

TALLHEDA - Shaping the Future of Digital Agriculture Education: A Questionnaire for Farmers and Farming Associations

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Purpose of the Questionnaire

This questionnaire is designed to gather insights into the current state and future needs of Digital Agriculture (DA) education within **Farmers and Farming Associations**. Our aim is to identify key areas requiring reform, enhancement, or support to ensure that DA education aligns with the latest advancements and industry demands. Through your valuable feedback, we seek to uncover challenges, opportunities for improvement, and potential areas for collaboration. The findings will inform strategic planning and initiatives to foster a culture of excellence in DA education, benefiting farmers, students, educators, and the broader agricultural sector. Your participation is crucial in shaping the future of DA education and ensuring its relevance and impact in addressing global agricultural challenges.

Confidentiality & Data Usage

- I wish to participate in the TALLHEDA Questionnaire: "**Shaping the Future of Digital Agriculture Education: A Questionnaire for Farmers and Farming Associations**".
- I am aware of my rights; I have been given the contact details of the responsible persons and I consent to the processing of my personal data for the purpose and under the conditions explained in the attached file below.

Legal information

For your convenience, the file is available in multiple languages. Please, select and download the version in your preferred language.

[legal-disclaimer-survey for farmers and farming associations in English.pdf](#)

[legal-disclaimer-survey for farmers and farming associations in Greek.pdf](#)

Estimated Completion Time

Thank you for taking the time to contribute to this important initiative. Completing this questionnaire is expected to take approximately 10 minutes. Your detailed responses are invaluable to us in understanding and shaping the future of Digital Agriculture education and research. We appreciate your willingness to share your insights and expertise.

II. Definitions

The following definitions have been taken from [learning resources](#) of [AgriSkills – Entrepreneurial Skills for Digitalization of Rural Agriculture project](#) (Erasmus+).

Digital Agriculture (DA) refers to the use of digital technologies, including precision farming and smart farming technologies to improve efficiency, sustainability, and productivity in agriculture. Farmers can increase their production, save costs, support sustainability and data-driven decision making. It includes advanced technologies, such as IoT (Internet of Things), drones, Artificial Intelligence (AI), cloud, big data and blockchain.

Digital farming, smart farming, and precision farming are related but distinct concepts in agriculture.

Precision Farming: Precision Farming involves the systematic observation, measurement, and enhancement of crop yields and livestock management. By harnessing technologies like GPS, drones, remote sensing, and soil sampling, farmers can fine-tune their farming practices for optimal productivity. These methods encompass variable rate planting, precise nutrient application, yield and soil mapping. The primary aim of precision agriculture is optimization.

Example: Instead of using the traditional way for applying an equal amount of fertilisers over a field, a farmer can use GPS-guided equipment to apply fertilizer and pesticides to specific areas of a field only where they are needed, reducing waste, saving costs and conserving resources.

Smart Farming: Smart Farming involves farmers collecting, tracking, monitoring, and analyzing extensive data to inform decisions about planting, harvesting, and crop management. This approach benefits farms of all sizes and integrates precision farming with various advanced technologies like IoT, drones, AI, cloud computing, and machine learning. Smart farming aims to boost agriculture's sustainability and profitability, while also enhancing

food quality and mitigating environmental impacts.

Example: A farmer can use smart farming techniques to get real-time data for monitor soil moisture levels, crop health and water usage. If the sensors detect that a certain area of the field is becoming too dry, the farmer could use a drone to irrigate only that area. If sensors detect illness in plants, the farmer can take care for single plant or for the entire field. The entire process is software-managed and sensor-monitored. In this way, a farmer can increase yields and the quality while saving labour and resources.

Internet of things (IoT): IoT refers to infrastructure, that is, devices located in the field equipped with sensors as well as networking and processing capabilities, data networks, servers and software, which allow for data exchange, processing/analysing over communication networks and/or Internet.

Example: With the recent implementations, IoT has already brought benefits, like an efficient use of water, optimisation of inputs, reduced waste, etc.

Drone: Drone is an unmanned aerial vehicle (UAV). Similar to sensor technology, drones represent hardware tools that can be used to gain a competitive advantage over competitors.

Example: Drones can increase accuracy, reduce the cost of on-the-ground crop surveys, increase efficiency and crop yields, and reduce CO2 Emissions.

Big Data: Big Data refers to the massive set of data that no conventional data management tool can handle.

Example: Big data is now being increasingly applied to agriculture as it enables real-time analysis of the data generated by IoT.

Artificial Intelligence (AI): AI consists of systems or machines that mimic human intelligence to perform tasks and can iteratively improve themselves based on the information they collect.

Example: While various agricultural data-analysis systems are created, AI allows them to go a step forward in improving predicting capabilities and data-based decision-making.

Blockchain: Blockchain is a system of recording information in a way that makes it difficult or impossible to change, hack, or cheat. A key difference between a typical database and a blockchain is how the data is structured. A blockchain collects information together in groups, known as blocks, that hold sets of information.

Example: Blockchain technologies can track and store all kinds of plant information, including the seed quality and how crops grow, and even create a record of a plant's journey once it leaves the farm. This data can increase the transparency of supply chains and reduce issues related to illegal and unethical production.

III. Current Situation in Applying Digital Agriculture (DA)

Do you believe that DA has a **potential impact** on improving your agri-business (crop, livestock farming, horticulture, etc.)? Please, rate on a scale from 1 to 5.

1 = Very Low

2 = Low

3 = Moderate

4 = High

5 = Very High

Have you **ever applied** any digital farming (e.g. precision farming, smart farming) technology (e.g. IoT, sensors) in your farm?

Yes

No

If yes, from the list below, please choose which digital farming technology you **have applied** on the farm:

E-commerce platform for direct sales to consumers

Digital Marketing for Agribusiness

Climate-smart agriculture technologies

Sensors for crop monitoring

Satellite applications and drones for monitoring

Digital Pest and Disease Management Solutions

Big Data Analytics for Precision Farming

IoT or mobile applications for Crops/Livestock monitoring and management

Digital applications (e.g. IoT, sensors) for Soil Health/Water/Environmental Monitoring etc.

Other

Please, specify other:

Which of the following **challenges** do you believe are associated with applying DA in your farm?

| | | | | | |
|------------|------------|----------|---------|-------------|-----------|
| Challenges | Not at all | Somewhat | Neutral | Quite a bit | Very much |
|------------|------------|----------|---------|-------------|-----------|

| | | | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| High Cost/ Investment | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Lack of Internet Infrastructure and Connectivity | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Skills Gap | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Age Gap | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Lack of life-long training | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Unclear productivity (e.g. crop yield potential) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| High Environmental Impact | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Please, specify:

IV. Educational Gap and Needs in Digital Agriculture (DA)

Have you ever been **trained** on the following DA technologies?

| Topics | Not at all | Somewhat | Neutral | Quite a bit | Very much |
|------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Artificial Intelligence (AI) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Blockchain | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Digital Twins | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Drones/ Robots | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Big Data/ Data Analytics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Internet of Things (IoT) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Please, specify:

Would you like **to be trained** on the following DA technologies?

| Topics | Not at all | Somewhat | Neutral | Quite a bit | Very much |
|------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Artificial Intelligence (AI) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Blockchain | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Digital Twins | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Drones/ Robots | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Big Data/ Data Analytics | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Internet of Things (IoT) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Please, specify:

Please, choose the **ways** with which prefer to be trained on DA topics:

| Ways | Not at all | Somewhat | Neutral | Quite a bit | Very much |
|------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Field demonstrations | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| On-line courses/e-learning | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Short-term seminars | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Practical courses/ workshops | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Online educational content | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Newsgroups | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Please, specify:

How important is to get DA training:

| Options | Not at all | Slightly | Moderately | Very | Extremely |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Before the implementation of the DA | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| During the implementation of the DA | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| After a short period of trial and error of DA on my own | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

V. General Information of the Respondents

What is your country?

- Belgium
- Greece
- Serbia
- Other

Please, specify:

In which prefecture belonged to?

You are answering this questionnaire as:

- Individual Farmer
- Member of Agricultural Cooperative
- Member of Group of farmers
- Agricultural advisor/Agricultural consultant/ Agronomist

What is your gender?

- Male

Female

What is your age?

What is your educational level?

- Primary education
- Secondary education
- Higher education

Please, select:

- Bachelor's degree
- Master's degree
- Doctoral degree

How many members does your organization have?

In which agricultural sub-sectors are you activating (e.g. crop, livestock, fisheries, forestry)?

Please, specify: