Challenges Are the Start of Great Solutions: Challenge Based Learning in Action!

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Programme

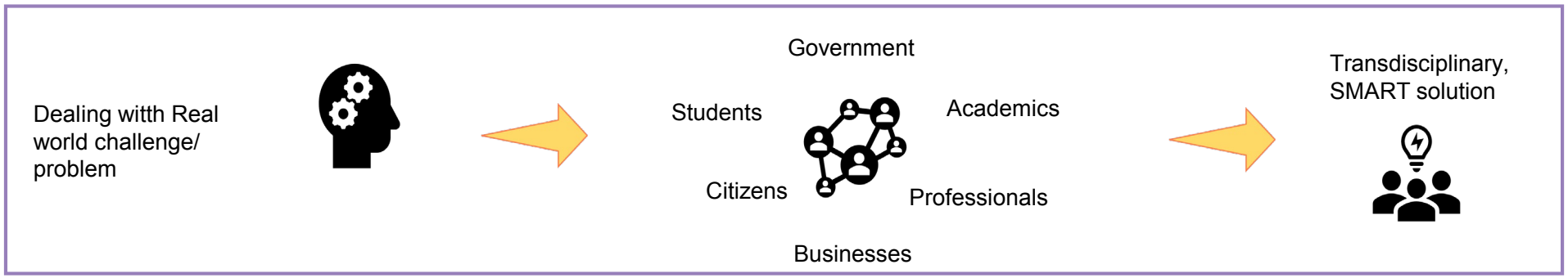
- Welcome
- Explanation CBL
- 3 x 5 min. inspirational sessions
  - Josep Bordonau
  - Jordi Segalàs and Gemma Tejedor
  - Michèle Gerbrands
- The Grand CBL Game
  - Explanation and set up
  - Playing game
- Awards and closure

Explanation CBL

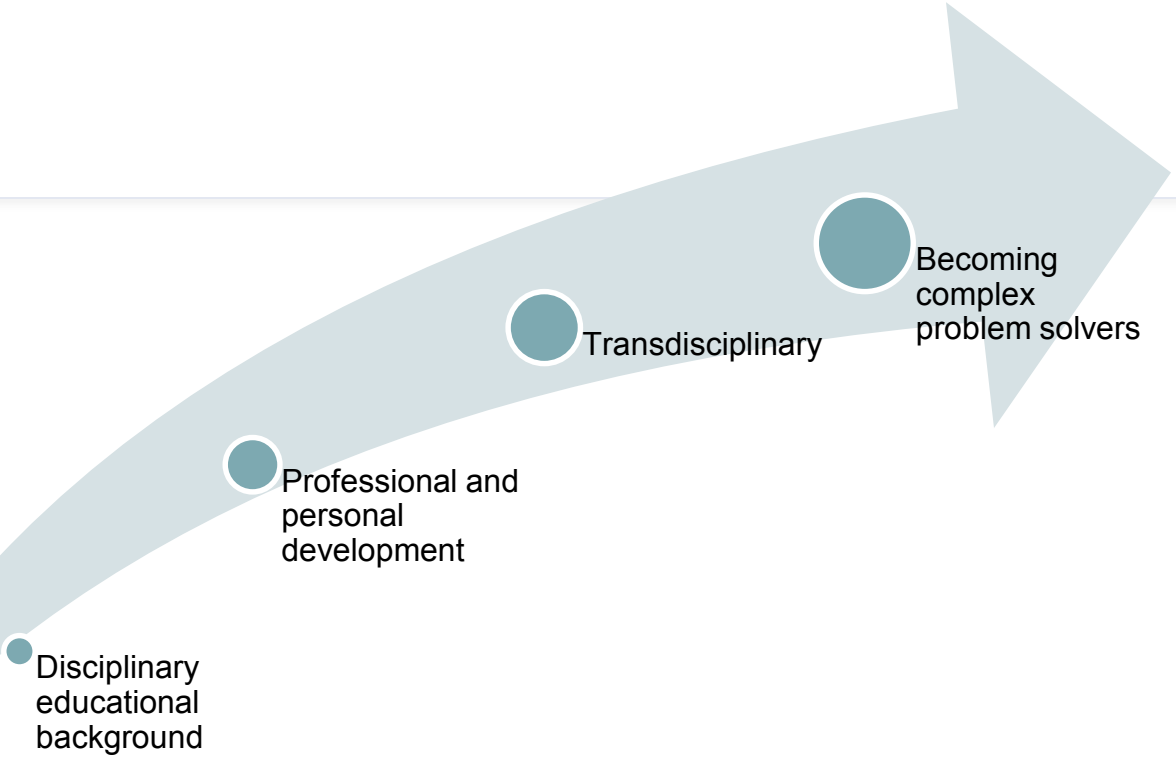
Challenge based learning (CBL) is an educational approach in which students work on global, real-world, authentic challenges, developing genuine solutions, creating measurable impact!

The solutions are co-developed, investigated and acted upon by students and multidisciplinary stakeholders

https://www.challengebasedlearning.org/

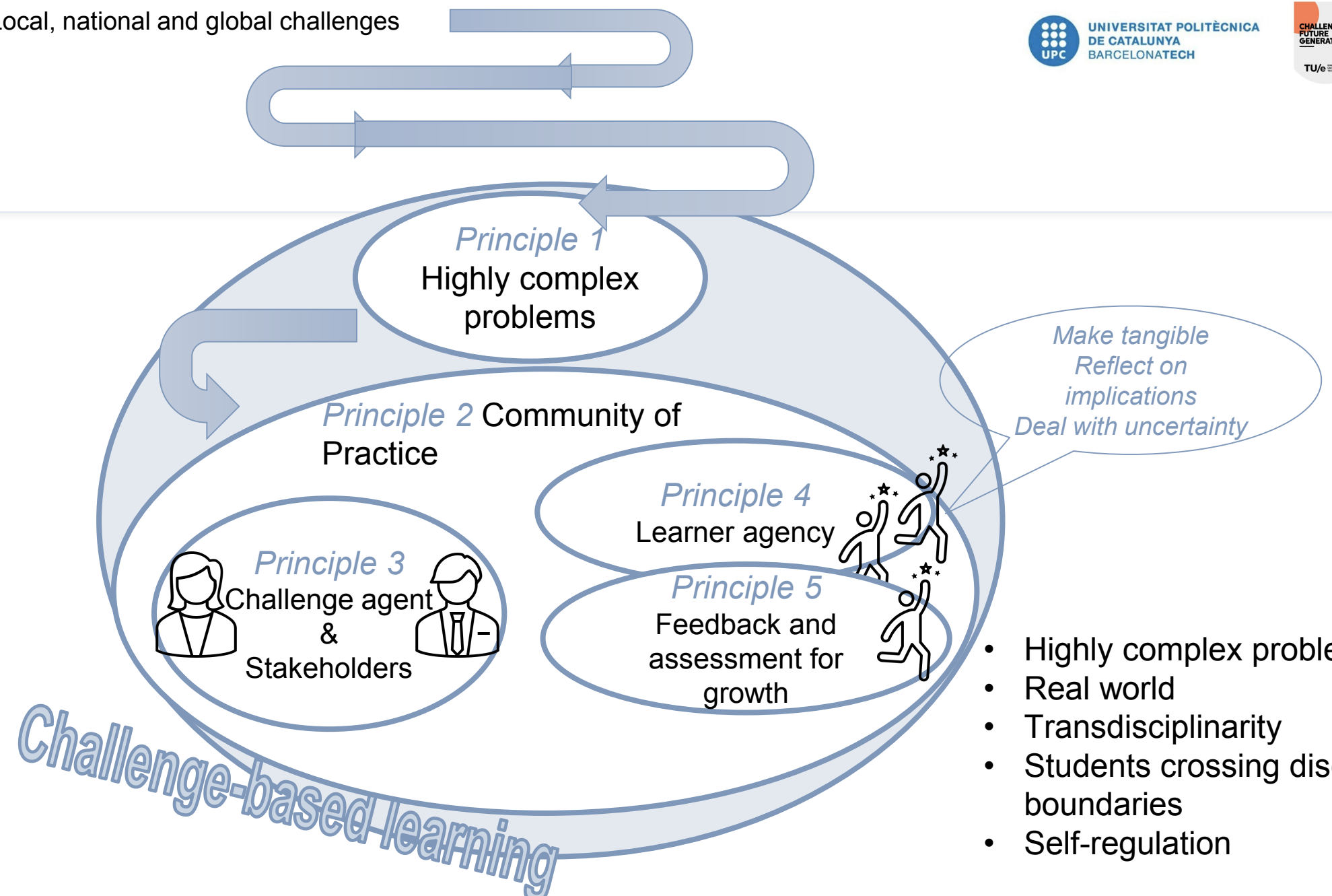


Explanation CBL



"In this sense **transdisciplinarity** is the highest form of integrated project, involving not only multiple disciplines, but also multiple non-academic participants (e.g., land managers, user groups, the general public) in a manner that combines interdisciplinarity with participatory approaches" (Stock and Burton 2011) from the very beginning.

Local, national and global challenges



- Highly complex problems
- Real world
- Transdisciplinarity
- Students crossing disciplinary boundaries
- Self-regulation

Inspirational session 1
How to work an Industry Challenge

About the context

- A method being worked since 2015 (Enrique Velo, Mónica Mejli, Sergio Busquets, Joan Nicolás, Àlber Filbà, Salvador Alepuz, Alfonso Conesa)

- Main results:
  - 30 % improvement of the full programme results in the surveys
  - 20 % improvement in teacher results in the surveys

Inspirational session 1
How to work an Industry Challenge

PROs for working an Industry Challenge

- REALISM
- CONTACT WITH PROFESSIONALS
- TRAINING FOR THE PROFESSIONAL LIFE IN A SAFE ENVIRONMENT

Inspirational session 1
How to work an Industry Challenge

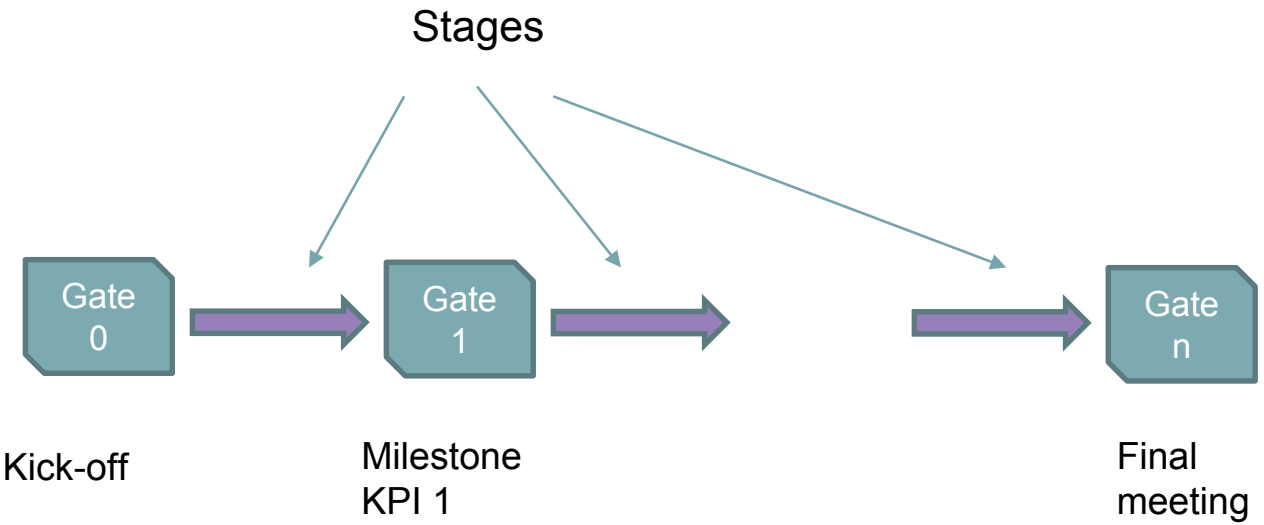
CONs when working an Industry Challenge

- INDUSTRY CHALLENGES RELATED USUALLY WITH SHORT TERM NEEDS
- NEITHER THE TEACHERS NOR THE STUDENTS HAVE FULL CONTROL FOR THE TOPIC
- THE STUDENTS MAY FEEL FAR FROM THEIR DREAM TOPIC FOR A CHALLENGE => eventual initial friction easy to be managed

Inspirational session 1
How to work an Industry Challenge

Building an Industry Challenge course

- Duration: a semester / a year
- To be worked in teams
- The work is co-organized by the Company, the students and the teachers.
- The Company presents the Challenge in the kick-off Gate meeting.
- From this point, the Gate meetings are coincident with Milestones and key decisions, being held with the participation of the industry experts, the students and the teachers.
- The milestones / KPIs (Key Performance Indicators) of the Industry Challenge, are reported in deliverables.
- Stages are the phases between 2 consecutive Gate meetings.
- The teachers meet weekly with the students for following up.

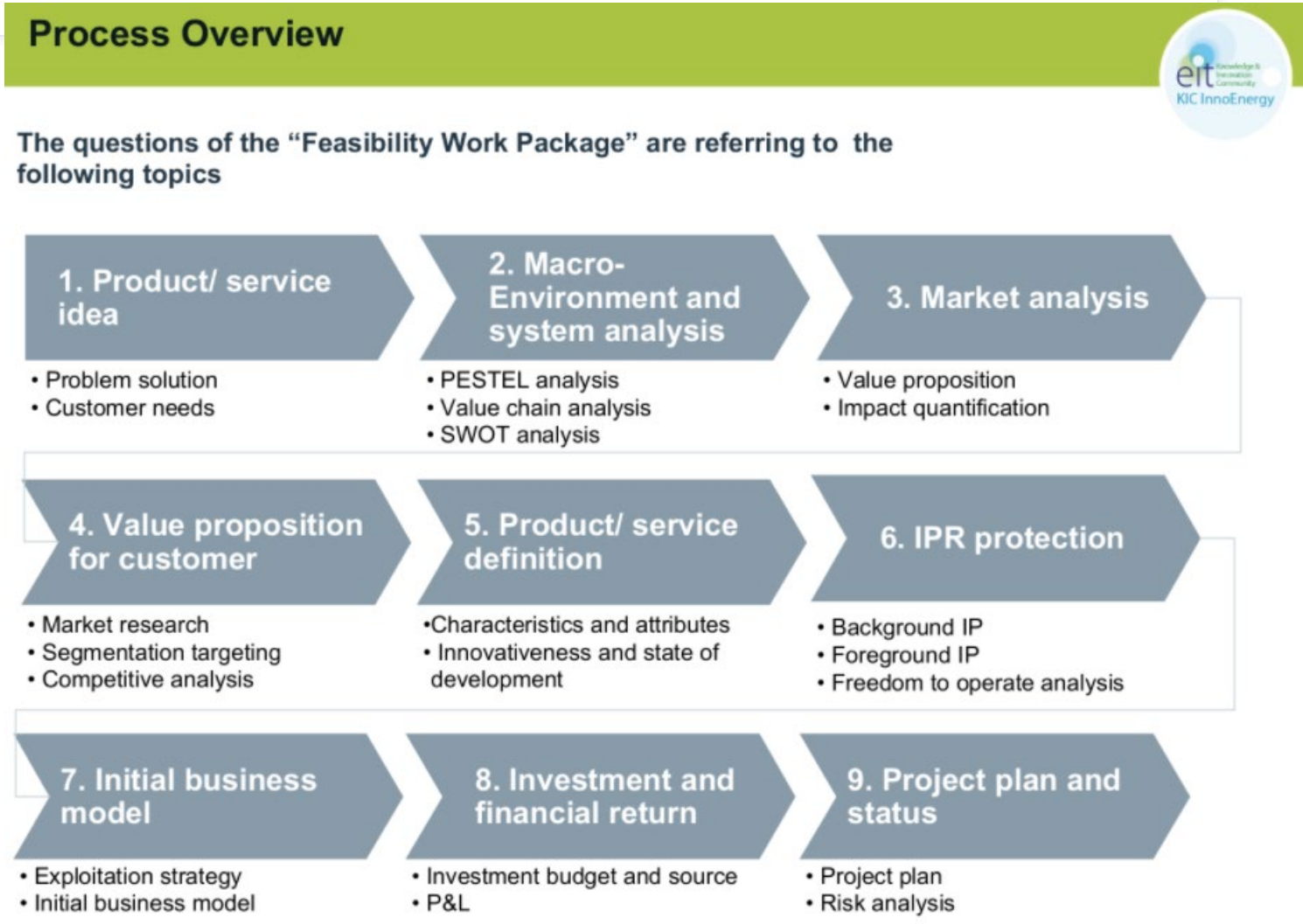


Inspirational session 1
How to work an Industry Challenge

Source: Feasibility Analysis developed by EIT InnoEnergy

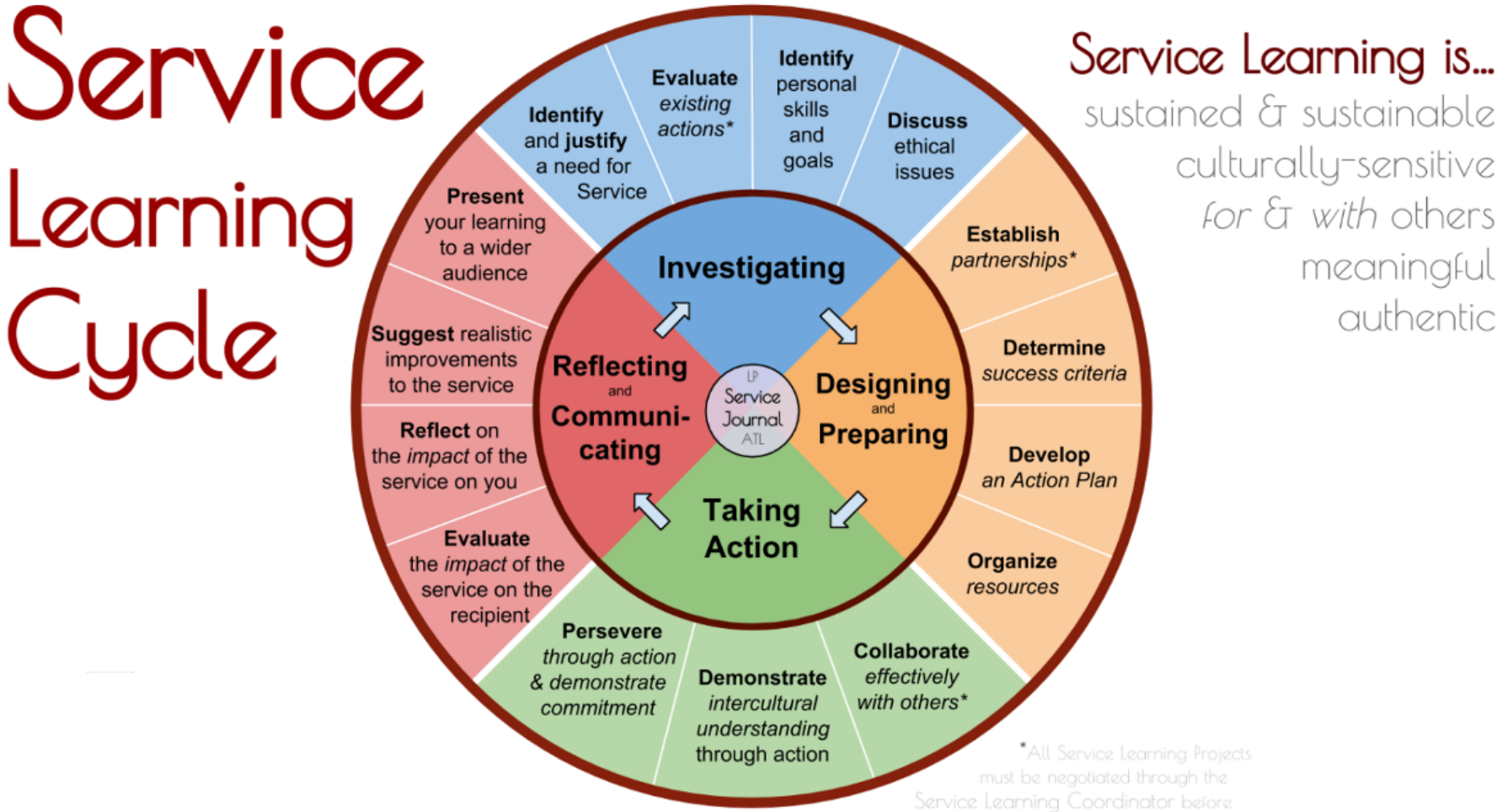
- Elaborated by EIT InnoEnergy Thematic Leaders to co-work and assess project proposals for becoming successful and validated by a number of companies of the network

- Many of the elements of the feasibility analysis are used as KPIs by the companies running the Challenges



Inspirational session 2

The Transdisciplinary Service Learning approach



Inspirational session 2
The Transdisciplinary Service Learning approach

Community-oriented SL educational modality

with **both objectives**

- Curricular learning
- Service to the community

with **transformative potential**

- Experiential education
- Interest in meeting social needs

critical thinking
social awareness

where **perspective of Social Justice** has 2 dimensions:

- related to practice -> disadvantage people
- **related to reflection -> instrument of social/political reform.** Includes:
  - structured reflection
  - critical debate on SJ (power, inequality)
  - implications of service on social change

complex thinking (Wang & Rodgers, 2006)
social commitment

Inspirational session 2
The Transdisciplinary Service Learning approach

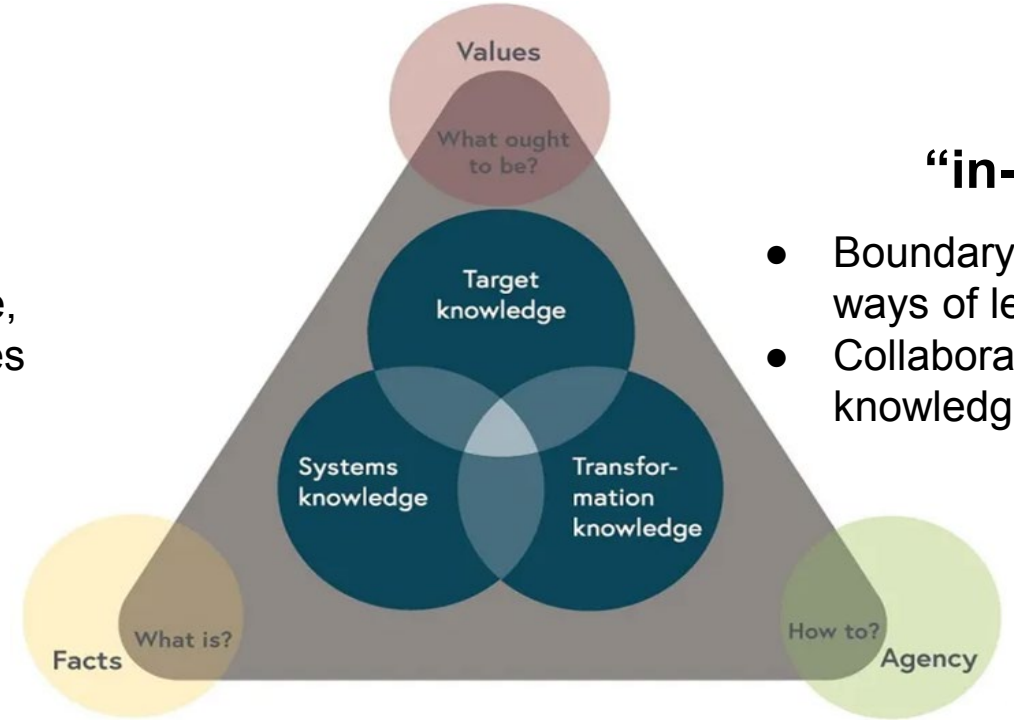
Transdisciplinary learning space

“robust knowledge”

- Re-integration: (validating) solutions owned by all
- Circularity: (restoring) impacts to the environment and society

“epistemic community”

- Mutual learning:
  - (between) academic/tàcit knowledge, societal actors, cultures, communities
  - (sharing) values, action rules
- Reflexivity: (driving) reflection methods
- Co-creation: (jointly) producing/building



“in-between spaces”

- Boundary crossing: (across) disciplines, ways of learning, membership roles
- Collaboration: (generating) legitimate knowledge

Society

Enterprise

0. Call for challenge

Government institutions

Enterprise

Government institutions

Society

Society

Enterprise

Government institutions

1. Engage | Co-owned

Understand *the challenge*

- BIG IDEA. Explore the real-world challenge
- Gather the required domain knowledge / inspiration
- Identify research problem
  - Creation / Ideation
  - Stakeholder analysis
  - Essential questions
- Critically review with stakeholders
- Narrow the challenge to a Research question

Society

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0. Call for challenge

Stakeholders
Government, business, users, community, etc.

Society

Enterprise

Government institutions

2. Investigate | Immediate

***Explore** possibilities by analysing information*

- Formulate guiding questions to stimulate decision making and entrepreneurship
- Select guiding activities / tools / innovation processes (workshops, inquiry, SWOT, PESTEL, Focus group…)*
- Apply the guiding tools

* Tools used may depend on each teacher's methodology

Enterprise

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Society

SDG's and KPI's reflection gates with stakeholders for societal impact

Innovation gate and collaboration for entrepreneurship

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3. Act — Actionable

Tackle *the challenge by presenting a working solution*

- Design intervention planning
- Generate possible solutions
- Impact analysis and feasibility (prospective, multi-criteria, scenario-building, SDG's indicators…)*
- Reframe the solution
- Present optimal solution

* Tools used may depend on each teacher's methodology

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4. Translate | **Shareable**

Publish *solutions to worldwide audience*

- Harvest learnings on the SDG's oriented solutions from the reflection gates
- Communicate impact on SDG's

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Enterprise

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Which Competencies are needed?
Which Learning Activities are needed?

Enterprise

Government institutions

Society

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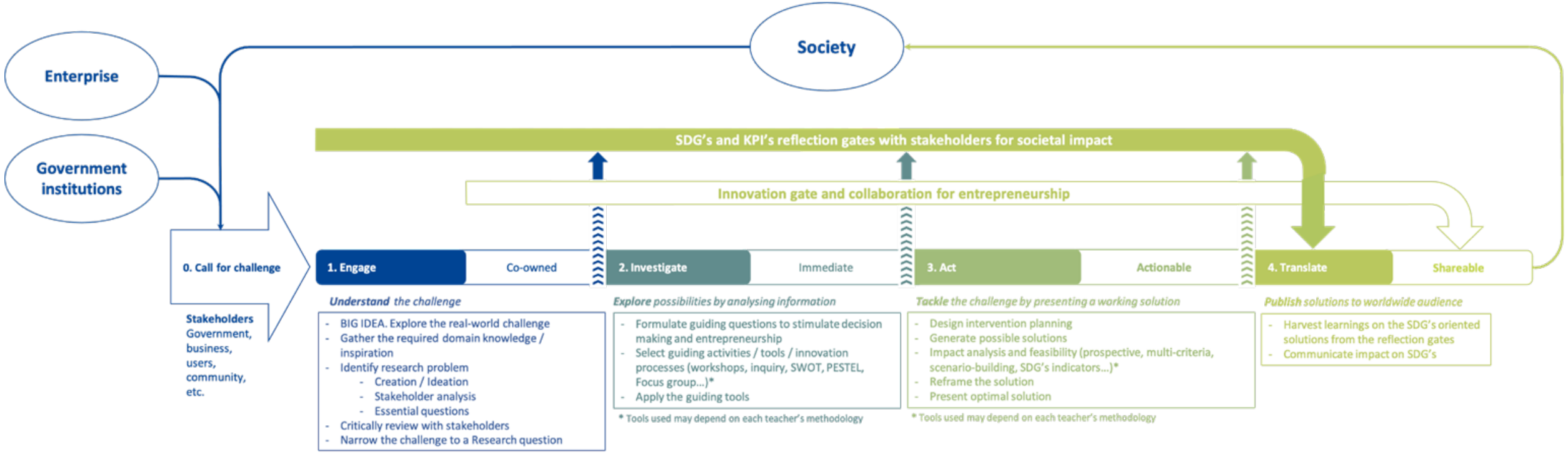
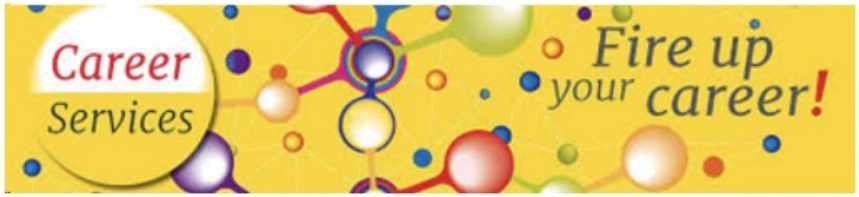


Inspirational session 3
The Co-Challenge

- 3 ECTS
- English
- Ba, Ma, PhD, recent graduates
- All students Utrecht University
- Two weeks full-time
- Preparation for the professional world
- Focus on personal and professional skills
- Solving societal issues
- Client selects and introduces authentic problem:
- Loneliness, transportation in the city center, student stress

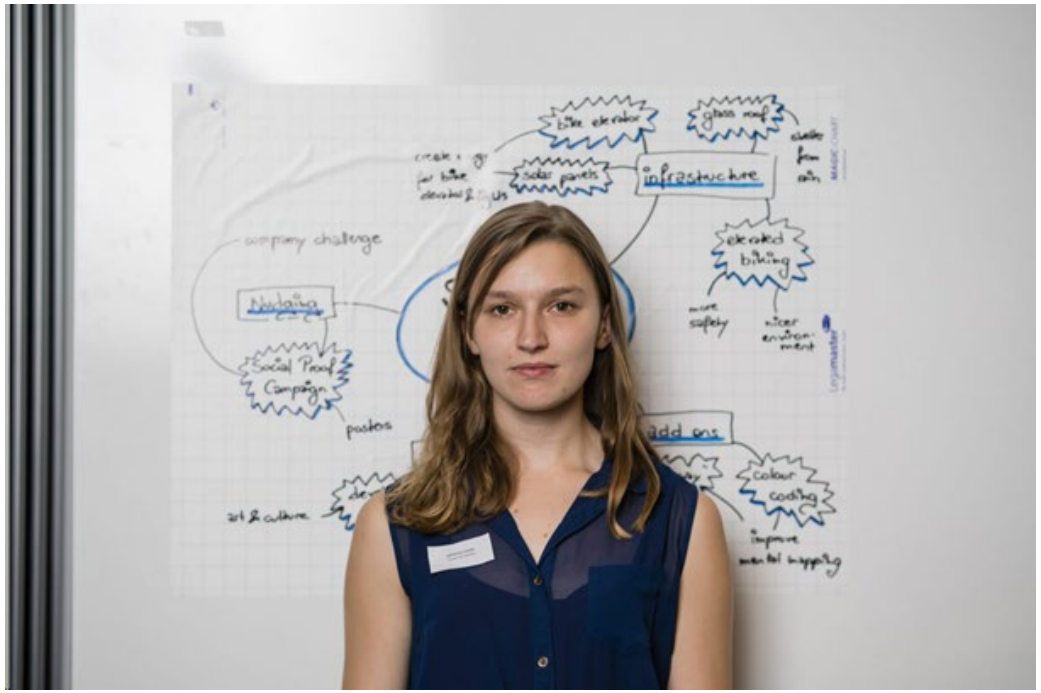


Inspirational session 3
The Co-Challenge

- The student is the director / self-directed
- No mandatory activities / own responsibility
- Three deadlines (problem definition,
- concept pitch, final pitch deliverables)
- Lecturers/ experts provide knowledge incentives
- Coaching on-demand
- Community of Practice
- Inspirational sessions (20 min)
- Workshops (focus on skills)
- Teamwork
- Communication with client

Inspirational session 3

- Well equipped room
  - Brainstorming materials
  - Coffee/tea/sandwiches
- Sharing knowledge (peerfeedback)
- Open and short communication lines (personal/active/on-demand)
- Online learning environment
- Exploration (uncertainty, being stuck, team issues)
- Facilitating learning process (create meaning)
- Educational team + students = community + everybody is equal)



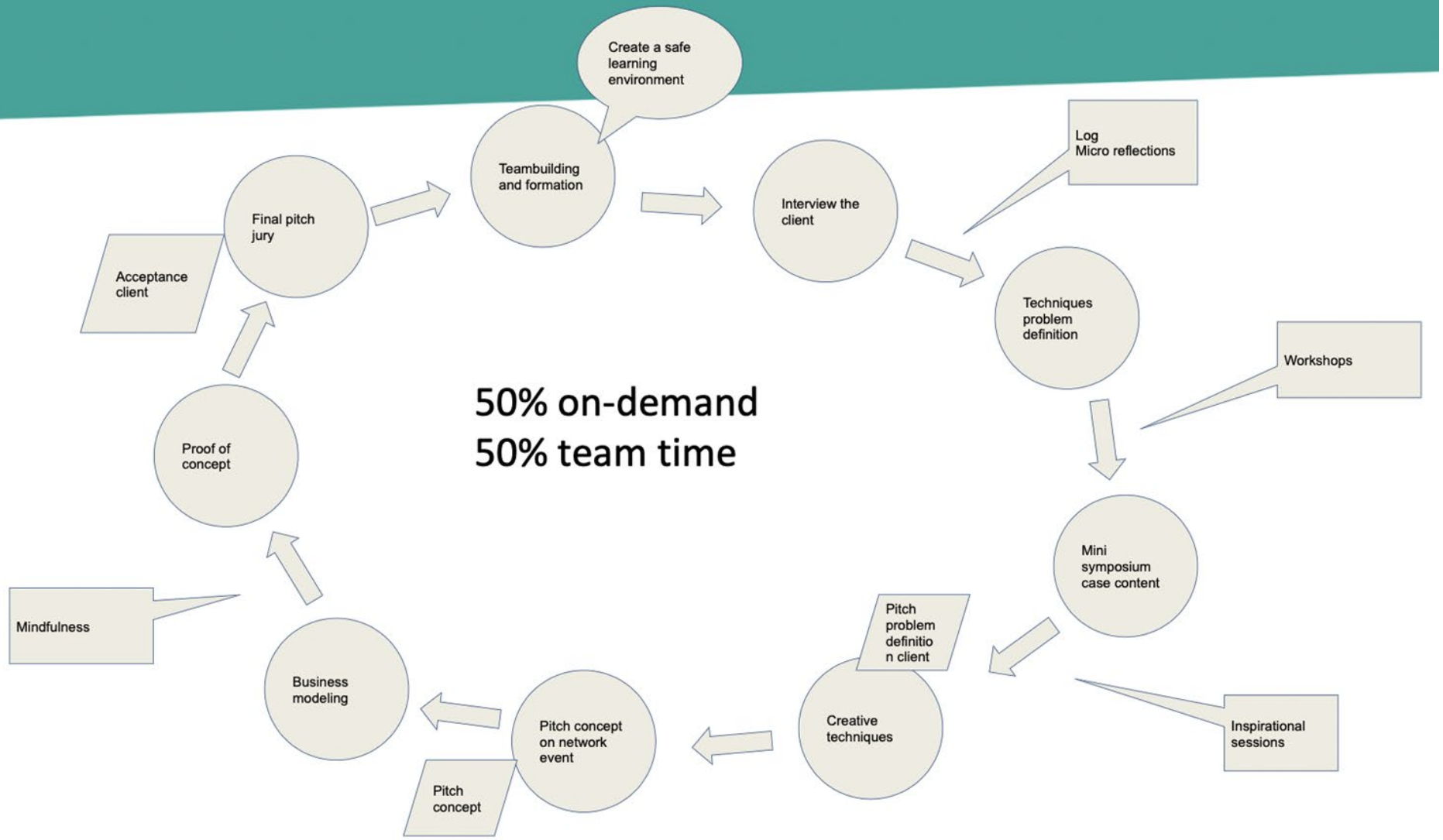
Inspirational session 3

Bachelor Human Geography & Planning
Liberal Arts & Sciences (specialization: social geography)
Master Environmental Biology
Bachelor Game and Media Technology
BA History, ReMA Ancient, Medieval, Renaissance Studies
Biology of disease
Bachelor of science in medicine,
Social Geography en Planologie (BSc) & Urban Geography (MSc)
Science Education & Communication
Social Policy and Social Interventions
MSc Environmental Biology
Master Biology of Disease
Bachelor programme: BSc. Economics and Business Economics
Master Biology of disease
Bio Inspired Innovation
Master Environmental Biology
Sustainable Development (Joint programme with University of Graz, Austria)
Master Cancer, Stem cells and Developmental Biology
Master Urban Geography (UU)
Recently graduated in Applied Cognitive Psychology (TCP)

60% Dutch
40 % International

Inspirational sessions:
•20 min.
•Expert knowledge
•On-demand coaching

Workshops:
Based on skills
Pitching
Networking
Collaboration
Interviewing
Feedback
Design thinking
Reflection
Business modeling



The Grand CBL Game

Purpose:
Create understanding of the basics of CBL design

Two teams per table will collaborate in making a CBL design by choosing learning activities to develop certain competences

Pioneering & prototyping

The Challenge

CO2 neutral transport in cities by 2040

Students teams need to find a solution for this
Teams of master students from different backgrounds
The challenge will take 10 weeks, and students need to spend 250 hours

The Game

We will play the game in different steps
What you need to know beforehand:

- Each team will build a lego tower
- Aim is to build the highest lego tower

STEP 0

Create two teams

Get acquainted with playing field and different cards

STEP 1

Choose 4 competencies to design learning activities for, per table:

1 community building
2 chosen by subteam 1
3 chosen by subteam 2
4 chosen in consensus

STEP 2

Choose 20 learning activity cards per competency

Place them in field 1

The other cards are placed in field 2

STEP 3

In turn:

- Pick a learning activity from field 1
- Place this on the playing field at the right point in time

Explain to the table members:

- Why you chose this learning activity
- Why do you place at this point in time during the challenge

Lego blocks

Build your tower while playing

+1 for placing a learning activity

+2 for first part of a match

+4 for blindly completing a match

memorize the number on the back!!

corresponding numbers on the back

secure the match with a fiche

STEP 4

Intermezzo

Take 2 minutes
to swop
Learning Activity cards
between field 1 and 2

STEP 5

In turn:

- Pick a learning activity
- Place this on the playing field at the right point in time

Explain to the table members:

- Why you chose this learning activity
- Why do you place at this point in time during the challenge

STEP 6

Intermezzo

Place your green dots on learning activities that are not typically CBL

STEP 7

Intermezzo

You can take away one learning activity in the challenge and place it in field 2

Replace it with a new learning activity from field 1 or 2

Matches cannot be removed

STEP 8

In turn:

- Pick a learning activity
- Place this on the playing field at the right point in time

Explain to the table members:

- Why you chose this learning activity
- Why do you place at this point in time during the challenge

Finish

UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

CHALLENGING FUTURE GENERATIONS

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY · WAGENINGEN UNIVERSITY & RESEARCH · Universiteit Utrecht · UMC Utrecht

Thank you for playing!!!

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Shaping the future of learning

Home