

INFOCOM 2024
Athens, Greece
March 10th-March 14th, 2024

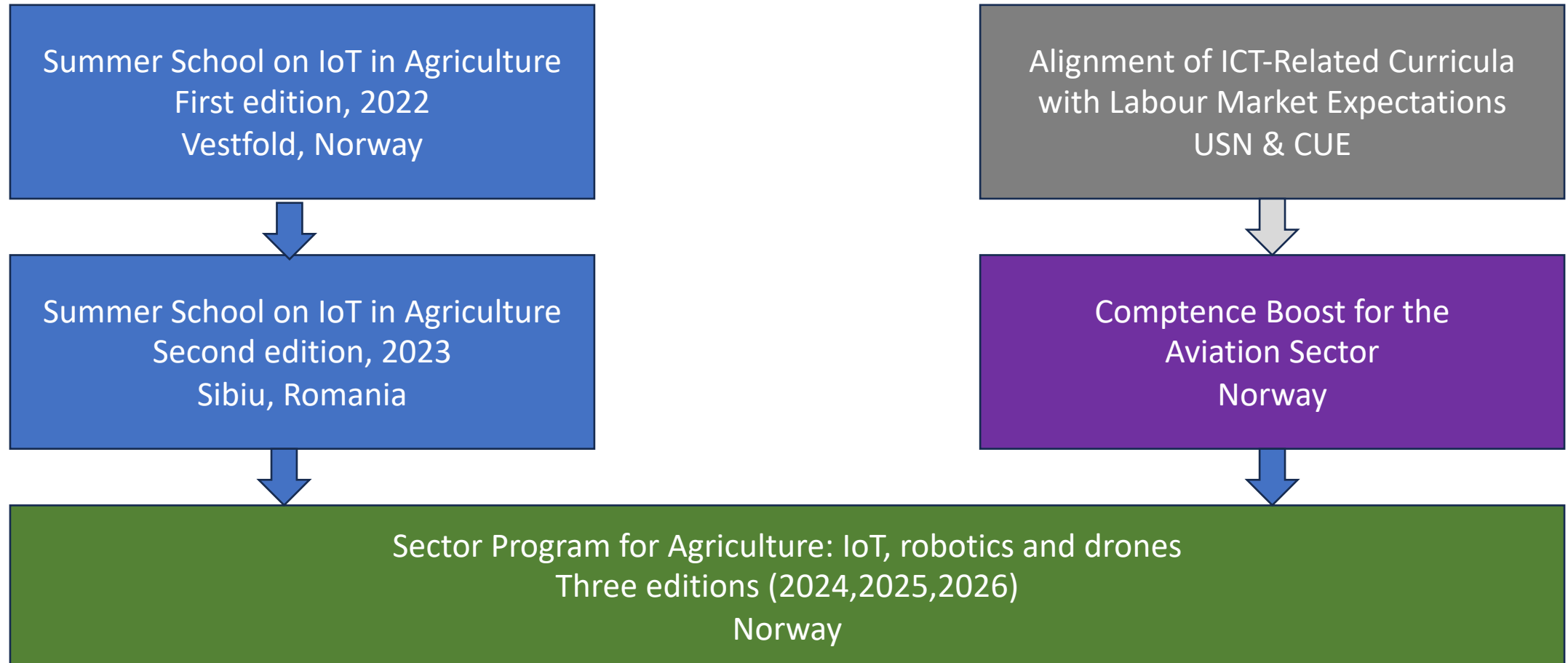
Harvesting Innovations: Nurturing Norway's Agricultural Future with Micro-credentials

Lasse Berntzen

University of South-Eastern Norway



Background



Micro-credentials is High on the EU Agenda

- On 16 June 2022, the Council of the European Union (EU) adopted a [Recommendation on a European approach to micro-credentials for lifelong learning and employability](#).
- The Recommendation seeks to support the development, implementation and recognition of micro-credentials across institutions, businesses, sectors and borders.



What Are Micro- credentials?

- Micro-credentials certify the learning outcomes of short-term learning experiences, for example a short course or training.
- They offer a flexible, targeted way to help people develop the knowledge, skills and competences they need for their personal and professional development.



Why Micro-credentials?

- More flexible and learner-centred forms of education and training
- Opportunities for disadvantaged and vulnerable groups.

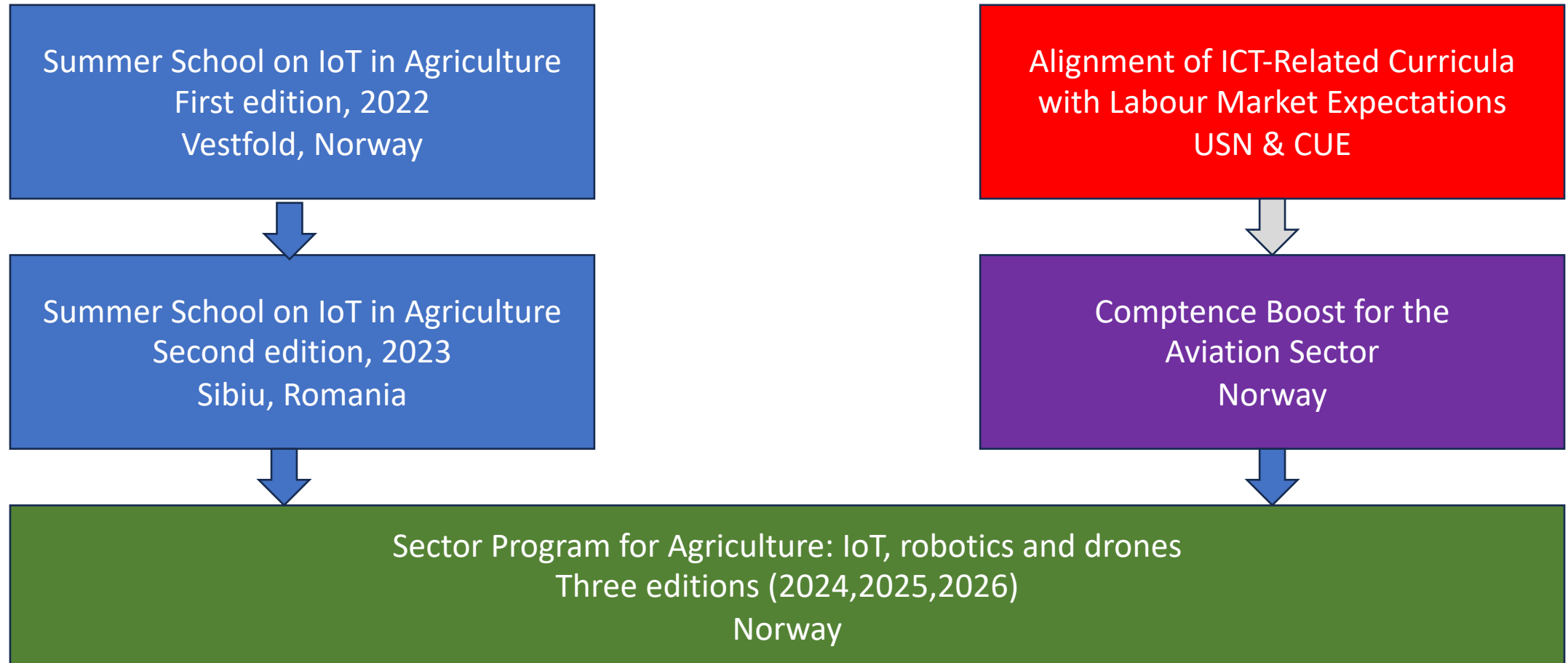


Micro- courses are Hot

- Recent regulatory change in Norway
- One ECTS courses are acceptable
- National level is talking favorable about micro-credentials
- New unit established: **USN Flexible** to offer lifelong-learning courses



Background



Alignment of ICT-Related Curricula with Labour Market Expectations (2022-2023)

Project partners:

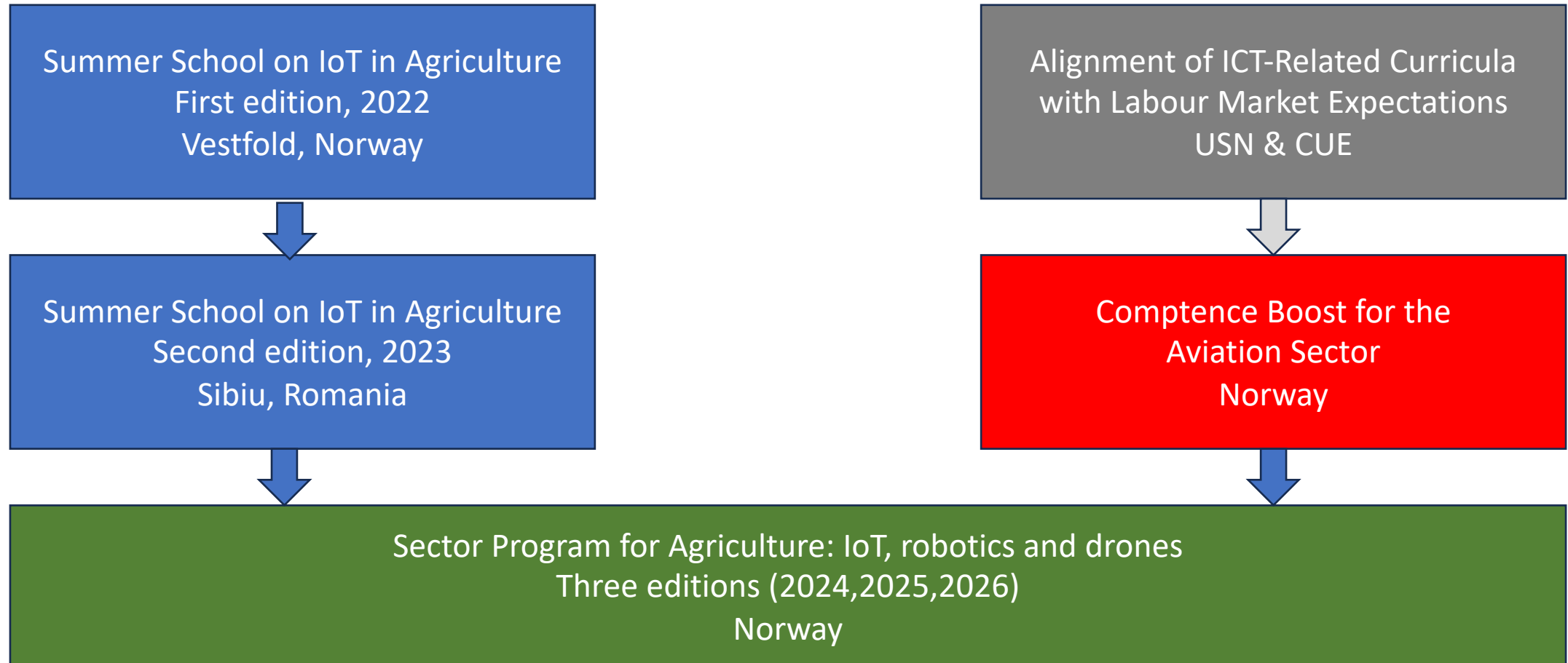
- Crakow University of Economics
- University of South-Eastern Norway

<https://icam.uek.krakow.pl/project-projekt>

Output 5

[Analysis of the concept of micro-credentials and its feasibility of implementation at CUE and USN](#)

Background



Norwegian (USN) Microcredentials Pilot

Post-Covid

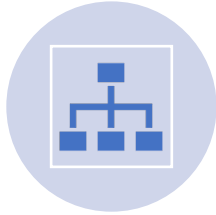
40 x 1 ECTS courses for the Aviation Sector (Competence Boost)

Enhancing competence

All courses digital and asynchronous

Completed

Norwegian (USN) Microcredentials Pilot



CO-CREATION



WIDERØE AND
AVARN



PODCAST
GUESTS

- Introduction video
- Who am I?
- 8 lectures (15 min)
- 8 podcasts (15 min)
- Quiz
- Reflection

Lessons learnt

The administrative burden is high

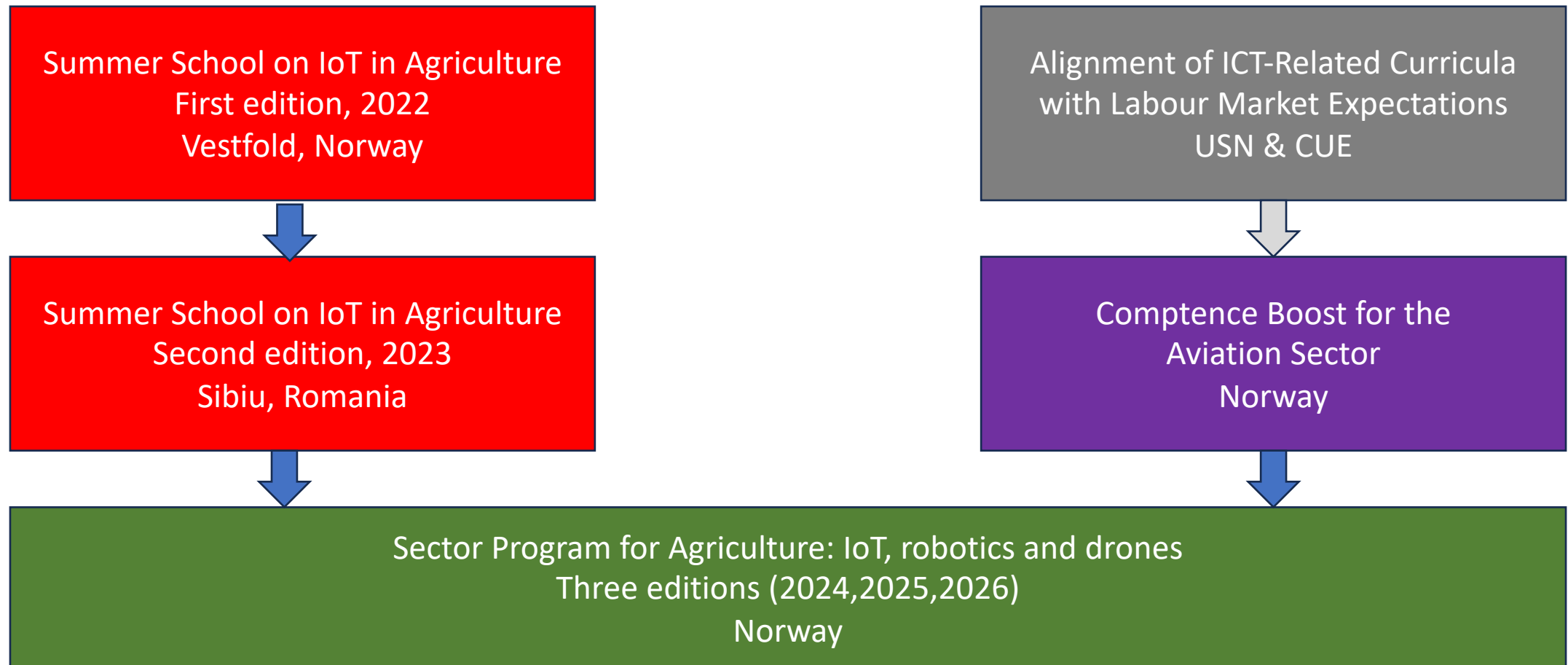
Larger units are more manageable

Students take courses sequentially

Free -> No shows

15-minute lectures and podcasts could be longer

Background



Maplot (Summer School)

Project partners:

- Lucian Blaga University of Sibiu
- University of South-Eastern Norway

- Two editions
 - Summer 2022: Vestfold, Norway
 - Summer 2023: Sibiu, Romania

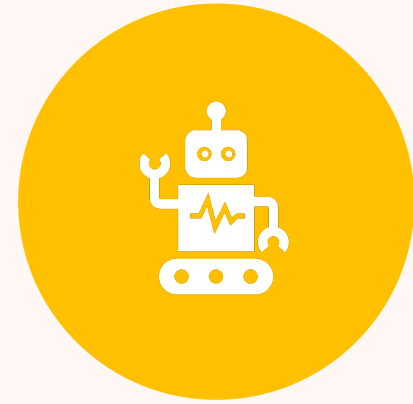
MapIoT (Summer School)



IOT



DRONES



ROBOTICS

Working on
IoTProjects



Creating an environmental monitoring station



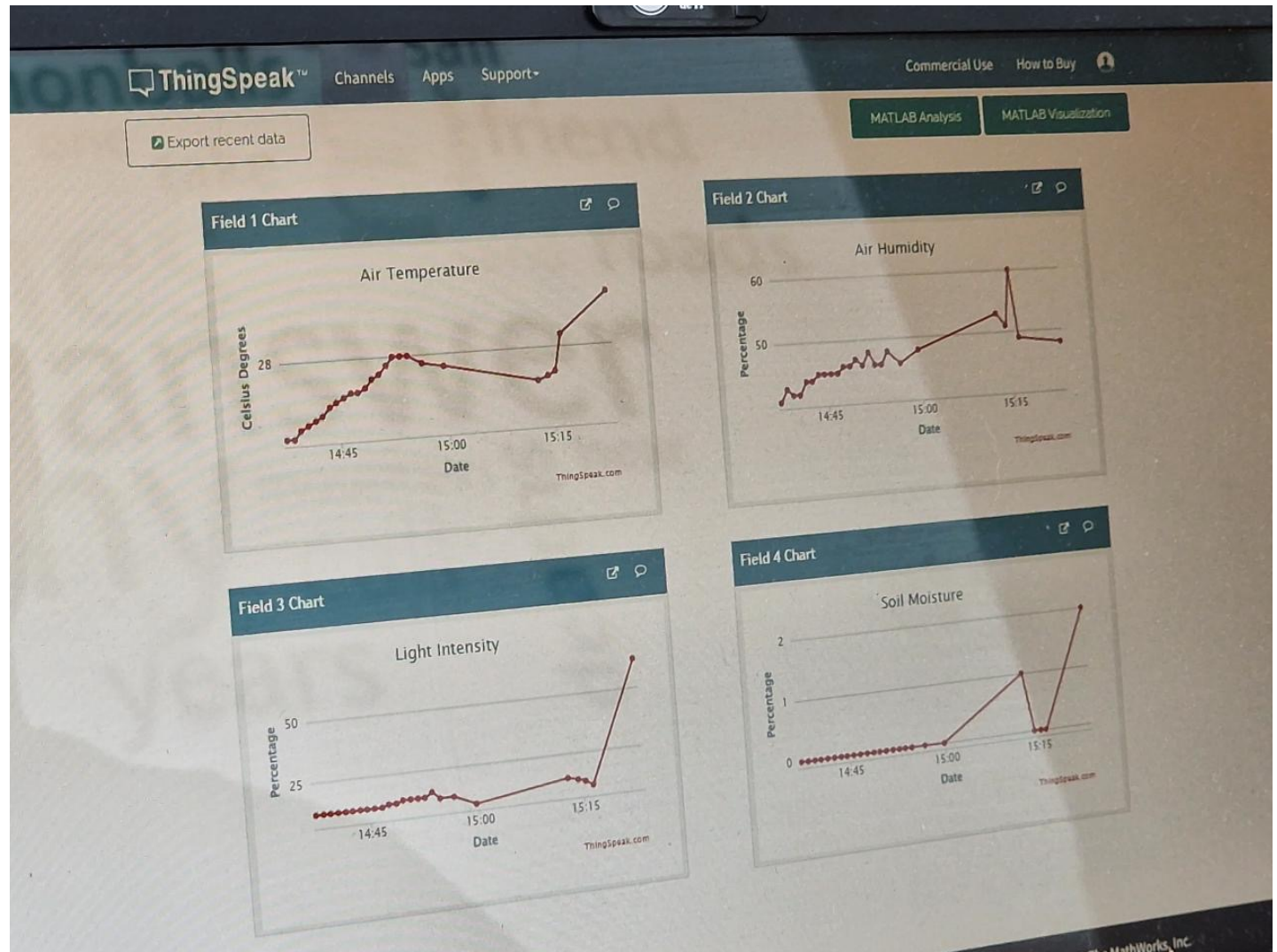
Environmental monitoring stations



Environmental monitoring stations deployed in the field



Collecting environmental data



Learning to fly drones





Learning to fly drones



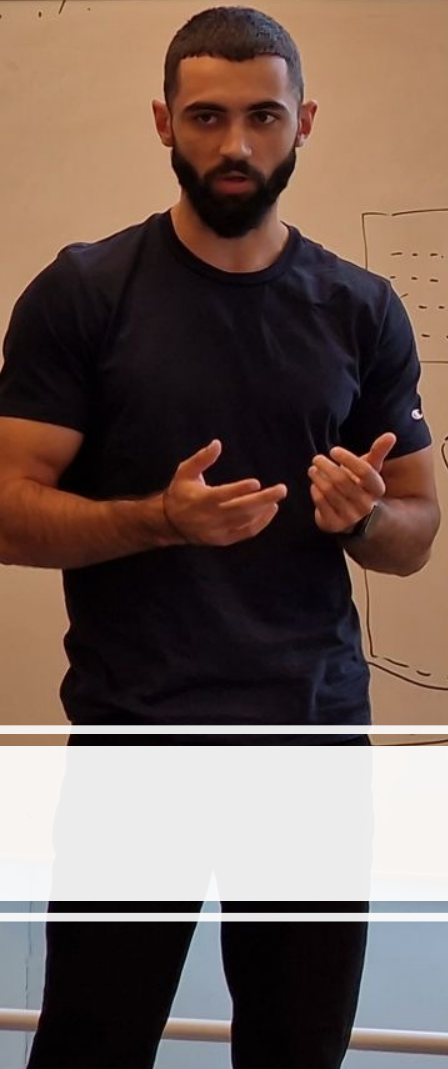
Learning to fly drones







Capturing images



1. Thresholding in RGB

2. Converting to grayscale

3. Calculate the mask

4. Apply the mask

Image processing

Learning robotics



The DoBot Magician



Real-world
robotics



Presentations by industrial companies

Sense

FARMER'S CHALLENGE I:
LACK OF IRRIGATION CONTROL

Problems:
Pipe coupling break
Hose leakage
Pump trouble
Turbine error
Wagon stop or tilt

Consequence:
Water waste
Crop drought
Damaged field/land/roads

MODERNIZING AGRICULTURAL PRACTICE USING INTERNET OF THINGS

SUMMER SCHOOL

in NORWAY
Melsom High School, Sandefjord
July-August 2022

in ROMANIA
Lucian Blaga University of Sibiu
July 2023

TOPICS

- AI (neural networks), GA (genetic algorithms) & Fuzzy Rules - applied in Modelling, Control, Predicting and Managing of processes from Agriculture and Food Engineering domains.
- IoT sensors and actuators, communications and cloud integration.
- Digital design of food manufacturing processes.
- Modeling an assembly line for picking fruits / vegetables.
- Using Drones and Computer Vision concepts for image gathering and analysis.

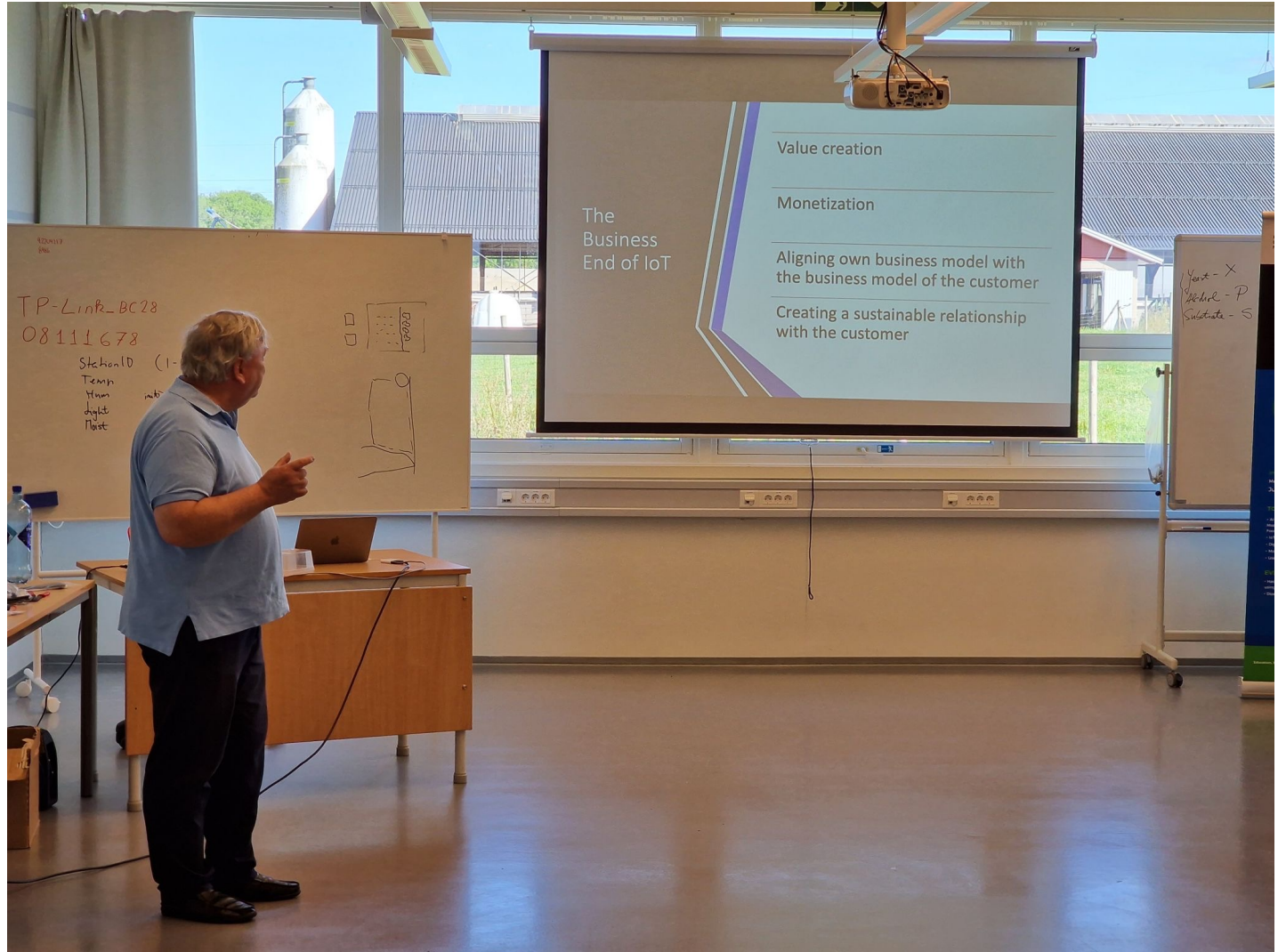
EVENTS

- Hackathon: Developing your own business idea in agriculture and food industry using IoT and digital technologies.
- Dissemination Workshop with external participation & Award session.

Working together for a green,
Competitive and Europe

FINANCED BY EEA and Norway Financial Mechanism 2014-2022
Education, Scholarship, Apprenticeship and Youth Entrepreneurship Programme (ESAFEP) in the
GRANT ID COP-0018 ESALVEP No. F-SEE-000002023

How to turn
knowledge
into business



New Microcredential Courses

- Continuing education for three sectors
- Agriculture: IoT, Drones, Robots (3 x 2,5 ECTS)
- Maritime: Cybersecurity, Sustainability (4 x 2,5 ECTS)
- Waste handling: Strategic communication (5 x 2,5 ECTS)
- The courses are funded for three years (30 students each year)
- Adopted most of the ideas used in the Aviation sector
- Most important: From 1 to 2,5 ECTS (less admin)
- Also, some physical events (varies)

Partners

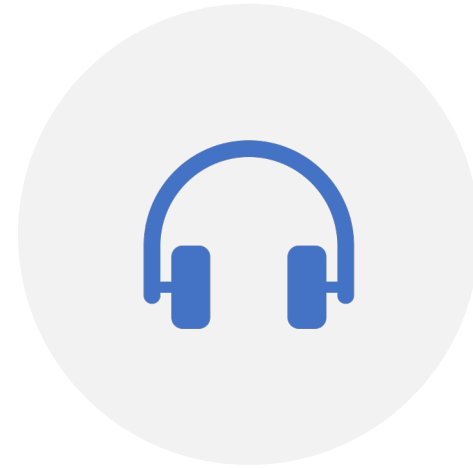


	Preparation	Gathering	Post-gathering	Reflection/report
Lecture	3 x 20 min	6 x 30 min	3 x 20 min	
Other teacher-led activities		3 x 90 min (rotation)		
Podcasts	6 x 20 min		3 x 20 min	
TOTAL	3 hours	7.5 hours	2 hours	
Homework	12 hours	4.5 hours	8 hours	30 hours

Online training material



LECTURES 6 X 20 MINUTES

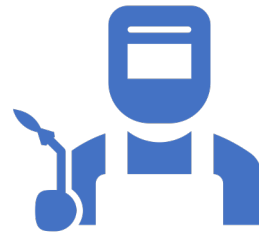


PODCASTS 9 X 20 MINUTES

Challenge – educational background



Farmers are not engineers.

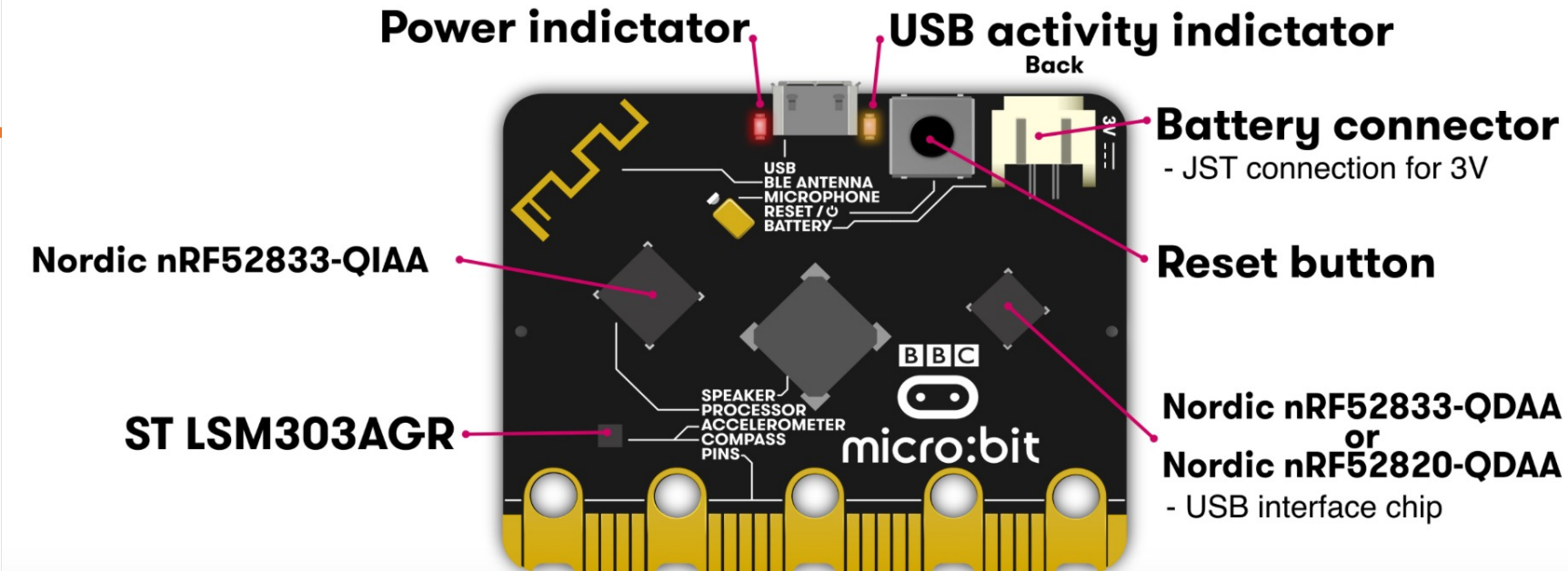
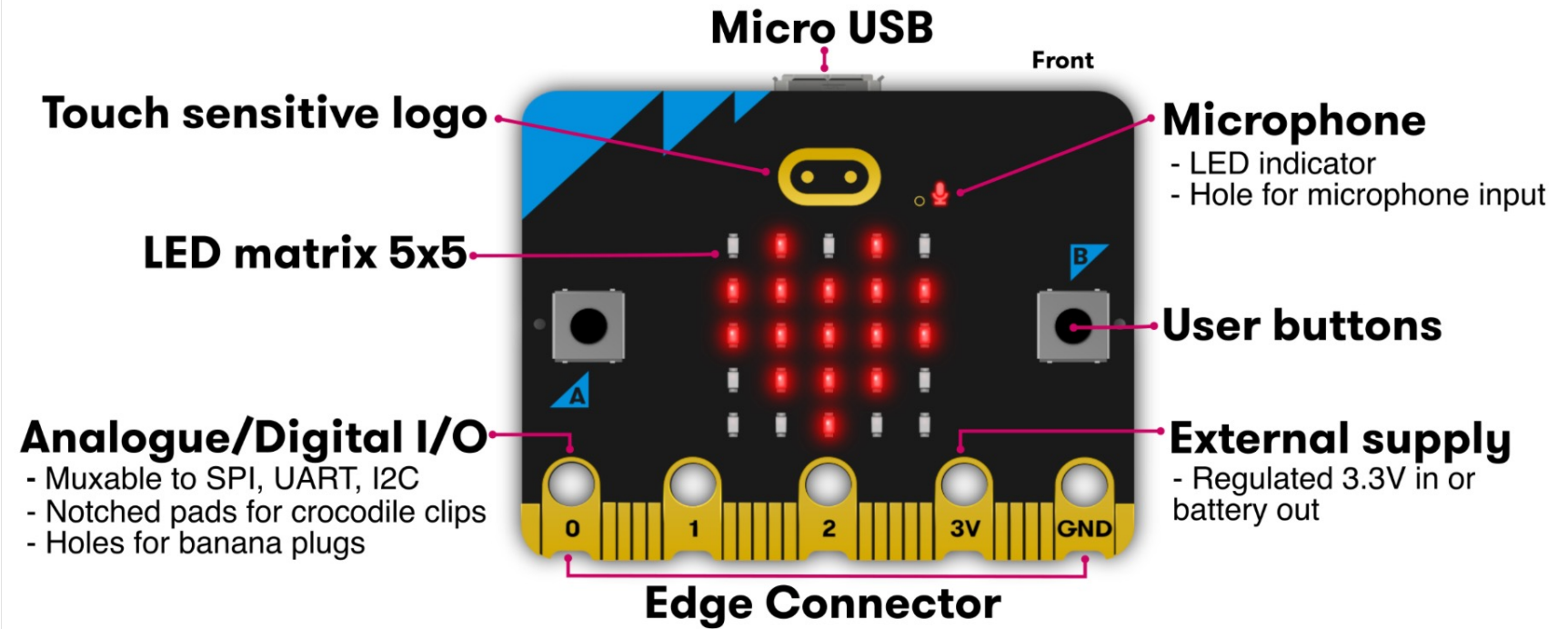


However, they have considerable technical expertise.



So we need to use suitable tools to teach the opportunities of technology

BBC:microbite



BBC:microbit

The image shows the BBC micro:bit IDE interface. On the left is the 'Toolbox' with a search bar and categories: Basic, Input, Led, and Variables. The main workspace contains a script with two blocks: an 'on start' block containing a 'set set steps to 0' block, and a 'forever' loop block containing a 'change set steps by 1' block. The 'change set steps by 1' block is highlighted with a yellow border.

Toolbox

Search... 🔍

- Basic
- Input
- Led
- Variables

on start

set set steps ▼ to 0

forever

change set steps ▼ by 1

Drone

E88 Pro

<20 Euro

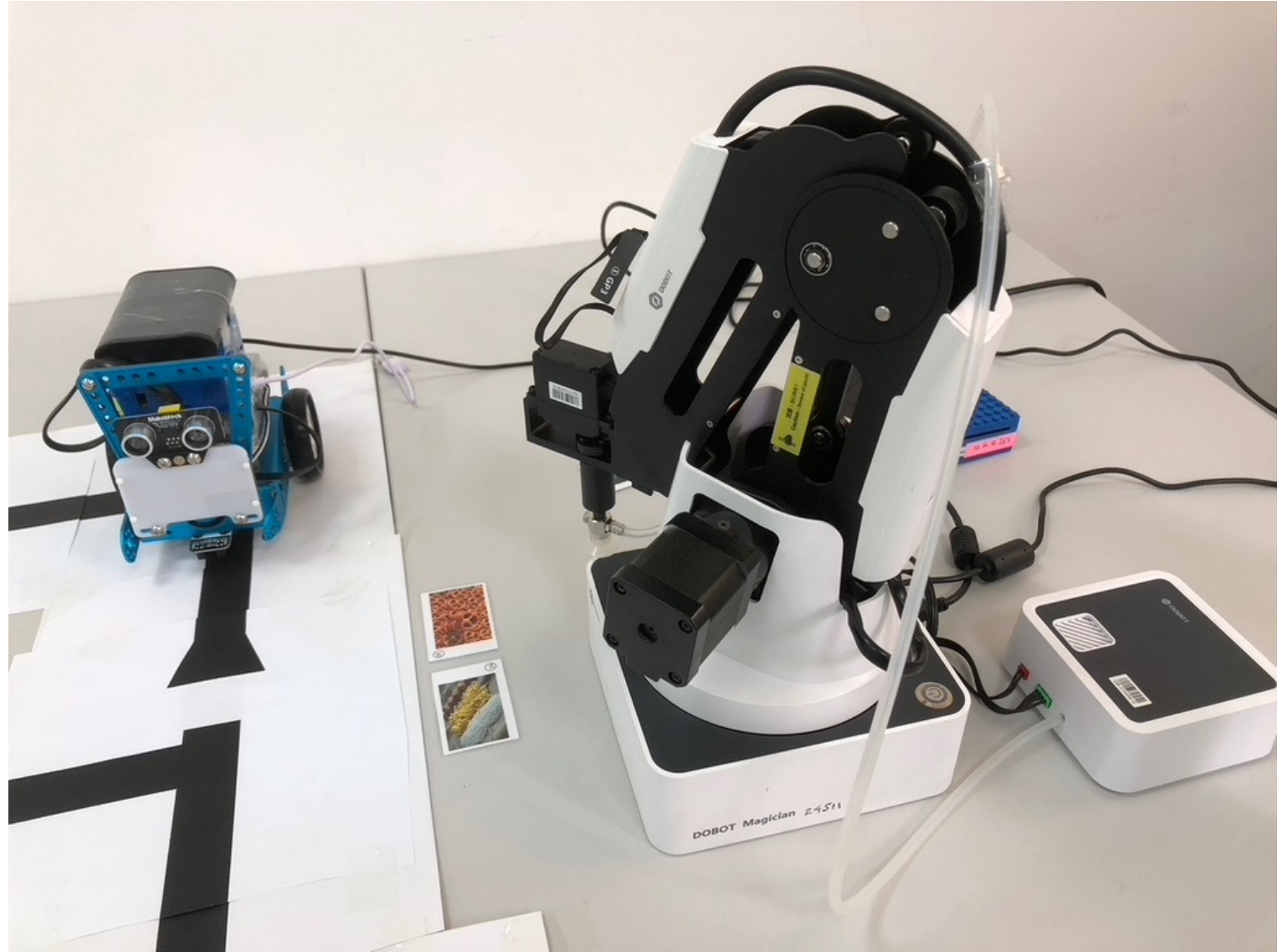


DJI Mavic 3
Pro

>2500 Euro



The DoBot Magician

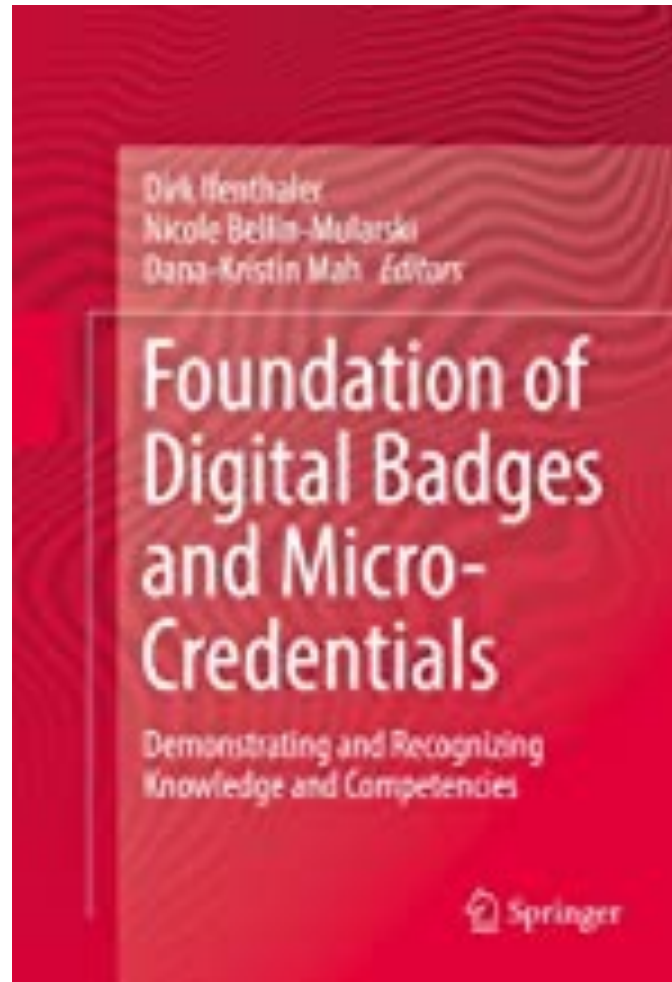


Thank You for Listening

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Further Reading



Inspiration

- <https://dteach.deakin.edu.au/wp-content/uploads/sites/103/2019/08/Making-micro-credentials-work-Oliver-Deakin-2019-full-report.pdf>
- <https://teachonline.ca/tools-trends/ten-facts-you-need-know-about-micro-credentials>
- Continuing Professional Development
- <https://cpduk.co.uk/explained>