



# SSL

4ADULTS



## PR1: FRAMEWORK

### SSL4Adults

Developing Adults Key Competencies  
by Improving their Socio-Scientific Literacy

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## Introduction

In the 21st century, we are surrounded by complex and ill-structured issues such as combating global climate change, preventing the spread of coronavirus, animal testing for medical purposes, consumption of GMO foods, establishing nuclear power plants and, cloning. Such ambivalent issues are called socio-scientific issues (Sadler, 2004). Due to its controversial nature, individuals who enter the decision-making process on these issues make decisions by thinking through many evidentiary sources such as the media, family, other people, the discourses of scientific authorities and personal justifications. Risk perceptions, misunderstandings and short cut biases (e.g. affect heuristic) used in this process inhibit the effective decision-making process (Acar et al., 2010; Frewer et al., 2004). For example, today, many people can hold back from the vaccination process for Covid 19 due to misunderstandings, media guidance and risk perceptions (Saribas & Cetinkaya, 2021). Governments and policymakers aim to ensure that citizens fairly assess the sources of evidence and make decisions by questioning the reliability of multiple sources of evidence in controversial, global and local problems such as pandemic, global warming, consumption of GMO foods and vaccine safety (Han Tosunoglu, & Ozer, 2021; Mugaloglu et al. , 2022). At this point, it is an important agenda for governments and policy makers to ensure that the level of scientific literacy and understanding of science are improved, both by those in formal education and by the public. Because individuals can make decisions about such issues that surround them only with an effective SSL literacy.

SSL4ADULTS is a project that aims to improve the socio-scientific literacy of adults on socio-scientific issues that concern society such as genetically modified organisms, cloning, organ transplantation, and Covid 19. Socio-scientific issues are ambivalent-controversial issues in which the concepts of science and technology are included and there is no definitive answer (Morris, 2014). This ambiguous structure or uncertainty arises from the uncertainty of the science and technology concepts underlying the subjects (Sadler & Zeidler, 2004).

For this reason, in order for a subject to be a socio-scientific subject, besides the fact that it includes value systems such as ethics and morality that concern society, the indispensable condition is that there are uncertainties arising from science and technology in the nature of the subject. For example, although the issue of migration

is a controversial issue that concerns society and includes value systems, it is not a socio-scientific issue because it does not have the uncertainty arising from science and technology. Different arguments and ideas with different evidence are put forward between scientists and different stakeholders on socio-scientific issues. In addition, these issues are inherently ethical, moral, and religious beliefs and values (Sadler & Zeidler, 2004). The main purpose of the SSL4ADULTS project is to develop effective decision-making mechanisms for adults and to improve SSL literacy on socio-scientific issues where such different ideas and uncertainties are involved.

Reviewed literature shows that many models have been proposed for the development of SSL. These models are generally based on sub-dimensions that support the development of individuals' scientific literacy and socio-scientific literacy in the context of science education and public understanding of science. Although different models are suggested, in general terms, argumentation, epistemological beliefs, and moral-value-based dimensions are the three basic dimensions on which SSL literacy is built (Han Tosunoglu & Irez, 2019). For this reason, the SSL4ADULTS project aimed to develop adult SSL literacy through argumentation, epistemological belief, and moral-value-based dimensions.

- ◇ **ARGUMENTATION:** Creating arguments by making claims based on data can be defined as the method by which counter-arguments and rebuttals are evaluated in the social-negotiation process. In classical logic, it is defined as making correct conclusions from premises.

**Example:** You will have a choice between two options, classical and mRNA vaccine for Covid 19, which vaccine would you prefer? What are your arguments for your choice? Are you aware of the opposing arguments?

- ◇ **EPISTEMOLOGICAL BELIEF:** Beliefs about the certainty, source, structure, and justification of knowledge.

**Example:** If a scientist in the discussion program states that GMO foods are harmless, would you trust this information? How sure do you think the scientist is about the accuracy of this information? On what grounds does he base his knowledge?

- ◇ **MORAL-VALUE REASONING:** To be able to make ethical and moral inquiries with a local and global perspective. Having multiple perspectives can be defined as identifying and evaluating the ethical and moral implications of SSL-related issues.

**Example:** Imagine that there are campaigns to support organ transplants in an organization and some people oppose this campaign because of their religious beliefs. How do you think the manager of the institution should evaluate the situation from the point of view of those people?

**Note:** *Every person is free and has the right to make decisions with free will without restricting other people's fundamental rights and freedoms. The SSL4ADULTS project does not impose what decisions adults should make. The SSL4ADULTS project shows how to make an effective decision by fairly evaluating the sources of evidence in adult-only decisions*

**These three dimensions are seen as the heart of socio-scientific literacy in many studies conducted in the literature. In the SSL4ADULTS project, based on the development of these three dimensions, the following Project Results will be produced.**

- ◇ PR1- Socio-Scientific Literacy(SSL) for Adults/Step by Step Competency Framework
- ◇ PR2-Socio-Scientific Literacy Assessment Tool
- ◇ PR3-Learning Resources(OER"s) - Training toolbox materials for low-skilled Adults
- ◇ PR4- Socio-Scientific Literacy E-Learning Environment-Learning Management System(LMS)

PR1- Socio-Scientific Literacy(SSL) for Adults/Step by Step Competency Framework is a basic structure that will directly affect other project outputs. Because other learning materials will be developed according to the framework determined in PR1.

## How was the PR1 developed?

PR1 was developed with the contribution of other parties under the leadership of Bursa Uludağ University. Four sub-methods were used in the development of PR1:

1. Delphi Analysis (2 months)
2. Literature Review -Content Analysis (2 months)
3. Examining EU Key Competencies(literacy, citizenship, etc) ) for Lifelong Learning (1 month)
4. Cross-Cut Process and Trustworthiness (1 month)

The development of PR1 is based on a bottom-up methodology along with the top-down approach available in the literature.

In many studies in which the top-down philosophy is adopted, it is known that individuals show resistance to innovations. Therefore, studies that take into account the beliefs and opinions of experts and adults working in the relevant field and that are formed with their participation are recommended. Delphi research is a type of research based on bottom-up philosophy. Delphi research is used to determine the ideas on which a larger sample group agrees/diverges under the supervision of experts, starting with the opinions of relevant experts when a new learning and teaching framework and policy will be developed. Although it is generally carried out in three stages, it was carried out in two stages in the SSL4ADULTS project.



### **DELPHI STUDY - 1:**

At this stage, in-depth Delphi interviews were held with experts in the field to draw the framework of SSL literacy. Interview questions were developed by academics under the leadership of BUU. Afterward, 5 participants from each partner's country were reached. In the selection of the participants, the status of working in areas related to SSL or the topics related to these areas (philosophy, morality, ethics, etc.) was considered. Table 1 of the participants (researchers, SSI studying lecturers, curriculum developers and NGO members, and public adult educators) is shown below. SSI topics, methods and techniques, learning materials, epistemology, argumentation, and moral-valued based semi-structured interviews were conducted on seven sub-themes of SSL-related knowledge, skills, and attitudes. The data obtained after the interviews were analyzed under seven sub-themes. The aim here is to obtain the selection of items to be placed under these themes.

### **DELPHI STUDY - 2:**

The analyzed data were converted into questionnaire items and delivered to a larger sample group, including the first Delphi participants. This sample group voted 1-7 types of Delphi survey items. The aim here is to reconcile ideas under seven sub-themes consisting of SSI topics, methods and techniques, learning materials, epistemology, argumentation, and moral-valued based SSL-related knowledge, skills, and attitudes. Obtained data were analyzed over median and interquartile range values.

### **LITERATURE REVIEW:**

In the last 5 years, 40 qualified research articles on socio-scientific issues have been reached. In the selection of these articles, attention was paid to the selection of the articles scanned in indexes such as Web of Science. While analyzing the articles, compliance with the results of the Delphi analysis was observed. To ensure this harmony, while the articles were subjected to content analysis, the descriptive codes in Delphi (SSI topics, methods and techniques, learning materials, epistemology, argumentation, and moral-valued based SSL-related information, skills, and attitudes). Articles were examined from the perspective of descriptive codes.

### **EXAMINING EU KEY COMPETENCIES:**

Many EU and international organizations (OECD, Council of Europe, WEF, UNESCO) have stated that 8 key skills within the lifelong learning program and 21st century skills (such as critical thinking and responsible decision-making, management and negotiation, cooperation and teamwork, conflict resolution, global awareness, tolerance, etc) are essential competencies in order to integrate into learning environments (EU, 2018). These key competencies have been studied and integrated into the SSL framework.

How was the PRI developed?

**CROSS-CUT ANALYSIS:**

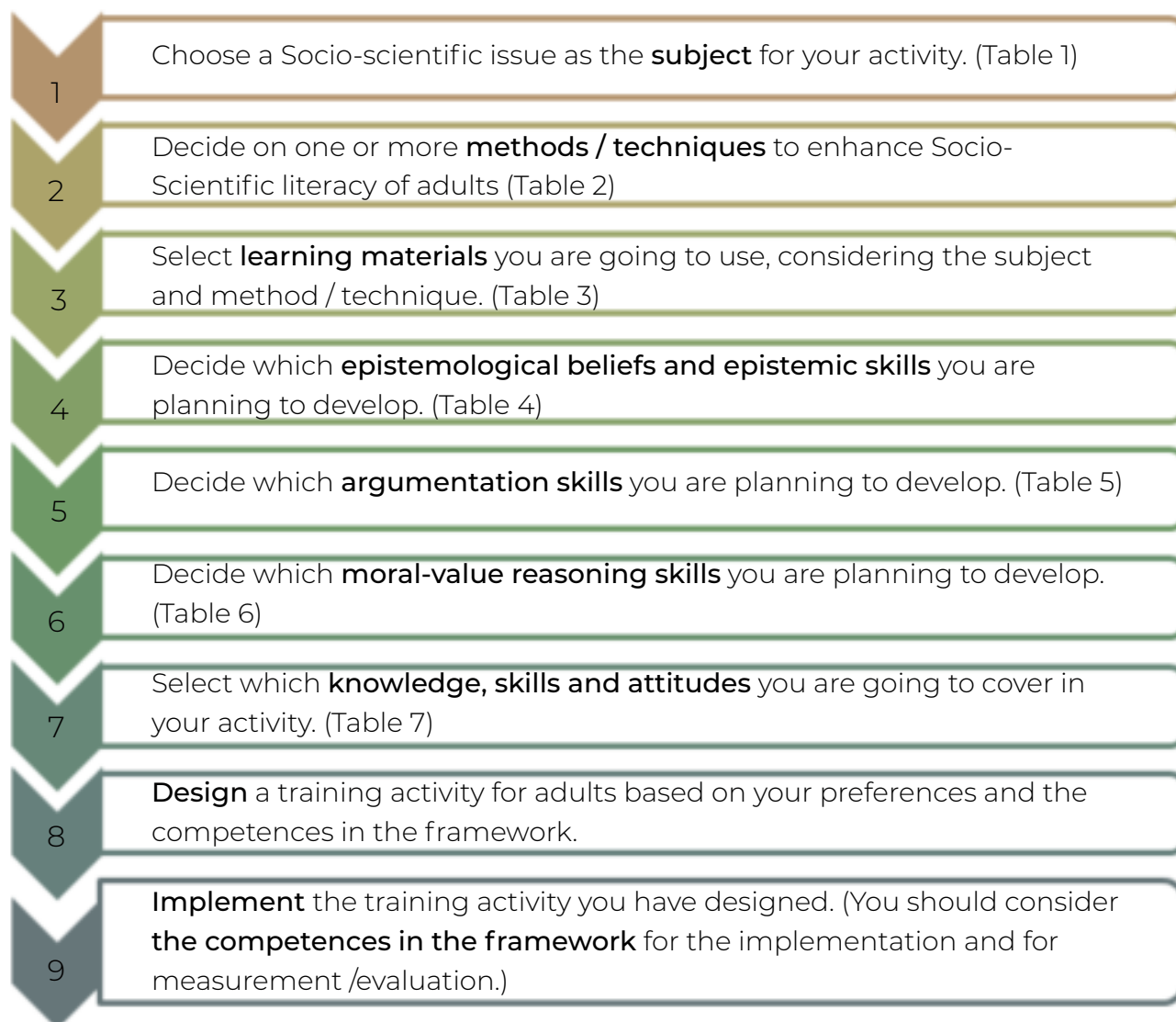
The data obtained from Delphi Analysis, Literature Review and Content Analysis, and Examining EU key competencies, were subjected to comparative analysis and common themes were determined. After the common themes, the framework obtained below was developed.





# How to Use the Framework?

An adult educator, who wants to design a training activity for adults is expected to follow these steps to utilize the Framework effectively:



## Explanation:

Adult educators can create a training activity that focuses on argumentation, epistemology, moral-value reasoning and SSL skills included in the framework to improve SSL literacy of adults. In this training activity, a content (topic) in Table-1 is selected (e.g. GMO food). One or more of the methods and techniques in Table-2 are decided in accordance with the nature of the content (e.g. Case Study). Then, learning materials supporting these methods and techniques from Table-3 are determined (e.g. Conflict scenario). In the context of this example, a training activity may aim to develop adults following skills;

- ◇ Question the source of knowledge (Table-4),
- ◇ Support the claim with evidence (Table-5),
- ◇ Empathy (Table-6),
- ◇ Cognitive flexibility (Table-7)

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# SSL4ADULTS Framework

**Table 1. Socio-scientific issues (SSI) that are planned to be included in adult education.**

<b>Table 1. Socio-scientific issues (SSI) that are planned to be included in adult education.</b>	<b>Delphi</b>	<b>Literature Review</b>	<b>EU Competences</b>
GMO Food		X	
Climate Change	X	X	
Nuclear Power		X	
Hydroelectric Power Plants		X	
Pandemic		X	
Vaccination	X	X	
Power of Big Pharmaceutical Companies		X	
Embryonic STEM cell research		X	
Sustainability of Energy Sources	X	X	
Renewable Energy	X	X	
Use of Plastic		X	
Environment and Sustainable Development	X	X	
Environment and Biodiversity (Biosystem of bear/wolf in France)		X	
Homeopathy - Alternative Medicine Practices		X	
Obesity- Diabetes		X	
Food Supplements Vitamin, Antibiotic Use		X	
Biotechnology - Biofuels - Biosecurity - Food Safety - Additives		X	
Agricultural Irrigation - Water Conservation		X	
Animal Experiments		X	
Industrial Revolution		X	

**Table 2. Methods and techniques to enhance Socio-Scientific literacy of adults.**

<b>Table 2. Methods and techniques to enhance Socio-Scientific literacy of adults.</b>	<b>Delphi</b>	<b>Literature Review</b>	<b>EU Competences</b>
Inquiry [MST Competence]		X	
Didactic (Basic information related to SSI)	X	X	
Case Study		X	
Argumentation/Debate	X	X	[MST Competence] [Literacy Competence]
Individual/Group Working	X	X	[Personal and Social Learning Competence]
Problem-solving	X	X	[Personal and Social Learning Competence] [Entrepreneurship] [MST Competence] [Digital Competence]
Field trip		X	
Mapping controls	X	X	
Learning Community	X	X	
Immersive Experiences		X	[Personal and Social Learning Competence]
Self-Report		X	[Personal and Social Learning Competence] [Literacy Competence]

**Table 3. Learning materials to be used to improve the Socio-Scientific literacy of adults.**

<b>Table 3. Learning materials to be used to improve the Socio-Scientific literacy of adults.</b>	<b>Delphi</b>	<b>Literature Review</b>	<b>EU Competences</b>
Websites		X	
Press Articles	X	X	
News Videos		X	
Opinions of Different Stakeholders		X	[Personal and Social Learning Competence]
Scenario - Vignette		X	
Real Life Issue		X	
Graphics, tables etc. data		X	[Mathematical Competence] [MST Competence]
Conflict scenario	X	X	
Poster		X	
Online Discussion		X	

**Table 4. Epistemological beliefs and epistemic skills that are planned to be developed with SSL**

<b>Table 4. Epistemological beliefs and epistemic skills that are planned to be developed with SSL</b>	<b>Delphi</b>	<b>Literature Review</b>	<b>EU Competences</b>
Self and critical reasoning	X		[Personal and Social Learning Competence] [Digital Competence]
Neutral aspect		X	
Understanding of the scientific dimension (SSI)		X	[MST Competence]
Reliability and certainty of information	X	X	[MST Competence] [Digital Competence]
Analyzes and assesses in an independent way	X	X	
multiple justification		X	[Digital Competence]
Questioning the sources/evidences	X	X	[Digital Competence] [Literacy Competence]
Separate fake news from real news	X		[Digital Competence] [MST Competence]
Multiple correct understanding		X	[MST Competence] [Digital Competence]
Reflective Judgment		X	[Digital Competence]
Questioning the authority		X	[MST Competence] [Digital Competence]

**Table 5. Argumentation skills that are planned to be developed with SSL**

<b>Table 5. Argumentation skills that are planned to be developed with SSL</b>	<b>Delphi</b>	<b>Literature Review</b>	<b>EU Competences</b>
Construct/Analysis Argument	X	X	[[Literacy Competence] [MST Competence]
Express the Argument	X	X	[Literacy Competence]
Scientific Reasoning		X	[MST Competence]
Understand and rebuttal counter arguments	X	X	
Make mistakes and ask others to help		X	[Personal and Social Learning Competence]
Feel comfortable to voice their opinions	X	X	[Personal and Social Learning Competence]
To have equality in the conversation		X	[Personal and Social Learning Competence] [Civic Competence]
Support to claim with evidence	X	X	[Digital Competence] [MST Competence]
Detected logical fallacy	X	X	[MST Competence]
Communication skills (assertive language, concretion of the message)		X	[Personal and Social Learning Competence] [Entrepreneurship] [Cultural awareness and expression] [Literacy Competence] [Digital Competence]
Self-reflection	X	X	[Personal and Social Learning Competence]
Personal Justification		X	[Personal and Social Learning Competence]
Informal Reasoning		X	[Personal and Social Learning Competence]

**Table 6. Moral-value reasoning to be considered in SSL.**

<b>Table 6. Moral-value reasoning to be considered in SSL.</b>	<b>Delphi</b>	<b>Literature Review</b>	<b>EU Competences</b>
Thinking about the moral aspect of the SSI		X	[Civic Competence] [MST Competence]
Understanding risks of SSI		X	[Civic Competence] [MST Competence]
Focus on different point view in SSI (financial and risk etc.)		X	[ PSL] [Civic Competence] [Cultural awareness and expression] [MST Competence]
Think about your duty as an individual / and with society		X	[Civic Competence] [Entrepreneurship]
Learn about different cultures, morals and opinions		X	[ PSL] [Civic Competence] [Cultural awareness and expression]
Empathy	X	X	[ PSL] [Entrepreneurship] [Cultural awareness and expression]
Ethical Understanding	X	X	
To be aware of different values (Democracy, equality etc.) and value systems.	X	X	[Civic Competence] [Cultural awareness and expression]
Different sociocultural realities and tolerance in diversity		X	[Personal and Social Learning Competence] [Civic Competence] [Cultural awareness and expression]
Transition from moral reasoning to scientific reasoning		X	



**Table 7. Knowledge, skills and attitudes to be considered in SSL.**

<b>Table 7. Knowledge, skills and attitudes to be considered in SSL.</b>	<b>Delphi</b>	<b>Literature Review</b>	<b>EU Competences</b>
Critical Thinking	X	X	[Entrepreneurship] [MST Competence] [Literacy Competence] [Digital Competence]
Gather and Search for Information	X		[Digital Competence] [Literacy Competence]
Comparing Data		X	[Literacy Competence]
Analyzing The Sources	X	X	[Digital Competence]
Self-Esteem		X	[Personal and Social Learning Competence]
Self-Confidence		X	[Personal and Social Learning Competence]
Open Minded	X	X	[Digital Competence]
Understanding The Nature of Science		X	[MST Competence]
Understanding The Nature of SSI		X	[MST Competence]
Cognitive Flexibility		X	[Personal and Social Learning Competence]
Democratic Discussion Skill		X	[Civic Competence]
Media Literacy	X	X	[Digital Competence] [Cultural awareness and expression] [Literacy Competence]
Decision Making Skills		X	[MST Competence]
Social and Civic Competencies		X	[Personal and Social Learning Competence] [Civic Competence] [Cultural awareness and expression]
Content Knowledge of SSI		X	
Self-efficacy		X	
Creativity		X	[Entrepreneurship] [Digital Competence]
Responsiveness		X	[Entrepreneurship] [Digital Competence]

## SSL4ADULTS Competency Framework Matched with EU Commission Competences

### Explanation:

Within this Framework, adults' competences related to argumentation, epistemology and moral-value domains were matched with lifelong learning competences. In this way, users can understand the relationship of three important components of SSL literacy with basic skills in EU adult education.

Using this framework, which is broadly matched in the context of SSL literacy, it can be followed which basic skills of adults are focused on. Specifically, learning environments or training activities that include sub-skills under 8 key skills, including the limits of SSL literacy, can be designed. In addition, measurement/evaluation tools to measure and evaluate competences of adults can be developed.



**CLASSIFICATION OF THE KEY COMPETENCES FOR LIFELONG LEARNING (EU Commission Competency Framework) BY DOMAINS**

DOMAINS		
ARGUMENTATION	EPISTEMOLOGICAL BELIEF	MORAL VALUE
Literacy competence	Mathematical, science, technology and engineering competence	Citizenship competence
Cultural awareness and expression competence	Digital competence	Personal, social and learning to learn competence
Mathematical, science, technology and engineering competence	Personal, social and learning to learn competence	Entrepreneurship competence
Personal, social and learning to learn competence		Cultural awareness and expression competence
Digital competence		
Citizenship competence		

## Epistemic Criteria (Knowing and Questioning Information)

Code	Epistemological beliefs and epistemic skills that are planned to be developed with SSL
E1	Self and critical reasoning
E2	Neutral aspect
E3	Understanding of the scientific dimension (SSI)
E4	Reliability and certainty of information
E5	Analyzes and assesses in an independent way
E6	Multiple justification
E7	Questioning the sources/evidences
E8	Separate fake news from real news
E9	Multiple correct understanding
E10	Reflective Judgement
E11	Questioning the authority

## Argumentation Criteria (Evidence-Based Thinking)

Code	Argumentation skills that are planned to be developed with SSL
A1	Construct/Analysis Argument
A2	Express the Argument
A3	Scientific Reasoning
A4	Understand and rebuttal counter arguments
A5	Make mistakes and ask others to help
A6	Feel comfortable to voice their opinions
A7	To have equality in the conversation
A8	Support to claim with evidence
A9	Detected logical fallacy
A10	Communication skills (assertive language, concretion of the message)
A11	Self-reflection
A12	Personal Justification
A13	Informal Reasoning

## Moral Criteria (Value System)

Code	Moral-value reasoning to be considered in SSL.
M1	Thinking about the moral aspect of the SSI
M2	Understanding risks of SSI
M3	Focus on different points of view in SSI (financial and risk etc.)
M4	Think about your duty as an individual / and with society
M5	Learn about different cultures, morals and opinions
M6	Empathy
M7	Ethical Understanding
M8	To be aware of different values (Democracy, equality etc.) and value systems.
M9	Different sociocultural realities and tolerance in diversity
M10	Transition from moral reasoning to scientific reasoning



# Literacy

Competence	
Literacy	
<p>Competence description: Literacy is the ability to identify, understand, express, create and interpret concepts, feelings, facts and opinions in both oral and written forms, using visual, sound/audio and digital materials across disciplines and contexts. It implies the ability to communicate and connect effectively with others, in an appropriate and creative way.</p>	
Learning outcomes	
Skills	Ability to <ul style="list-style-type: none"> <li>• Communicate orally [A2] [A10]</li> <li>• Communicate in writing [A2] [A10]</li> <li>• Monitor and adapt communication to the requirements of the situation. [A4] [A10]</li> <li>• Distinguish and use different types of sources [A1] [A9] [E6] [E7]</li> <li>• Search, collect and process information [A1] [E5]</li> <li>• Formulate and express oral and written arguments in a convincing way appropriate to the context [A1] [A2] [A4] [A8] [A10]</li> <li>• Think critically [E4] [E7] [E8] [E11] [A9] [A11] [A13]</li> <li>• Assess and work with information [E4] [E7] [E8] [E11]</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Reading [A10]</li> <li>• Writing [A10]</li> <li>• Understanding of oral and written information [A2] [A10]</li> <li>• Knowledge of vocabulary, functional grammar and the functions of language. [A2] [A10]</li> <li>• Awareness of the main types of verbal interaction, [A2] [A10]</li> </ul>
Attitudes	<ul style="list-style-type: none"> <li>• Disposition to critical and constructive dialogue [A6] [A10]</li> <li>• Appreciation of aesthetic qualities and an interest in interaction with others [A6] [A10]</li> <li>• Awareness of the impact of language on others [A6] [A10]</li> <li>• Understand and use language in a positive and socially responsible manner [A10]</li> </ul>



## Cultural awareness and expression competence

Competence	
Cultural awareness and expression competence	
Competence description: Competence in cultural awareness and expression involves having an understanding of and respect for how ideas and meaning are creatively expressed and communicated in different cultures and through a range of arts and other cultural forms. It involves being engaged in understanding, developing and expressing one's own ideas and sense of place or role in society in a variety of ways and contexts.	
Learning Outcomes	
Skills	Ability to <ul style="list-style-type: none"> <li>• express and interpret figurative and abstract ideas, experiences and emotions [A2] [A10]</li> <li>• empathy [M6]</li> <li>• engage in creative processes, both as an individual and collectively [M4]</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Knowledge of languages [A10]</li> <li>• Knowledge of cultural tradition [M5] [M8] [M9]</li> <li>• understanding of cultural expressions' influence on the ideas of the individual [M5] [M8]</li> <li>• understanding the different ways of communicating [A10]</li> <li>• the understanding of cultural diversity [M5] [M8] [M9]</li> </ul>
Attitudes	<ul style="list-style-type: none"> <li>• Respect for diversity of cultural expression [M5] [M8] [M9]</li> <li>• willingness to participate in cultural experiences [M5]</li> </ul>

## Mathematical, science, technology and engineering competence

Competence	
Mathematical, science, technology and engineering competence	
<p>Competence description: Mathematical competence is the ability to develop and apply mathematical thinking and insight in order to solve a range of problems in everyday situations. Building on a sound mastery of numeracy, the emphasis is on process and activity, as well as knowledge. Mathematical competence involves, to different degrees, the ability and willingness to use mathematical modes of thought and presentation (formulas, models, constructs, graphs, charts).</p> <p>Competence in science refers to the ability and willingness to explain the natural world by making use of the body of knowledge and methodology employed, including observation and experimentation, in order to identify questions and to draw evidence-based conclusions. Competences in technology and engineering are applications of that knowledge and methodology in response to perceived human wants or needs. Competence in science, technology and engineering involves an understanding of the changes caused by human activity and responsibility as an individual citizen.</p>	
Learning Outcomes	
Skills	<p>Ability to</p> <ul style="list-style-type: none"> <li>• follow and assess chains of arguments [A1] [A8] [A9] [A4]</li> <li>• reason mathematically [E3] [A3]</li> <li>• understand mathematical proof [E3] [E4] [E8] [A3] [A8] [A1] [E5]</li> <li>• communicate in mathematical language [E3] [A10]</li> <li>• use appropriate aids including statistical data and graphs [A3] [A8]</li> <li>• understanding of science as a process for the investigation through specific methodologies, including observations and controlled experiments [E3]</li> <li>• use logical and rational thought to verify a hypothesis [E11] [A3] [A9]</li> <li>• the readiness to discard one's own convictions when they contradict new experimental findings [E1]</li> <li>• using scientific data to reach an evidence-based decision or conclusion [A1] [A3] [A8] [E3]</li> <li>• recognise the essential features of scientific inquiry [E4] [E9] [E3] [A13] [A3]</li> </ul>

<p>Knowledge</p>	<ul style="list-style-type: none"> <li>• understanding of mathematical terms and concepts [E3]</li> <li>• the basic principles of the natural world [E3]</li> <li>• fundamental scientific concepts, theories, principles and methods [E3] [A3]</li> <li>• understanding of the impact of science, technology, engineering and human activity in general on the natural world [M2] [M3]</li> <li>• advances, limitations and risks of scientific theories, applications and technology (in relation to decision-making, values, moral questions, culture, etc.) [M1] [M2] [M3]</li> </ul>
<p>Attitudes</p>	<ul style="list-style-type: none"> <li>• respect for truth [E2] [E5]</li> <li>• willingness support for both safety and environmental sustainability [M2] to look for reasons and to assess their validity. [E4]</li> <li>• concern for ethical issues [M1] [M7]</li> </ul>



# Personal, social and learning to learn competence

Competence	
Personal, social and learning to learn competence	
<p>Competence description: Personal, social and learning competence is the ability to reflect upon oneself, effectively manage time and information, work with others in a constructive way, remain resilient and manage one's own learning and career. It includes the ability to cope with uncertainty and complexity, learn to learn, support one's physical and emotional well-being, to maintain physical and mental health, and to be able to lead a health-conscious, future-oriented life, empathise and manage conflict in an inclusive and supportive context.</p>	
Learning Outcomes	
Skills	<p>Ability to</p> <ul style="list-style-type: none"> <li>• deal with complexity, critically reflect and make decisions [E1] [A11] E10</li> <li>• learn and work both collaboratively and autonomously [E5]</li> <li>• organise and persevere with one's learning evaluate and share it [A10] [A11] [E1] [E10]</li> <li>• communicate constructively in different environments [A10]</li> <li>• collaborate in teams and negotiate [A5] [A10]</li> <li>• show tolerance [M9] [M8]</li> <li>• express, understand and respect different viewpoints [A6] [A7] [M6] [M9] [M5]</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Understand the codes of conduct and rules of communication generally accepted in different societies and environments [M5] [M9]</li> <li>• Knowing one's competence development needs and various ways to develop competences [A11] [E1]</li> </ul>
Attitudes	<ul style="list-style-type: none"> <li>• Positive attitude toward one's personal, social and physical well-being [A6] [A7]</li> <li>• Positive attitude toward learning throughout one's life [A11] [A6] [A7]</li> <li>• Collaboration, assertiveness and integrity [A10]</li> <li>• Identify and set goals, motivate themselves and develop resilience [A11] [E1]</li> <li>• Desire to apply prior learning and life experiences and the curiosity to look for opportunities to learn and develop in a variety of life contexts [E1] [A12]</li> </ul>

# Digital competence

Competence	
Digital competence	
<p>Competence description: Digital competence involves the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking.</p>	
Learning Outcomes	
Skills	<p>Ability to</p> <ul style="list-style-type: none"> <li>• use digital technologies to support collaboration with others [A10] [A5]</li> <li>• access, filter, evaluate, create, program and share digital content [A8] [A10] [E1] [E6] [E8] [E7] [E9] [E11]</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Understanding how digital technologies can support communication, creativity, and innovation. [A10]</li> <li>• Adopting a critical approach to the validity, reliability and impact of information and data provided by digital means [E4] [E6] [E7] [E8] [E11]</li> </ul>
Attitudes	<ul style="list-style-type: none"> <li>• Reflective and critical attitude [E1] [E10]</li> <li>• Ethical, safe, and responsible approach to the use of digital technologies [M7]</li> </ul>

# Citizenship competence

Competence	
Citizenship competence	
<p>Competence description: Citizenship competence is the ability to act as responsible citizens and to fully participate in civic and social life, based on understanding of social, economic, legal and political concepts and structures, as well as global developments and sustainability.</p>	
<p>Learning Outcomes</p>	
<p>Skills</p>	<p>Ability to</p> <ul style="list-style-type: none"> <li>• engage effectively with others in the common or public interest [M4]</li> <li>• develop arguments [A1]</li> <li>• participate in decision-making [E1] A13</li> </ul>
<p>Knowledge</p>	<ul style="list-style-type: none"> <li>• Knowledge of basic concepts and phenomena relating to individuals, groups, work organisations, society, economy and culture [M5] [M8]</li> <li>• Awareness of the aims, values and policies of social and political movements (as of sustainable systems, in particular climate and demographic change at the global level and their underlying causes.) [M1] [M2]</li> <li>• Awareness of diversity and cultural identities in Europe and the world [M5] [M8] [M9]</li> </ul>
<p>Attitudes</p>	<ul style="list-style-type: none"> <li>• Willingness to participate in democratic decision-making at all levels and civic activities [A7] [M4]</li> <li>• Support social and cultural diversity [M5] [M8]</li> <li>• Interest in political and socioeconomic developments, humanities and intercultural communication [M5]</li> </ul>

# Entrepreneurship competence

Competence	
Entrepreneurship competence	
<p>Competence description: Entrepreneurship competence refers to the capacity to act upon opportunities and ideas, and to transform them into values for others. It is founded upon creativity, critical thinking and problem solving, taking initiative and perseverance and the ability to work collaboratively in order to plan and manage projects that are of cultural, social or financial value.</p>	
Learning Outcomes	
Skills	<p>Ability to</p> <ul style="list-style-type: none"> <li>• critically and constructively reflect [E1] [E10] [A11]</li> <li>• make financial decisions relating to cost and value [M3] [E1]</li> <li>• effectively communicate and negotiate with others [A10]</li> <li>• cope with uncertainty, ambiguity and risk as part of making informed decisions [M2]</li> </ul>
Knowledge	<ul style="list-style-type: none"> <li>• Have self-awareness of their own strengths and weaknesses [E1]</li> <li>• Awareness of ethical principles and challenges of sustainable development [M7]</li> </ul>
Attitudes	<ul style="list-style-type: none"> <li>• Sense of initiative and agency, pro-activity [M4]</li> <li>• Forward-looking [M3]</li> <li>• Desire to motivate others and value their ideas [M8] [M9]</li> <li>• Empathy / taking care of people and the world [M6]</li> <li>• Accepting responsibility [M4]</li> <li>• Taking ethical approaches throughout the process. [M7]</li> </ul>

## Sources for the Competency Framework

European Commission, Directorate-General for Education, Youth, Sport and Culture, Key competences for lifelong learning, Publications Office, 2019, <https://data.europa.eu/doi/10.2766/569540>

Eu commission, key competences, ESCO European Skills, [ec.europa.eu/esco/portal/home](http://ec.europa.eu/esco/portal/home), Cedefop, OECD,



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