Mas personal

Integrar el conocimiento del sistema alimentario en el curriculum

12. Vol agregar alguna cosa que consideri rellevant per al tema?

2 responses

L'alumnat ha de tenir més connexió amb el barri/ciutat

gràcies

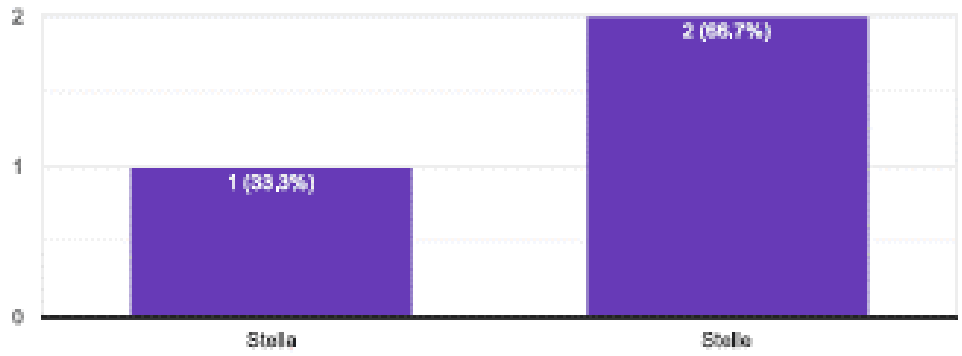
Entrevista FS Pathways

Sobre tu

1. Nom (no serà publicat)

Copy

3 responses



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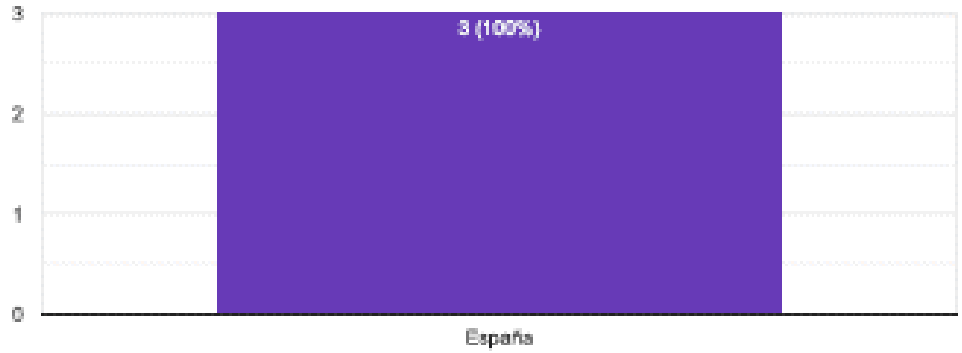
2. País d'ocupació

3 responses



3. Anys d'experiència en aquesta àrea:

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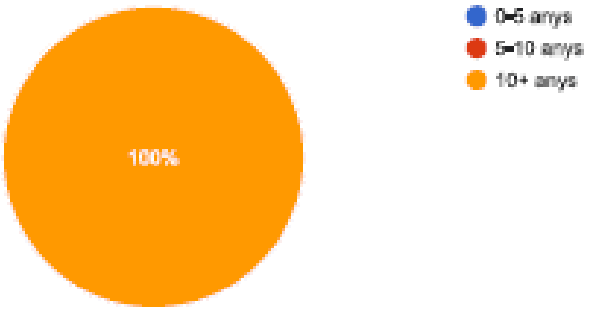
3 responses

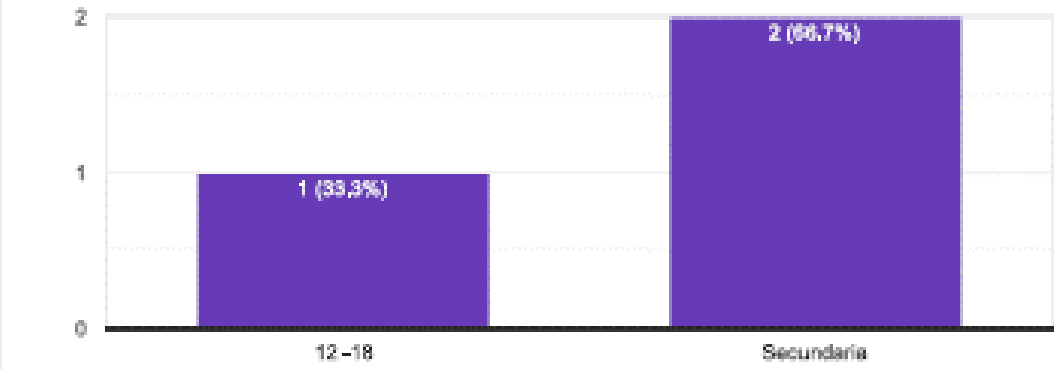


4. En cas que participi en l'educació dels estudiants, especifiqui:

Copy

a. Tipus/nivell d'educació

3 responses



b. Grup d'edat dels estudiants

3 responses

Secundaria

12-18

12 -18

C. Camp d'experiència

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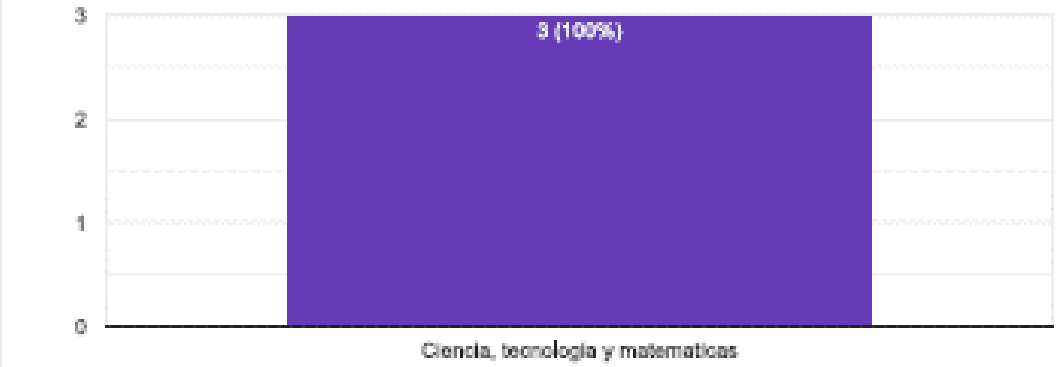
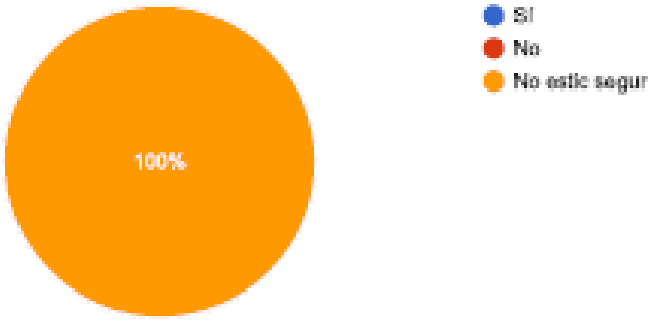
3 responses



Està familiaritzat amb el terme "Sistemes alimentaris sostenibles"?

Copy

3 responses

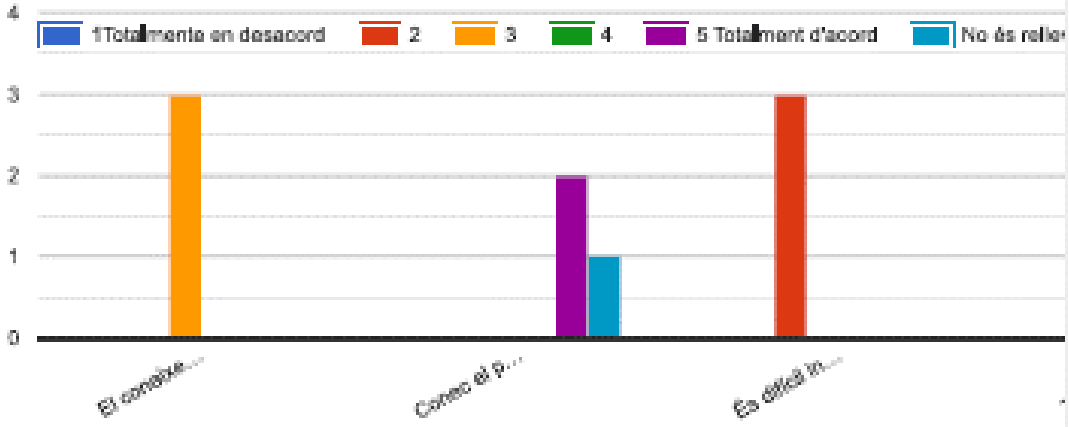


Educació sobre el tema de Sistemes Alimentaris Sostenibles (SAS)

Les següents preguntes li preguntaran sobre l'educació sobre el tema dels sistemes alimentaris sostenibles. Abans de respondre a aquestes preguntes, consulti a continuació la definició de Sistemes alimentaris sostenibles (SFS):

5. Indiqui si les següents afirmacions s'apliquen a vostè (en una escala de 1 a 5, amb 1 totalment en desacord):

Copy



Si té declaracions addicionals que són rellevants per a vostè respecte a l'educació sobre SAS, senti's lliure de compartir-les aquí:

0 responses

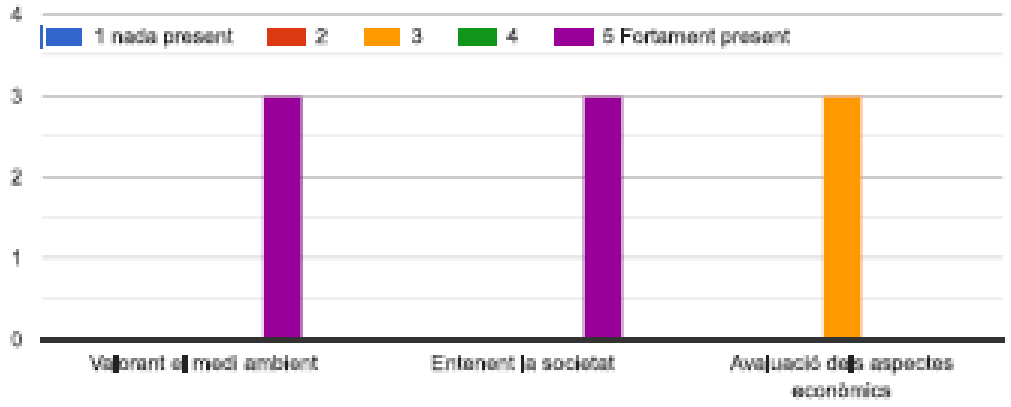
No responses yet for this question.

Competències sostenibles

A continuació, trobarà una llista de 13 competències sostenibles (separades en 5 categories), recuperades de múltiples fonts (consulti les fonts a continuació). Per a cada competència també pot trobar un exemple pràctic.

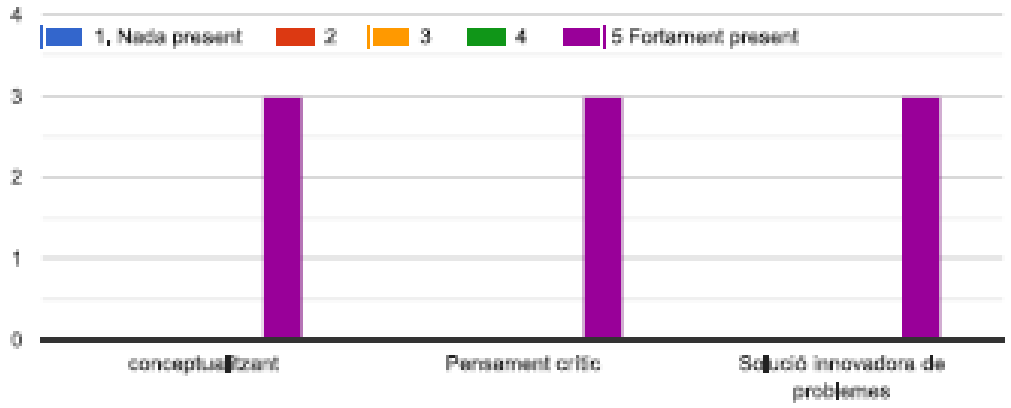
Indiqui en quina mesura aquestes competències estan representades en el seu treball (en una escala de l'1 al 5, on 1 no és present en absolut)

Copy



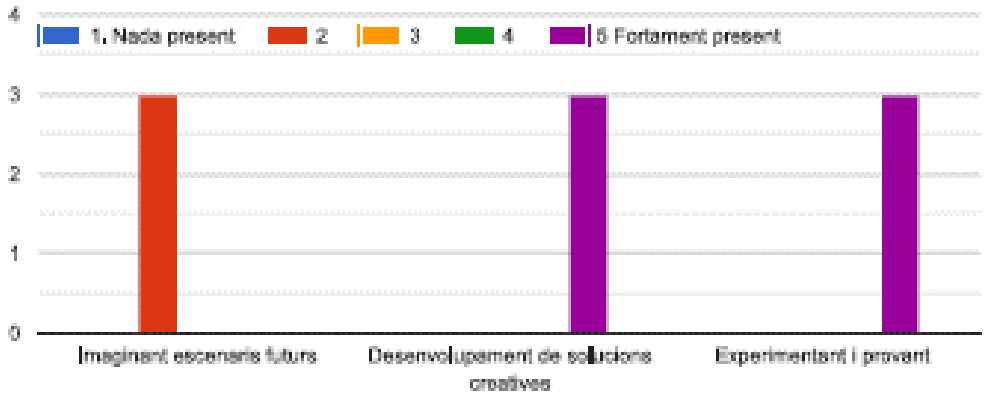
Indiqui en quina mesura aquestes competències estan **representades** en el seu treball (en una escala de l'1 al 5, on 1 no és present en absolut)

Copy



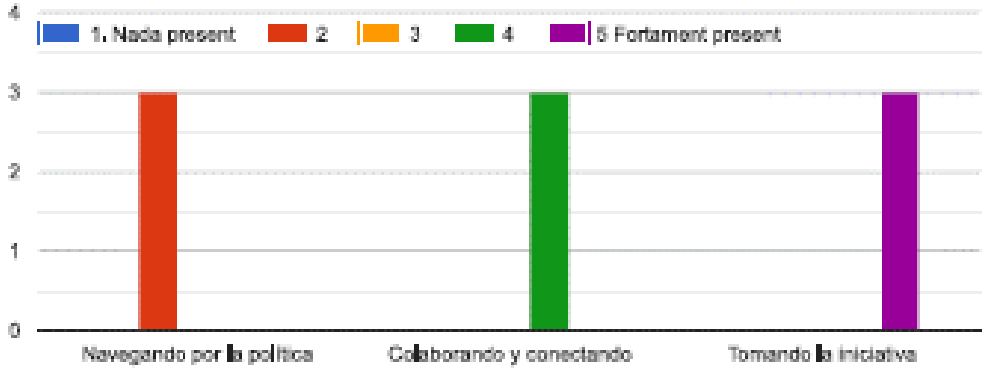
Indiqui en quina mesura aquestes competències estan **representades** en el seu treball (en una escala de l'1 al 5, on 1 no és present en absolut)

Copy



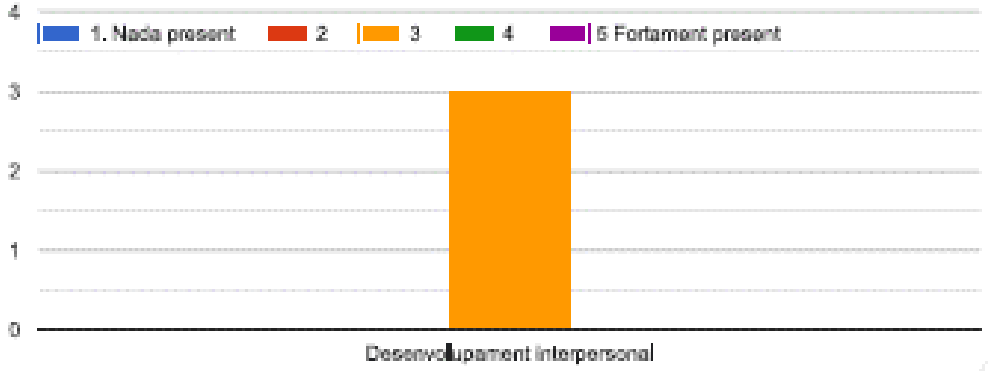
Indiqui en quina mesura aquestes competències estan **representades** en el seu treball (en una escala de l'1 al 5, on 1 no és present en absolut)

Copy



Indiqui en quina mesura aquestes competències estan **representades** en el seu treball (en una escala de l'1 al 5, on 1 no és present en absolut)

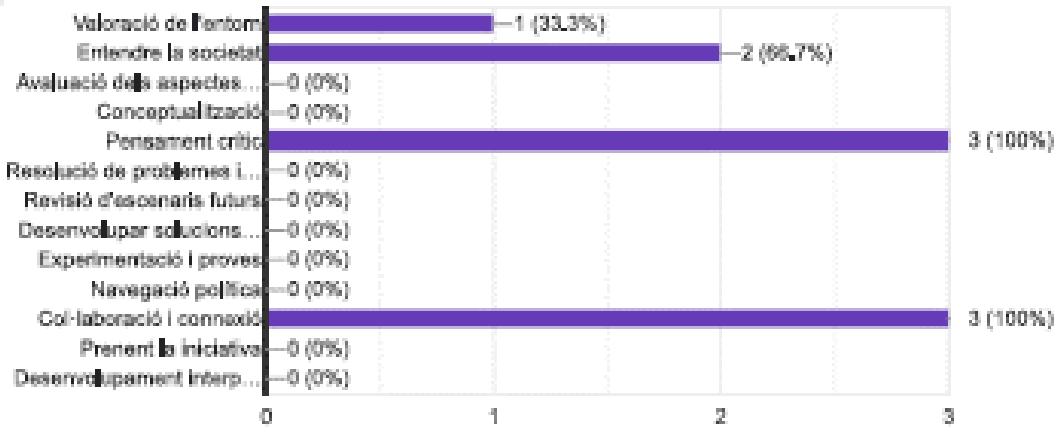
Copy



7. Trieu les 3 competències de la llista anterior que considereu **més importants** per educar els estudiants sobre els sistemes d'aliments sostenibles:

Copy

3 responses



Expliqui les seves opcions:

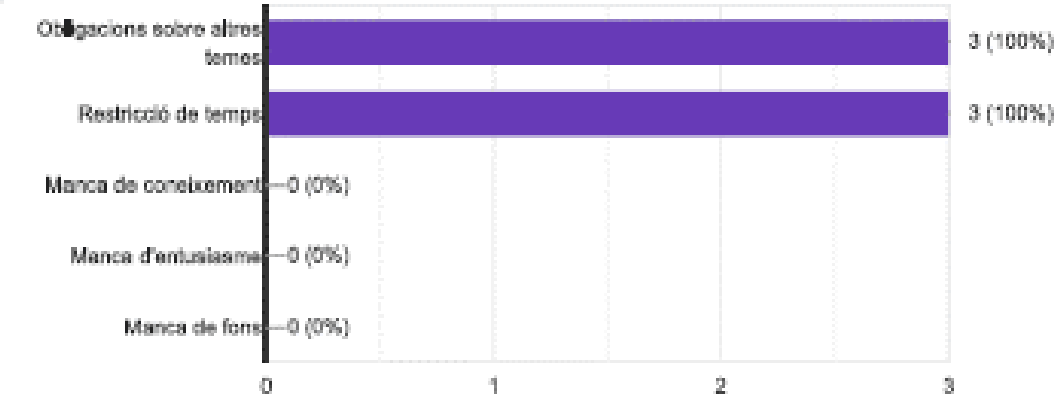
0 responses

No responses yet for this question.

8. Experimenta alguna barrera que dificulti (més) la integració de SAS en aquestes competències en el seu treball? Trii tots els que corresponguin.

Copy

3 responses



Si us plau, detall les seves barreres selecciona:

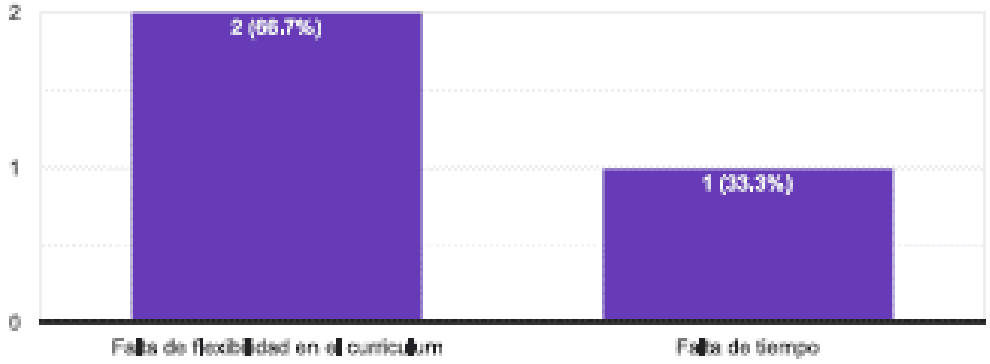
0 responses

No responses yet for this question.

10. Nom els factors més importants que estan causant aquestes barreres (màxim de 3):

Copy

3 responses



11. Pots pensar en formes/coses que eliminarien/alleugeririen les barreres que estàs experimentant? Si us plau expliqui.

3 responses

integrate food system knowledge more deeply into the curriculum

Integrar el sistema alimentario mas profundamente en el sistema educativo

Integrar el conocimiento sobre el sistema alimentario en el curriculum

12. Vol agregar alguna cosa que consideri rellevant per al tema?

0 responses

No responses yet for this question.

Fi de l'entrevista

Si us plau, deixi les seves dades de contacte a continuació si desitja que ens comuniquem amb vostè novament:

0 responses

No responses yet for this question.

T'agradaria rebre un resum del projecte? Si us plau, deixi la seva adreça de correu electrònic aquí

0 responses

No responses yet for this question.

Finalitzar

Li agraïm novament pel seu temps. Si té alguna pregunta sobre el projecte, no dubti a contactar-nos responent a la persona de qui va rebre aquest enllaç.

Si us plau, no oblidi fer clic en el botó Enviar.

A.6 Curricula surveys from Sweden

WP2 Curriculum Survey

please fill out one template per identified case

General comments:
Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

13. Which curricula did you find? Please give an overview specifying the following:
    Name: **Biology, year 7-9**
    Level: ◯ **national** ◯ regional ◯ city/school level
    a. Learning system/education level (Please see attached schematic view of the school systems for your country)
        i. Please use attached chart to indicate the institutional setting of the curriculum. **EQF2**
        ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
    b. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:

https://www.skolverket.se/undervisning/grundskolan/laroplan-och-kursplaner-for-grundskolan/laroplan-lgr22-for-grundskolan-samt-for-forskoleklassen-och-fritidshemmet?url=-996270488%2Fcompulsorycw%2Fjsp%2Fsubject.htm%3FsubjectCode%3DGRGRBIO01%26tos%3Dgr&sv.url=12.5dfee44715d35a5cdfa219f

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

iii. Food - none
jjj. Nutrition - none
kkk. Agri(culture) - none
lll. Health – see below
mmm. Related (pick most relevant, e.g., sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own) – **See below**

If none of the above can be found, please provide insights on why:

General:
Natural science has its origins in man's curiosity and need to know more about himself and his surroundings. Knowledge in biology is of great importance for the development of society in areas as diverse as nature management, the environment and health. With knowledge about nature and man, people get tools to influence their own **well-being**, but also to be able to promote **sustainable development.**

Through teaching, students must be given opportunities to use knowledge of biology to formulate their own and review others' arguments. In doing so, students must develop their ability to communicate and handle practical and ethical choice situations in matters relating to the **environment and health**. The students must also be given the conditions to search for answers to subject-specific questions using different types of sources. In this way, the teaching should contribute to the students developing critical thinking and confidence in their ability to handle issues related to natural science that are important to themselves and society.

Learning objectives

- Ability to use biology to review information, communicate and take a position on issues related to the **environment** and **health.**

Main content:

- Human impact on nature locally and globally, and how to promote **sustainable development** on an individual and **societal level**. The importance of biodiversity and ecosystem services.

- How **mental** and **physical healt**h is affected by living conditions, diet, sleep, exercise, stress, and addictive substances and how **health** problems can be limited at individual and societal level.

- Information search, critical review and use of information related to biology. Argumentation and positions on current issues relating to the **environment** and **health**.

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

iii. Fragmented/separate/isolated
jjj. Repeatedly but incoherent
kkk. Addressed in separate learning objectives
lll. Integrated in wider context/sections
mmm. Key competence throughout curriculum

Please elaborate on your answer: …

C. Human impact on the environment on promotion of sustainable development is addressed as a separate learning objective/main content to be addressed. Food systems are not specifically mentioned but can be addressed as part of this.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g., by testing or handouts during lessons)?

The most suiting one:

- Ability to use biology to review information, communicate and take a position on issues related to the **environment** and **health.**

No information on how this should be measured.

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g., field trips, excursions)? Also consider nonformal and informal communications and statements.

- Field studies and experiments with both analogue and digital tools. Formulation of researchable questions, planning, execution, evaluation of results and documentation with pictures, tables, diagrams, and reports.

This is from the curriculum and should be included as part of the education, but there are no specific requirements regarding what these field studies/experiments should include except what is mentioned above. This could be used as an opportunity for a project with focus on sustainability/food etc.

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

N/A

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

N/A

WP2 Curriculum Survey

please fill out one template per identified case

General comments:

Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

14. Which curricula did you find? Please give an overview specifying the following:
    Name: Biology 1
    Level: ◯ **national** ◯ regional ◯ city/school level
    a. Learning system/education level (Please see attached schematic view of the school systems for your country)
        i. Please use attached chart to indicate the institutional setting of the curriculum. **EQF4** HE preparatory programmes 3 years
        ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
    b. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:

https://www.skolverket.se/undervisning/gymnasieskolan/laroplan-program-och-amnen-i-gymnasieskolan/gymnasieprogrammen/amne?url=-996270488%2Fsyllabuscw%2Fjsp%2Fsubject.htm%3FsubjectCode%3DBIO%26courseCode%3DBIOBIO01%26version%3D2%26tos%3Dgy&sv.url=12.5dfee44715d35a5cdfa92a3#anchor_BIOBIO01

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

nnn. **Food -** none
ooo. **Nutrition -** none
ppp. **Agri(culture) -** none
qqq. **Health – see below**
rrr. **Related** (pick most relevant, e.g., sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own) – **See below**

If none of the above can be found, please provide insights on why:

General:

Teaching in the subject of biology should aim for students to develop knowledge of biology's concepts, theories, models and working methods. It should help students develop an understanding of the importance of biology in society, for example for **quality of life** and **health** through medicine, and for the p**rotection of the earth's ecosystem through ecology**. Through the teaching, students must be given the opportunity to develop a scientific perspective on our world around us with the theory of evolution as a basis. Current research and the students' experiences, curiosity and creativity must be taken into account in the teaching. The teaching should also contribute to the students, from a natural science point of view, being able to participate in the social debate and discuss ethical issues and positions.

Learning objectives

- **None**

Main content:

- **Ecologically sustainable development** locally and globally and various ways to contribute to this.
- Relationship between **living conditions**, **health**, and illness. Ethics in medical matters.
- (Microorganisms and their importance for **health** and disease. Antibiotics and evolutionary processes.) (Not so relevant)

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

nnn. **Fragmented/separate/isolated**
ooo. **Repeatedly but incoherent**
ppp. **Addressed in separate learning objectives**
qqq. **Integrated in wider context/sections**
rrr. **Key competence throughout curriculum**

Please elaborate on your answer: …

A: Sustainable development is mentioned in one of 23 “main contents to address”. Not in any learning objective or in the general overview/purpose of the course.

(IV) Explicit learning objectives
Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g., by testing or handouts during lessons)?

No

(V) Extra-curricular dimension
Is there any mentioning of extracurricular focus on Food & Sustainability (e.g., field trips, excursions)? Also consider nonformal and informal communications and statements.

No

(VI) Practical examples
If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

N/A

(VII) Additional comments
Please add anything which is helpful in understanding the situation – e.g., political discussions, plans, public opinion, press articles:

N/A

WP2 Curriculum Survey

please fill out one template per identified case

General comments:
Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

15. Which curricula did you find? Please give an overview specifying the following:
    Name: **Geography year 7-9**
    Level: ◯ **national** ◯ regional ◯ city/school level
    a. Learning system/education level (Please see attached schematic view of the school systems for your country)
        i. Please use attached chart to indicate the institutional setting of the curriculum. **EQF2 Primary and lower secondary programme**
        ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
    b. Please share the curricula with us (web page/link/attachment).

https://www.skolverket.se/undervisning/grundskolan/laroplan-och-kursplaner-for-grundskolan/laroplan-lgr22-for-grundskolan-samt-for-forskoleklassen-och-fritidshemmet?url=-996270488%2Fcompulsorycw%2Fjsp%2Fsubject.htm%3FsubjectCode%3DGRGRGEO01%26tos%3Dgr&sv.url=12.5dfee44715d35a5cdfa219f

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

sss. Food - none
ttt. Nutrition - none
uuu. Agri(culture) - none
vvv. Health - none
www. Related (pick most relevant, e.g., sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own) – **See below**

If none of the above can be found, please provide insights on why:

General:

Teaching in the subject of geography should aim for students to develop knowledge of geographical conditions and patterns in different places and in different regions. The teaching should broaden and deepen the students' knowledge of natural processes and **human activities** in different parts of the world, and **how these affect landscapes and habitats**. Through teaching, students must be given the conditions to switch between different **spatial perspectives: local, regional, and global, as well as between different time perspectives.**

The teaching should give students the conditions to develop knowledge about **environmental** and **development issues** linked to **climate** change, human access to and use of natural resources, as well as population issues and **living conditions** in different parts of the world. Thereby, the students must be given the conditions to analyse and reflect on different solutions to the global challenges of our time and the future based on ecological, social, and economic perspectives on **sustainable development.**

Learning objectives:

- Gain knowledge about environmental and development issues based on ecological, social, and economic perspectives on **sustainable development.**

Main content:

- What climate is and factors that affect the **climate**. **Human impact on the climate** and consequences of climate change for humans, society, and nature in different parts of the world.

- Local, regional, and global work to promote **sustainable development.**

- Global **production and consumption patterns** and flow of goods and services.

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

sss. Fragmented/separate/isolated
ttt. Repeatedly but incoherent
uuu. Addressed in separate learning objectives
vvv. Integrated in wider context/sections
www. Key competence throughout curriculum

Please elaborate on your answer: …

Sustainability level D/E. One out of three learning objectives concerns sustainable development and an additional one partly concerns human activities and its effect on landscapes and living environments. In the main/central content of the course, one out of three topic areas focus on sustainable development in relation to climate and use of resources.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g., by testing or handouts during lessons)?

- Gain knowledge about environmental and development issues based on ecological, social, and economic perspectives on sustainable development.

No information on how this should be measured.

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g., field trips, excursions)? Also consider nonformal and informal communications and statements.

No

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

N/A

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g., political discussions, plans, public opinion, press articles:

N/A

WP2 Curriculum Survey

please fill out one template per identified case

General comments:

Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

16. Which curricula did you find? Please give an overview specifying the following:
    Name: Geography 1

Level: ◯ **national** ◯ regional ◯ city/school level

a. Learning system/education level (Please see attached schematic view of the school systems for your country)
   i. Please use attached chart to indicate the institutional setting of the curriculum. **EQF4** HE preparatory programmes 3 years
   ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know

b. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:

https://www.skolverket.se/undervisning/gymnasieskolan/laroplan-program-och-amnen-i-gymnasieskolan/gymnasieprogrammen/amne?url=-996270488%2Fsyllabuscw%2Fjsp%2Fsubject.htm%3FsubjectCode%3DGEO%26courseCode%3DGEOGEO01%26version%3D2%26tos%3Dgy&sv.url=12.5dfee44715d35a5cdfa92a3#anchor_GEOGEO01

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

xxx. **Food** - none
yyy. **Nutrition** - none
zzz. Agri(culture) - none
aaaa. **Health** - **only reproductive health**
bbbb. **Related** (pick most relevant, e.g., sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own) – **See below**

If none of the above can be found, please provide insights on why:

General:

Teaching in the subject of geography should aim for students to develop knowledge of the earth as an intertwined, changing, and complex system. This system view is necessary to be able to describe and **analyse spatial patterns and processes locally**, regionally, and globally as a result of interaction between man, society and nature.

Through the teaching, students must be given the opportunity to develop knowledge about the earth's varied habitats, their development, changeability, resources, and vulnerability, as well as about opportunities and problems in enabling **sustainable development**. In connection with issues of **sustainable development**, students must be given the opportunity to analyse, for example, consequences of a climate-changed world, access to water resources and arable land, natural risks and threats, natural resource use and resource conflicts, **as well as social justice and solidarity based on different perspectives such as gender, sexuality, class, and ethnicity**. The teaching should lead to the students developing a global geographic frame of reference where knowledge of their own and other people's living environment is a part.

In teaching, students must be given the opportunity to collect, process, c**ritically interpret and evaluate spatial data and to formulate and visualize results in the form of texts, maps, images, models, tables, and diagrams.** The students must also be given the opportunity to develop knowledge about society's needs for different spatial data and about how large amounts of information can be handled with the help of digital geographic tools such as geographic information systems (GIS). Field studies, excursions, laboratories, and exercises must be included

in the teaching to observe, identify, categorize, and analyse events and changes in the outside world.

Learning objectives

- Ability to analyse conflicts of interest with connections to natural risks and human activities, as well as how conflicts of interest affect the earth's habitats **and human living conditions**, from the perspective of **sustainable development.**

Main content:

- Human needs for natural resources over time. Resource assets and the uneven distribution of resources and consequences of society's resource use. **Relationship between arable land, food production**, political ecology, and **local development**. Energy transition, renewable energy resources and new technology as well as **local**, regional, and global **community development**.

- The global game plan and local development. Relationship between population development, resource availability, resource use and conflicts of interest. Ethical questions linked to the competition for the earth's resources, alternative and possible paths to social justice and **sustainable development**.

- A **climate**-changed world. Earth's climate and the **climate**'s variation and changeability over different time perspectives. Climate classification. The consequences of **climate** change for the natural landscape, social development, and **human living conditions**, locally and globally. Water resources and development issues.

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

xxx. Fragmented/separate/isolated
yyy. Repeatedly but incoherent
zzz. Addressed in separate learning objectives
aaaa. Integrated in wider context/sections
bbbb. Key competence throughout curriculum

Please elaborate on your answer: …

D/E. Sustainable development in relation to climate/environment is mentioned as an overarching learning goal. It is also integrated in several more specific learning objectives/main contents to be addressed.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g., by testing or handouts during lessons)?

- Ability to analyse conflicts of interest with connections to natural risks and human activities, as well as how conflicts of interest affect the earth's habitats and human living conditions, from the perspective of sustainable development.

No information on how this should be integrated in teaching or measured.

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g., field trips, excursions)? Also consider nonformal and informal communications and statements.

No

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

N/A

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g. political discussions, plans, public opinion, press articles:

N/A

WP2 Curriculum Survey

please fill out one template per identified case

General comments:

Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

17. Which curricula did you find? Please give an overview specifying the following:
    Name: Home and consumer studies 7-9th grade
    Level: ◯ **national** ◯ regional ◯ city/school level
    a. Learning system/education level (Please see attached schematic view of the school systems for your country)
        i. Please use attached chart to indicate the institutional setting of the curriculum. **EQF2**
        ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know
    b. Please share the curricula with us (web page/link/attachment).

https://www.skolverket.se/undervisning/grundskolan/laroplan-och-kursplaner-for-grundskolan/laroplan-lgr22-for-grundskolan-samt-for-forskoleklassen-och-fritidshemmet?url=-996270488%2Fcompulsorycw%2Fjsp%2Fsubject.htm%3FsubjectCode%3DGRGRHKK01%26tos%3Dgr&sv.url=12.5dfee44715d35a5cdfa219f

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

cccc. **Food – See below**

dddd. **Nutrition -** none

eeee. **Agri(culture) -** none
ffff. **Health – see below**
gggg. **Related** (pick most relevant, e.g., sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own) – **See below**

If none of the above can be found, please provide insights on why:

General:

Life at home and family has a central meaning for mankind. Our habits at home affect the well-being of the individual and the family as well as society and nature. Knowledge of consumer issues and work in the home gives people important tools to create a functioning everyday life and promote **sustainable development** by being able to make informed choices as consumers regarding **health,** finances, and the **environment.**
The teaching in the subject of home and consumer knowledge should aim for the students to develop knowledge of and interest in work, finances, and **consumption choices** in the home. In a process where thought, sensory experience, and action work together, students must be given the opportunity to develop knowledge related to **food and meals.** The teaching should thereby contribute to the students developing their initiative and creativity when cooking, creating meals and other tasks at home.
Through the teaching, students should have the opportunity to develop awareness of the consequences of choices in the household for **health**, well-being, and shared resources.

Learning objectives:

- Ability to plan and prepare **food** and meals for different needs and contexts as well as manage other practical work that occurs in a home.

- Ability to value choices and actions that occur in a home based on how they affect **health**, finances, and the **environment**.

Main content:

- Creation of own meals, for example based on season and leftovers.

- Resource management. Positions when choosing and using food and other goods. How the production, transport and recycling of food and other goods affect people's **health**, the economy, and the **environment**.

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

cccc. **Fragmented/separate/isolated**
dddd. **Repeatedly but incoherent**
eeee. **Addressed in separate learning objectives**
ffff. **Integrated in wider context/sections**
gggg. **Key competence throughout curriculum**

Please elaborate on your answer: …

D. Food choices and its effect on health and environment are important elements in the course. However, other elements not related to food/sustainability are also integrated which is why I would say D and not E.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g., by testing or handouts during lessons)?

- Ability to plan and prepare **food** and meals for different needs and contexts as well as manage other practical work that occurs in a home.

- Ability to value choices and actions that occur in a home based on how they affect **health**, finances, and the **environment**.

No information on how the objectives should be measured.

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g., field trips, excursions)? Also consider nonformal and informal communications and statements.

No

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

N/A

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g., political discussions, plans, public opinion, press articles:

N/A

WP2 Curriculum Survey

please fill out one template per identified case

General comments:

Do not worry about exact translation of the entire documents; a summary of your key findings and relevant passages in English with reference to the original text is sufficient. Please also share the source of the original document for future reference.

(I) Curricula identification

18. Which curricula did you find? Please give an overview specifying the following:
    Name: Natural Science 1b (also 1a1). 1a1 is a more compact and shorter version of the course which is included in some programs.
    a. Level: ◯ **national** ◯ regional ◯ city/school level
    b. Learning system/education level (Please see attached schematic view of the school systems for your country)
        i. Please use attached chart to indicate the institutional setting of the curriculum. **EQF4** HE preparatory programmes 3 years

ii. If you have some (general) information on certain system/education levels that have more focus on Food & Sustainability, please let us know

c. Please share the curricula with us (web page/link/attachment).

Please comment on your choice:

https://www.skolverket.se/undervisning/gymnasieskolan/laroplan-program-och-amnen-i-gymnasieskolan/gymnasieprogrammen/amne?url=-996270488%2Fsyllabuscw%2Fjsp%2Fsubject.htm%3FsubjectCode%3DNAK%26courseCode%3DNAKNAK01a1%26version%3D3%26tos%3Dgy&sv.url=12.5dfee44715d35a5cdfa92a3#anchor_NAKNAK01a1

(II) Coverage of target topics

Please apply the following search terms to navigate through the content of each of the curricula. Collect your findings (by marking them in the text or quoting them in a separate document).

hhhh. Food - none

iiii. Nutrition – none

jjjj. Agri(culture) - none

kkkk. Health – see below

llll. Related (pick most relevant, e.g., sustainability, nature, circularity, regenerative, innovation, climate, etc. – or add own) – **See below**

If none of the above can be found, please provide insights on why:

General:

The subject of natural science is interdisciplinary in nature with a foundation in biology, physics, geoscience, and chemistry. The subject deals with **health,** energy and **sustainable development**, areas of knowledge that have emerged where natural science meets social science.

Learning objectives:

- Gain knowledge of the role of natural science in current social issues and **in relation to sustainable development.**

- Gain knowledge about the consequences of different lifestyles both for one's own **health** and for public health and the **environment**.

Main content:

- The relationship between the individual's **health**, daily habits, and lifestyles in society, for example in terms of exercise, diet, drugs, consumption, and impact on the environment. How natural science can be used as a starting point for critical examination of messages and norms in the media.

- Issues of **sustainable development:** energy, **climate,** and ecosystem impact. Ecosystem services, resource utilization and the capacity of ecosystems.

- **Different aspects of sustainable development, for example in terms of consumption, resource distribution,** human rights, and gender equality.

(III) Profile/relevance of target topics

In what way are aspects of sustainable and healthy food systems addressed in the curricula? Pick from the options below and elaborate briefly:

hhhh. Fragmented/separate/isolated

iiii. Repeatedly but incoherent
jjjj. Addressed in separate learning objectives
kkkk. Integrated in wider context/sections
llll. Key competence throughout curriculum

Please elaborate on your answer: …

C/D. Sustainability related to health and climate/environment are integrated in about half of the learning objectives/ main content areas.

(IV) Explicit learning objectives

Are there currently any concrete learning objectives towards sustainability & food? In what way are these measured (e.g., by testing or handouts during lessons)?

- Gain knowledge of the role of natural science in current social issues and **in relation to sustainable development.**

- Gain knowledge about the consequences of different lifestyles both for one's own **health** and for **public health** and the **environment**.

There is no information on how these should be addressed in the classroom or measured.

(V) Extra-curricular dimension

Is there any mentioning of extracurricular focus on Food & Sustainability (e.g., field trips, excursions)? Also consider nonformal and informal communications and statements.

No

(VI) Practical examples

If you came across practical examples/insights (that are not yet covered by above questions, such as a sustainability festival) that are of great added value for the project because of its message or execution; please describe them here:

N/A

(VII) Additional comments

Please add anything which is helpful in understanding the situation – e.g., political discussions, plans, public opinion, press articles:

N/A

A.7 The New Curriculum of the Netherlands: Path to cohesion, or scattered ambitions?

In 2019, a collaborative project with teachers and school leaders in the Netherlands was finished, resulting in so-called “learning areas” with several building blocks and competences. These were presented as a proposal to the Ministry of Education, Culture and Science. Since then, a committee has reviewed the proposal and made a selection for the actualisation of the core objectives and exam programs. SLO has started with the actualisation in 2021, and this is ongoing to this date. Although the new proposal looked promising, it is unclear to what extent this is (going to be) implemented, since there is no comprehensive overview of “the curriculum”. On the website of SLO, a jumble of documents is scattered under categories like “basic skills”, “updating core objectives and exam programs”, “subject specific themes” and “more themes”.

In the documents on “basic skills”, no specific topics were mentioned, but it was merely focused on (general) competences and skills. Under the “subject specific themes”, exam programs of each subject for each year could be found, but these documents also mostly describe competencies and skills, rather than specific topics. Via one of the participants in the interview sessions, we were directed to a theme about Nutrition (under “more themes''). Note: this could not have been found by going through the website’s menu. None of these “other themes” had been mentioned in the sources we found before. The cohesion between the “more themes” and the other categories is unclear, if present at all, which complicated navigating to the desired documents as well as the analysis on the current representation of SFS in education.

Although the Nutrition theme presents very relevant topics and measurable levels of knowledge per school year, it is not specified how these topics are to be presented to the students. One page on the website suggests it is eventually up to the teachers to elaborate them into lessons and activities, but there is no advice on how to deal with the division of subjects among different teachers.

The New Curriculum does not seem to improve this lack of cohesion, but the structure of learning areas with building blocks could - when implemented eventually - create some opportunity for the introduction of specific topics.

Annex B: Questionnaire

B.1 Questions

Dear reader,

Thank you for your effort to take a moment to help us proceed with the project “FoodShift Pathways”. We would like to ask you to share your perspective on a couple of questions regarding education about food, sustainability and healthy eating in your country. This should not take longer than 20 minutes. If you are interested in the topic, feel free to elaborate in the final (open) questions and/or leave your contact details at the end so we can contact you again in the future.

If you prefer to take an online survey, you can find the questions via this link.

0. About you (personal information will not be published)

a. Name (will not be published):

…

b. Country of occupation:

…

c. Profession (title/description and field/company) (will not be published):

…

d. Years of experience in this area:
- 0-5 years
- 5-10 years
- 10+ years

1. In case you are involved in educating students, please specify:

a. Type/level of education:

…

b. Age group of students:

…

c. Field of expertise:

…

2. Sustainable Food Systems

a. Are you familiar with the term “Sustainable Food System”?

- ○ Yes
- ○ No
- ○ Not sure

The following questions will ask you about education on the topic of Sustainable Food Systems. Before answering these questions, please have a look below at the definition on 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*.”

b. Please indicate whether the following **statements** apply to you (on a scale from 1-5, with 1 fully disagree and 5 fully agree):

Statement:	Fully disagree **1**	**2**	**3**	**4**	Fully agree **5**	Not relevant **-**
Knowledge about sustainable food systems (SFS) should be obligatory for all students.						
I am aware of the current curriculum in my field of education.						
It is difficult to integrate topics like SFS into the current curriculum.						
I have (some) freedom on the topics that are taught to students.						
I teach my students about SFS.						
Students are interested to learn about SFS.						
Education about SFS can best be done through extracurricular programs.						
I feel I don't know enough about SFS to include it in my teachings.						

c. If you have additional statements that are relevant for you regarding education about SFS, feel free to share here:

…

3. Sustainable competences

The following questions will ask you about your view on the use of sustainable competences in education.

- *What are sustainable competences for a teacher?*

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.

Below, you will find a list of 13 sustainable competences, retrieved from multiple sources (see below for sources). **For each competence you can find a practical example on the last page.**

a. Please indicate to what extent these competences are 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).

	Competence	Key issues	Not used at all 1	2	3	4	Part of the core learning goals 5
Normative	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					
Peda-gogical	Interpersonal development	Cooperation & empathy, solidarity & ethnocentrism, team dynamics, leadership, trans-cultural understanding, serious gaming, tools					

b. Please pick the 3 competences from the list above that you consider **most important** in educating students about Sustainable Food Systems:

___ *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	

c. Please explain your choices:

…

4. Barriers for integration

a. Do you experience any **barriers** that make it (more) difficult to integrate SFS into these competences in your work? Choose all that apply.

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

b. Please elaborate on your selected barriers:

…

c. Name the most important factors that are causing these barriers (max of 3):

-
-
-

d. Can you think of ways/things that would take away/lighten the barriers you are experiencing? Please explain.

…

5. Final remarks

e. Do you want to add anything that you feel is relevant to the topic?

…

This is the end of the interview. If you would like to be contacted to contribute again in the project, please leave your contact details below (name, email address, phone number).

…

○ Check this box if you would like to receive a summary of the project (via email, provide in above question.

We thank you again for your time. If you have any questions towards the project, please do not hesitate to contact us at XX@XXXXX.
More about the FS Pathways project can be found on https://www.foodshift-pathways.eu/

Key sources:

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

Wiek et al. 2011: Wiek, A., Withycombe, L. & REdman, C.L. 2011. Key competencies in sustainability: a reference framework for academic program development. Integrated Research System for Sustainability Science, United Nations University, and Springer (DOI 10.1007/s11625-011-0132-6'

UNESCO 2011: EDS Source Book Teacher Education) Education for sustainable development: sourcebook - UNESCO Digital Library'

Tippmann 2020: Tippmann, M. (2020). Education for Sustainable Food and Nutrition – Towards Criteria for German Secondary Schools. Glocality, 3(1): 5, 1–12. DOI: https://doi.org/10.5334/glo.28

Other sources:

Maliotou, MN & Liarakou, G. 2022. Teachers' Perceptions and Educational Practices on Sustainable Nutrition in Cyprus. Research, Sage Publications, Vol: 16(1–2) 61–79 10.1177/09734082221116858;

Janhonen, K. & Elkjaer, B. 2022. Exploring Sustainable Food Education as Multi-professional Collaboration between Home Economics and School Food Catering, Research Vol: 16(1–2) 19–41 10.1177/09734082221120101

UNESCO 2012. Exploring sustainable development: a multiple-perspective approach. Exploring sustainable development: a multiple-perspective approach - UNESCO Digital Library

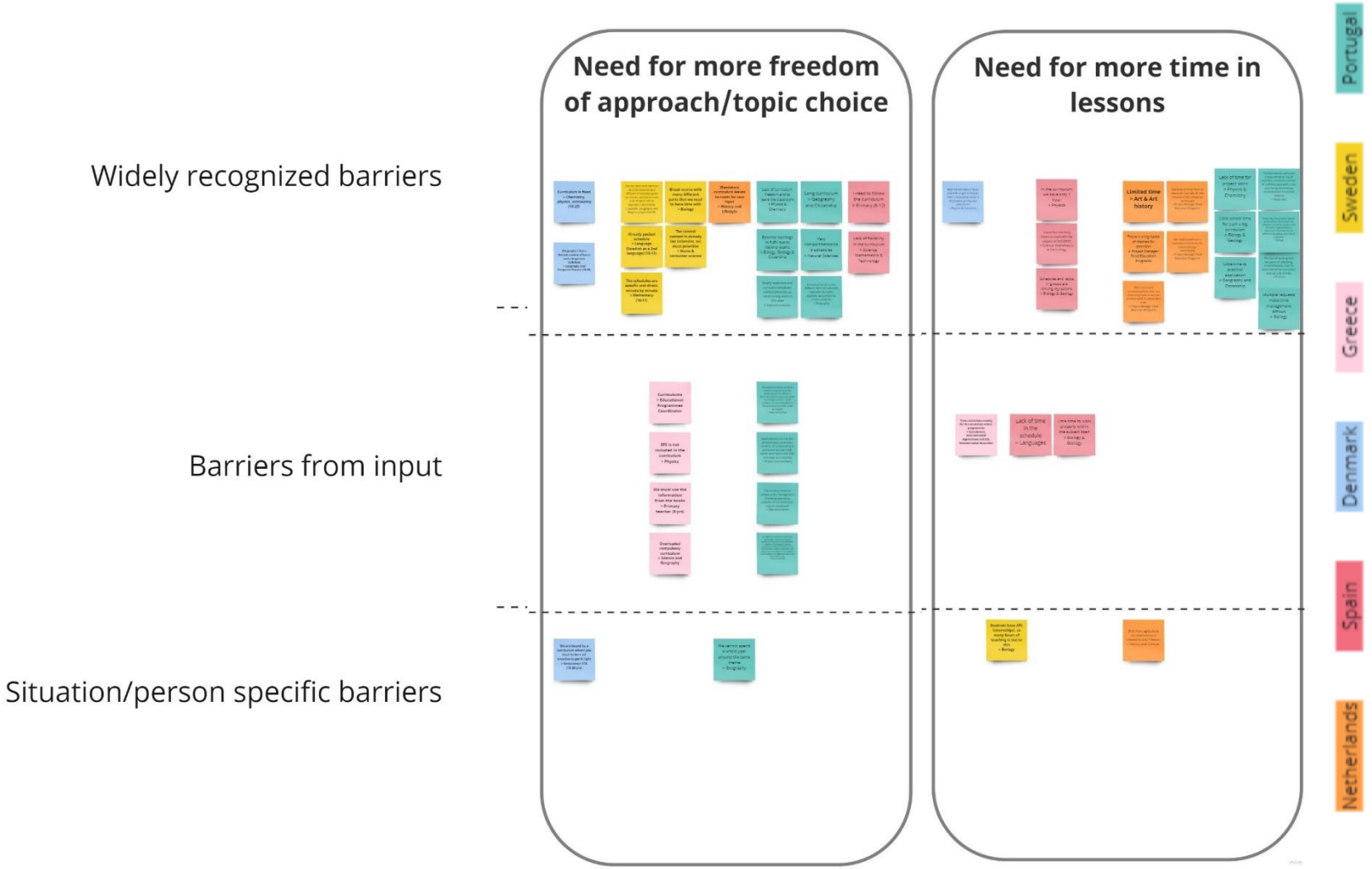
Schemenauer, J. 2020. www.teachsustainability.org

Wascher, D. & Arciniegas, G. 2021: GuidelinesforhandlingInnovationManagement. Deliverable 8.4 of the EU Project FoodSHIFT 2030 (www.foodshift2030.eu)

Appendix: Examples competences

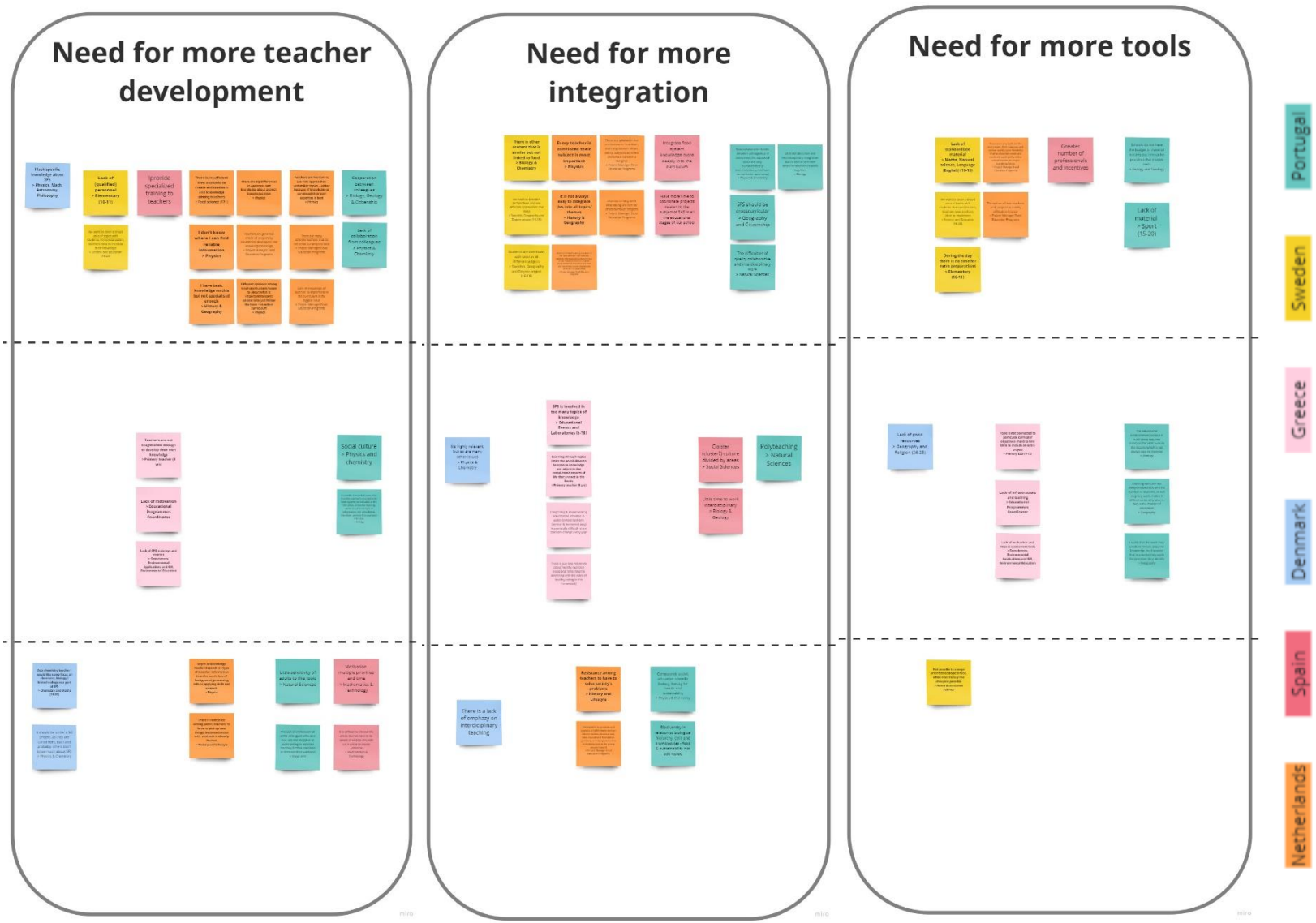
	Competence	Key issues
Normative	Valuing the environment	Principles, goals, measurable targets, thresholds, cultural norms or personal values
	Example: Students learn how to reduce their ecological footprint related to the food they eat	
	Understanding society	Diversity, cooperation, inclusion, compassion 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	

Annex C: Screenshots Miro Board

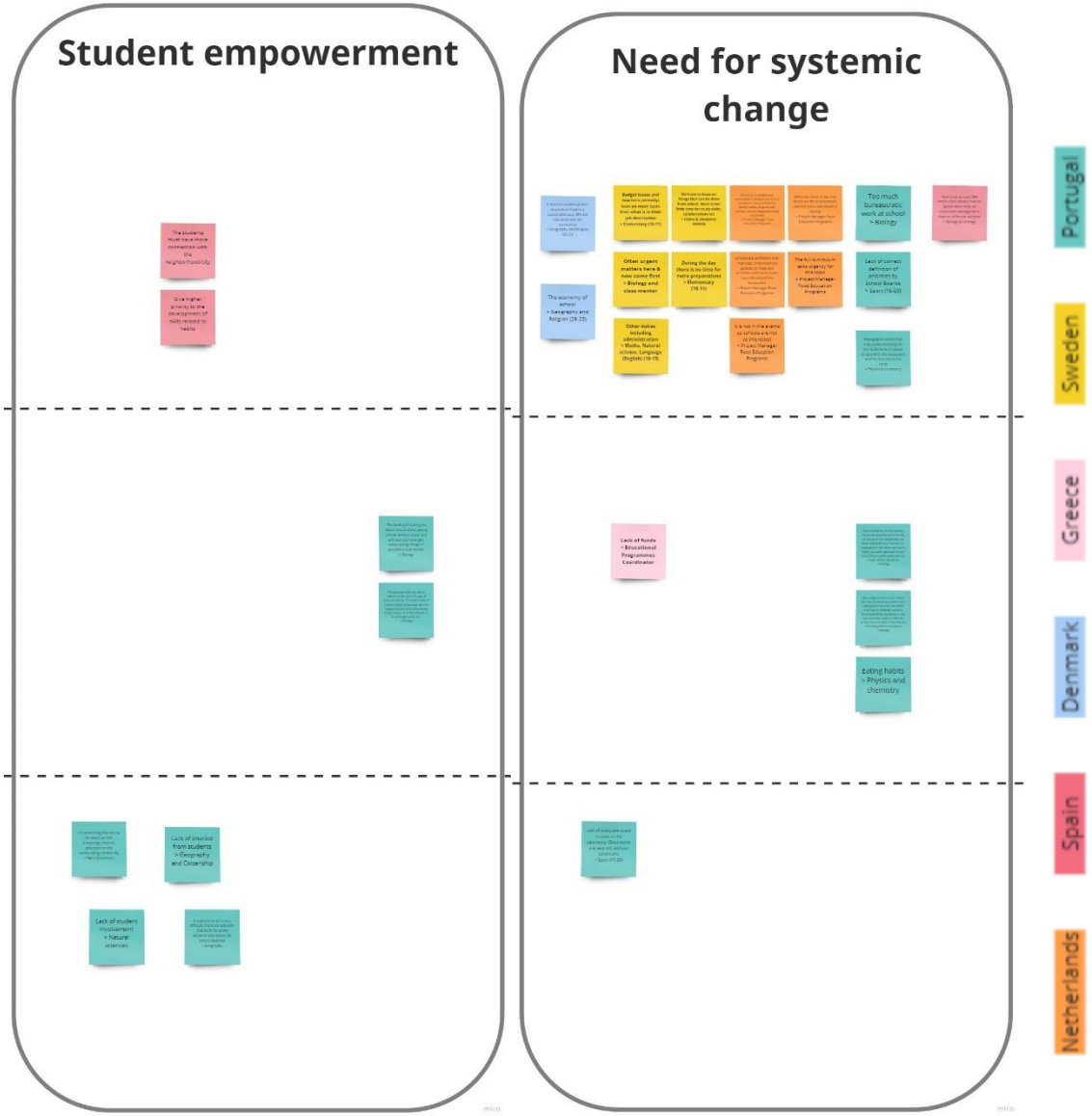


This project has received funding from the European Union Erasmus+ programme under grant agreement No 2022-1-SE01-KA220-SCH-000089962.

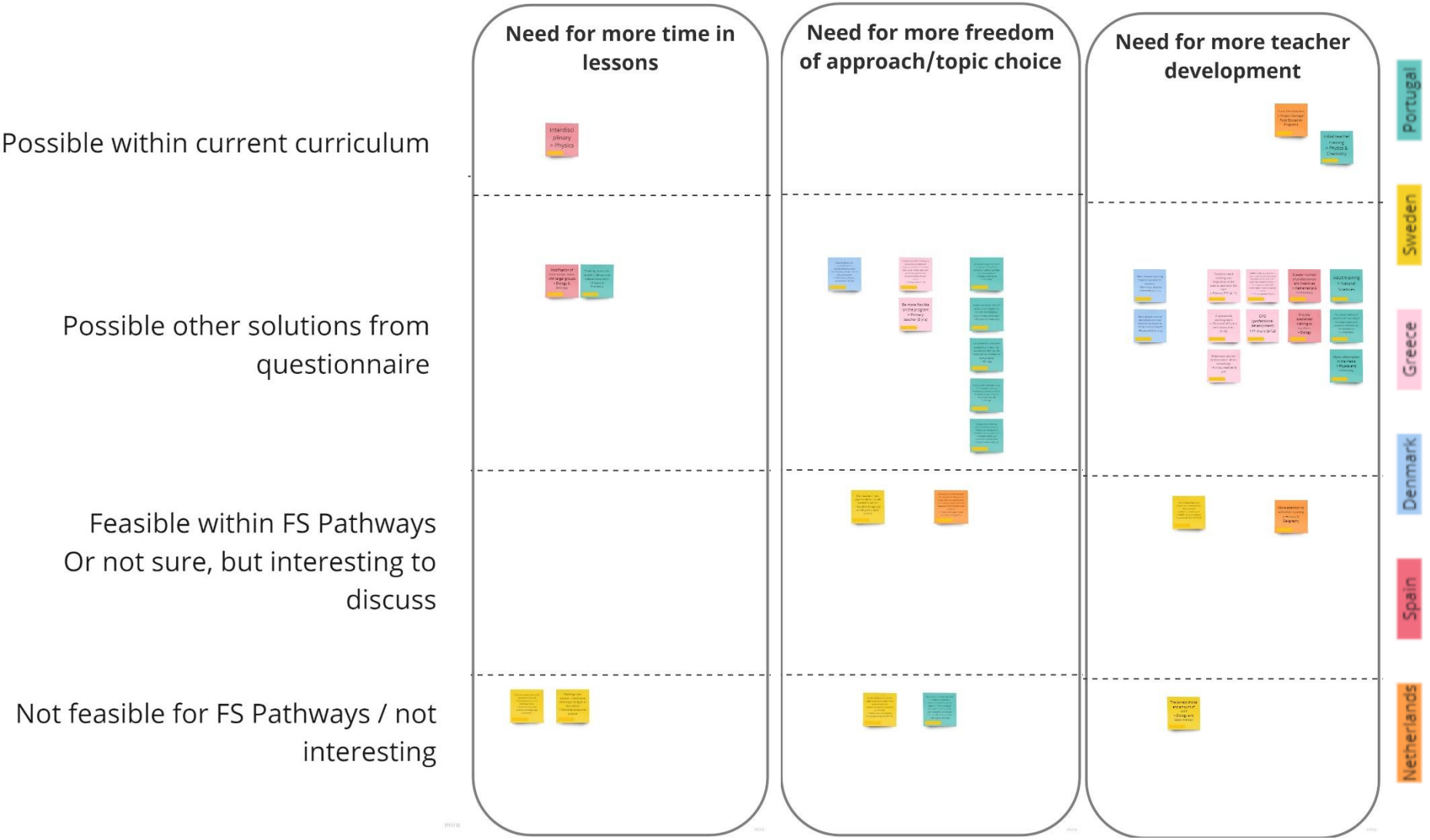
Barriers from open questions – part 2/3



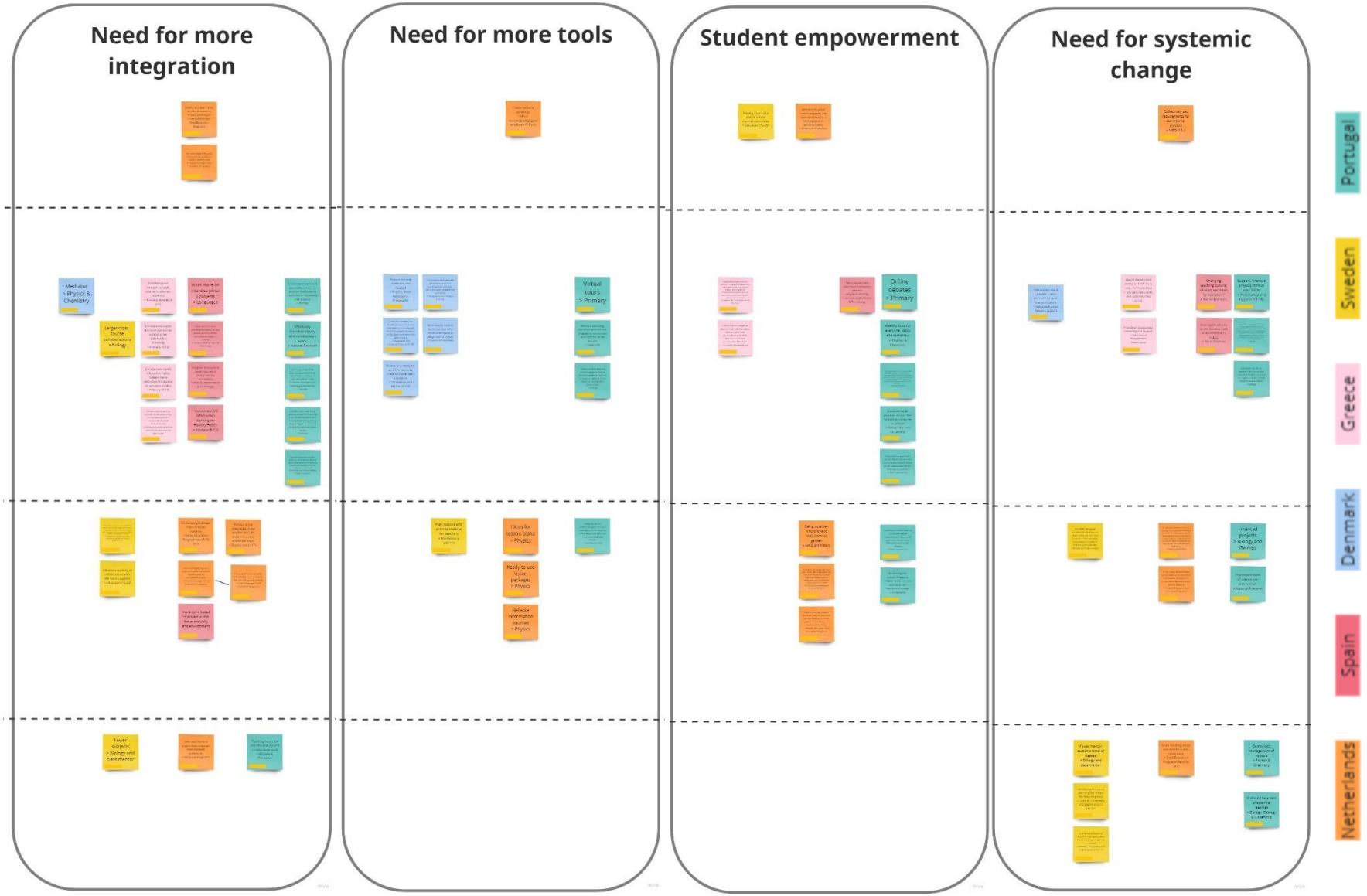
Barriers from open questions – part 3/3



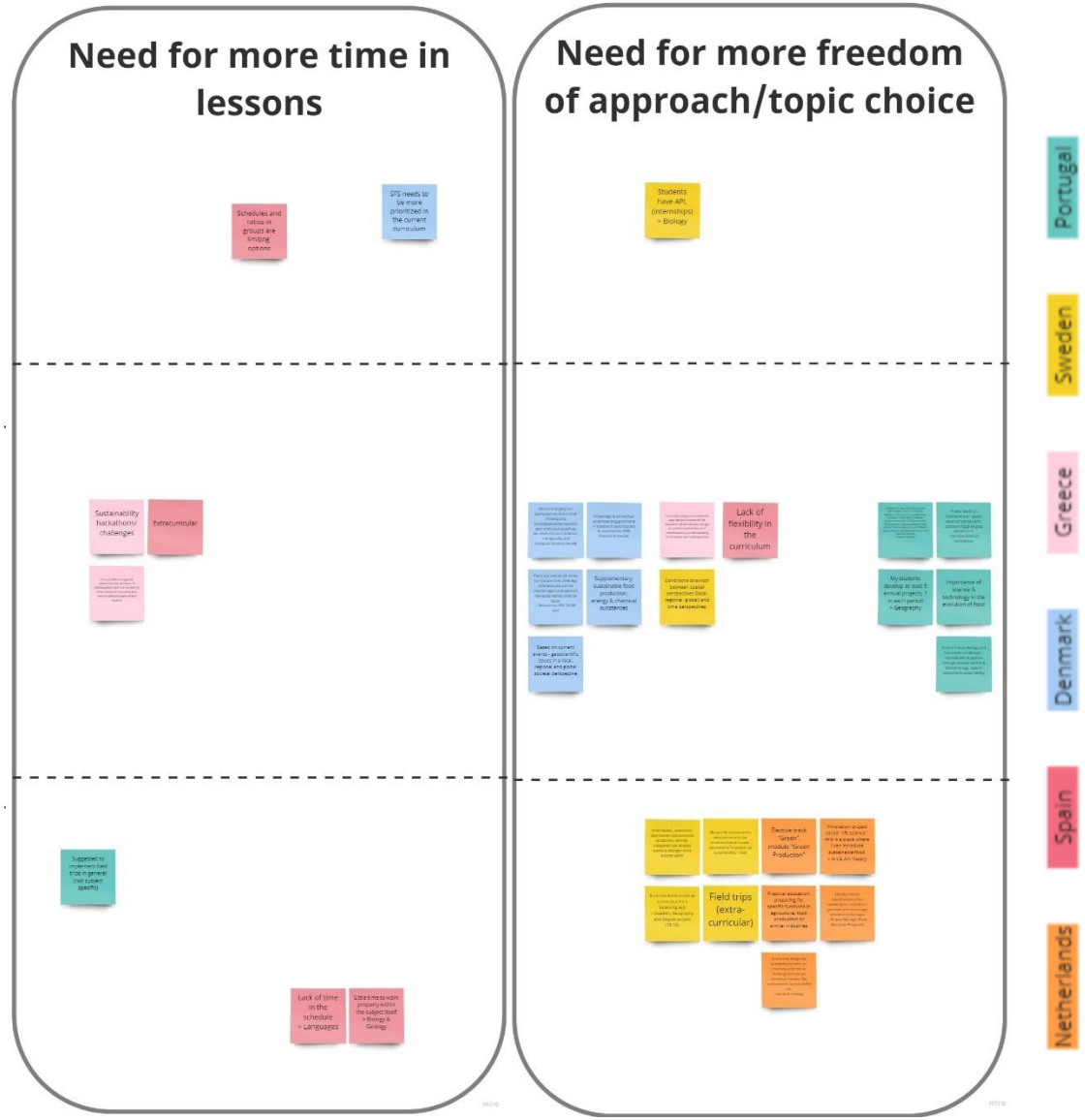
Possible solutions from open questions – part 1/2



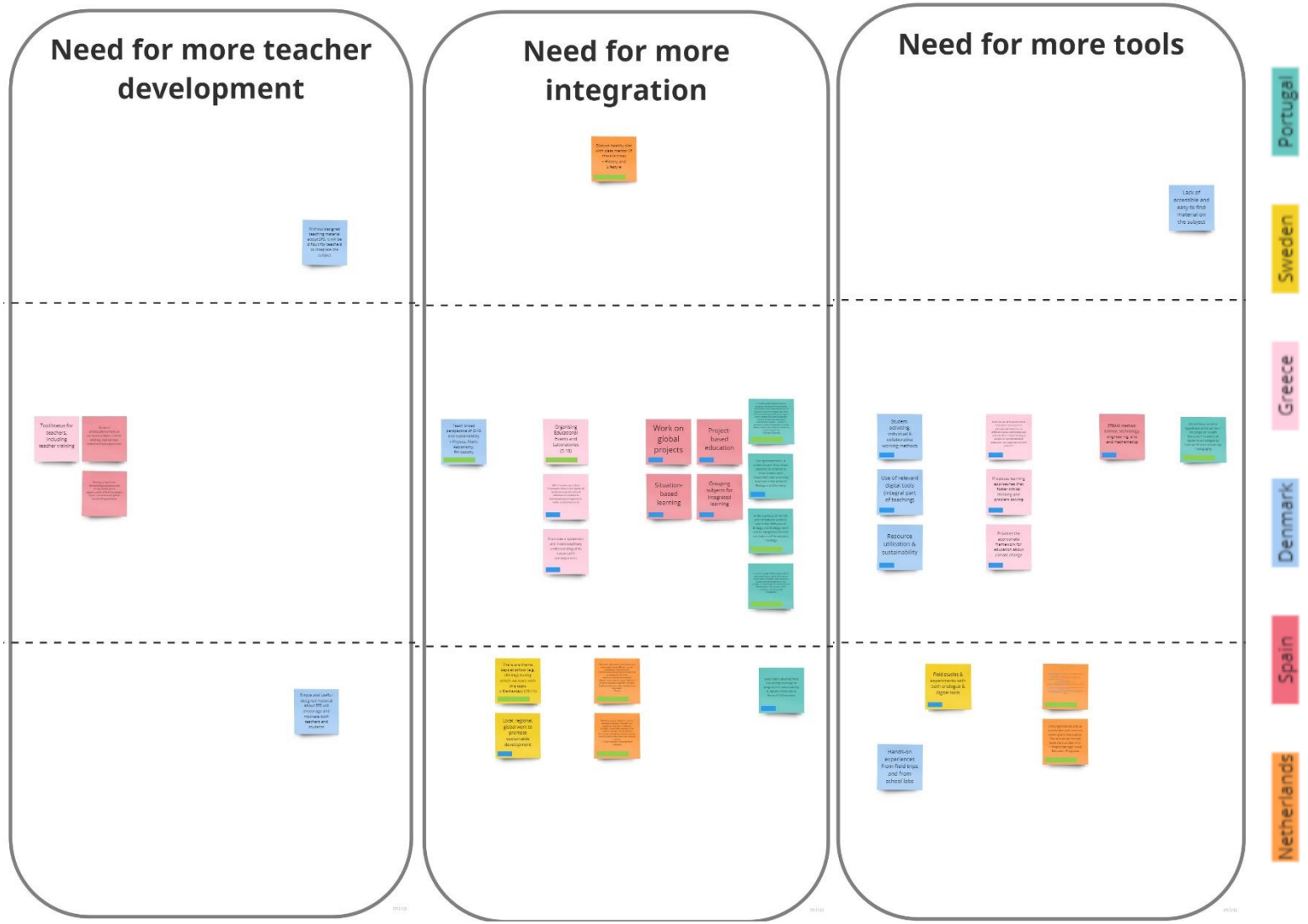
Possible solutions from open questions – part 2/2



Already available initiatives/projects – part 1/3



Already available initiatives/projects – part 2/3



Already available initiatives/projects – part 3/3