EO Connect

Zero Hunger MOOC

The Role of Earth Observation in achieving Zero Hunger

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Funded by:

Bundesministerium für Bildung und Forschung

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Meet the team

Dr. Nesrin Salepci
Friedrich-Schiller-University Jena
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Experienced in research in SAR data analysis for variety of applications.
Active in the production and publication of EO College Educational materials since 2018.

Stefanie Steinbach
Ruhr-University Bochum
stefanie.steinbach@rub.de

EO for food security with experience in capacity building in East and West Africa in GlobE Wetlands, DeMo-Wetlands, ETES-Rice & CITGI4Muringato.

Robert Eckardt
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Project Coordinator EO College

Specialised in development of eLearning content and online course production for EO applications

Jun. Prof. Dr. Andreas Rienow
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Long-standing experience in EO education in schools, expert on scientific knowledge transfer. Manager of ESERO Germany and (Co-)PI of the projects EO-CONNECT, MOOC4Land, EO4Edu, EO College, KEPLER ISS & CITGI4Muringato.

EO Connect

Promoting global networking in Earth observation education

- **Showcase the capabilities of EO technology to mitigate world hunger,**

Display and teach the tool, services and data available in Earth observation

- **Enable learners to take action**

Focus on practical engagement and tutorials

- **Leverage latest e-learning technology**

E.g. microlearning and other engaging ways to display the learning content

- **Achieve a strong networking of involved stakeholders**

DLR

Bundesministerium
für Bildung
und Forschung

Earth Observation in Schools

Fernerkundung in Schulen (FIS)

Columbus Eye & KEPLER ISS

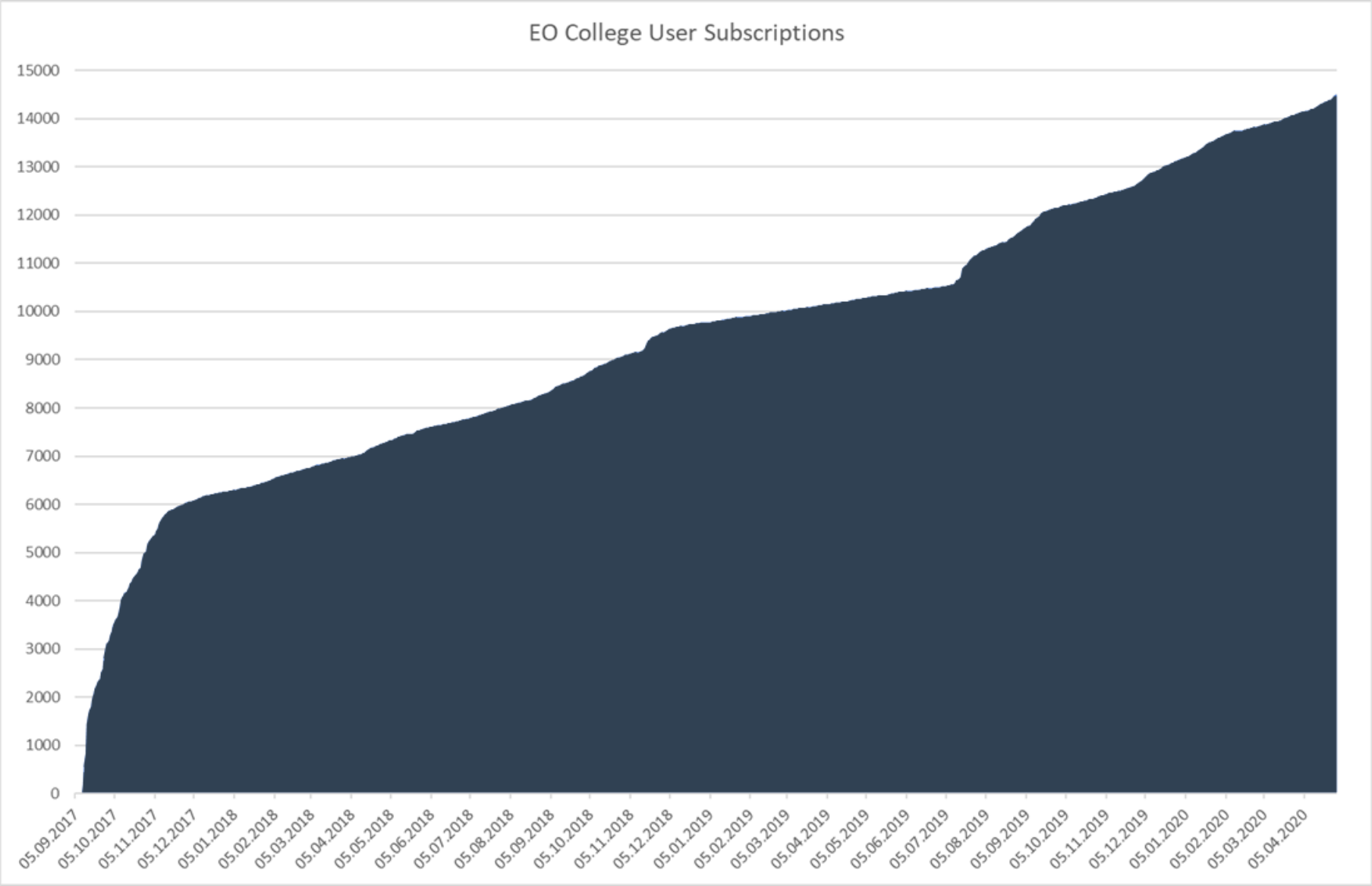
ESERO Germany

- **Interactive teaching resources on EO for schools**
- **Teacher trainings**
- **~100,000 students and ~30,000 teachers**

Funded by ESA and DLR / BMWi

"What beauty. I saw clouds and their light shadows on the distant dear Earth…. The water looked like darkish, slightly gleaming spots…. When I watched the horizon, I saw the abrupt, contrasting transition from the Earth's light-colored surface to the absolutely black sky." Juri Gagarin

EO College - MOOCs on EO



eo college

eo-college.org

September 2017

>16.000 registered users

> 1.700.000 pageviews

FRIEDRICH-SCHILLER-UNIVERSITÄT JENA

esa

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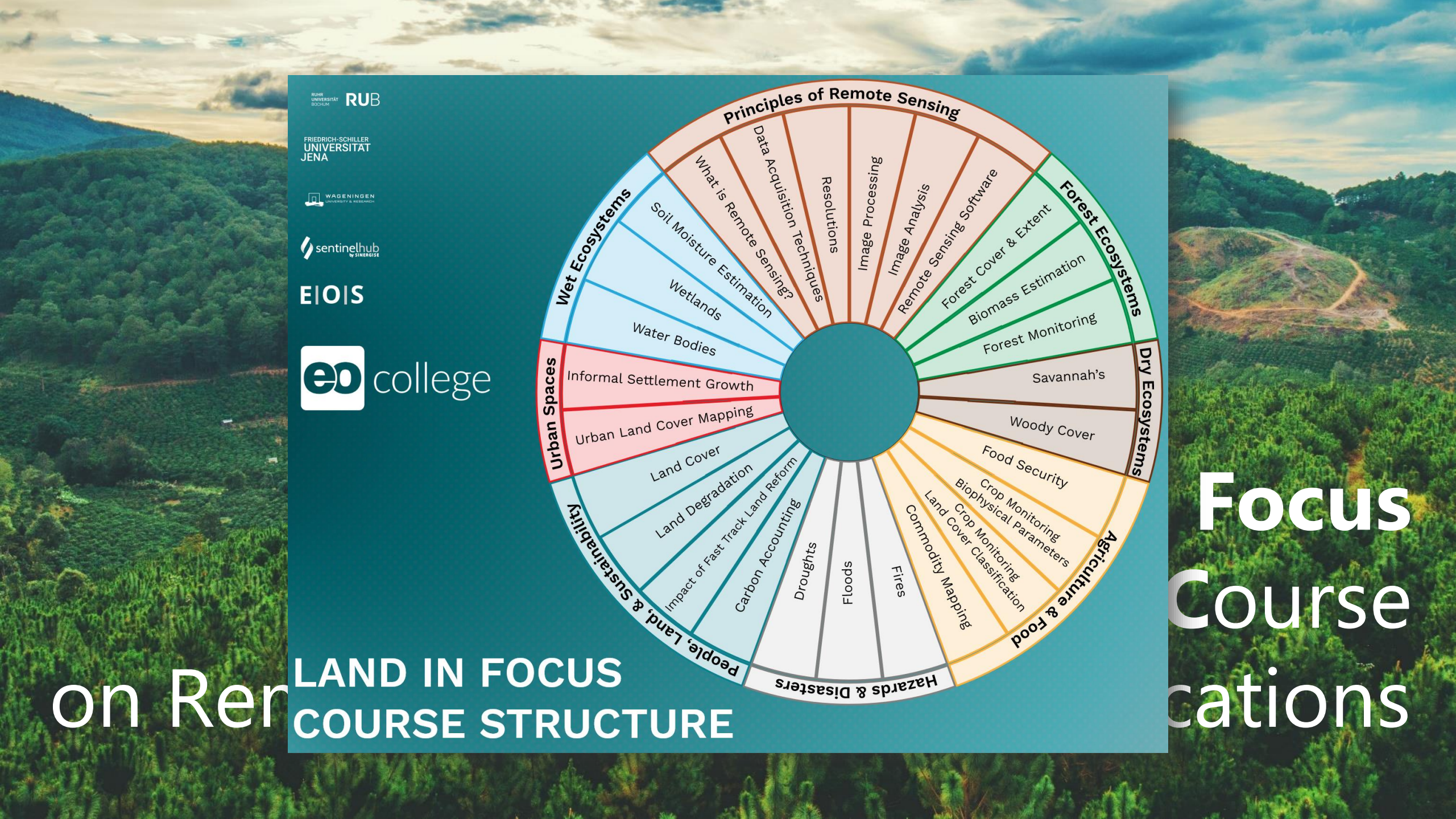
MOOC History

Echoes in Space	(2017)	EOS
Basic Principles of Radar Backscatter	(2021)	EOS
Winter, Water, Warming	(2021)	CSA ASC
Basics Hyperspectral	(2021)	GFZ Helmholtz Centre Potsdam
Land in Focus	(2021)	EOS
Zero Hunger	(2022)	Friedrich-Schiller-Universität Jena


RUHR UNIVERSITÄT BOCHUM RUB
FRIEDRICH-SCHILLER UNIVERSITÄT JENA
WAGENINGEN UNIVERSITY & RESEARCH
sentinelhub by SINERGISE
EIOIS
eo college
Principles of Remote Sensing
What is Remote Sensing?
Data Acquisition Techniques
Resolutions
Image Processing
Image Analysis
Remote Sensing Software
Forest Ecosystems
Forest Cover & Extent
Biomass Estimation
Forest Monitoring
Dry Ecosystems
Savannah's
Woody Cover
Food Security
Agriculture & Food
Crop Monitoring Biophysical Parameters
Crop Monitoring Land Cover Classification
Commodity Mapping
Hazards & Disasters
Fires
Floods
Droughts
People, Land, & Sustainability
Carbon Accounting
Impact of Fast Track Land Reform
Land Degradation
Land Cover
Urban Spaces
Urban Land Cover Mapping
Informal Settlement Growth
Wet Ecosystems
Water Bodies
Wetlands
Soil Moisture Estimation
LAND IN FOCUS
COURSE STRUCTURE
on Ren
Focus
Course
cations

The Zero Hunger MOOC…

…should be able to cater for users with **different backgrounds**

…should make use of **modern learning concepts** and **technical possibilities**

MICRO CONTENT

ADAPTIVE LEARNING

GAMIFICATION

EXPLORABLE EXPLANATIONS

…should reflect the broad **range of topics and methods** around **SDG#2**

AGRICULTURE

LIVESTOCK

FORESTRY

FISHERY

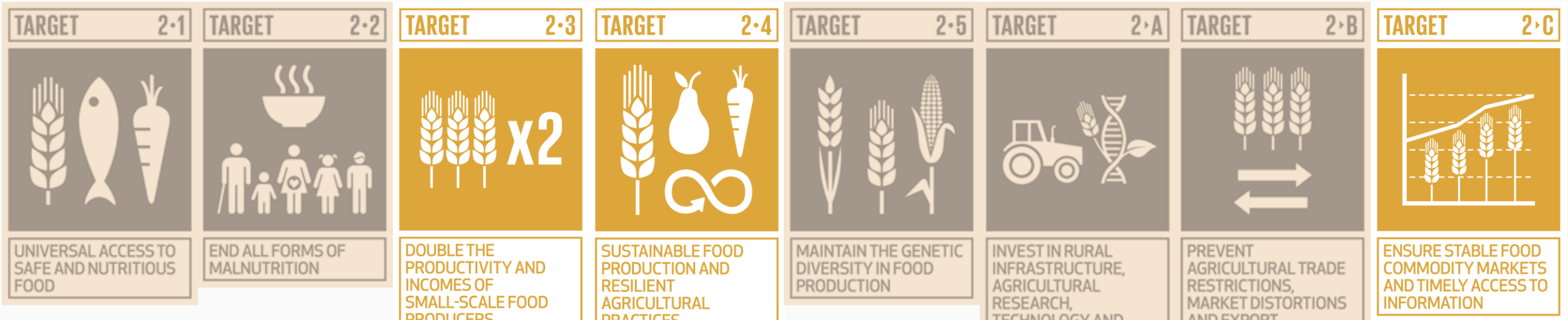
…should address the learners' **different objectives** ("levels of learning")

ELEMENTARY LEVEL

ADVANCED LEVEL

EO to support the SDG#2 targets

https://www.globalgoals.org/2-zero-hunger



Indicator **2.4.1**

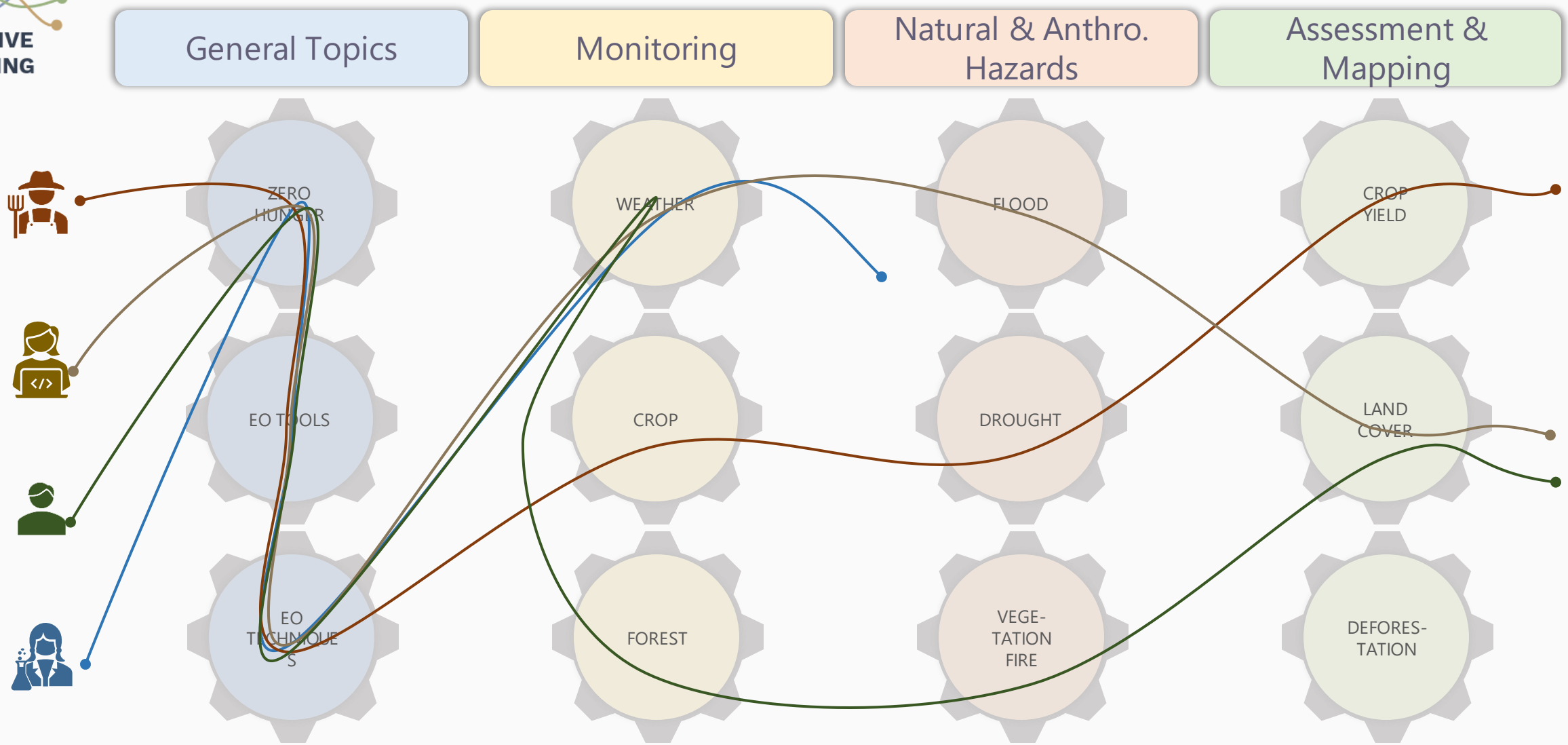
Proportion of agricultural area under productive and sustainable agriculture

Group on Earth Observation (GEO), 2017, Document on Earth Observations in support of the 2030 Agenda for Sustainable Development.

https://www.earthobservations.org/documents/publications/201703_geo_eo_for_2030_agenda.pdf

Zero Hunger MOOC - Concept

ADAPTIVE LEARNING



MOOC Elements:

BASIC ELEMENTS

TEXT

VIDEO

INFOGRAPHICS

QUIZ

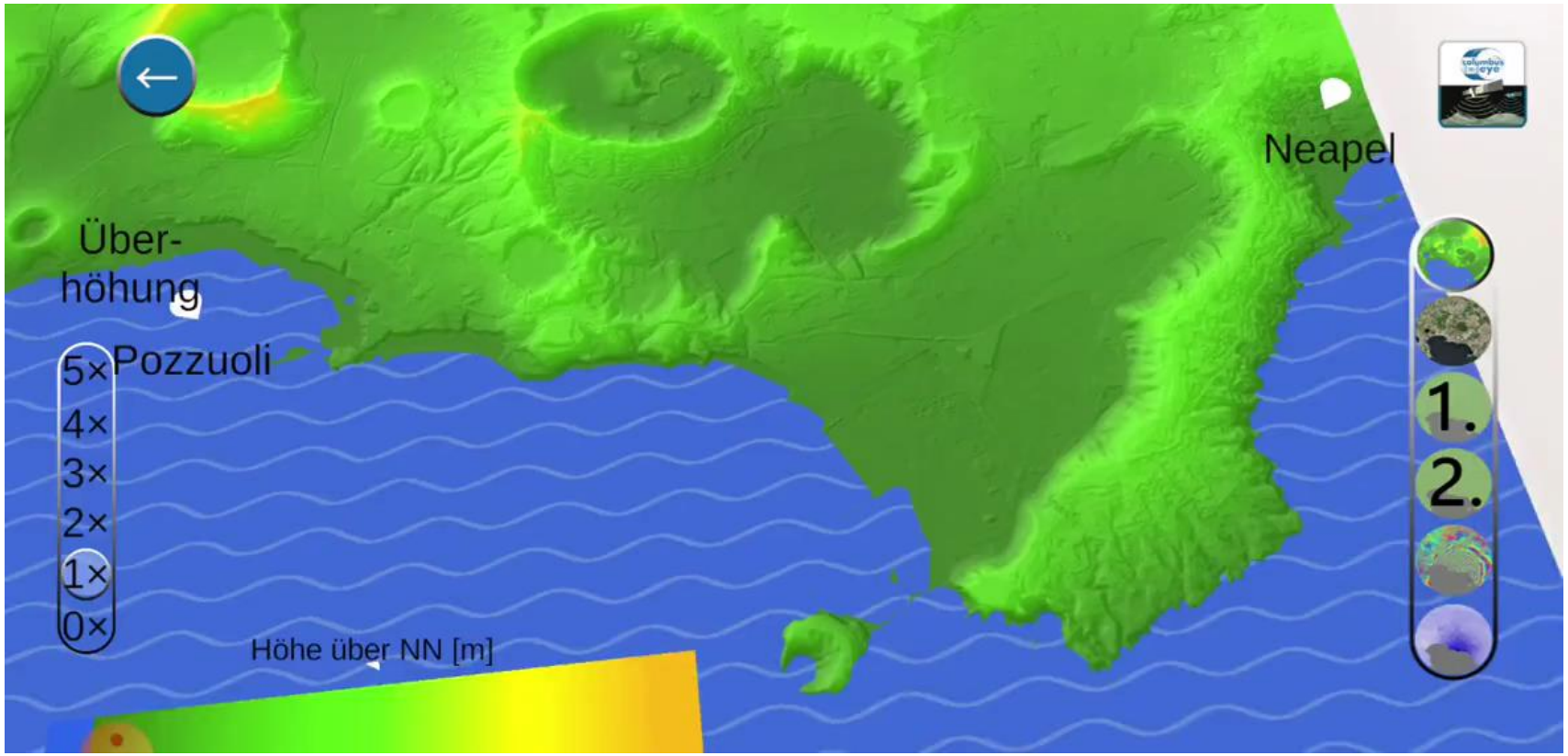
MOOC Elements

BASIC ELEMENTS

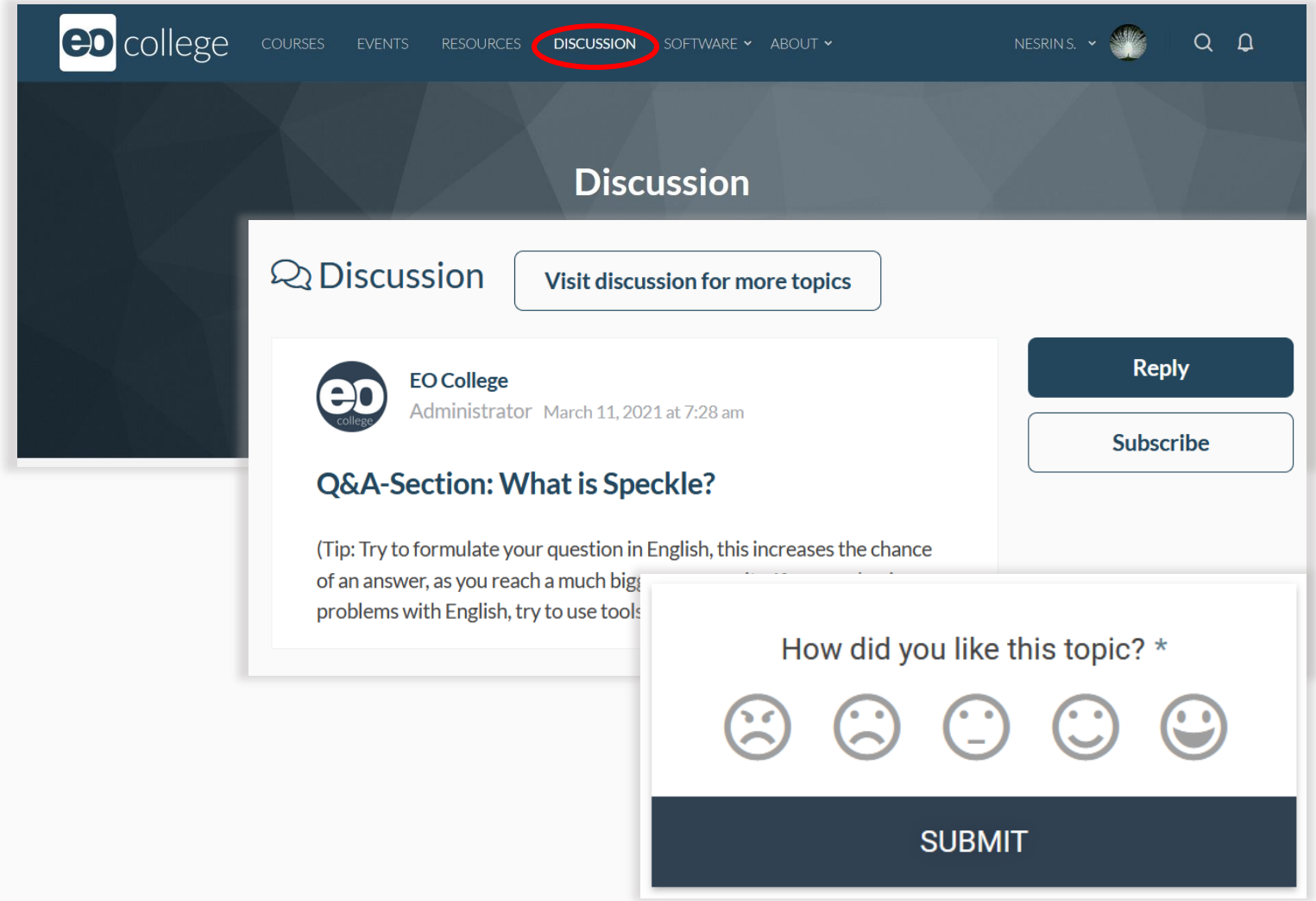
- TEXT
- VIDEO
- INFOGRAPHICS
- QUIZ

HANDS ON ELEMENTS

- EXPLORABLE EXPLANATIONS
- TUTORIAL
- GAMIFICATION



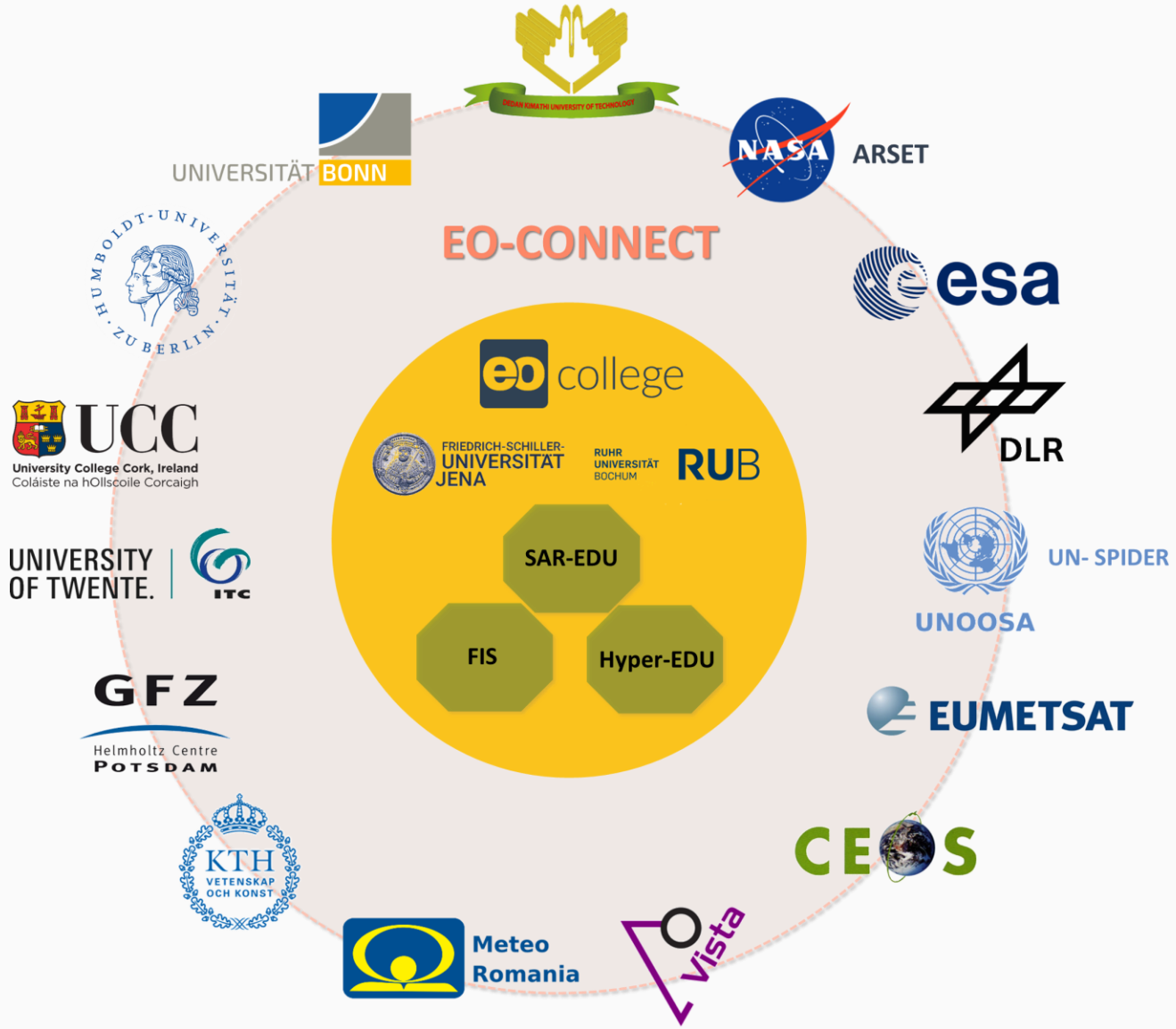
MOOC Elements:



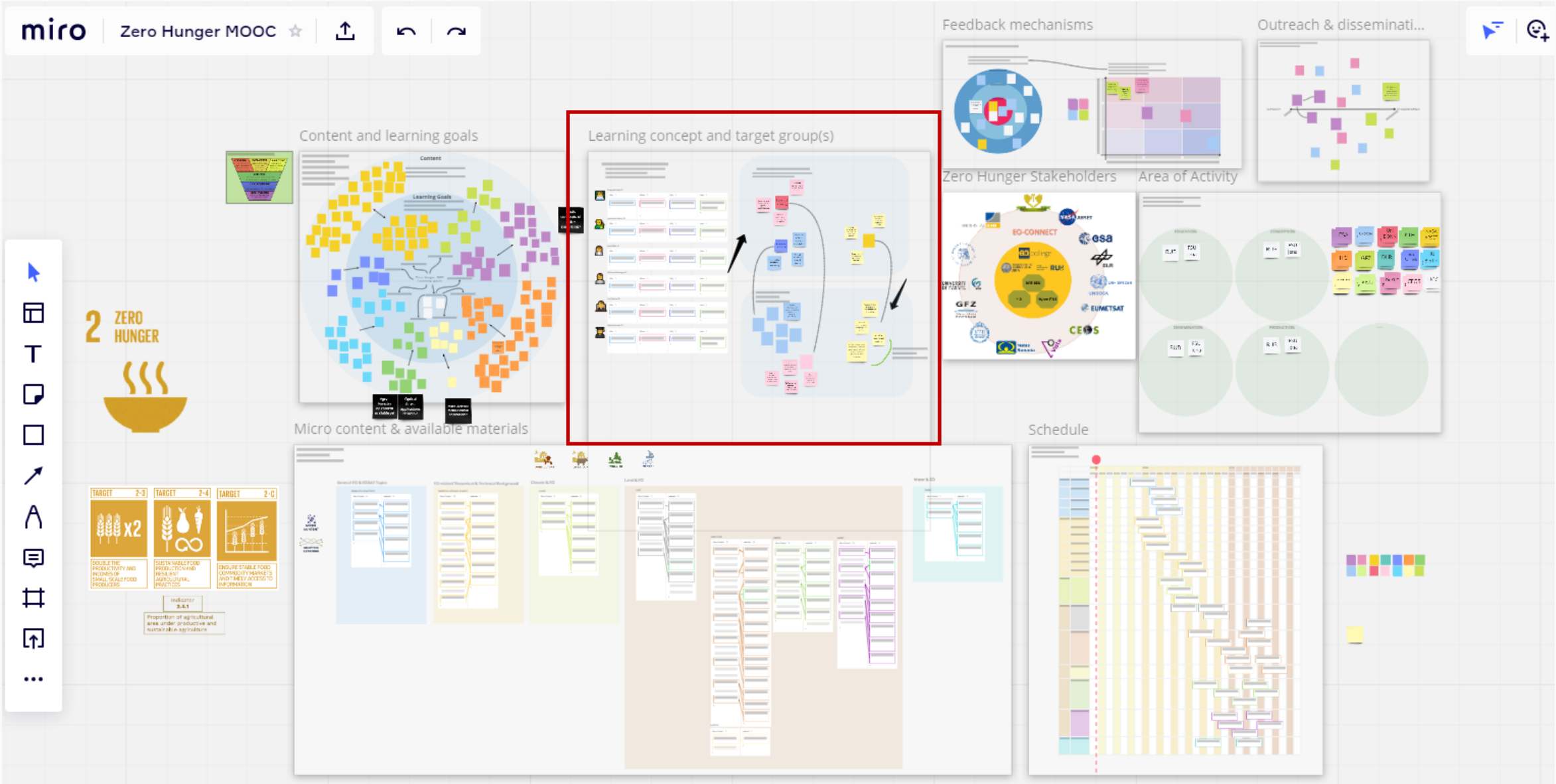
Currently:

15 Stakeholders

- Universities
- Research Institutions
- Space Agencies
- International Organizations
- Company
- ....



Zero Hunger MOOC - Participation



miro | Zero Hunger MOOC

Who are the learners and how are we going to address their needs?

Whom can we target with our MOOC to make it inclusive and valuable to the comprehensive idea of SDG#2, but still specific enough?

- The personas are imaginary persons made up to represent a slice of the target audience
- Review the suggested personas, comment on their characteristics or create new personas by copying and modifying the target audience template

Resolve

Comment: Today, 16:58

This might be the largest user group

Leave a reply. Use @ to mention.

Ifunanya Achebe, 32

Who | 1	Where | 1	Why | 1	How | 1
Researcher and PhD student	High-profile research facility in Ibadan, Nigeria	Give data-driven policy advice with his research – employability	Good technical skills – speaks English, French, local languages

José Antonio Santos, 38

Who | 1	Where | 1	Why | 1	How | 1
Small-scale farmer with a part-time job in town	Close to Sinaloa de Layva, Mexico	Increase and stabilize his maize and vegetable yields	Hard-/software constraints – speaks Spanish and some English

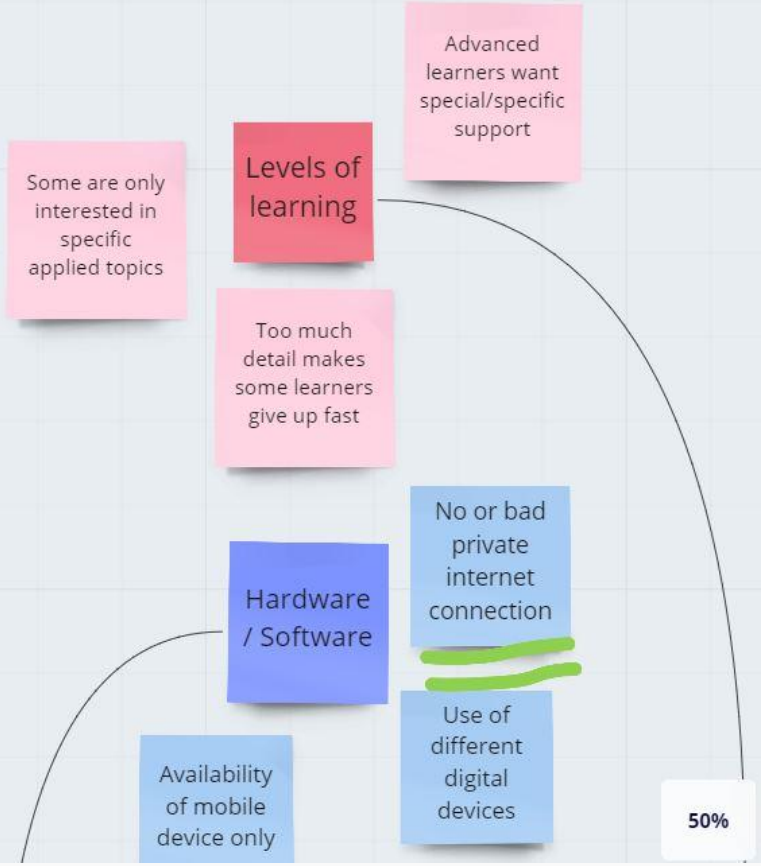
Jessica Bash, 41

Who | 1	Where | 1	Why | 1	How | 1
Employee tasked with developing large-scale rice irrigation schemes	Big company in Varanasi, India	Shorten the exploration phase for new projects	Excellent technical skills – good equipment – speaks English and multiple Indian

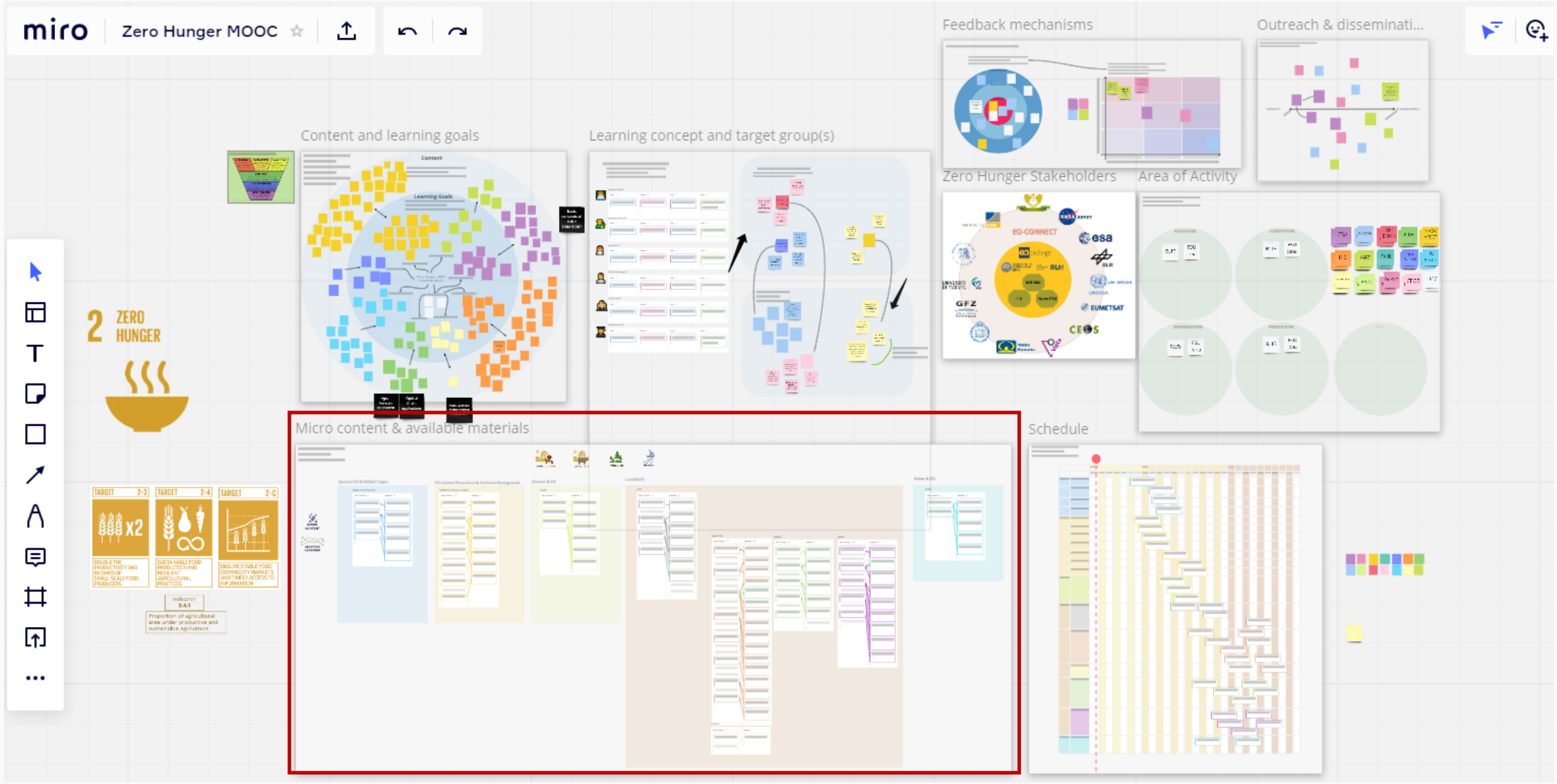
Which challenges result from the identified personas?

Which challenges can be identified?

- Fill in or add post-its to point to possible challenges
- Post-its can be grouped around the overarching topics or stand for themselves



Zero Hunger MOOC - Participation



Zero Hunger MOOC - Participation

miro | Zero Hunger MOOC ☆

Micro content & available materials

How can the individual pieces of content be organized into learning units?

- This space reflects how the pieces of content above can be grouped into learning units
- Use the comment function to add your feedback

AGRICULTURE LIVESTOCK FORESTRY FISHERY

MICRO CONTENT

ADAPTIVE LEARNING

General EO & SDG#2 Topics

GENERAL EO & SDG #2 TOPICS

Micro Content | 4

- Zero Hunger & EO — Agri + Live + For + Fish
- Overview of EO Data (free data) — Agri + Live + For + Fish
- Overview of EO Tools (free) — Agri + Live + For + Fish
- Food Security — Agri + Live + For + Fish

materials | 5

- Sustainable Development Goal 2 and — Agri + Live + For + Fish, Text, UNOOSA, Video recording
- Sentinel-1 data access — Agri + Live + For + Fish, FSU Jena, Tutorial, Video recording, part of a MOOC
- Radar Missions & Radar Data Sources — Agri + Live + For + Fish, FSU Jena, Text, part of a MOOC
- EO Data processing software & — Agri + Live + For + Fish, FSU Jena

EO related Theoretical & Technical Background

THEORETICAL & TECHNICAL EO BASICS

Micro Content | 13

- Fundamentals of remote sensing — Agri + Live + For + Fish
- Type something
- Optical basics — Agri + Live + For + Fish
- Type something
- Radar Basics — Agri + Live + For + Fish

materials | 7

- Fundamentals of Remote Sensing — Agri + Live + For + Fish, FSU Jena, Text, part of a MOOC
- Essential Image Analysis Techniques — Agri + Live + For + Fish, FSU Jena, Text, part of a MOOC
- Processing Fundamentals of Remote — Agri + Live + For + Fish, FSU Jena, Text, part of a MOOC
- Radar Backscattering Basics — Agri + Live + For + Fish, En., Fr., Sp., Gr.,

Climate & EO

CLIMATE

Micro Content | 3

- Introduction to Satellite based — Agri + Live + For + Fish
- Analysis of Climate Data — Agri + Live + For + Fish
- Climate time series analysis — Agri + Live + For + Fish

materials | 6

- Satellite based Climate Data Records — Agri + Live + For + Fish, EUMETSAT, Video recording
- CM SAF R Toolbox for Climate — Agri + Live + For + Fish, EUMETSAT, Video recording
- R-Instat for statistical analysis for — Agri + Live + For + Fish, EUMETSAT, Video recording
- A climate data record of soil moisture — Agri + Live + For + Fish, EUMETSAT, Video recording

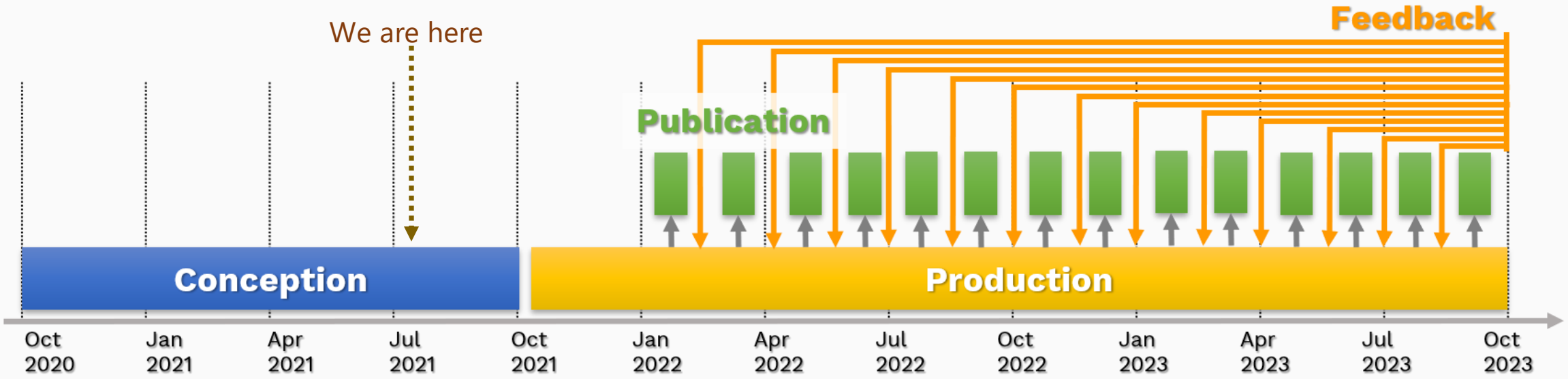
?

- **Sustainability** and **quality** of materials
- **Discoverability** of materials
- **Reusability** of materials
- **Engaging** learners
- **Bridging** the **digital divide**
- **Efficient use** of **resources**

!

- **Metadata Standards**
- **Blended Learning**
- **Mobile Learning**
- **Cloud processing** interface
- **Adaptive learning**
- The role of **AI**

- **Consolidate MOOC concept** with the **stakeholders**
- Set-up the **network**
- Collect the **stakeholder contributions**



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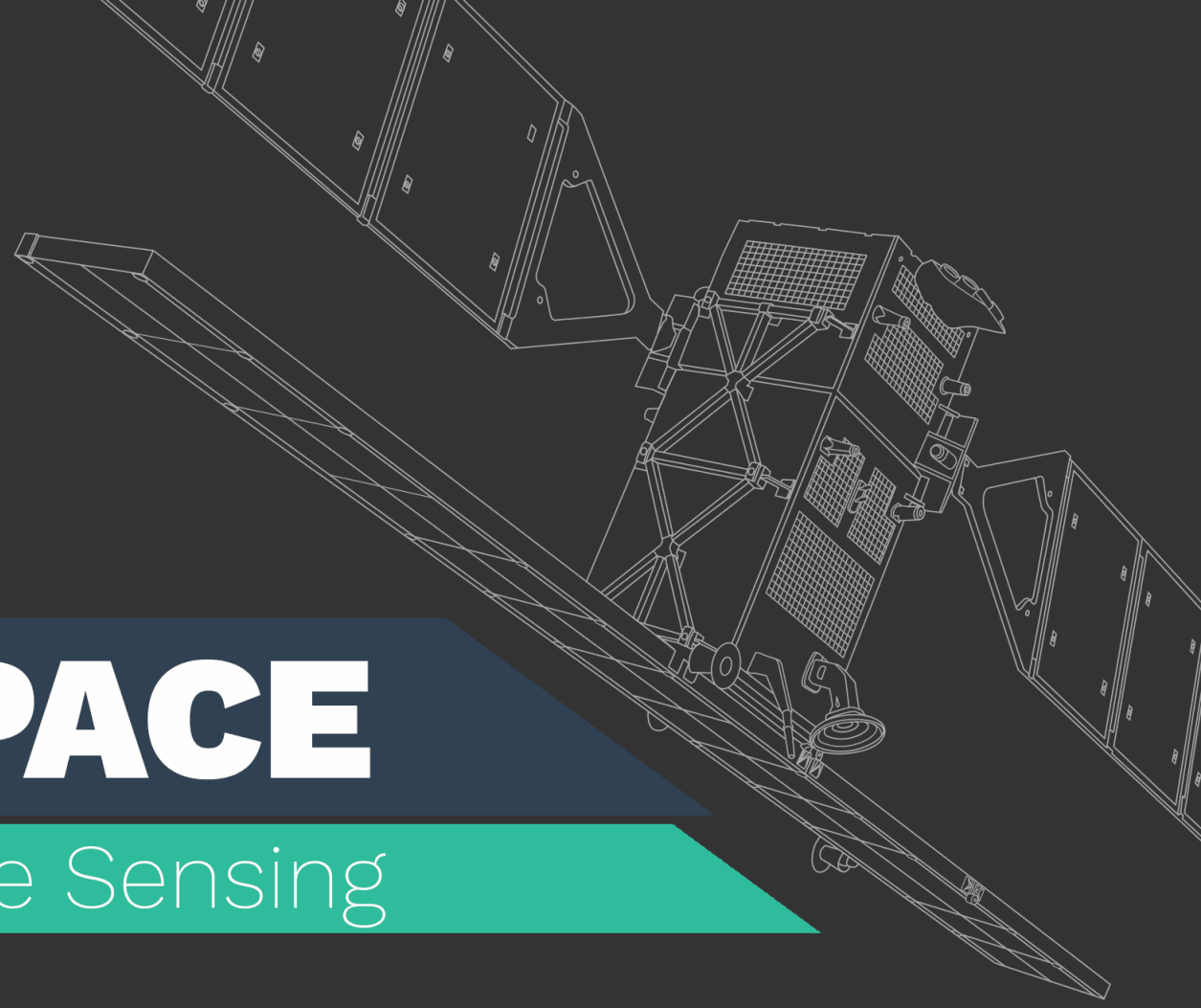


ECHOES IN SPACE

Introduction to Radar Remote Sensing

FREE OF CHARGE

OPEN TO ANYBODY

SELF-PACED LEARNING

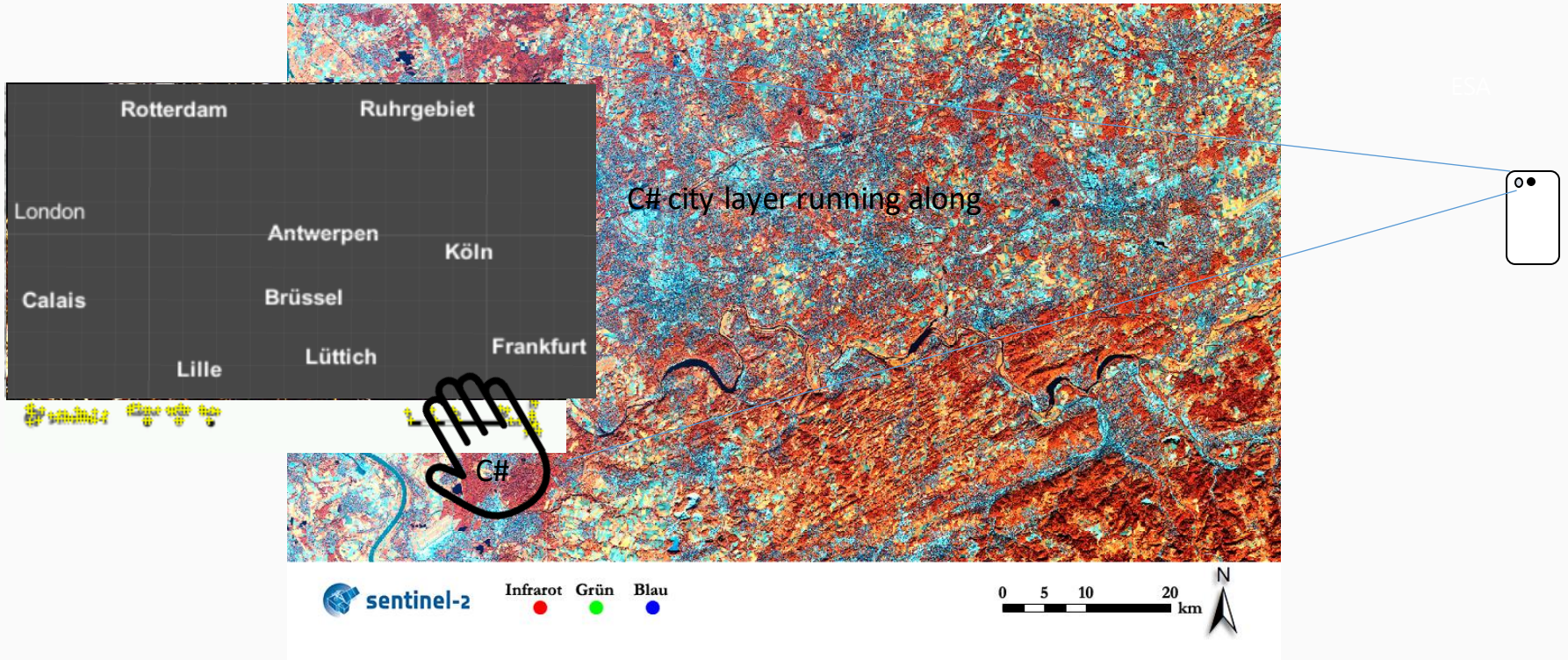
5 LESSONS

CERTIFICATE FOR COMPLETION

eo-college.org/courses/echoes-in-space

High Definition Earth Viewing – HDEV

Made with unity

vuforia™

- Augmented Reality App