smart4food

innovative microlearning for farmers

Smart4Food Curriculum

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1. PROJECT SUMMARY

innovative microlearning for farmers

The Smart4Food project (With a Smart Farm Towards Food Security) is a European collaborative initiative designed to strengthen the innovation, sustainability, and competitiveness of small and family farms through vocational education and training (VET). The project brings together six partner organizations from Croatia, Slovakia, Turkey, Cyprus, Ireland, and Italy, combining expertise in agriculture, education, rural development, and digital innovation.

At its core, Smart4Food aims to empower smallholders with digital, entrepreneurial, and green competencies, enabling them to modernize their practices and contribute to sustainable food systems. The project aligns with the EU Green Deal, and the Sustainable Development Goals (SDGs), addressing key priorities such as environmental sustainability, innovation in VET, and adaptation of training to labour market needs.

Smart4Food's central outcomes include the development of:

- A Key Competence Map for small and family farmers,
- A Smart4Food Curriculum and Open Education Resources (OER), and
- A Smart4Food Hub – an interactive digital platform hosting microlearning materials, tools, and case studies to foster lifelong learning and knowledge exchange across Europe.

Through an innovative combination of microlearning, open digital resources, and gamified educational design, Smart4Food provides flexible, accessible, and highly practical training pathways. By integrating sustainability, technology, and entrepreneurship into agricultural education, Smart4Food will contribute to a more resilient, climate-smart, and digitally competent agricultural workforce across Europe.

2. INTRODUCTION: DEVELOPMENT OF THE SMART4FOOD CURRICULUM

2.1. SCOPE

The Smart4Food Curriculum is an innovative educational framework aimed at equipping small and family farmers (EQF Level 4) with the competencies required for sustainable and digital transformation in agriculture. The curriculum is based on findings from the Key Competence Map developed through field research, stakeholder consultations, and data mapping across partner countries.

The curriculum forms part of the **Smart4Food Innovation Training Program**, combining **microlearning principles and open multimedia resources (OER)** to make training accessible, flexible, and relevant to real-world agricultural challenges. Designed for adult learners with diverse educational backgrounds, it focuses on building both **technical** and **transversal** skills to enhance farm innovation, efficiency, and environmental responsibility.

The program structure includes **six modules**, each targeting a specific area of competence crucial for the modernization of small farms.

The modules include:

1.Digital Tools for Smart Farming

2.Sustainable and Regenerative Agriculture

3.Smart Marketing and Communication for Small Producers

4.Local Food Systems and Short Supply Chains

5.Training and Education for Rural Development

6.Policy, Innovation and Project Development in the Agri-sector

2.2 METHODOLOGY OF CURRICULUM DESIGN

The development process integrates **evidence-based research**, **co-creation with stakeholders**, and **European quality frameworks** (EQF and NQF).

To ensure **transparency, recognition, and mobility of learners**, the Smart4Food curriculum is fully aligned with the **European Qualifications Framework (EQF Level 4)** and mapped against the **National Qualifications Frameworks (NQFs)** of partner countries. This alignment guarantees that learning outcomes are clearly defined in terms of **knowledge, skills, and competences**, allowing for comparability across educational systems. Such compatibility supports **seamless progression and validation of learning**—whether learners continue in formal VET, transition to higher education, or apply their competences in professional practice. By establishing a shared reference for qualification levels, the project also enhances **cross-border recognition** and facilitates **mobility of learners and workers** within the European vocational education space.

Key methodological elements include:

- **Needs Analysis:** Identification of digital, entrepreneurial, and green skills gaps among smallholders based on surveys, interviews, and focus groups (MEI, 2024).
- **Competence Mapping:** Definition of learning outcomes according to EQF Level 4, ensuring transparency and portability across the EU.
- **Microlearning Design:** Use of bite-sized, multimedia learning units (infographics, videos, podcasts, quizzes) aligned with clear objectives and practical outcomes.
- **Gamification and Engagement:** Integration of interactive tools and micro-assessments to sustain motivation and reinforce learning.
- **Multilingual Accessibility:** Development of content in six EU languages to support inclusive participation.

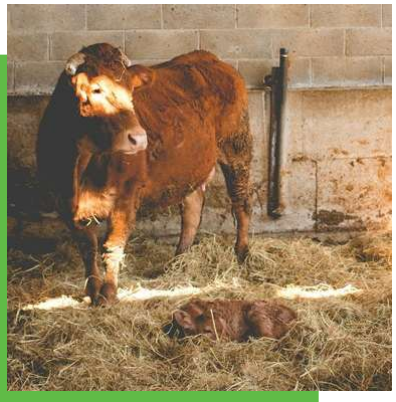
The curriculum development was led by **New Edu (SK)**, with methodological input from **MEI (IE)**, digital structure and templates provided by **MAGNETAR (CY)**, and thematic content co-created by all partners based on their expertise.

2.3 TRAINING AND ASSESSMENT METHODS

Smart4Food applies a **learner-centred**, **competence-based** approach emphasizing learning-by-doing. The program includes e-learning – self-paced digital learning through the Smart4Food Hub. Assessment integrates both **formative** and **summative** methods: quizzes, micro-assessments, peer reviews, projects, and practical assignments. The emphasis is on "**assessment as learning**", encouraging reflection, feedback, and continuous improvement.

2.4 PILOT TESTING AND FEEDBACK

Pilot testing, led by **Kocaturk (TR)**, ensures the validation and refinement of the curriculum and OER. The pilot involves at least **180 participants** across six partner countries (farmers, trainers, development agencies). Participants provide feedback on content relevance, usability, and learning impact, which will inform final adjustments and the publication of the **Smart4Food Innovation Training Program** in all national languages.



2.5 EXPECTED RESULTS AND IMPACT

The Smart4Food Curriculum will:

- Provide a **comprehensive, modular training program tailored** to small and family farms.
- Strengthen farmers' **digital, entrepreneurial, and sustainable skills** in line with labour market needs.
- Establish a **transferable model for microlearning in rural education**, accessible through the Smart4Food Hub.
- Promote **lifelong learning and innovation** in the agri-food sector.
- Contribute to the **green and digital transformation** of European rural communities.

3. STRUCTURE OF THE CURRICULUM

The curriculum includes the following sections:

3.1 MICROLEARNING UNIT (MU)

Each **Microlearning Unit (MU)** represents the smallest autonomous learning element in the Smart4Food curriculum. It is designed to deliver a single, focused learning outcome through a short, engaging and action-oriented format.

The MU is defined in terms of:

- **Title and Code:** Short and clear identification of the topic and module reference.
- **Learning Outcome (LO):** A single, measurable and observable skill or piece of knowledge that the learner will acquire by completing the unit. (e.g. “Learner can identify the key benefits of using smart irrigation systems on small farms.”)
- **Success Indicator:** Description of how the learner’s achievement can be demonstrated or observed. (e.g. “Chooses the correct irrigation method for different scenarios in the quiz.”)
- **Practical Context:** Short explanation of when or how the learner might apply the new knowledge in a real-life small farm situation. (e.g. “This skill can help you reduce water waste during dry seasons on your own plot.”)

Microlearning Design Principles Applied:

- Duration: 5–8 minutes
- 1 idea = 1 module
- Includes interactive task or mini challenge
- Ends with “call to action” for real-life application

3.2. TRAINING MODULE (TM)

In the context of Smart4Food, the full learning experience is built from **microlearning modules**, which are grouped into **Microlearning Training Paths (MTPs).**

Each **MTP** corresponds to a **competence area** (e.g., Digital Marketing, Sustainable Resource Management) and consists of several short, focused **Microlearning Units (MU).** The MTP is the modern equivalent of a traditional Training Module, but redesigned to be modular, flexible, and digitally accessible.

1. Structure of a Microlearning Training Path (MTP):

- **Domain-based** (1 MTP = 1 Competence Area)
- Consists of 4–8 **Microlearning Units (MU)**
- Each unit teaches **one concrete outcome** (skill, knowledge or behavior)
- MTP ends with an optional **final reflection task or quiz**

2. Each MTP includes:

- Name and theme
- Target group relevance (TG1, TG2, TG3)
- List of Microlearning Units included
- Estimated completion time (30–45 mins total)
- Required tools or devices (if any)
- Competence goal and link to Smart4Food Competence Map

3.3. MICROLEARNING UNIT DESCRIPTION (MU)

Each Microlearning Training Path (MTP) is made up of several **Microlearning Units (MUs).** Each unit focuses on one well-defined learning objective and can be completed independently in a short time.
A Microlearning Unit is characterized by the following structure:

- **Title**: Clear and concise name of the unit
- **Code**: Unique identifier linked to curriculum structure
- **Target Group**: TG1 (smallholders), TG2 (educators/advisors), TG3 (regional actors)
- **Duration**: Typically, 5–8 minutes of active engagement
- **Learning Outcome (LO):** A concrete, observable skill or understanding the learner will achieve
- **Success Indicator** (instead of Evaluation Criteria): A short statement of what successful completion looks like (e.g., "Can name three digital marketing channels used by small farms.")
- **Instructional Content**: The core content presented via micro-video, infographic, animation, etc.
- **Activity / Micro Task:** Learner performs an action: selects an answer, reflects, applies knowledge to a scenario, etc.
- **Mini Assessment:** 2–3 short quiz questions to check understanding, with feedback
- **Methodological Format**

    - Mobile-first
    - Self-paced
    - Multilingual
    - Modular / stackable

- **Call to Action (CTA):** A suggestion for applying what was learned in real life
(e.g., "Try taking a photo of your product and post it with a caption using one of the techniques learned.")

3.4. LEARNING OUTCOMES (LO) IN MICROLEARNING

In the Smart4Food microlearning approach, each microlearning unit (MU) delivers **one specific, observable Learning Outcome.** This outcome reflects what the learner will be able **to do, apply, or recognize** immediately after completing the short activity.

Characteristics of Learning Outcomes in Smart4Food

- Clearly formulated in one sentence
- Focused on **practical behavior**, not abstract knowledge
- Observable and **demonstrable by the learner** (e.g. via quiz, task, or reflection)
- Describes **newly acquired behavior** achievable through the module
- Must be **measurable** and **simple**, written in plain language

Microlearning LO Examples:

- Learner can list 3 benefits of using organic compost.
- Learner can identify which irrigation system is most water efficient.
- Learner can create a simple post to market a farm product on Facebook.

Assessment Alignment (Success Indicator)

Instead of traditional "Evaluation Criteria (EC)", Smart4Food uses **success indicators**, i.e. short statements or quiz checks showing the LO was achieved.

Success is defined as:

- Learner selects correct answer
- Completes an action (e.g., fills a form, uploads a task)
- Reflects or explains how to apply a learned concept

Types of Learning Outcomes in Smart4Food

Type of LO	Definition & Role	Example
Micro-LO	Specific to one Microlearning Unit	*"Learner can identify 3 digital tools…"*
Module-Level LO	Summary of 3–5 Micro-LOs within one MTP	*"Learner understands basic e-commerce..."*
Curriculum LO	Achieved by completing full domain (optional)	*"Learner can apply digital marketing..."*

3.4.1. Microlearning Competence Description

In the Smart4Food microlearning system, each unit is built around **one key competence**, formulated as a **practical action** the learner should be able to perform after completion.

Definition:

A competence is a combination of **knowledge and skills** that enables learners to perform a specific task or action related to their farming or educational context.

Each competence is expressed through:

- A short, clear **Learning Outcome** using an **active verb** (e.g. apply, select, describe, compare).
- A **contextual object** (e.g. "apply digital marketing principles to local farm promotion").
- A **Success Indicator** – a concrete sign that the learner has understood and can apply the competence.

Guidelines for competence formulation:

- Use one simple sentence: Verb + object + context.
- Avoid vague verbs like "understand" or "be familiar with".
- Avoid over-technical or abstract phrasing.
- Competences should reflect **minimum achievement** expected from the learner.
- Align with EQF logic, but in simplified form (EQF levels are not explicitly referenced).

Example:

Competence: Learner can select the most suitable social media channel for marketing farm products.

3.4.2. Success Indicators

In the Smart4Food microlearning system, **Success Indicators** replace the traditional concept of Evaluation Criteria. They define **what successful completion of a microlearning unit looks like** from the learner's perspective.

Definition

A **Success Indicator (SI)** is a short, observable behaviour or response that confirms the learner has achieved the **Learning Outcome (LO).**

Each LO should be accompanied by at least one SI that is:

- **Simple and specific**
- **Observable** via interaction (e.g., quiz, choice, short reflection)
- **Action-based** (demonstrates ability, not just memory)

Types of Success Indicators

KNOWLEDGE SI – KNOW	SKILLS SI – KNOW HOW TO DO
Checks learner's understanding or recall of key facts, principles, or terms	Checks learner's ability to apply or analyse content in context
Example: "Select 2 reasons why crop rotation improves soil health."	**Example:** "Choose the best irrigation method for a dry-season farm scenario."
Action Verbs: Identify, Match, Compare, Select, Explain, Classify, List, Describe, Name	**Action Verbs:** Apply, Choose, Demonstrate, Decide, Plan, Use, Simulate, Select, Recommend

Formulation Guidelines

- Use clear **action verbs**
- Match SI directly with the **Learning Outcome**
- Avoid vague verbs like "understand" or "know" without further action

Example

- **Learning Outcome:** Learner can identify at least 2 organic fertilizers suitable for small-scale farming.
- **Success Indicator (quiz):**

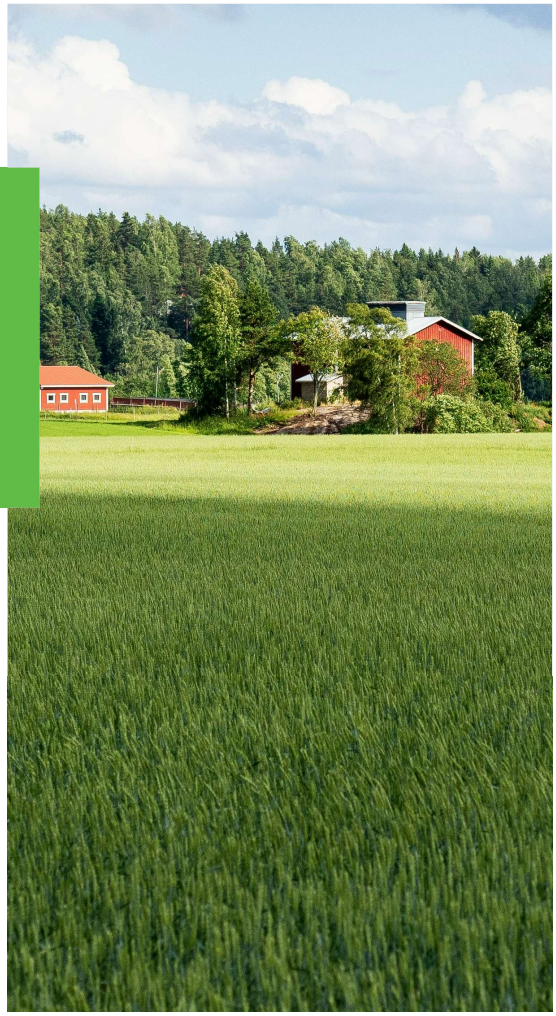
Q: Which of the following are considered organic fertilizers?

✔ Compost

✔ Manure

✗ Urea

✗ Pesticide mix



4. CONTENT IN SMART4FOOD MICROLEARNING MODULES

In the Smart4Food microlearning approach, content is structured into **small, focused learning chunks** that directly support the **learning outcome** of the module. Each module addresses a clear “need to know” or “need to do” for smallholders and related stakeholders.

4.1. TYPES OF CONTENT

Core Knowledge ("What to know")

Short explanations of **concepts, facts, principles, or tools**

Delivered via:

O 1-minute video
O infographic
O image + short caption
O audio summary

Should answer:

O “What is it?”
O “Why is it important?”
O “When do I use it?”

Practical Content ("What to do")

Demonstrates or guides the **application of knowledge**

Delivered via:

O step-by-step video or animation
O checklist
O template or example

Should answer:

O “How do I do it?”
O “How can I try it on my farm?”

4.2. CONTENT GUIDELINES

• Keep it **short and visual** – max. 1–2 content blocks per module
• Use **plain language**
• Link content directly to the **Learning Outcome and Success Indicator**
• Avoid passive knowledge – prioritize **action-oriented examples**

Examples of Content Structure in Microlearning Module

Section	Type	Format Example
Concept intro	Core Knowledge	Infographic: "What is composting?"
Application tip	Practical	Video: "How to set up compost on your farm"
Action prompt	Practical	Task: “Take a photo of your compost pile”

4.3. RELATION TO LEARNING OUTCOME

All content is:

• Directly linked to the **Learning Outcome**
• Measurable through the **Success Indicator**
• Relevant to the learner’s **real-world context**

5. METHODOLOGICAL STRATEGIES

In Smart4Food, methodological strategies define how learners interact with content to achieve the intended Learning Outcomes (LO). Unlike traditional classroom methods, microlearning strategies are digital-first, self-paced, and focused on active engagement in a short time frame.

5.1. WHAT DO METHODOLOGICAL STRATEGIES DESCRIBE?

They describe **HOW** learning happens — the sequence of actions, media, and learning tools used to support learners in acquiring a specific competence.

5.1.1. Principles of Microlearning Strategies

Effective methodological strategies in Smart4Food:

- Focus on **short, goal-driven activities**
- Combine **visual, audio, and interactive elements**
- Encourage **learn-by-doing** approaches
- Are designed for **mobile and online delivery**
- Can be completed **independently in 5–8 minutes**

Strategy Design is Based on:

- The **Learning Outcome** and **Success Indicator**
- The **type of competence** (knowledge or skills)
- Available **digital resources and tools**
- The **real-life relevance** of the topic
- The need to **trigger reflection or action**

Examples of Microlearning Strategies

Strategy Type	Description	Example
Watch & Reflect	Learner watches a video or reads a short input, then answers a question	"Watch how to make compost → Select what materials are compostable"
Try & Upload	Learner performs a short task and shares result or reflection	"Make a 3-line farm promotion post and upload a screenshot"
Choose & Compare	Learner selects between options based on a scenario	"Which irrigation system fits this farm type?"
Explore & Decide	Learner interacts with visual tool, chart, map, or image	"Use a table to compare fertilizer costs → Choose the best option"

5.1.2. Recommended Learning Tools & Formats

- Short instructional videos (1–3 minutes)
- Infographics or photo stories
- Mini quizzes with instant feedback
- Templates or task guides
- Voice or video reflections (optional)
- Clickable PDFs, Google Forms, or digital cards

5.1.3. Learner Activities in Smart4Food

In Smart4Food, each Microlearning Unit (MU) includes at least one short, meaningful activity aligned with the Learning Outcome and designed to be completed in 5 minutes or less.

Purpose of Activities:

- Reinforce the learning content
- Prompt real-world application
- Make learning interactive and practical
- Lead to a visible or reportable result

Types of Microlearning Activities:

Type	Description	Example
Self-check quiz	Learner selects correct answers or matches terms	"Which 2 practices reduce water loss?"
Mini task	Learner does a real-life action or simulated step	"Create a simple farm budget using this form"
Visual selection	Learner chooses or labels from images	"Click the correct part of the plant affected by a disease"
Try & reflect	Learner applies idea in real world and reflects	"Observe your compost pile → Record one thing you would change"
Decision-making	Choose best solution based on a farming scenario	"Which marketing strategy fits a local farm selling honey?"

5.1.4. Pedagogical Methods in Microlearning Context

Pedagogical methods in Smart4Food are not classroom-based but built for short, digital, **self-paced learning experiences**. Each Microlearning Unit is based on **active engagement**, not passive absorption.

Smart4Food Encourages:

- **Active methods:** "learning by doing" – practical tasks, simulations, mini-projects
- **Experiential learning**: real-life application and reflection
- **Micro-case learning:** using authentic examples from farming practice
- **Visual/interactive methods:** infographics, animations, step-by-step guidance
- **Choice-based learning:** learner chooses pathways or answers based on their needs

Recommended Techniques:

- Scenario-based tasks
- Problem-solving
- Interactive forms or templates
- Peer-to-peer exchange (optional through the platform)
- Short reflective prompts (text or audio)

5.1.5. Method Type: How it's Used in Smart4Food

Affirmative	Elaborative	Active
Introductory videos, definitions, brief tutorials	Visual explanations, comparison charts, infographics	Task-based, decision-making, application in real-life context

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DIGITAL LEARNING FORMATS & TOOLS

- All content should be optimized for **mobile-first** use.
- Modules will use **lightweight, accessible formats** (e.g., short videos, infographics, clickable PDFs, audio clips).
- Tools used should be **freely accessible**, such as Canva, Google Forms, PowerPoint, or open-source editors.
- Resources required by learners: smartphone/tablet, optional headset, stable internet connection.

7. Microlearning Assessment Strategy

- Evaluation is based on **success indicators (SIs)** per microlearning unit.
- Every unit ends with:
  - **Mini quiz** (2–3 multiple-choice or true/false questions)
  - **Task completion** (e.g., submit photo, complete form, make a choice)
  - **Optional reflection** (open question or short
- No final test or grading is required.
- Trainers may analyze results to **refine modules**, not to “pass/fail” learners.
- Self-assessment and learning logs can be integrated into the Smart4Food Hub.

8. EVALUATION PLAN STEPS

Each module defines:

- The **Learning Outcome**
- The **Success Indicator**
- The **Activity or Mini-Task**
- The **Form of Assessment** (e.g. quiz, checklist, task upload)

9. CONCLUSION

The **Smart4Food Curriculum** represents a forward-looking and inclusive approach to agricultural education, designed to empower small and family farmers with the **digital, green, and entrepreneurial skills** needed to thrive in a rapidly evolving sector. Developed through extensive research, stakeholder collaboration, and alignment with **European and national qualification frameworks**, the curriculum ensures both quality and relevance to real-world challenges in rural contexts.

*By combining **microlearning, open educational resources**, Smart4Food creates flexible and accessible learning opportunities that respect the realities of rural life and seasonal work. Its modular structure allows learners to personalize their training paths, while formative and practical assessment methods encourage active engagement and continuous growth.*

Ultimately, the Smart4Food curriculum not only contributes to **capacity building and innovation in rural areas**, but also promotes the **sustainability, digital transformation, and resilience** of the European agri-food system. Through its integration into the **Smart4Food Hub**, the curriculum will remain an open, evolving resource—supporting lifelong learning, knowledge sharing, and cross-border mobility for learners and professionals across Europe.

Annex: Curriculum Template

Curriculum Unit Overview

- **Title of Training Path / Domain:** *(e.g. Digital Marketing for Smallholders)*
- **Module Code:** *(e.g. DM01)*
- **Target Group(s):** TG1 / TG2 / TG3
- **Duration (total):** *(e.g. 30–45 min / 3–5 microlearning units)*
- **Competence Area:** *(e.g. Business & Marketing)*
- **Expected Learning Outcome of Module:**

One-sentence summary of what the learner will be able to do after completing this module.

Microlearning Unit Structure (Repeat this section per each micro-unit)

- **Microlearning Unit [#]:**
- **Title:**
- **Learning Outcome (LO):**
- **Success Indicator (SI):**
- **Estimated Duration:** (5–8 min)
- **Content Elements:**
- **Core Knowledge Block:** *(e.g. Short video / infographic / audio summary)*
- **Practical Application Block:** *(e.g. Step-by-step task / checklist / template / visual scenario)*
- **Activity / Task:** *(e.g. "Choose the right marketing channel for this product")*
- **Micro-Assessment (Optional):** *(e.g. 2–3 questions, true/false or multiple-choice)*
- **Call to Action:** Suggestion for applying knowledge in real life *(e.g. "Create a social media post for your farm")*

Pedagogical Strategy Summary

- **Method Used:** e.g. discovery, demonstration, visual scenario, reflection
- **Format of Delivery:** video / image / text / interactive form
- **Tool Suggestions:** e.g. Canva, Google Forms, PowerPoint, Flipgrid, etc.
- **Accessibility Notes:** subtitles, mobile-friendly, no login needed

Evaluation Method

- **Assessment Type:** (Quiz / Task Submission / Reflection Prompt)
- **Feedback Style:** Immediate / Peer-optional / Self-check

Localization & Partner Info

- **Responsible Partner:** *(e.g. New Edu*)
- **Language Versions Available:**
- **Last Updated:**