www.**universeh**.eu

European Space University for Earth and Humanity

UNIVERSEH is an alliance of five European universities established to develop a new way of collaboration in the field of Space, within the "European Universities" initiative.

The alliance aims to create new higher education interactive experiences for the university community, teachers, and students, and for the benefit of society as a whole. Such initiatives will enable broadminded, informed, and conscientious European citizens to capture and create new knowledge and become smart actors of European innovation, valorisation, and societal dissemination within the Space sector, from science, engineering, liberal arts to culture.

Grant agreement number: 101004066

Funding Scheme: Erasmus+ / European Universities

D5.2: Development plan for UNIVERSEH curriculum in entrepreneurship and Innovation with a focus on Space field

Due date of deliverable: M20
Actual Submission date: 05/07/2022

Start date of the project: 05/07/2022 Duration: 36 months

UNIVERSEH – European Space University for Earth and Humanity is an alliance of

Co-funded by the Erasmus+ Programme of the European Union

Organisation responsible for this deliverable: **University of Luxembourg, Luxembourg**

Dissemination level

PU	**Public**	**X**
CO	**Confidential, only for members of the consortium**	

Document History

Version	Date	Author	Partner	Summary of main changes
1.0	**30/06/2022**	**Eric Tschirhart**	**Uni.lu**	**-**

Objective

A catalogue of courses on entrepreneurship and innovation available at partners' universities have been established previously, which depicts the landscape of entrepreneurship-related courses in the partner universities.

Our primary goal is to develop and offer a group of courses to our students which fulfils the following criteria:

- Space is the sectorial activity of UNIVERSEH knowledge transfer
- The NewSpace economy is a complete gamechanger in the socio-economic approach of space in Europe and worldwide
- Classic entrepreneurship and innovation do not include this new dimension of NewSpace or also called entrepreneurial space, represented by companies such as Orbital (now retired), Sierra Nevada Corporation, Northrop Grumman Innovation Systems, SpaceX and a multitude of SMEs and start-ups.

Hence, to prepare our students to the NewSpace paradigm and economy, our intention is to design, develop and propose a set of courses incorporating entrepreneurship, innovation, and practical sessions.

Co-funded by the Erasmus+ Programme of the European Union

Output

The analysis of the existing curricula and of the learning objectives of the courses led to the design of a new 5-ECTS Teaching & Learning module called “Entrepreneuring in space industry” (130 hours/student workload). This proposal was discussed and finalized during the first semester of 2022, through online meetings and an extensive final session in Krakow on 1st and 2nd June 2022.

The process was assisted with an instructional designer and an expert in innovative methods for teaching & learning.

The concurrent design of the module “Entrepreneuring in space industry” plans the following courses:

- Space economy: past, present, and future
- Foundation courses
- Team ideation
- Entrepreneurial project and monetization
- Protecting and funding Minimal Viable Products
- Presentation and assessment

The comprehensive characteristic of the module is its interdisciplinarity when using a business and engineering approach to combine different fields of study. The student body will be composed of students from Business, Engineering, Humanities and Social Sciences.

Likewise, multilingual approaches to enhance the learning of languages, promote plurilingualism and intercultural education will be incorporated into the module through three distinctive channels. The first approach is to use digital tools to add captions/subtitles to videos and lectures, the second one is to provide student support and mentoring in different languages, and the third one to provide resources and supporting material in different languages.

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Dissemination

On behalf of the group, Peter Törlind presented the work package production at Sweden's largest conference and meeting place for everyone with an interest in higher education pedagogical education and development, NU 2022 Conference. The Swedish University and College Association (SUHF) is behind the conference.

P. Törlind (2022) *Designing student-centred learning for students with heterogeneous backgrounds – Implementation in an entrepreneurship and innovation course in the European University UNIVERSEH*, NU 2022 Conference, June 15-17, 2022.

In conclusion, the development plan for a course in Space and New Space entrepreneurship is set, to allow the implementation of a full 5-ECTS module in September 2023 within the partner universities.

Version: final

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NU22

DESIGNING STUDENT-CENTRED LEARNING FOR STUDENTS WITH HETEROGENEOUS BACKGROUNDS

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UNIVERSEH

Peter Törlind Associate professor Product innovation

Program director Industrial design engineering

Distinguished university teacher

131
Thesis supervised

14100
Teaching hours

57
Research papers

709
Citations

13
h-index

2
Best paper awards

5800
Textbooks sold

11
Pedagogical papers

Average course satisfaction

EUROPEAN UNIVERSITY INITIATIVE

EU Funded initiative through Erasmus+

41 Consortiums in Europe

"Increase international competitiveness of European higher education and bring Europeans together"

UNIVERSEH – EUROPEAN UNIVERSITY INITIATIVE

UNIVERSEH

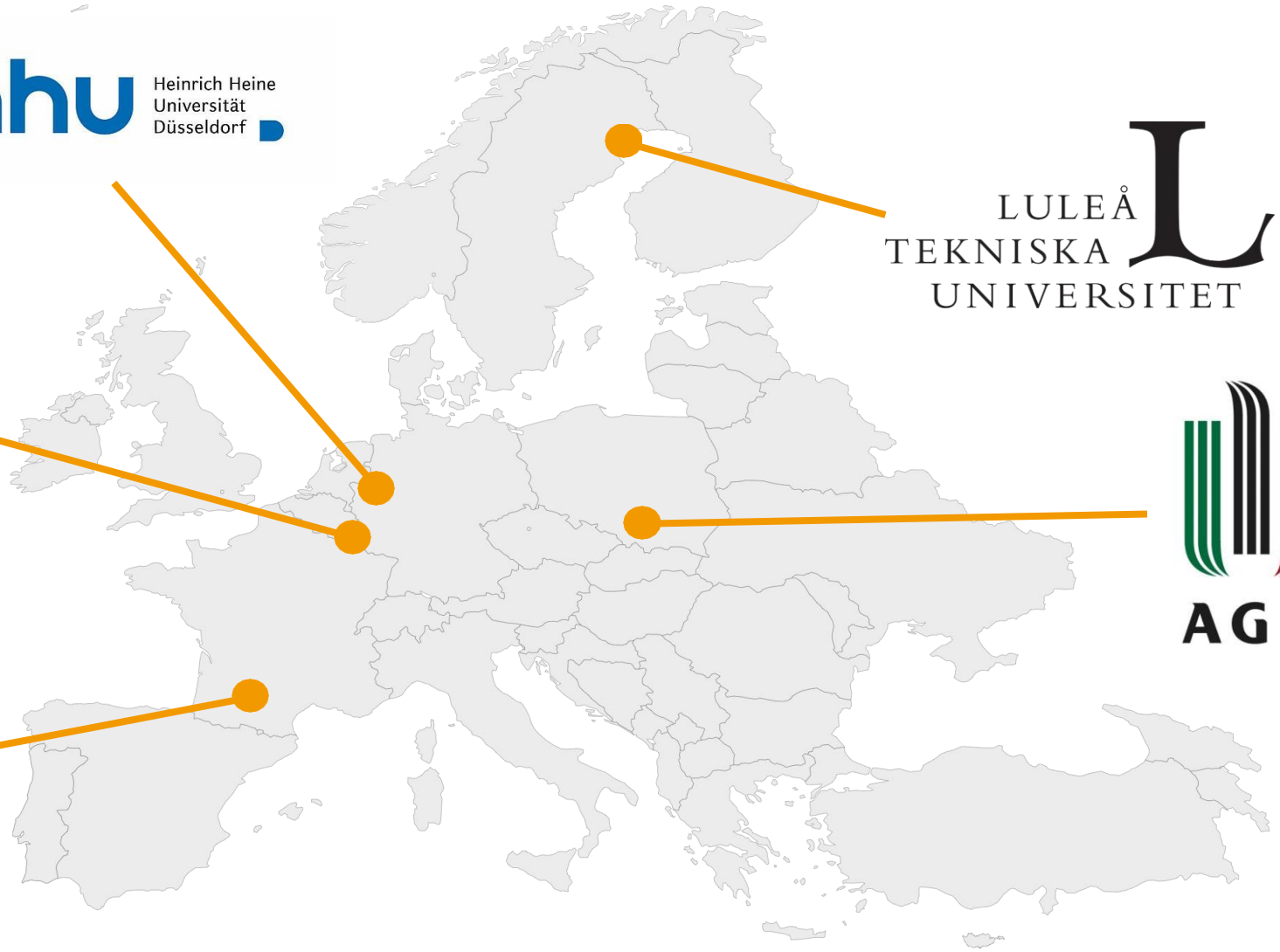
hhu Heinrich Heine Universität Düsseldorf

LULEÅ TEKNISKA UNIVERSITET

uni.lu UNIVERSITÉ DU LUXEMBOURG

AGH

Université Fédérale Toulouse Midi-Pyrénées



CHALLENGE

- *Students from five universities/ countries*
- *Different faculties – Engineering, Business, Law, Social science, Humanities…*

Students come to the course with different prior knowledge, pedagogical experiences, attitudes, interests, preferences, strengths and weaknesses.

PEDAGOGICAL CONCEPTS

Student-centered learning where students take active responsibility for their learning process.

- *Active learning*
- *Micro credentials*
- *Student as a teacher*
- *Multi disciplinary teamwork*

HETEROGENOUS BACKGROUNDS

After university most professionals will work in multidisciplinary or interdisciplinary teams.

Multidisciplinary: *people from different disciplines working together, each drawing on their disciplinary knowledge.*

Interdisciplinary: *integrating knowledge and methods from different disciplines, using a real synthesis of approaches.*

HETEROGENOUS BACKGROUNDS

After university most professionals will work in multidisciplinary or interdisciplinary teams.

Unfortunately we do not train our students for this!

HETEROGENOUS BACKGROUNDS

*Students need to be **aware** of others expertise and competences.*

*Students also need to have an **empathy and respect** for others expertise.*

*And we need a **common ground** to been able to interact*

CREATING COMMON GROUND

To be able to meet and discuss things it's important that all members in the team understand each other.

"Grounding refers to the interactive process of making sure that what is communicated is also correctly understood."

Clark and Brennan, (1991)

COURSE DESIGN

CONTEXT

Space economy past, present and future

BMC

IPR

Space sectors

Management of Innovation

Diversity in space

Engineering design

Concurrent design

Entrepreneurship fundamentals

Foundation courses

THE TEAM AND THE IDEA

Team ideation

SUSTAIN ABILITY

PROJECT, IPR FUNDING

Entrepreneurial projects and monetization

FOUNDATION COURSES

Emanuel
Business student
from Toulouse

Lisa
Space student
from Kiruna

BMC

IPR

Space sectors

Management of Innovation

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FOUNDATION COURSES

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- Space sectors
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- Engineering design

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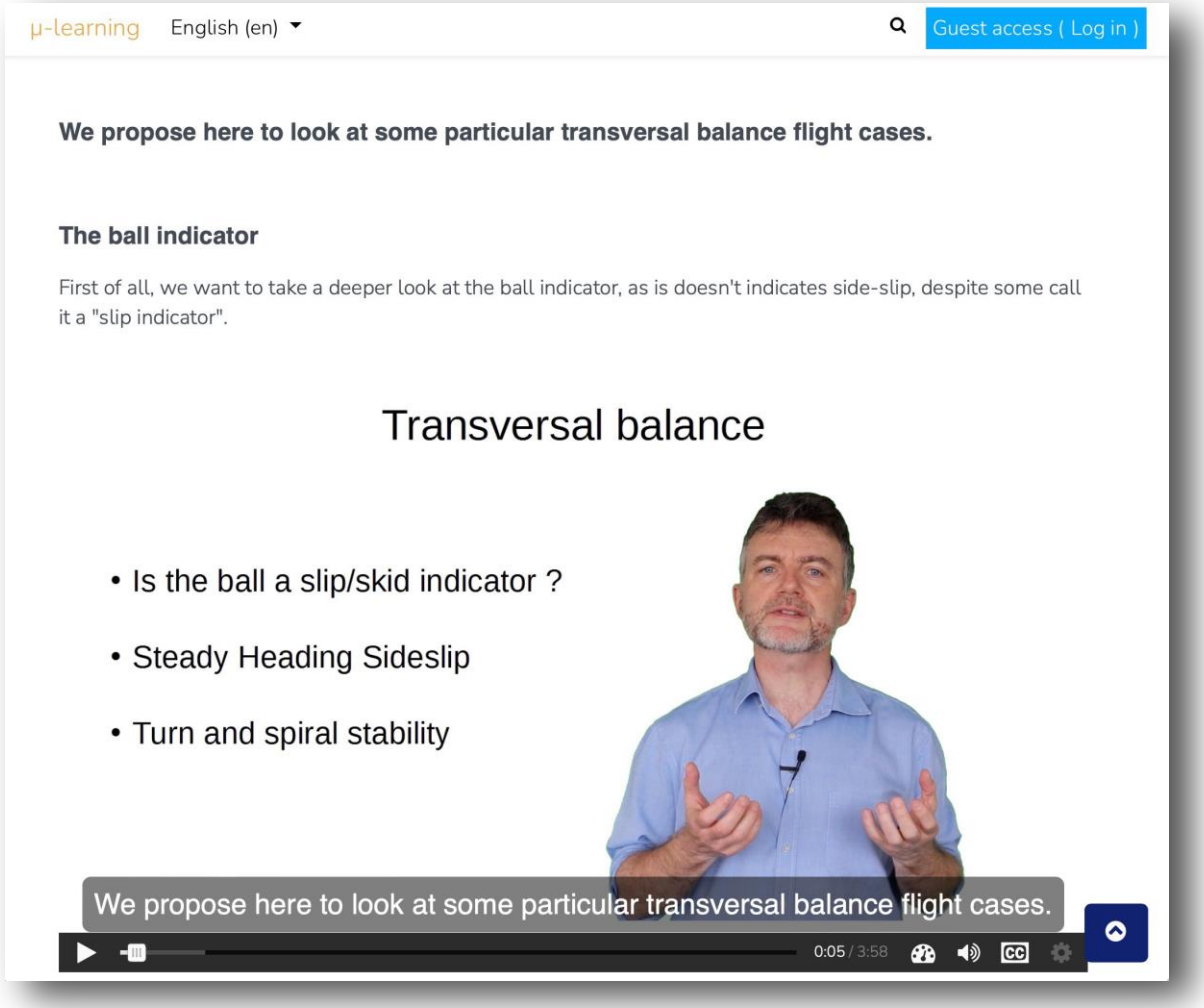
- BMC
- Management of Innovation
- IPR

MICROLEARNING

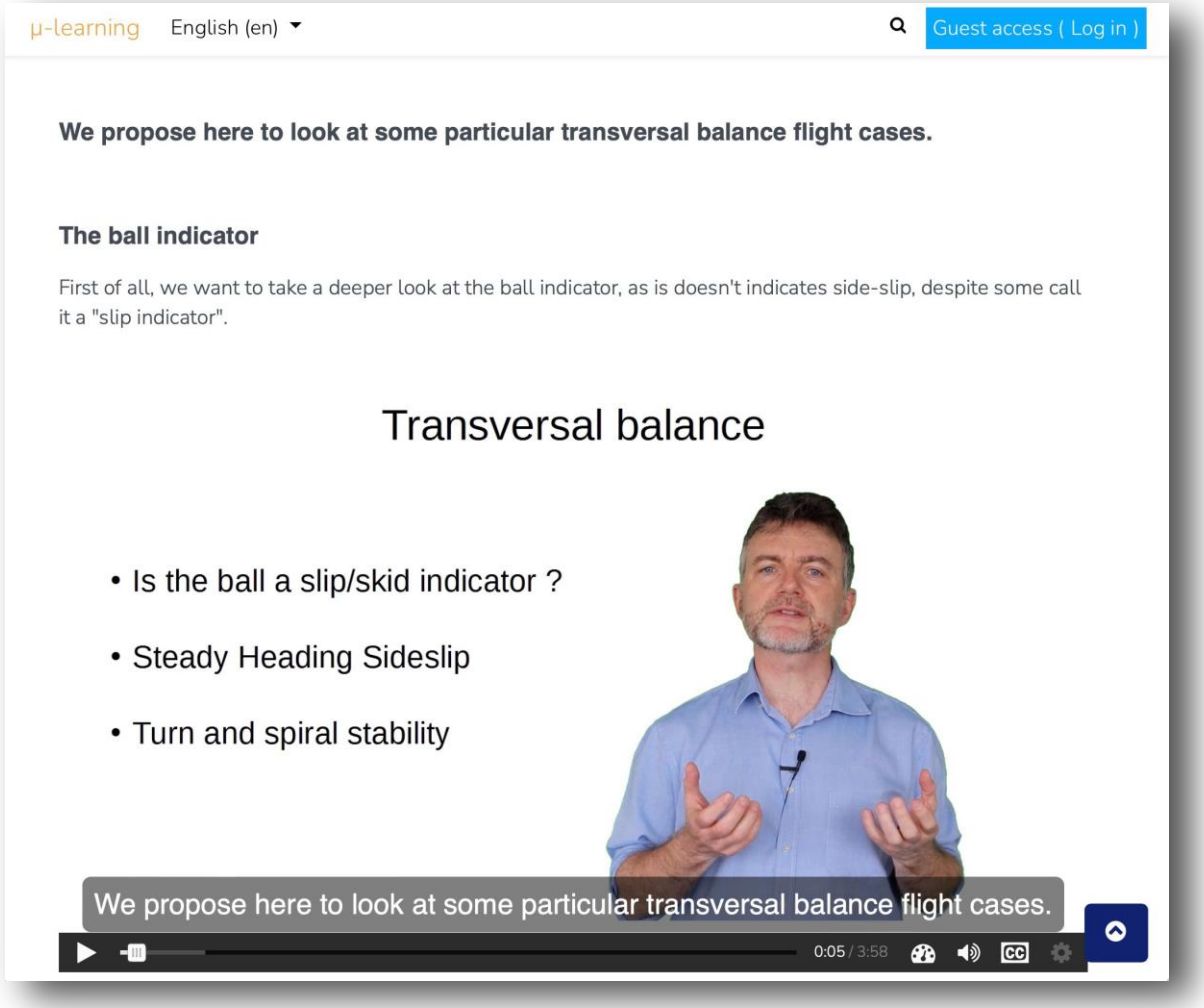
Aerospace digital nuggets

"The nuggets are small (less than 45 min learning time) chunk of interactive knowledge"



MICROLEARNING

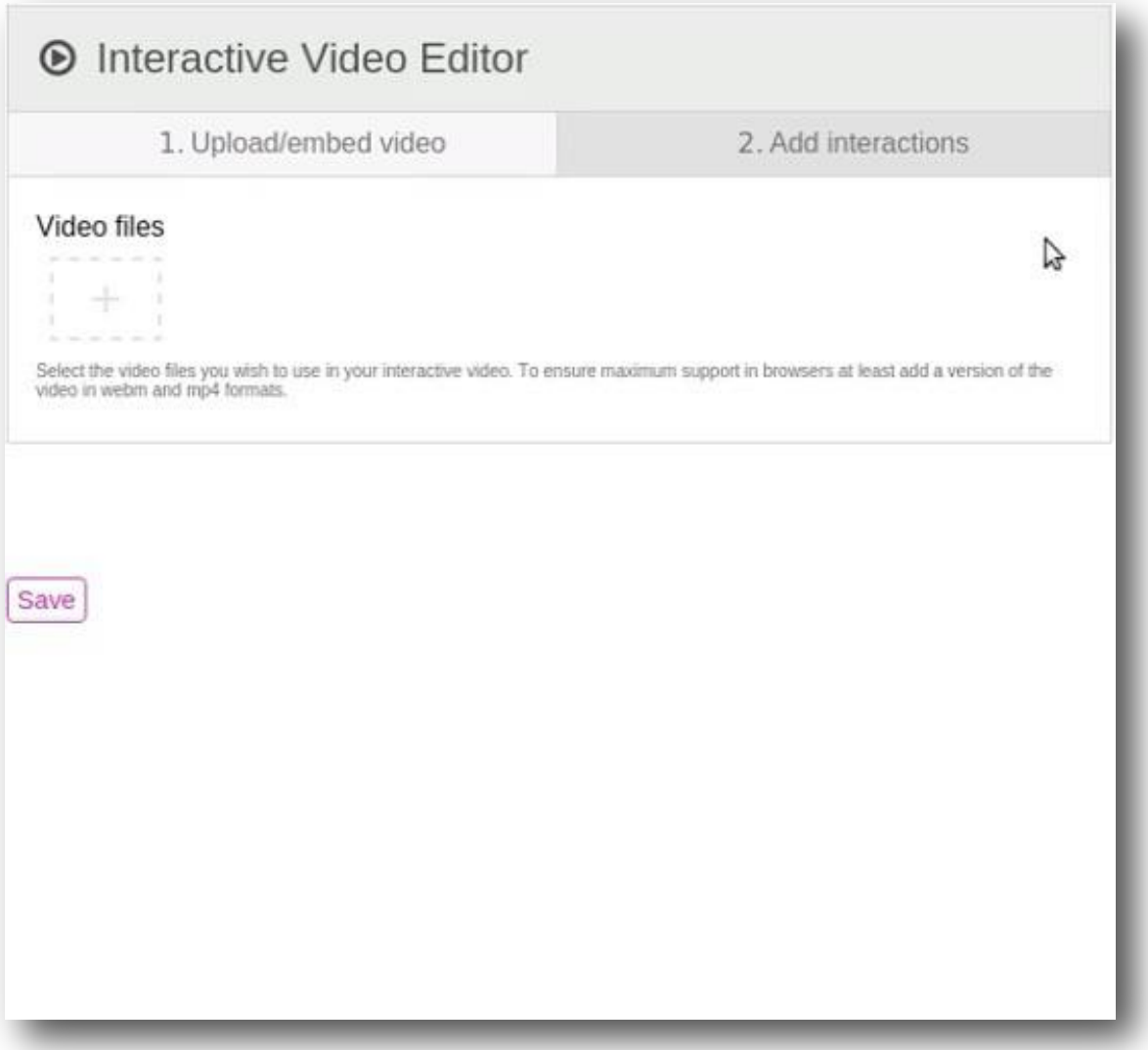
- *Self paced personal learning modules*
- *Accessible anytime/ anywhere*
- *Clear learning objectives*
- *Includes assessment*



AEROSPACE DIGITAL NUGGETS

A sequence of HTML5 assets

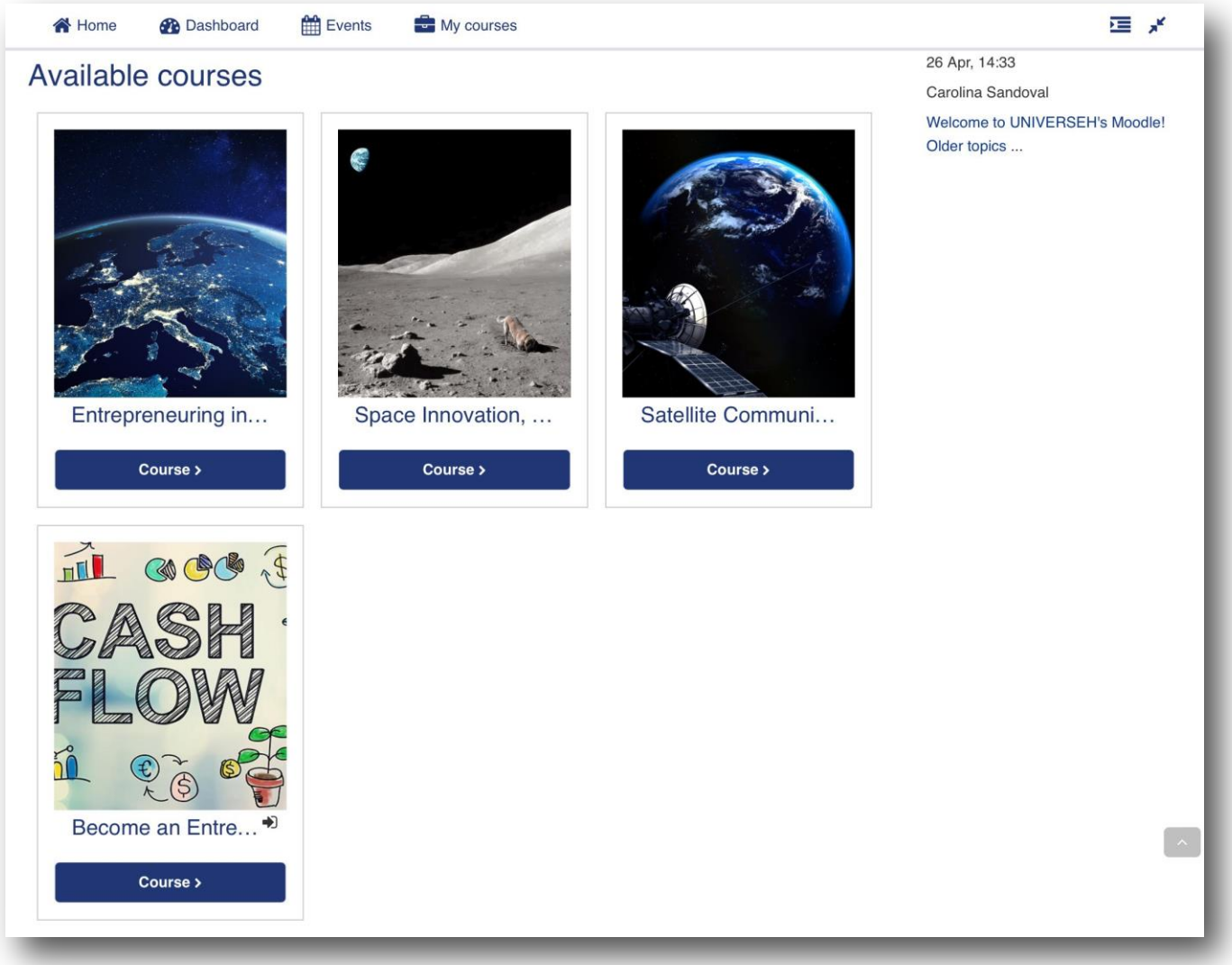
Using H5P plugin



Create interactive content for the web

MOODLE LMS

- *Shared LMS for the consortium*
- *Single sign on*
- *A lot of support from pedagogical support staff*



NOT JUST ONLINE

CONTEXT

Space economy past, present and future

BMC

IPR

Space sectors

Management of Innovation

Diversity in space

Engineering design

Concurrent design

Entrepreneurship fundamentals

Foundation courses

THE TEAM AND THE IDEA

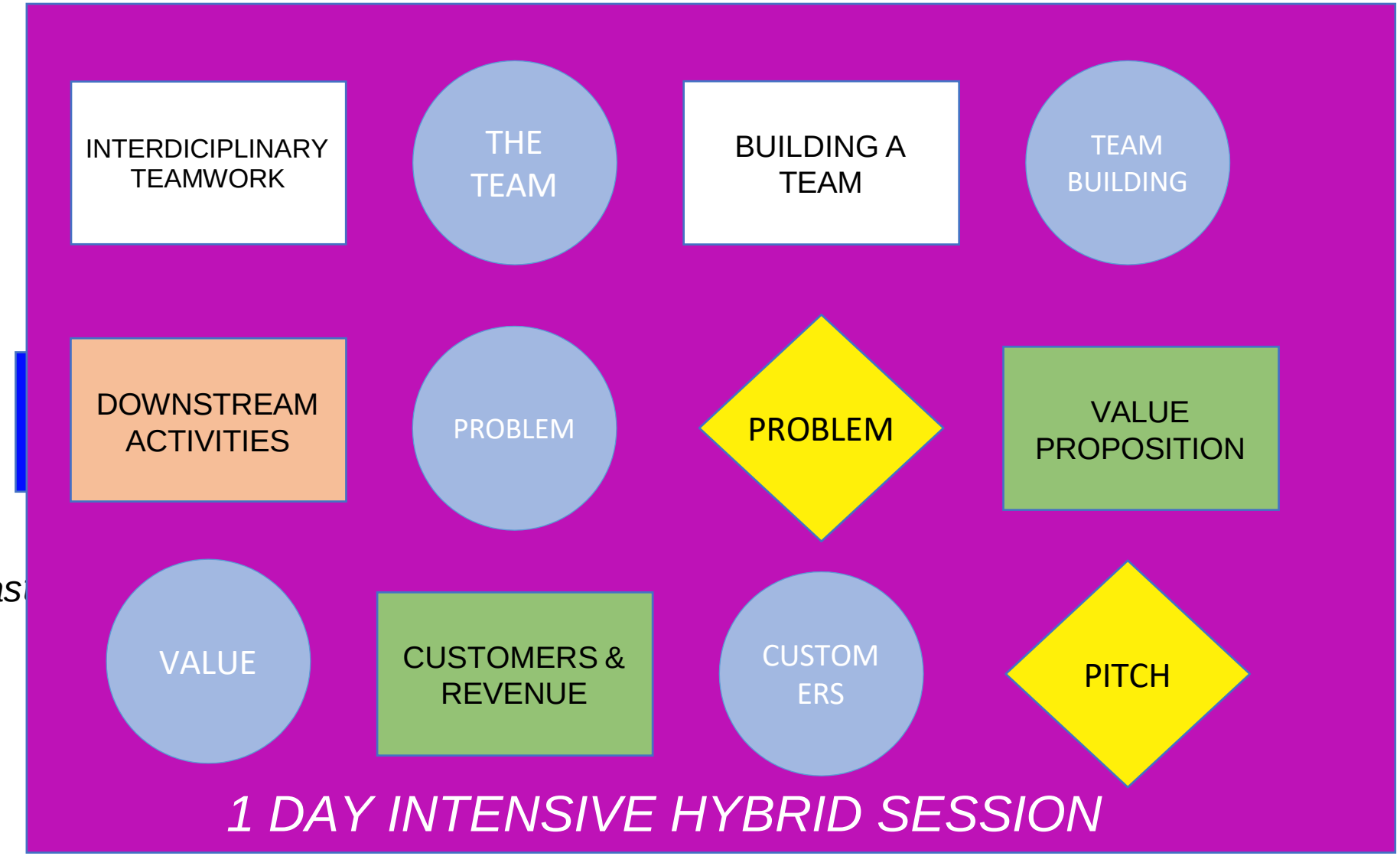
Team ideation

SUSTAIN ABILITY

PROJECT, IPR FUNDING

Entrepreneurial projects and monetization

TEAM BOOTCAMP



LECTURE TEAMWORK

LECTURE SPACE

LECTURE ENTREP.

TEAM

PITCH

OTHER ISSUES

- *Academic calendars mismatch*
- *Different rules and polices*
- *Multilingual approach*
- *How to handle accreditation of courses?*
- *Course ownership*
- *GDPR*

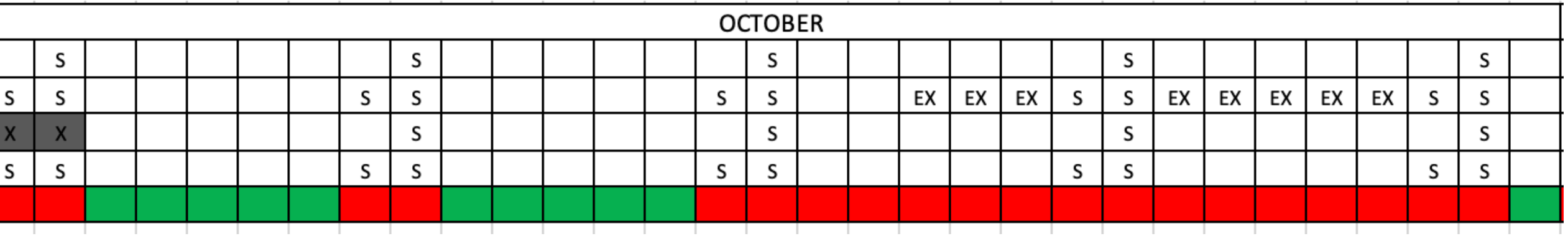
ACADEMIC CALENDARS

Very different calendars at universities

	SEPTEMBER																										
UNI.LU	X	X	X	X	S	X	X	X	X	X	X	S							S						S		
LTU				S	S						S	S						S	S						S	S		
AGH	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
UT	X	X	X	X	X	X	X	X	X	X	X	X						S	S						S	S		

ACADEMIC CALENDARS

Very different calendars at universities



Only 80 days per year are shared!

RULES AND POLICIES

"A lecture is 3h no more, no less"

"You are not allowed to create video lectures! Lectures should be live!"

"Students are only allowed to take the exam three times"

"The course has to be in the program syllabus"

RULES AND POLICIES

$$(Administration\ x\ policies)^{5} = pain$$

SUMMARY

Entrepreneurial course for students with heterogenous background

- *Creating **common ground** by fundamental courses adapted to the students background and expertise*
- *Students must take an **active responsibility for their learning process***
- ***Work in progress** – first course autumn 23*

UNIVERSEH

EUROPEAN UNIVERSITIES

Erasmus+