

Development of a Hybrid Human-AI Personalised Learning Path for VET for Innovation in Agriculture



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PERSONA: Design of Programme.

D2.1 Design of the Microcredentials Programme in Innovation Process Management in Agriculture.

This document provides a detailed outline of the programme developed as part of the PERSONA project.

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Contents

Introduction	1
Vision/Value Statement	3
Programme Outcomes.....	3
Graduate Attribute/	4
Testimonial Outcomes.....	4
Programme Aims	4
Macro-areas.....	4
Duration.....	5
Location/	5
Delivery.....	5
When can I sit & partake in modules?	5
EQF Level	5
Programme Target Audience.....	5
How will I be assessed?	5
Curriculum Overview	6
Program Content – What students expect to see in the curriculum.....	7
Opportunities for Graduates and Past Pupils	16
Program Recognition	16

Introduction



Agricultural innovation involves the introduction of new practices, technologies, and knowledge, which can positively impact the economy, society, and the environment. However, supporting innovation within the Agricultural Knowledge and Innovation System framework remains challenging due to the need for relevant services for various actors, such as advisors, agricultural trainers, and teachers. Agricultural TVET education and continuous professional development (CPD) play a critical role in enabling future farmers to adapt to technological and policy changes.

The project focuses on addressing challenges in innovation management education for agricultural TVET Providers, investing in new technologies for TVET systems, and strengthening Agricultural Knowledge and Information System (AKIS) policies in EU Member States and regions. The specific objectives of the project include innovating learning processes, products, and services, improving Agricultural TVET Education and integrating innovation into institutional strategies, enhancing the ability of Agricultural TVET Education to provide transversal and technical skills for innovation, and strengthening relationships between Agricultural TVET Education and other AKIS actors at the European level.

In order to achieve these objectives six modules have been developed and incorporated into the programme. These modules cover a wide range of competencies identified for supporting change. The following six modules to be included in the PERSONA hybrid-AI system were developed: (i) Agricultural Financial Management; (ii) Agricultural Software Support Tools; (iii) Agricultural Sustainability; (iv) Farm Entrepreneurship; (v) The Role of Groups in Agriculture; and (vi) Robotics in Agriculture. An in-depth programme outline is provided below.



Vision/Value Statement	This is an academic micro credential course designed for farmers, agricultural students, extension workers, agricultural educators, and industry personnel seeking to gain expertise in increasingly important areas of agriculture such as technology, sustainability, knowledge exchange, innovation and finance. A strong emphasis is placed on the quality of education provided to those who undertake this program. The programme is highly interactive, involving case studies and interactive scenarios, which significantly increases opportunities for engagement with learning, thus creating a more successful learning environment. The programme is flexible, can be taken anytime, anywhere in a space that is convenient for the learner, covering a broad range of key agricultural topics and issues. The programme readily equips the learner with the necessary knowledge, skills and attitudes to support their career within the agri-food sector. Approaches to teaching, learning and assessment include a blend of interactive material and assessment as well as autonomous student learning hours.
Programme Outcomes	Upon completing this programme, learners will have developed a comprehensive skill set encompassing digital and technological skills, agronomy and sustainable farming practices, data analysis, communication, problem solving, business management, entrepreneurship, networking, and leadership. Learners will also acquire key knowledge in areas such as agricultural innovation, policy and regulatory issues, environmental impact, financial management, robotics, and group interactions. Additionally, learners will gain exposure to attitudes fostering innovation, adaptability, sustainability, entrepreneurial thinking, and a forward-looking mindset. Hands-on learning and collaboration will further enhance their critical thinking, problem-solving abilities, and resilience, all of which will aid in equipping learners with the competencies necessary to implement innovation process management in agriculture. Upon successful completion of this programme learners should be able to: 1. Provide solutions to various financial aspects which will increase farm profitability, and efficiency while promoting the use of technology. (Agricultural Financial Management). 2. Demonstrate the role of agricultural software support tools, from an environmental and economic point of view, as well as understanding the key features and types of support tools available within the agricultural industry. (Agricultural Software support Tools).



	3. Outline the key concepts and processes around sustainability adoption on farms (Agricultural Sustainability). 4. Develop strategies that can be implemented by farmers to future proof farms against uncertainty through embracing entrepreneurial spirit and new technologies (Farm Entrepreneurship). 5. Distinguish key aspects of robotics in agriculture ranging from its technical application to its economic feasibility. (Robotics in Agriculture). 6. Develop skills to adequately interact with others in order to successfully exchange knowledge and information regarding key agricultural topics such as those undertaken in previous modules throughout the programme. (The Role of Groups in Agriculture).
Graduate Attribute/ Testimonial Outcomes	1. Graduates will demonstrate proficiency in technologies, digital literacy, IT, and digital communication with the ability to effectively apply them in agricultural settings. 2. Graduates will demonstrate the ability to work collaboratively with diverse groups, including students and farmers, towards shared objectives. They will develop interpersonal skills to manage group dynamics and engage effectively with individuals of varying personalities and backgrounds. 3. Graduates will display the ability to implement innovative solutions on farms to ensure a sustainable and secure future for farm businesses. 4. Graduates will demonstrate the ability to recognize diversification/entrepreneurial opportunities to implement on farms.
Programme Aims	This programme aims to: • Foster competencies in innovation process management within the agricultural sector. • Equip learners with comprehensive knowledge, skills and attitudes in key areas using an active learning approach whereby students are continually challenged, motivated and eager to learn. • Prepare students to navigate and thrive in the evolving landscape of agricultural production.
Macro-areas	Digital Technology – The goal is to equip learners with digital proficiency in areas including digital and technological skills, data and analytical skills and digital and IT knowledge.



	<u>Business Model Innovation</u> – The area of business model innovation seeks to advance students competence in areas such as business and financial management, entrepreneurship and marketing, agricultural innovation and technology adoption, as well as fostering an entrepreneurial and innovative mindset approach. <u>Sustainable Innovation</u> – Sustainable innovation aims to equip students with the competencies to adequately support students in undertaking sustainable practices and sustainable innovation ideas that can positively affect sustainability on farms. Competencies included are in areas such as agronomy and sustainable farming, sustainable and regenerative farming practice and climate change.
Duration	120 hours (20 hours per module).
Location/ Delivery	The programme is delivered fully online, at a distance.
When can I sit & partake in modules?	Modules can be taken anytime, anywhere, at the learner's own convenience. Learners will complete a self-assessment questionnaire initially which will inform an individualized learning plan for the learner based on the score received in the self-assessment questionnaire. This will ensure each learner receives a learning plan specific to their training needs which includes a weekly educational plan linked to the modules within this innovation process management programme. Beyond the self-assessment questionnaire and individualized learning plan, it is suggested modules within the programme are taken in the following order: 1. Agricultural Sustainability. 2. Agricultural Software Support Tools. 3. Robotics in Agriculture. 4. Farm Entrepreneurship. 5. Agricultural Financial Management. 6. The Role of Groups in Agriculture.
EQF Level	EQF Level 5.
Programme Target Audience	Farmers, agricultural students, extension workers, agricultural educators, agri-food industry, etc.
How will I be assessed?	This programme incorporates a variety of engaging assessment types across the modules. These include:



	1. Multiple Choice Questionnaires. 2. Roleplays. 3. Scenario Solving. 4. Interactive Exercises. 5. Case Studies.
Curriculum Overview The Microcredential Programme comprises six modules: 1. Agricultural Financial Management. 2. Agricultural Software Support Tools. 3. Agricultural Sustainability. 4. Farm Entrepreneurship 5. Robotics in Agriculture. 6. The Role of Groups in Agriculture. Detailed information on each module within the programme is outlined below.	



Program Content – What students expect to see in the curriculum

Agricultural Financial Management	
Module Descriptor: This module is designed to build competencies in financial planning, management, and decision-making tailored to the needs of agricultural professionals. Learners will explore innovative financial tools and strategies, grounded in sustainable and data-driven practices, to support the resilience and economic growth of agricultural enterprises.	
Learning Outcomes:	
Knowledge:	
• Know financial principles specific to agriculture, including budgeting and investment strategies. • Name innovative financing tools such as cooperative models, crowdfunding, and digital platforms (FARMINFIN project insights). • Know policies and regulations impacting agricultural finance and sustainability.	
Skills:	
• Analyze and interpret financial data to guide decision-making. • Develop and evaluate budgets for agricultural operations. • Apply innovative financing methods to optimize resource allocation.	
Attitudes:	
• Foster an entrepreneurial and innovative mindset in financial management. • Advocate for sustainable financial practices. • Demonstrate openness to adopting new tools and technologies for financial management.	
Transversal Skills:	
• Apply critical thinking for problem-solving in financial decision-making. • Effective communication of financial insights to stakeholders.	
Green Skills:	
Align financial planning with environmentally sustainable practices.	
Link to module material	Please find more information on the lesson topics for the module “Agricultural Financial Management” here .



Agricultural Software Support Tools

Module Descriptor: The module on Agricultural Software Support Tools provides a structured approach to understanding, applying, and evaluating digital technologies in precision agriculture. These tools include software for precision farming, Decision Support Systems (DSS), and digital platforms, which are integral to modern agricultural practices. The modules aim to enhance the technical competence of learners in leveraging these technologies to improve productivity, optimize resource use, and support sustainable farming practices. Throughout the modules, learners will explore key functionalities such as satellite positioning systems, variable-rate technology, data-driven decision-making, and platform integration for enhanced farm management. By the end of the module, learners will be equipped to apply these tools in real-world contexts, addressing both operational efficiency and environmental stewardship within agricultural systems.

Learning Outcomes

Knowledge

- Understand the key features and functionalities of precision agriculture tools, including software for satellite positioning systems, variable-rate applications, and digital platforms.
- Describe the principles and applications of Decision Support Systems (DSS) in agricultural operations to optimize productivity and resource efficiency
- Explain the role of digital platforms in integrating data from various sources (e.g., sensors, satellites, and equipment) for informed decision-making.
- Identify the environmental and economic impacts of applying advanced agricultural software on modern farming practices.

Skills

- Develop actionable strategies for integrating digital tools into daily farm management tasks.
- Demonstrate the practical use of agricultural software for creating precision maps, planning resource-efficient farm operations, and interpreting data for informed decisions.
- Compare different software and platform options, assessing their advantages, limitations, and applicability to specific agricultural scenarios.
- Analyze data inputs (e.g., weather, soil conditions, equipment metrics) to evaluate the effectiveness of DSS and digital platforms in achieving sustainability goals.

Attitudes

- Advocate for the use of advanced software in farming to support environmentally responsible practices.



- Collaborate with peers to propose innovative solutions for adopting software tools and platforms tailored to local agricultural challenges.
- Take responsibility for implementing agricultural technologies that enhance operational efficiency and sustainability.
- Evaluate the long-term implications of digital tools on farming ecosystems, ensuring alignment with sustainability principles.

Transversal Skills

- Communicate technical knowledge effectively to stakeholders, promoting the adoption of precision agriculture tools.
- Apply critical thinking to solve complex problems related to agricultural decision making and resource optimization.
- Work collaboratively within diverse teams to design sustainable farming practices using advanced digital tools.
- Adapt to emerging technologies and integrate them into evolving agricultural systems.

Green Skills

- Analyze how precision agriculture tools and platforms interact with environmental systems to optimize resource use and minimize waste.
- Apply technology to regenerate soil health, reduce chemical inputs and support biodiversity in farming ecosystems.
- Advocate for policies and practices that encourage the adoption of digital platforms for sustainable farming.

Collaborate on initiatives that promote the use of DSS and other tools to address sustainability challenges.

Link to module material

Please find more information on the lesson topics for the module “Agricultural Software Support Tools” [here](#).



Agricultural Sustainability

Module Descriptor: The module addresses sustainable agriculture with a focus on innovative approaches. Participants will learn about the key differences between farming practices, the importance of sustainable innovation and the impact of natural processes on environmentally friendly production. Emphasis will be placed on practices that promote a circular economy and enable resource efficiency. The module also includes an overview of European policies such as the Green Deal, as well as innovative business models and financing mechanisms to support sustainable practices. Participants will develop concepts for sustainable agricultural practices that combine environmental, social, and economic aspects.

Learning Outcomes

Knowledge:

- Describe the key differences between conventional agriculture and sustainable agriculture.
- Define the concept of sustainable innovation and how it affects sustainable development in agriculture.
- List agricultural practices that are important for sustainable development.
- Explain natural processes and how they can be innovatively integrated into agricultural practice to reduce environmental impact.
- Explain practices that support recycling, waste reduction and resource reuse in agriculture.
- Describe strategies, policies and directives that support sustainable innovation in agriculture (e.g. European Green Deal).
- Describe innovative business models and financing methods to support sustainable practices.
- Define a concept of sustainable agricultural practices.

Skills:

- Create agricultural practices to reduce environmental impact and increase sustainable development.
- Compare their farming practices with sustainable farming practices.
- Analyse, monitor, evaluate and optimise sustainable agricultural practices on own farm.
- Prepare basic business plans, which include sustainable pressures.
- Show collaboration with different stakeholders for effective implementation of sustainable solutions.
- Analyse, monitoring, and application of innovative agricultural technologies in sustainable agriculture.
- Prepare innovative concepts for adapting agriculture to climate conditions.

**Attitudes:**

- Independently manage a farm or projects in line with sustainable principles.
- Adapt agricultural strategies to changes in environmental, political, or economic conditions.
- Understand the complex interlinkages between natural resources, technologies, and social systems for sustainable farming.
- Make decisions and implement practices that are consistent with the principles of sustainability and social responsibility.
- Critically evaluate existing agricultural practices, strategies, and innovations.

Transversal Skills:

- Adapt and modify agricultural strategies to effectively respond to environmental, political, and economic changes.
- Analyse and understand the complex interconnections between natural resources, technologies, and social systems in the context of sustainable farming.
- Make informed decisions and implement practices grounded in sustainability and social responsibility.
- Critically evaluate contemporary agricultural practices, strategies, and innovations.

Green Skills:

- Understand and apply the principles of sustainable agriculture to minimize environmental impact.
- Design and implement agricultural practices that promote recycling, waste reduction, and resource reuse.
- Innovatively integrate natural processes into farming systems to reduce environmental impact.
- Develop sustainable business plans that address environmental and social challenges.
- Adapt farming strategies to align with shifting climate, environmental, political, and economic conditions.

Analyse, monitor, and optimise agricultural practices to achieve sustainability goals.

Link to module material

Please find more information on the lesson topics for the module “Agricultural Sustainability” [here](#).



Farm Entrepreneurship

Module Descriptor: The module focuses on developing entrepreneurial competencies specific to the agricultural sector. It covers fundamental aspects of farm business management, including strategic planning, marketing, technological innovation, and sustainable practices.

Learning Outcomes:

Knowledge:

- Define the main principles of entrepreneurship in agriculture.
- Describe the process of developing a farm business plan.
- Explain market dynamics and strategies for diversification in farming
- Recognize opportunities for the use of technology and innovation in agricultural practices.
- Identify the key EU agricultural regulations, including CAP, environmental practices, and food safety standards.

Skills:

- Apply strategic business planning skills.
- Develop marketing and branding strategies for agricultural products.
- Use digital tools and data for farm business management.
- Identify the key EU agricultural regulations, including CAP, environmental practices, and food safety standards.
- Solve challenges related to adopting innovative farming technologies.
- Identify opportunities, develop creative solutions, and implement flexible business strategies.

Attitudes:

- Adopt an entrepreneurial and innovative mindset.
- Value the role of adaptability and innovation in sustainable farm entrepreneurship.
- Embrace technological changes in agriculture.
- Appreciate the importance of sustainable business practices.

Transversal Skills:

- Practice effective communication and networking.
- Apply critical thinking in business decision-making.
- Demonstrate problem-solving abilities.
- Exercise adaptability to change.

Green Skills:

- Promote sustainable farming practices.
- Consider environmental impact on business decisions.
- Support resource-efficient agricultural methods.
- Integrate climate-smart agricultural practices.



<u>Link to module material</u>	Please find more information on the lesson topics for the module “Farm Entrepreneurship” here .
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Robotics in Agriculture	
<u>Module Descriptor:</u> The module on Robotics in Agriculture provides a focused and practical learning experience designed to equip participants with essential knowledge and skills to integrate robotics into modern farming practices. The course aims to enhance understanding of how robotics, automation, and artificial intelligence (AI) could improve efficiency, precision, and sustainability in agriculture. It addresses key challenges, including labor shortages and environmental concerns, while promoting innovation and technical proficiency in the sector. The module includes frontal lessons, individual study self-assessment tests and problem solving within given scenarios. Learners will gain practical knowledge to identify pros and cons of a robotic system and formulate possible technical procedures.	
<u>Learning Outcomes</u> <u>Knowledge:</u> • Identify where robotics could be applied in the agricultural context. • Identify different types of robotic solutions in different agricultural contexts. • Define the technologies involved in agricultural robotics. • Define the sensor-based measurements to be recorded for robotics use in agriculture. <u>Skills:</u> • Distinguish the different key areas of robotics application. • Analyze the possible technical "bottle necks" within a given area of robotics application. • Calculate simple indices from soil/pant sensor-based measurements. <u>Attitudes:</u> • Evaluate the adoption of different types of robotics in different agricultural contexts. • Specify the economic items to be quantified for the business plan elaboration. • Appraise the economic feasibility of robotics in. a given agricultural context. <u>Transversal Skills:</u> • Problem solving. • Digital literacy. • Digital tools and systems for farming. • Basic data interpretation. • Critical thinking. <u>Green Skills:</u> • Sustainable farming practices & techniques. • Training in emerging agricultural innovations.	
<u>Link to module material</u>	Please find more information on the lesson topics for the module "Robotics in Agriculture" here



The Role of Groups in Agriculture

Module Descriptor: The module on Robotics in Agriculture provides a focused and practical learning experience designed to equip participants with essential knowledge and skills to integrate robotics into modern farming practices. The course aims to enhance understanding of how robotics, automation, and artificial intelligence (AI) could improve efficiency, precision, and sustainability in agriculture. It addresses key challenges, including labor shortages and environmental concerns, while promoting innovation and technical proficiency in the sector. The module includes frontal lessons, individual study self-assessment tests and problem solving within given scenarios. Learners will gain practical knowledge to identify pros and cons of a robotic system and formulate possible technical procedures.

Learning Outcomes:

Knowledge

- Describe the foundational knowledge and practical skills required to enhance communication, collaboration, and openness towards innovative ideas at farm level.
- Illustrate expertise in understanding the principles of group interactions and how to manage those interactions.
- Recognise the skills required to be a skilled public speaker.

Skills

- Apply their communication and interpersonal skillsets, enabling them to collaborate effectively with diverse stakeholders in agricultural settings.
- Use their skills to effectively facilitate a farmer discussion group.
- Learners will display expertise in delivering effective communication strategies, improving public speaking, and managing interactions to ensure clarity, engagement, and effective knowledge transfer.

Attitude

- Learners will adopt a collaborative approach to learning and knowledge-sharing, recognizing the value of peer-to-peer exchanges among farmers, advisors, and experts in driving continuous improvement and innovation in agricultural practices.
- Value the importance and role that human interactions play in agricultural environments.

Transversal Skills

- Students will strengthen their critical thinking and problem-solving abilities, enabling them to approach complex challenges, providing innovative solutions.
- Students will improve their communication skills, including public speaking and interaction management



- Students will develop leadership capabilities and decision-making skills, empowering them to make informed and impactful choices.
- Students will strengthen their collaboration skills.

Green Skills

- Students will strengthen their ability to tackle issues around sustainability and environmental concerns by implementing competencies that they have gained in areas such as group interactions and farmer discussion groups.
- Students will improve their capacity for group interactions and learn how to implement sustainable practices on farm by cooperating in farmer-farmer and farmer-advisor discussions.

Link to module material

Please find more information on the lesson topics for the module “The Role of Groups in Agriculture” [here](#)

Opportunities for Graduates and Past Pupils	This program will provide graduates with many opportunities upon successful completion. Students will be equipped with the competencies to enhance roles in areas such as: 1. Advisory Services. 2. Research. 3. Sustainability. 4. Finance. 5. Software.
Program Recognition	Digital Badge upon successful completion.



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