ALMA MATER STUDIORUM UNIVERSITÀ DI BOLOGNA

esade

POLITÉCNICO DE PORTALEGRE

UNIVERSITY of INFORMATION TECHNOLOGY and MANAGEMENT in Rzeszow, POLAND

DT meets STEM workshop

"TEACH to BE Aware Students" Project (2022-1-PL01-KA220-HED-000089791)

Co-funded by the European Union

Teach-BEASTs
Teach to BE Aware STudents

Kick Off

DAY 1

WELCOME!

Agenda DAY 1

09.00 - 09.30	Welcome, Day 1 Opening & plan for the day
09.30 – 10.50	Session 1 : Mindset, process and value of Design Thinking in STEM courses
10.50 - 11.00	Logistics
11.00 - 11.30	*Coffee break*
11.30 – 13.00	Session 2: Tools for designing projects and project team collaboration.
13.00 - 14.30	*Lunch break*
14.30 – 16.00	Session 3 : Tools for exploring and defining the problem space (I)
16.00 - 16.30	*Coffee break*
16.30 - 17.30	Session 4 : Tools for exploring and defining the problem space (II) + Q&A
17.30 – 18.00	Day 1 close and wrap up

Agenda DAY 2

09.00 - 09.15	Day 2 Opening & plan for the day
09.15 – 10.00	Session 5 : Tools for creating and testing the solution (Solution Space)
10.00 – 11.00	Session 6: Course Transformation: Syllabus improvement with PBL (I)
11.00 - 11.30	*Coffee break*
11.30 - 13.00	Session 7 : Course Transformation: Syllabus improvement with PBL (II)
13.00 - 14.30	*Lunch break*
14.30 – 15.00	Session 8 : Course transformation: Create Supporting slides
15.00 – 16.00	Session 9: Challenge development (I)
16.00 - 16.30	*Coffee break*
16.30 - 17.30	Session 10: Challenge development (II)
17.30 – 18.00	Day 2 close and wrap up

Agenda DAY 3

09.00 - 09.15	Day 3 Opening & plan for the day
09.15 - 11.00	Session 11: Evaluation of PBL courses
11.00 - 11.30	*Coffee break*
11.30 - 13.00	Session 12: Course transformation cont.
13.00 - 15.00	*Lunch break*
15.00 - 16.00	Session 13: Supporting structure
16.00 - 16.15	*Coffee break*
16.15 - 16.45	Session 14: Share & Feedback: Course Transformation
16.45 - 18.00	Workshop close and feedback

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Workshop Objectives

1. Learn the DT process, methodology and tools in order to teach professors of STEM courses how to bring the DT approach into STEM courses.

2. Learn the “Teachers process” and the “Student experience”.

3. Understand how to use the material: DT Meets STEM Manual, Miro, Mission, Slide Deck

4. Test whether the material generated for the objectives of the DT in STEM is easy to understand and use. Identify improvements in the material provided.

5. Generate examples of the use of the manual.

Expected Outputs

After the 3 days workshop you have created the first draft of the following:

1. Updated Syllabus for your course, incorporating the CBL through DT. How will you allocate time to CBL and DT in your course?

2. Material for class: Slides that you will use in class

3. Handouts for students: Material that you will give to students in the course (e.g. Miro, Missions)

4. Teams: What types of teams will you create?

5. Challenge: What type of challenge suits the process and course?

6. Evaluation: What type of evaluation best suits the course?

During the session you will have a booklet for your notes. As part of our learning, we would like to make a copy of your notes in the booklet.

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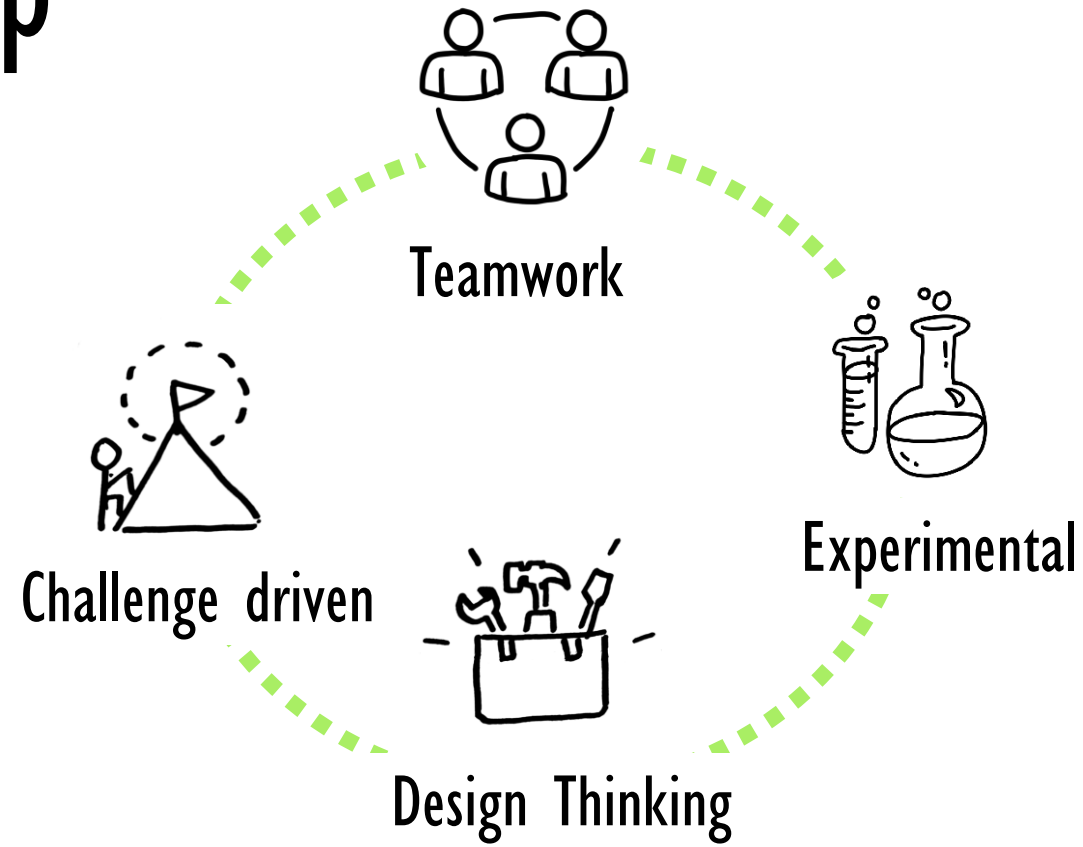
Workshop Dynamic



Source_Aurelie Glorieux, 2024

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Workshop Process

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How will we do the workshop?

1

Process and tools through an example case STEM course

2

Individual work
Apply techniques to your course syllabus

3

Teamwork: in pairs, teams and plenary

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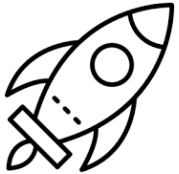
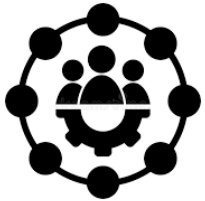
Why apply DT in STEM courses?

Better problem solving through user-centric approach



Boost creativity

Boost critical thinking



Multi-disciplinary collaboration

Impact on Professional Readiness

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How to bring DT into STEM?

Transform part of the existing course

Transform 100% of the existing course

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Sessions outline

Day 1 21.10.2024

Venue: Fusion Point, Rambla of Innovation

Session 1: Mindset, process and value of Design Thinking in STEM courses

Session 2: Tools for designing projects and project team collaboration

Session 3 & 4 : Tools for exploring and defining the problem space

Day 2 22.10.2024

Venue: E-Garage, Rambla of Innovation

Session 5 : Tools for creating and testing the solutions

Session 6 & 7: Course Transformation: Syllabus improvement with PBL

Session 8 : Course transformation: Create Supporting slides

Session 9 & 10: Challenge development

Barcelona Design Week – Fusion Point students' projects expo and Voluntary dinner in Barcelona

Day 3 23.10.2024

Venue: Fusion Point, Rambla of Innovation

Session 11: Evaluation of PBL courses

Session 12: Course transformation cont.

Session 13: Supporting structure

Session 14: Share & Feedback

Workshop close and feedback

Day 1
Session 1
09.30 – 11.00

DESIGN THINKING MINDSET AND TOOLS

Session 1 Objectives

1. What is Design Thinking?
2. Understand the DT process and introduction to basic concepts and tools.
3. How can it help STEM students?
4. Understand the process, tools and structure
5. The basics: Pre, during and after course.

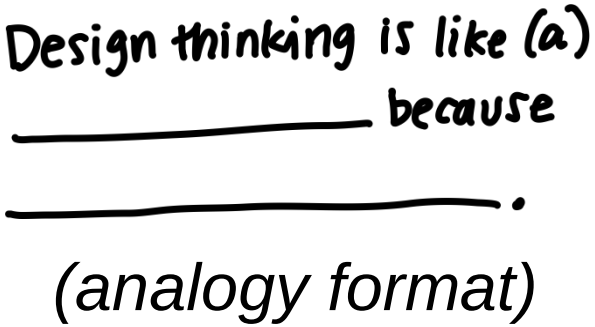
Session I Agenda

09.30 – 10.00	What is Design Thinking?
10.00 – 11.00	The Basics: Process, Tools and Structure

DT ice breaker

ACTIVITY 5 min

1. 1 thought about design thinking
2. 1 question you would like answered
3. 1 analogy to describe design thinking



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FIXED MINDSET

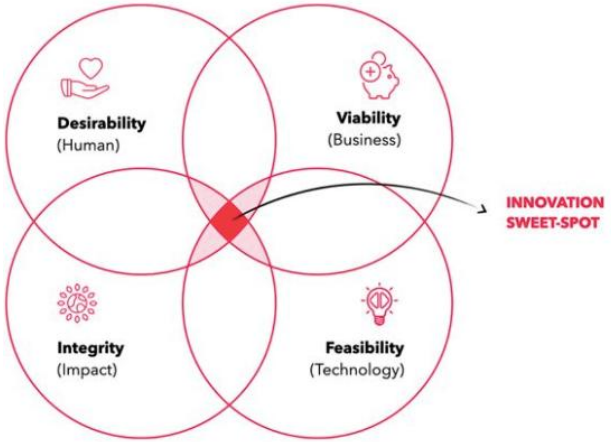
GROWTH MINDSET

Fuente: https://www.iecl.com/fixed-mindset-versus-a-growth-mindset/

Design Thinking

"Design thinking is a human-centered approach to innovation that draws from the designer's toolkit to integrate the needs of people, the possibilities of technology, and the requirements for business success."

Tim Brown, IDEO



Source: Yoel Lenti, Hatch Studios, Noviembre 2023

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Design Thinking

Design Thinking is a creative, human-centred, iterative approach to problem-solving recognised by academic and industry as a practical and agile process which engages people in generating innovative solutions to complex challenges.

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Design Thinking

Interdisciplinary

Collaborative

Iterative

Creative

Experimental

User Centric

Learn from Failure

Empathy

Source_Inspired by Aurele Glorieux, 2024

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Design Thinking

PROCESS

TOOLS

STRUCTURE

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Design Thinking

PROCESS

1. Empathise
2. Define
3. Ideate
4. Prototype
5. Test

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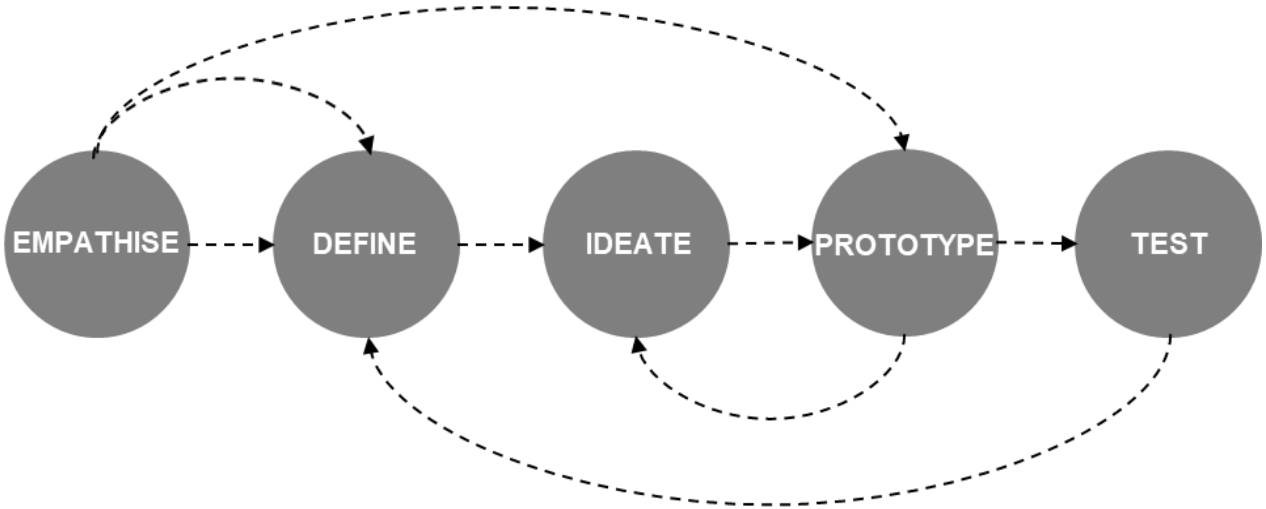
Design Thinking

PROCESS

Hasso Plattner Institute of Design, Stanford



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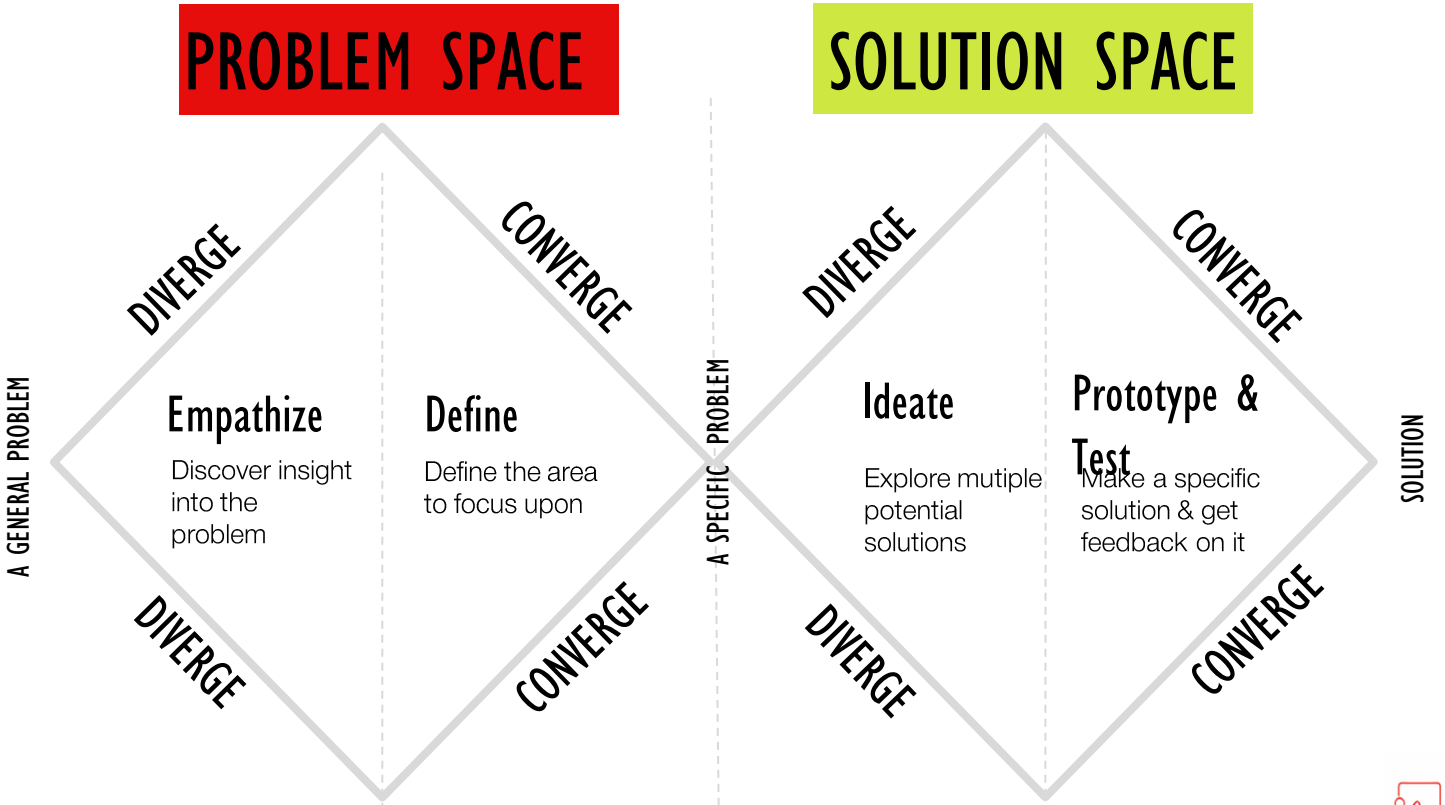
Design Thinking Double Diamond



Source: IDEO

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Design Thinking

STRUCTURE

1. Building balanced teams
2. Student project challenge
3. Evaluation
4. Managing the student journey

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Design Thinking

STRUCTURE

1. Time and resources
2. Building balanced teams
3. Student project challenge
4. Learning objectives
5. Evaluation

1. Managing students during project journey
2. Ongoing evaluation and feedback

1. Evaluationand feedback

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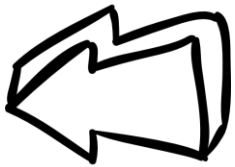
Design Thinking

PROCESS

TOOLS

STRUCTURE



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Design Thinking

STRUCTURE

TIME

3 ECTS
9 presential class sessions
08.00 – 11.15
9 weeks

Design Thinking

STRUCTURE

RESOURCES

Academic & Support Team

Budget

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Course Plan 2024

STRUCTURE

1	2	3	4	5	6	7	8	9
Kick-off and Explore challenge	Explore the challenge.	Learnings from research and Define opportunity	Ideation and Storyboard	Prototype	Prepare and run user tests	Insights and Iteration	Iteration	Final presentation

Interviews

User Tests

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Design Thinking

STRUCTURE

STUDENT TEAMS

6 teams of 5 students
Diverse MSc courses

Student Profile

- Age: mid-20s.
- Nationalities: + 40 countries.
- Academic Background: Degrees in economics, management, or business, engineering, humanities, social sciences.

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Design Thinking

STRUCTURE

EVALUATION

The final grade is made up as follows:

30%

Assignments during the course

30%

Final deliverable

10%

Peer evaluation

30%

Individual assignment

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Design Thinking

STRUCTURE

LEARNING OBJECTIVES

1. Apply the Design Thinking methodology in order to solve business and societal problems.
2. Identify market opportunities based on desirabilty: understand how to explore unmet user needs.
3. Create solutions that are desirable.
4. Validate your ideas: create early prototypes and experiments to get initial feedback for your ideas.

MUTI-DIMENSIONAL LEARNING	EXPECTED LEARNINGS
KNOWLEDGE What we know and understand	• Design Thinking methodology and process. • Human centric design techniques. • Experiments for learning
SKILLS AND COMPETENCIES How we use this knowledge	• Creativity, innovation and entrepreneurship skills • Collaboration and teamwork skills • Communication skills
VALUES, ATTRIBUTES AND ATTITUDE How we behave and engage	• Growth mindset • Empathy • Learning to learn

Design Thinking

CHALLENGE

Mental Health in Young People

STRUCTURE

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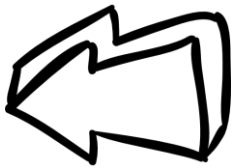
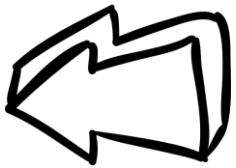
Design Thinking

PROCESS



TOOLS



STRUCTURE

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Design Thinking

1. EMPATHY
2. DEFINE
3. IDEATE
4. PROTOTYPE
5. TEST

PROCESS

+

TOOLS

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IMPERIAL

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Study shows climate distress related to anxiety and action in young people

by Corinne Farrell, Emily Medcalf
24 August 2023

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Imperial researchers have carried out a study to understand the psycho-social impacts of climate crisis on young people in the UK.

The study found that distress over climate change is related to many difficult emotions in young people – even in the absence of direct climate-related experience. It can, though, also motivate them to take positive climate actions.

The work, led by Climate Cares at the Institute of Global Health Innovation, Imperial College London, was conducted with researchers at King's College London and Queensland University, Australia.

In 2020, researchers surveyed 539 young adults in the United Kingdom.

FEATURED

Dr Emma Lawrance
Institute of Global Health Innovation

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Health

euronews. My Europe World Business EU Policy Green Next Health Travel Culture Video

By Mared Gwyn Jones & Isabel Marques da Silva
Published on 27/09/2023 - 07:00 • Updated 15:53

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Six young people from Portugal took on 32 countries in the European Court of Human Rights (ECHR) on Wednesday for failing to protect them against climate change.

The historic trial is the first time so many countries will have to defend themselves in front of any court in the world. All 27 European Union member states, the UK, Turkey, Russia and Norway are among the defendants.

The Portuguese youth, aged between 11 and 24, say governments' inaction on climate change breaches their human rights and discriminates against young people.

Devastating heat and wildfires in Portugal are restricting their ability to sleep and exercise, harming their physical health and causing mental distress. They also say that climate anxiety is now widespread among their generation.

Source: https://www.imperial.ac.uk/news/247155/study-shows-climate-distress-related-anxiety/, https://www.euronews.com/my-europe/2023/09/27/court-case-over-climate-inaction-against-32-countries-opens-at-the-european-court-of-human

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Target User Profile

Educated and concerned about climate change

Master Student in Spain

Seeks positive impact and stability

Under 30

Social

Long-term orientation

Isabela Ramírez

Unsure of how to process/manage anxiety

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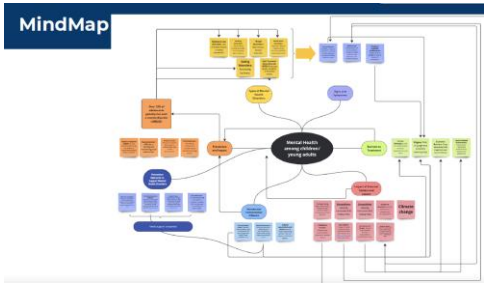
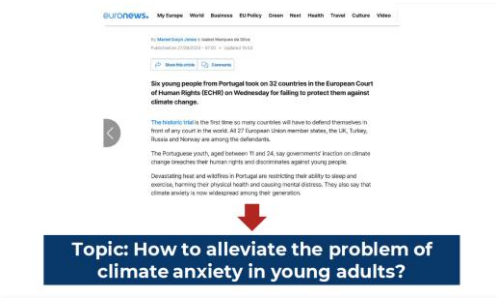
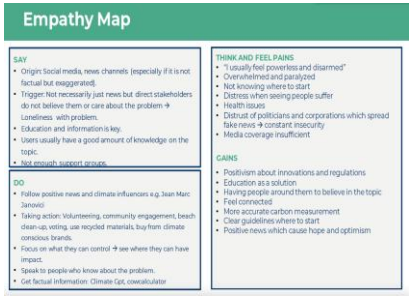
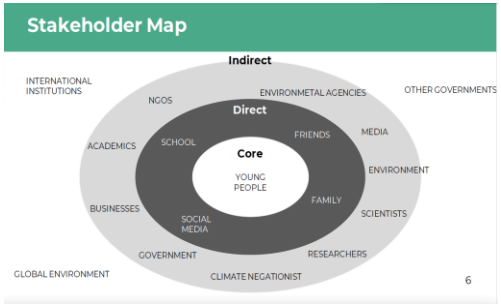
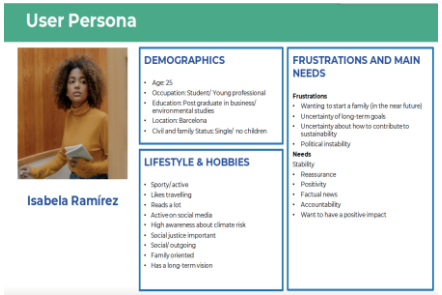
I. Empathy

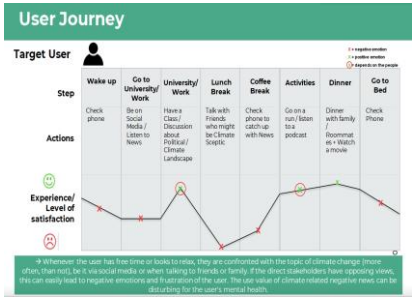












Source: Amrita Anand, Marie Leu, Alzbeta Androvicova, Elsa Levan, Marc Bou Khalil, Daphne Lilli, ESADE 2024

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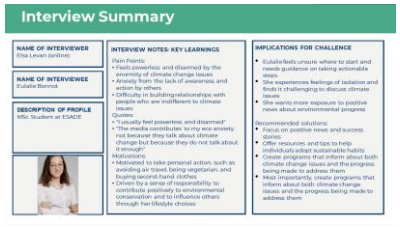
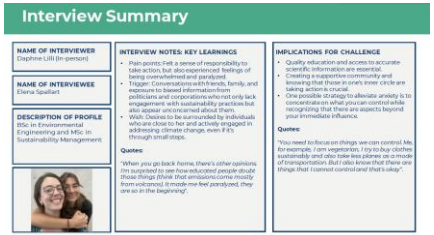
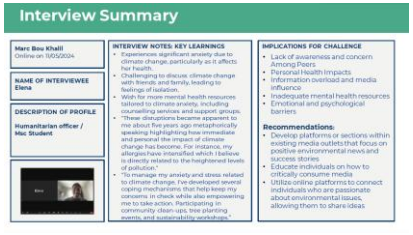
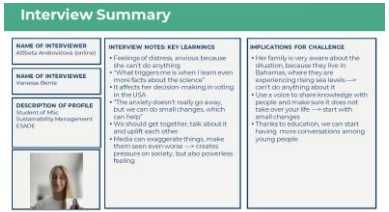
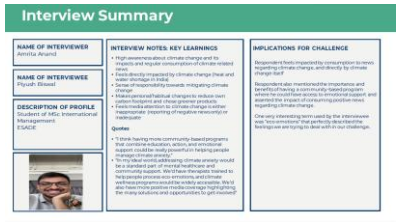
I. Empathy

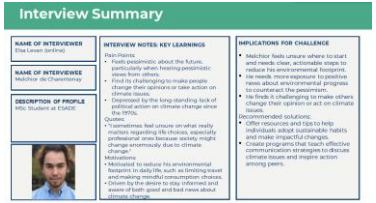


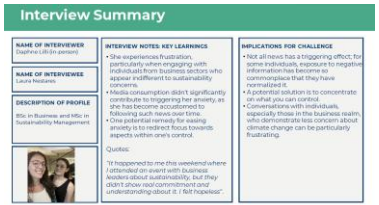


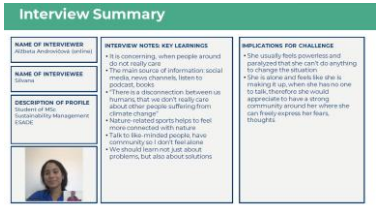












Source: Amrita Anand, Marie Leu, Alzbeta Androvicova, Elsa Levan, Marc Bou Khalil, Daphne Lilli, ESADE 2024

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Design Thinking

1. EMPATHY
2. DEFINE
3. IDEATE
4. PROTOTYPE
5. TEST

PROCESS

+

TOOLS

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2. Define

1. “Eco-anxiety” is a form of anxiety related to environmental issues, including climate change, pollution, deforestation, species extinction, overpopulation, and other environmental challenges.
2. ‘Doomscrolling’ (the act of spending an excessive amount of time reading negative news online) increases environmental anxiety.
3. Eco-anxiety can lead to helplessness, despair, and loss of hope for the future—especially for Gen Z or those born between 1997 and 2012. Per Yale Environment 360, climate anxiety is greatest for Gen Z, who have been bombarded with news of climate disasters on social media and in the news.

Sorce: https://www.anxietycanada.com/articles/coping-with-eco-anxiety/

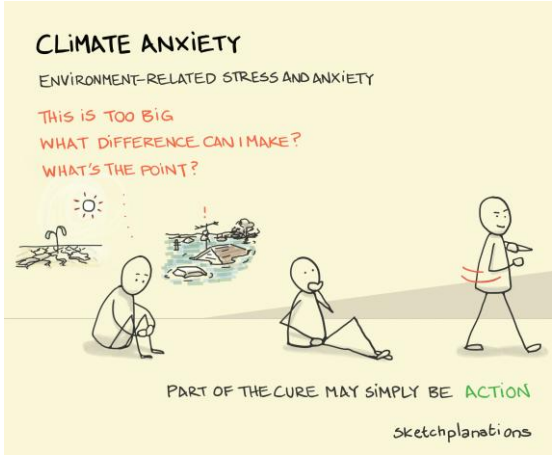
2. Define

Initial Hypothesis

Impacts on life and human existence

Loss / deterioration of physical environment

Well-being tied to state of planet



Fear of future

Lack of control

Uncertainty

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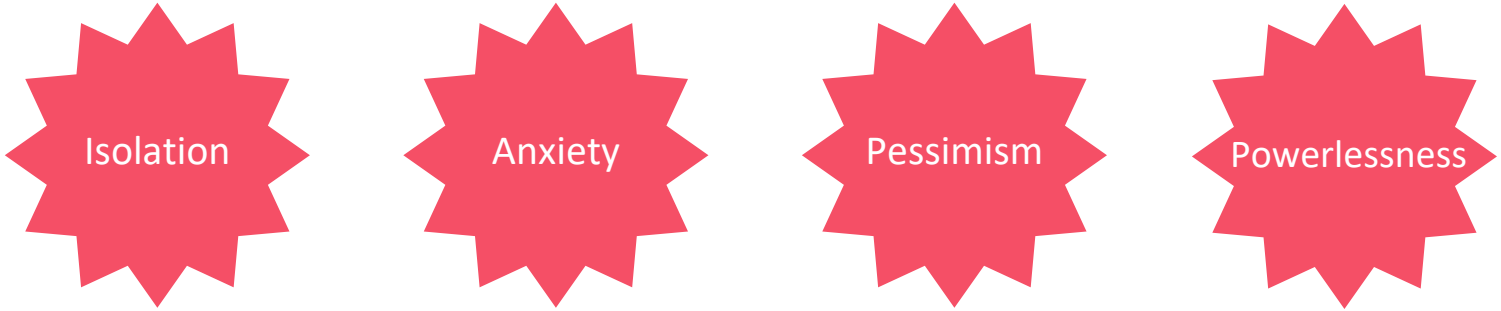
Interviews Key Insights



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Communication barriers

Insufficient media coverage

=

Education on solutions

Need to feel connected

Community support

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2. Define

Problem Statement

TARGET USER	NEED	OBJECTIVE
Young adults (aged 19 to 30) who are well-informed, actively engaged, and deeply concerned about climate change	To overcome the feeling of loneliness in environmental concerns	In order to create a like-minded, supportive community
	To address the uncertainty about where to start in the sustainability journey	In order to give access to accurate and factual information and actionable steps

How Might We...?

- ... **connect like-minded users so they feel more uplifted?**
- ... **foster collaboration among young adults to avoid feelings of being powerless?**
- ... **utilize education, existing information, and media to alleviate the sense of overwhelm associated with the topic of climate change?**
- ... **provide actionable steps to fight climate change so that users feel like they have an actual impact?**

Source: Amrita Anand, Marie Leu, Alzbeta Androvicova, Elsa Levan, Marc Bou Khalil, Daphne Lilli, ESADE 2024

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Design Thinking

1. EMPATHY
2. DEFINE
3. IDEATE
4. PROTOTYPE
5. TEST

PROCESS

+

TOOLS

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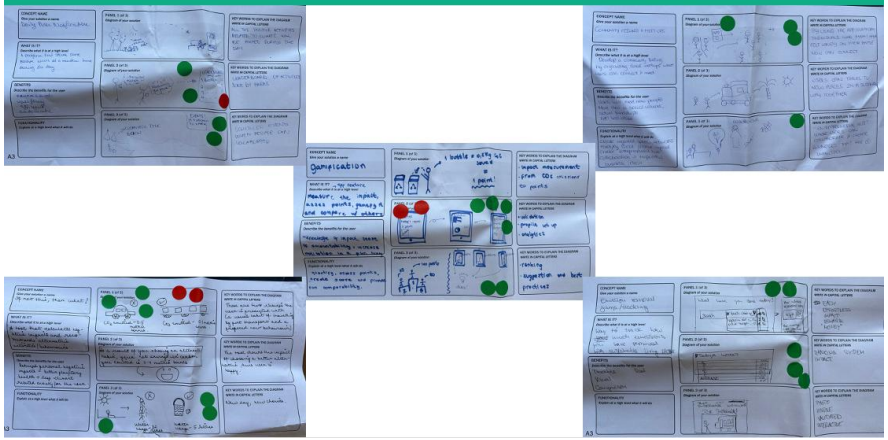
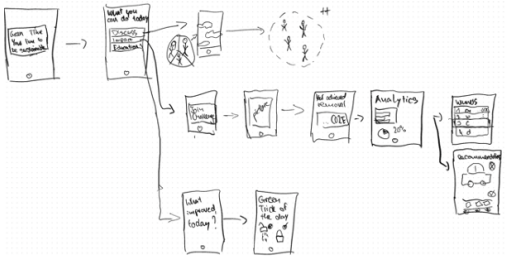
3. Ideate

Panel Sketches



Conceptual Solution



The app will consist of **three** different features:

1. **Discussion:**
- The app will also allow users to discuss with other users
  - Some discussions will be reserved to certain groups Other discussions will be open to the public (e.g., reddit)

1. **Education:**
- The app will provide users access to positive climate-related news and tips to "be more sustainable" in their daily life
- Additionally, there will be "pop ups" twice a day that will appear on the user's phone displaying contents mentioned above.

1. **Challenge:**
- Users can take part in challenges so to create a sense of action, thereby reducing climate anxiety and a feeling of loneliness
  - Once they join a challenge, they need to "prove" their impact by taking a picture and sharing it with the community (on the app).
  - For every action they do, they will get points (depending on the level of impact).
  - The user will be able to see the overall impact of every challenge individually and the aggregated impact.
  - There will be a leadership board, thereby fostering further engagement from users.
  - Once the user analyzes the result, they will be able to see "tips" to increase their impact and get more points

Source: Amrita Anand, Marie Leu, Alzbeta Androvicova, Elsa Levan, Marc Bou Khalil, Daphne Lilli, ESADE 2024

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3. Ideate

2. Storyboard

1) TRIGGER
News and unfactual information can cause climate anxiety

2) "GreenTime" Notification
App "GreenTime" will help to effectively deal with climate anxiety by sending notifications up to three times a day. A "GreenTime" alert can also be triggered by a Smart Watch which measures stress level.

3) "GreenTime" Features
User can access the app and will find on the home screen the four different features: Discuss, Track, Learn, Do

4) Discuss
Feature allows to link users which have similar concerns. Users can chat among each others and share thoughts, tips and can join local community chats similar to Reddit.

5) Track
Based on an easy questionair users can track their environmental footprint and receive information about how they could even save more emissions. They also see the average emissions of a "GreenTime" user.

6) Learn
User has the possibility to receive and learn about positive news and topics. After a learning session users can answer a quiz and earn points contributing to a gamification of the app.

7) DO
User can find a list of activities or meet ups they can volunteer for locally depending on the time they have available. A moderator can clarify any questions users might have.

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Design Thinking

1. EMPATHY
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PROCESS

+

TOOLS

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4. Prototype

GreenTime

1 **LEARN**

Positive news updates

2 **DO**

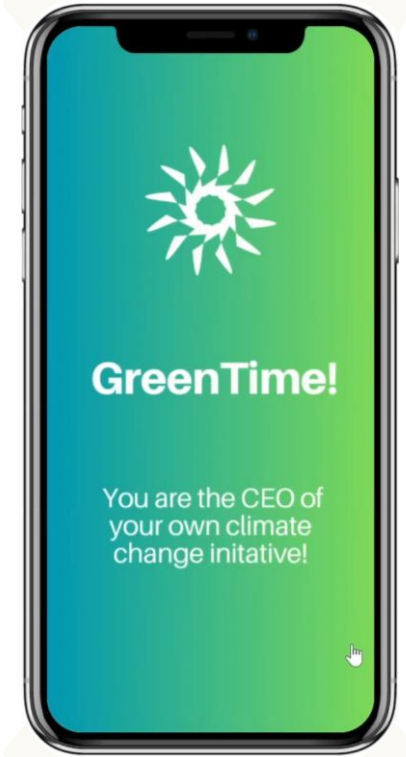
Find local opportunities for volunteering

3 **TRACK**

Tracking individual carbon footprint

4 **DISCUSS**

Discussing topics with like-minded



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4. Prototype

Design the Experiment

MOST IMPORTANT ASSUMPTIONS TO BE TESTED

- Are people willing to download the App?
- Do users like all features of the App?
- Would people pay for features of the App?

WE BELIEVE THAT .....

...people feeling climate anxious would download, pay for an app and actively engage with it. Through connection and guidlines, they will reduce their stress level.

HOW WE WILL TEST IT

- Poster which will guide the users to the to a survey.
- 8 interviews with potential users those users, interviews will be based on the reaction prototype

TO TEST THAT, WE WILL.....

- Ask for the attractiveness of the features
- Ask for the willingness to engage
- Ask for additional input on the optimal solution

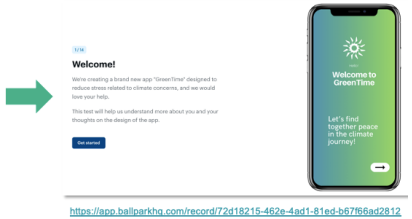
THE METRIC WE WILL USE/ HOW WE WILL EVALUATE THE TEST

- User Feedback cards
- Outcome analysis of survey

AND MEASURE.....

- How much do users like the features
- Is there a willingness to use the App
- Is there a willingness to pay

User Tests



https://app.ballparkhq.com/record/72d18215-462e-4ad1-81ed-b67f68ad2812

Source: Amrita Anand, Marie Leu, Alzbeta Androvicova, Elsa Levan, Marc Bou Khalil, Daphne Lilli, ESADE 2024

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4. Prototype

Prototype V1

Source: Amrita Anand, Marie Leu, Alzbeta Androvicova, Elsa Levan, Marc Bou Khalil, Daphne Lilli, ESADE 2024

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Design Thinking

1. EMPATHY
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4. PROTOTYPE
5. TEST

PROCESS

+

TOOLS

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5. Test

- 25 poster responses
- 8 qualitative interviews

User Test Feedback Card

CUSTOMER and PROBLEM
- Vanessa feels climate anxious mainly when she is learning more facts about climate science, talking to knowledgeable but pessimistic people and due to specific events like Hurricane Dorian
- It influences her voting decisions, lifestyle and shopping choices and feels distressed about the future due to the actions of big corporations
- She spends time in nature and tries to talk to like-minded people
- Needs community support to talk about climate anxiety and uplift each other
- Believes media exaggerates climate issues, which can raise anxiety but also creates necessary pressure to change

CUSTOMER LIKES OBSERVED
- *Vanessa really likes the visuals of the app and the features it provides*
- *She believes that a learn tab can be very beneficial since we don't see enough good news and breakthroughs*
- *She likes the "DO" aspect as she can learn more how to take practical steps to take action and feel more proactive.*

CUSTOMER DISLIKES OBSERVED
- *She is afraid that tracking emissions could spike a level of anxiety for some people , because she would get controlled with that feature*
- *Focus on individual actions does not fully address her concerns about the larger systemic change*

New questions, uncertainties or ideas
- Adding a feature of also sharing some books, podcasts, movies that are released on climate topics
- Simplify the CO2 tracking feature to avoid overwhelming users.
- Users appreciate being able to customize their app experience, including notification settings

User Test Feedback Card

CUSTOMER and PROBLEM
- Eulalie feels powerless and disarmed by the enormity of climate issues
- She experiences anxiety from the lack of awareness and action by others
- Eulalie frequently feels the problem, especially when exposed to indifferent media coverage
- She is now taking actions by avoiding air travel, being vegetarian, and buying second-hands goods
- Personal actions provide a sense of contribution

CUSTOMER LIKES OBSERVED
- *She also believes that the "Learn" feature seems very informative which could help reducing her feelings of powerlessness*
- *"I like the "Do" feature as it really could push people towards taking actionable steps"*

CUSTOMER DISLIKES OBSERVED
What didn't they like? Why? What did they say that you hadn't considered before?
- *She hopes that we could integrate a "success stories" or "testimonials" (once app is more developed) to enhance motivation and credibility*
- *"Incorporating success stories from other users would provide additional motivation"*

New questions, uncertainties or ideas
- More success stories in the "Do" feature
- Users need dynamic and community-driven content to maintain engagement and motivation

User Test Feedback Card

CUSTOMER and PROBLEM
- Silvana has a deep appreciation for nature
- She experiences anxiety and emotional distress related to climate change – mainly after seeing direct effect of climate change and due to different priorities with peers and family
- She struggles to balance sustainable living with systemic constraints
- She needs community and support network to freely discuss climate-related fear and anxieties
- She believes education is needed on both problem and solutions part to climate change
- She advocated for small-scale actions and personal changes to create a positive impact

CUSTOMER LIKES OBSERVED
- Daily notifications of positive environmental news is refreshing and motivating
- A community forum could allow her to connect with like-minded individuals

CUSTOMER DISLIKES OBSERVED
- Engaging with people who have different views on climate change could be frustrating and stressful
- Even positive notifications can feel like an obligation if they are too frequent

New questions, uncertainties or ideas
- Make sure there is a strong moderation in the discussion forum to ensure respectful and constructive conversations, e.g. flagging inappropriate content
- Make sure you are not sending too many notifications because it can be perceived as pressuring
- Incorporate features that address systemic changed and corporate responsibility

User Test Feedback Card

CUSTOMER and PROBLEM
- Elena has climate anxiety caused by climate changes when the environment and shifts affect her health directly. She explains that anxiety triggers can be the growing concern with climate change, more substantial visible changes in the climate, and personal health issues, especially when exacerbated by pollution, such as heightened allergies. This anxiety is definitely very evident in all aspects of the client's daily living, her diet, activities and interactions with other people wherein she employs various positive environmental practices and stress relieving mechanisms.
- "Absolutely! I have personally experienced anxiety and distress related to climate change particularly as it affects my health directly. For instance, the changing climate patterns exacerbated my allergies which are now a year round concern."

CUSTOMER LIKES OBSERVED

CUSTOMER DISLIKES OBSERVED
What didn't they like? Why? What did they say that you hadn't considered before?
- *She didn't like the ideas of quizz as a reminder. She feels the pressure " I feel if I have a knowledge gap it will increase more my anxiety"*

New questions, uncertainties or ideas
- She would like to have online seminars once per month accessible from the app with an expert on climate change
- Be able to book some psychological counselling related to climate changedirectly on the app.

User Test Feedback Card

CUSTOMER and PROBLEM
- Melchior feels quite pessimistic about the future and finds it challenging to make people change their opinions or take action on climate issues
- He regularly encounters the problem of lack of alignment when discussing climate change with others
- He tries to reduce his environmental footprint in his daily life by taking the plane as little as possible and daily change of habits
- Difficulty in influencing others and the lack of positive news on environmental progress

CUSTOMER LIKES OBSERVED
- Melchior believes that the "discuss" feature is promising as finding people to discuss with is one of the main challenge he encounters on a daily basis
- He also enjoyed the "learn" feature as it provides positive, factual information
- The feedback aligns with Melchior's need for community interaction
- "I really like this discuss feature as it is hard to build a community of like-minded people on such topics"

CUSTOMER DISLIKES OBSERVED
- He believes the "Discuss" feature could also be led by some experts as it would structure the discussion topics better
- He also proposed the idea of implementing webinars
- "More structured discussions, maybe led by some experts in the topic, could improve the quality of the interactions."

New questions, uncertainties or ideas
- More expert-led content and structured discussions
- Users also want to have some expert insights, not only in the "learn" feature, but also on the "discuss" one

User Test Feedback Card

CUSTOMER and PROBLEM
- Laura experiences significant anxiety, particularly when trying to convince others—friends and family—about the urgency of climate change and the necessity of collective action.
- She feels frustrated when seeing "fake news" and political commitments that, unfortunately, will be hardly achieved.
- What has been working for her is to "work on how she can control": *"I know I cannot solve climate change by myself, but I try to reduce my CO2 emissions through my diet and transportation choices, it's already a start—and that's what has been helping with my anxiety".*

CUSTOMER LIKES OBSERVED
- Preferred Features: She particularly likes the "do" and "track" features.
- Local Events: Enjoys discovering nearby events.
- Personalized Recommendations: Appreciates personalized suggestions for actions to take in her area.
- Competitive Element: Likes the competitive aspect and mentioned she would participate, though she would prefer to share within the app rather than on her own social media like Instagram.

CUSTOMER DISLIKES OBSERVED
- Finds the "do" feature less intuitive.
- Quizzes in Learning: Enjoys quizzes related to courses but prefers quick and concise updates for news. She mentioned, **"if there is a test about it, I won't use it**. Maybe I am not interested enough to be tested on it."
- Discussion Feature: **Doesn't find the discussion feature important,** as she prefers conversations with friends and family.

New questions, uncertainties or ideas
- Personalized Questionnaire: She suggested implementing a brief, personalized questionnaire at the start to provide specific recommendations tailored to individual users.
- Recommended adding a "streak" feature to foster consistency and enhance community engagement within the app.
- Suggested that the "do" feature should include recommendations for organizations and events.
- Connections and Small Chats: Proposed adding a feature for connecting with friends and family and facilitating small group chats.

Source: Amrita Anand, Marie Leu, Alzbeta Androvicova, Elsa Levan, Marc Bou Khalil, Daphne Lilli, ESADE 2024

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5. Test

User Tests Insights and Modifications

01 Multiple Triggers > Climate Anxiety

Personalization

- Quiz
- Suggestion
- On/Off feature

02 More clarity

Tutorial

03 DEPTH in the learn section

Webinars, courses, podcasts and sucess stories

04 HEALTHY gamification

Streak feature

05 Premium version isn't the answer to all

Partnership with sustainable brands - promo codes

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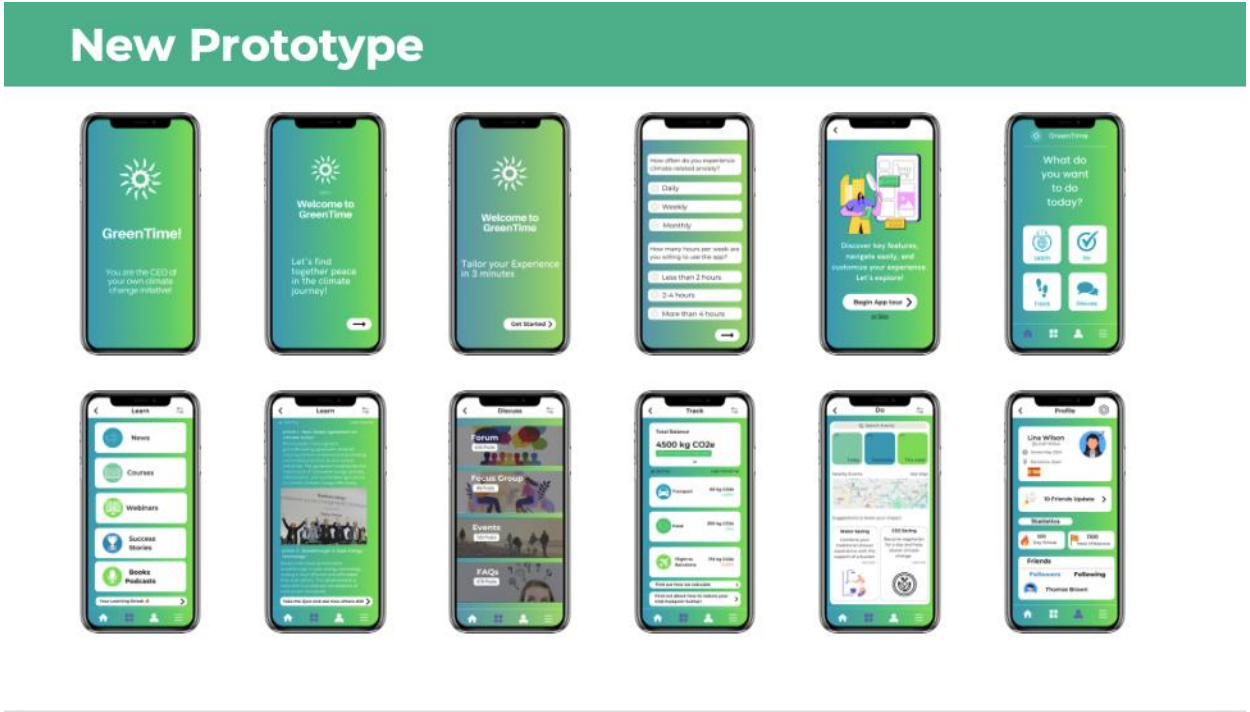
5. Test



Source: Amrita Anand, Marie Leu, Alzbeta Androvicova, Elsa Levan, Marc Bou Khalil, Daphne Lilli, ESADE 2024

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Day 1
Session 2
11.30 – 13.00

TOOLS FOR PROJECTS
PROJECT TEAM COLLABORATION

Session II Objectives

1. Understand Project-Based Learning (PBL)
2. Clarify the importance of team collaboration
3. How to deal with a distributed team
4. How to use Teach-BeAst provided Tools:
    - Structure of the manual;
    - Miro boards;
    - Slide deck;
    - DT tools;
5. •How to implement DT into your syllabus by using DT Tools and Techniques

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Session II Agenda

11.30 – 12.00	Let's introduce Project-Based Learning (PBL)
12.00 – 12.30	Team Dynamics
12.30 – 13.00	Supporting tools to implement PBL into university courses

PROJECT BASED LEARNING?

PBL is a learner-centric pedagogy with a theoretical foundation based on constructivism, where individuals construct knowledge through interacting with their environment (Altay 2014; Savery and Duffy 1995).

PROJECT BASED LEARNING?

Thomas Markham (2011) describes project-based learning (PBL) thus: *"PBL **integrates knowing and doing**. Students learn knowledge and elements of the core curriculum but also apply what they know to solve authentic problems and produce results that matter. PBL students take advantage of digital tools to produce high-quality, collaborative products. **PBL refocuses education on the student, not the curriculum**—a shift mandated by the global world, which rewards intangible assets such as **drive, passion, creativity, empathy, and resilience**. These cannot be taught out of a textbook, but must be activated through experience.".*

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PROJECT BASED LEARNING?

Blumenfeld et al. elaborate on the processes of PBL: *"Project-based learning is a comprehensive perspective focused on teaching by* ***engaging students in investigation****. Within this framework, students pursue solutions to complex problems by asking and refining questions, debating ideas, making predictions, designing plans and/or experiments, collecting and analyzing data, drawing conclusions, communicating their ideas and findings to others, asking new questions, and creating artifacts."*. The basis of PBL lies in the authenticity or **real-life application of the research.** Students working as a team are given a "driving question" to respond to or answer, then directed to create an artifact (or artifacts) to present their gained knowledge. Artifacts may include a variety of media such as writings, art, drawings, three-dimensional representations, videos, photography, or technology-based presentations.

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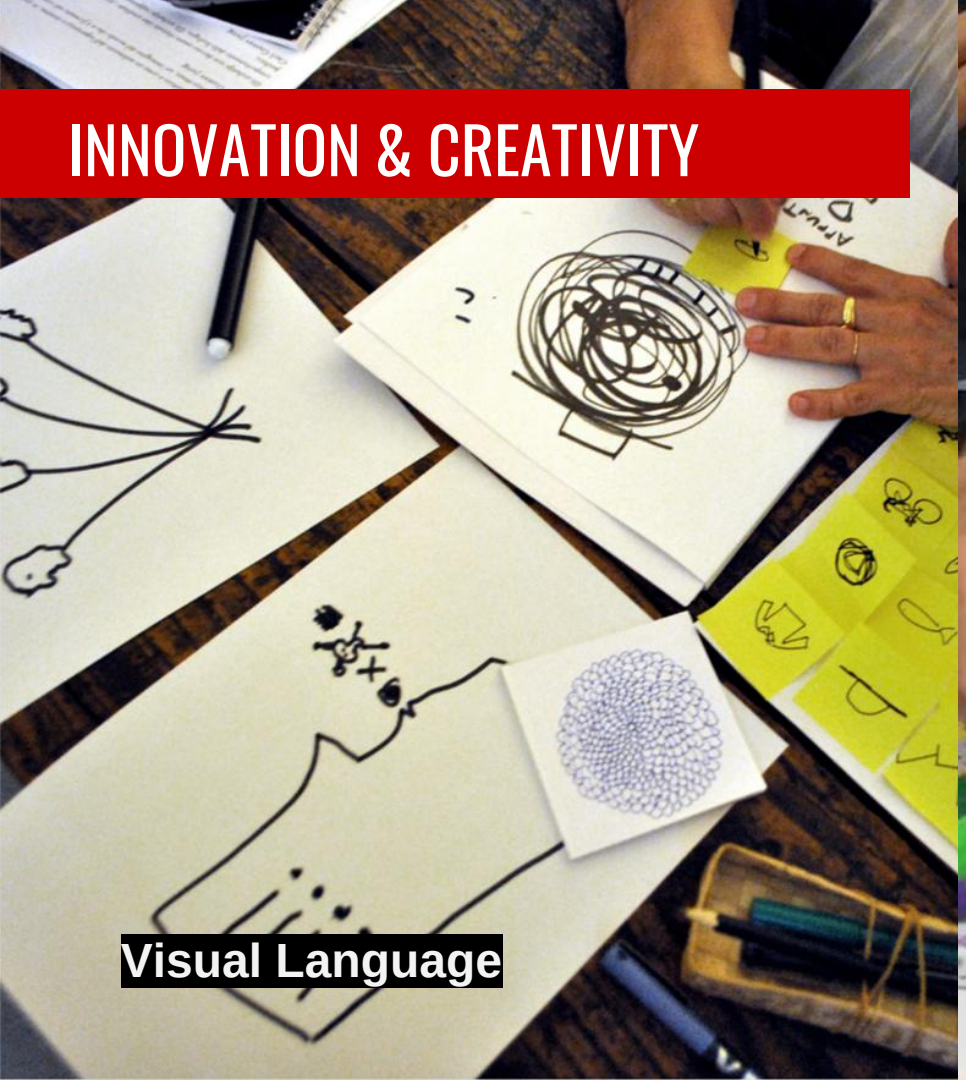
PROJECT BASED LEARNING?

PBL provides a powerful alternative to the conventional teacher-centric cognitivist model of learning (Carroll et al. 2010) by challenging students to formulate new-to-the-world ideas, where the necessary skills or knowledge to accomplish the tasks are not specified (Dym et al. 2005; Simon 1996).

PROJECT BASED LEARNING?

Students are invited to explore uncertain paths and no homogeneity of response is demanded. Rather, a diversity of response is encouraged, providing opportunities for the individual to develop his or her own interpretations of the given topic (Hanney 2018).

INNOVATION & CREATIVITY



Visual Language

Experimentation

STEM

Lime-S

DESIGN AND EDUCATION?

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AGAIN, YOU?

YOU ARE ALL DESIGNERS!

Teaching is a creative design act by nature.

Every day you create learning experiences,

ways of collaborating with colleagues,

of using classroom and university spaces,

of engaging with students...

INTRODUCTION
The education context

Many agree that engagement and motivation are fundamental aspects in today's education and various paths have been explored in this direction.

BUT

Little is known about how to support young practisioners in forming their identity, which is considered a key driver to face this challenge.

(Adams et al., 2011, Tonso, 2006; Stevens et al., 2008)

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Backgroud

Engineering Education in Reggio Emilia

a laboratory to develop a new paradigm of education, inspired by both PBL (Dym et al, 2005) and Reggio Emilia Approach (Malaguzzi, 1993)

PRINCIPLES

Education based on relations

Multiplicity over uniformity
Uncertainty over standardization
Circularity over linearity
Collectivity over individuality
Visibility over restriction
Affectivity over detachment

PURPOSE

Professional and human identity

Who is the young practitioner?

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REGGIO - Project Based Learning

Image of the learner

Student as Engaged Practitioner

Student are producers of new knowledge, able to envision the future and to shape it today. They have creative energies and interests to improve the context, quality and prospect of human life.

Role of the learner

Network

Students' social network is integrated into their learning experience to create a rich and diverse educational environment. They engage with families, friends, clients, citizens, academics and professionals. In this rich and complex scenario, the system of relationships has a virtually autonomous capability to educate.

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Role of the Educator in Relation to the Student

Partner & Co-Learner

Educator is a partner and co-learner in the students' learning experience who respects and considers the opinions of the group and individuals. Instead of knowing the 'right' answers, Educators provide cognitive scaffolding and encourage active exploration.

Role of the Educator towards educational practice

Researcher and Reflective Practitioner

Educators engage each other in deep dialogues, mutual criticism and self-examination of teaching instruments and behaviors. Engaging in pedagogical research and documentation of learning activities, they bring new considerations, ideas, and opportunities into practice.

Context of the Knowledge to be Learned

Science and Art

The student is capable of interacting with any stakeholder through the synthesis of all the expressive, communicative and cognitive languages. Science and art are integrated by promoting the penetration of artistic and humanistic disciplines into the technical environment to help young professionals find their own way of creating, discovering, and exchanging their talents with others.

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Context of the Knowledge to be Learned - Learning Environment

Ecosystem

In addition to designated Collaborative Spaces on campus and within partner organizations, the learning environment includes the entire ecosystem. Learners become integrated into their local ecosystem to access available resources to prototype, test and validate their ideas and solutions.

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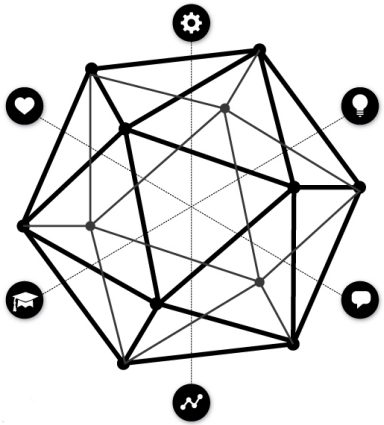
EDUCATION BASED ON RELATIONS



an education that goes beyond economic objectives: it must not only prepare students to be capable practitioners, but also enable them to discover their inner selves, as individuals and as citizens. In addition, as the development of one's identity is related to interaction and confrontation with others, education needs focus on relations, on collectivity and on participation.

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“

I'D RATHER HAVE A GREAT TEAM WITH BAD TOOLS

than a bad team with great tools.

The great team will find ways to communicate well, regardless of the tools.

SCOTT BERKUN / Author & Speaker, Berkun Media

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What is the primary difference between a co-localized and a distributed team?

- Proximity
  - 'real' and 'perceived'
- The positive effects of proximity (Kiesler and Cummings, 2002)
  - *Others' physical presence* increases attention, social impact, and familiarity (Milgram, 1975)
  - *Face to face communication* enables coordination (Allen, 1977)
  - *Sharing a physical space* increases similarity in experiences and expectations and favors the creation of a shared context
  - *Spontaneous communication* engenders the creation of strong ties

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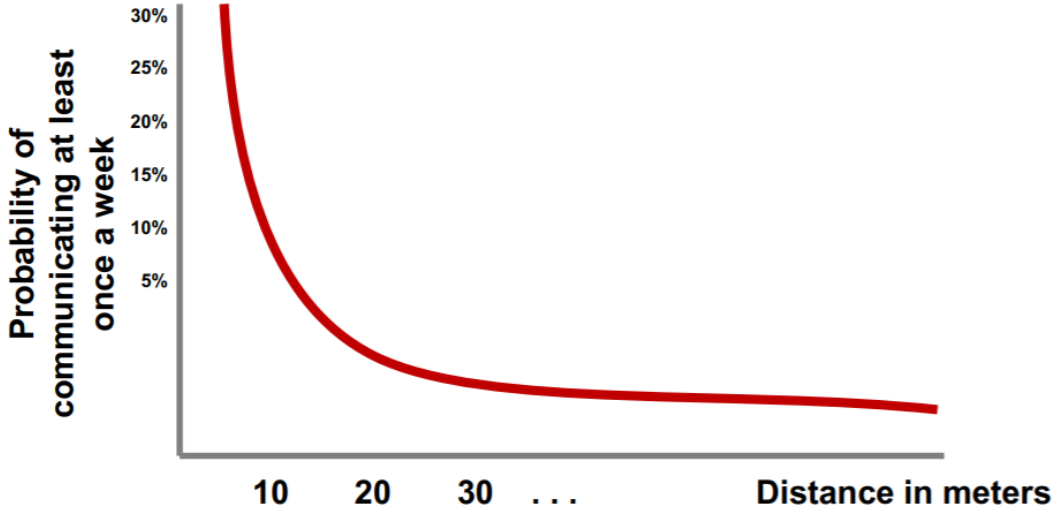
Allen' study on the correlation between distance and frequency of communication



Allen, 1977

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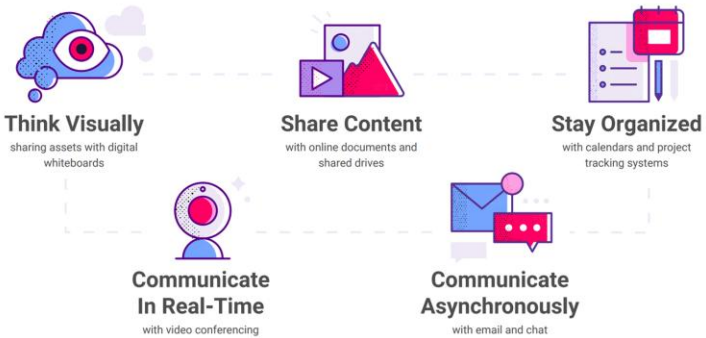
The elements to design a distributed team

1. Roles
2. Competences
3. Task design
4. Norms and protocols
5. Knowledge management systems
6. Performance evaluation
7. Incentives and compensation
8. Training

Tools

Not another tool!

We hear that all time. While tool fatigue is all too common, remote workshops rely on applications to make the interaction possible. Choose tools you'll use based on five key capabilities needed for remote workshops:



The Definitive Guide To Facilitating Remote Workshops
Authors: Mark Tippin, Jim Kalbach, David Chin
First Edition: June 2018

PLAY BOX
PIETRO
SOFI
REXY
LEO
Players
BOOM!
POLO
DEPT.

TOOLS FOR PROBLEM SPACE

Session 3
14.30 – 16.00

Session 4
16.30 – 17.30

Session III Objectives

1. How to use Teach-BeAst provided Tools:
    - Structure of the manual;
    - Miro boards;
    - Slide deck;
    - DT tools;
2. How to implement DT into your syllabus by using DT Tools and Techniques

Session III Agenda

14.30 – 16.00 Design Thinking Tools -> PROBLEM SPACE

TECHNICAL-BASED COURSES

Goal

Equip students for careers in software engineering, mechanics, electronics, and other tech-driven fields – or every time your students design practical solutions. Technical-based courses focus on problem-solving based on provided technologies or methodologies.

Key Characteristics:

1) Focus on Problem Solving- Design and development competencies to solve real-world problems;

2) Laboratory Work - Practical work with hardware and software.

Target audience

- Students aiming for careers in technology
- Future software engineers, data analysts, cybersecurity specialists, and technologists.

Learning outcomes

- Design and implement technological solutions.
- Mastery of programming, software development, digital tools or development of mechanical output.
- Proficiency in applying computational and logical thinking to problem-solving.

Deliverables

- Working prototypes or digital tools (e.g. apps, algorithms)
- Technical reports on software or system development
- Coding projects or technology-driven solutions addressing real-world problems

PBL

Course duration often takes up 2/3 of the total amount of hours

Example: 40/60 h per semester with focus on project-based learning and practical application (6ETCS course).

SCIENCE-BASED COURSES

Goal

Prepare students for careers in research, healthcare, environmental sciences, and other scientific fields. Science-based courses focus on understanding the natural world through the scientific method.

Key Characteristics:

1) Focus on Natural & Physical World - Theoretical knowledge, empirical observation, and experimentation;

2) Laboratory Work - Hands-on experiments using scientific equipment and techniques;

Target audience

- Students interested in natural sciences and research.
- Future scientists, researchers, healthcare professionals, and environmental specialists.

Learning outcomes

- Develop deep understanding of natural and physical phenomena
- Mastery of the scientific method: hypothesis, experimentation, analysis.
- Proficiency in data interpretation and experimental techniques.

Deliverables

- Research papers or reports based on experimental findings.
- Presentations of scientific models, theories, or ecological analyses.
- Laboratory results and data interpretations.

PBL

Course duration often takes up 1/3 of the total amount of hours.

Example: 20/60 h per semester with focus on project-based learning and challenge-based innovation (6ETCS course).

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How we used design thinking in the two archetypes?

TECHNICAL-BASED COURSES

Structure

5 Missions
1 Week per Mission

Goals

- Create solutions which are human centered (**Desiderability**)
- Explore the economical aspect of solutions (**Viability**)

Deliverables

- Design Brief
- Technical Proposal of the final solution
- Economic Evaluation
- (Technological) Solution
- Final Presentation
- Personal Reflection

SCIENCE-BASED COURSES

Structure

5 Missions
3h Class and an elective1h follow-up

Goals

- **Understand how ones own science can be relevant** in real-world challenges

Deliverables

- Challenge Presentation
- Opportunities presentation
- Solution concepts
- Personal Refelction

LEARNING OUTCOMES AFTER PBL IMPLEMENTATION

- **Problem-Solving Skills**
- **Collaboration and Teamwork**
- **Critical Thinking and Reflection**
- **Empathy and User-Centred Approach**
- **Adaptability and Resilience**

- **Practical Application of Technical Skills**
- **Systems Thinking**
  - (ability to think holistically about systems, understanding the interconnectedness of components)
- **Prototyping and Iteration**
- **Efficiency and Optimization**
- **Technical Communication**

- **Inquiry-Based Research**
  - (DT helps structure experiments, hypotheses testing, and exploration)
- **Scientific Literacy and Data Interpretation**
- **Hypothesis Development and Testing**
  (iterative nature of Design Thinking is aligned with the scientific method)
- **Integration of Theoretical Knowledge**
- **Ethical and Societal Impact**
  - (awareness of how scientific solutions can affect communities and ecosystems)

DT for Tech-Based Courses

PBL LESSON EXAMPLE:
TOTAL COURSE: 6 ECTS
ALLOCATED TO DT: 2 ETCS

SET UP

TOOLS

Miro board
Mission 1
Course syllabus

DESIGN BRIEF

1 week

TOOLS

Miro board
Mission 1
Design Brief

BENCHMARKING

1 week

TOOLS

Mission 2
Actors Map
Benchmark
Competitors map

NEED/FINDING

1 week

TOOLS

Mission 3
Interview Cards
AEIOU Frame
Affinity Diagram
Personas

SOLUTION CREATION

1 week

TOOLS

Mission 4
Design Principles
Brainstorming

PRETOTYPING AND TESTING

1 week

TOOLS

Mission 5
Pretotype and test template
Technical data sheet

PROJECT CLOSING

TOOLS

Mission 6
Presentation storyboard
Individual reflection doc
Reflective diary template

Co-funded by the European Union

DT for Science-based courses

PBL LESSON EXAMPLE:
TOTAL COURSE: 6 ECTS

SET UP

TOOLS

Miro board
Mission 1
Presentation slides

CHALLENGE EXPLORATION

TOOLS — 30 min

Miro board
Mission 1
Presentation slides

DISCIPLINE TO CHALLENGE

TOOLS — 30 min

Miro board
Mission 2
Presentation slides

OPPORTUNITY IDENTIFICATION

TOOLS — 45 min

Miro board
Mission 3
Presentation slides

BRAINSTORMING ON EPOs

TOOLS — 45 min

Miro board
Mission 4
Presentation slides

EXTERNAL SOLUTION TEST

TOOLS — 1 week

Miro board
Mission 5
Presentation slides

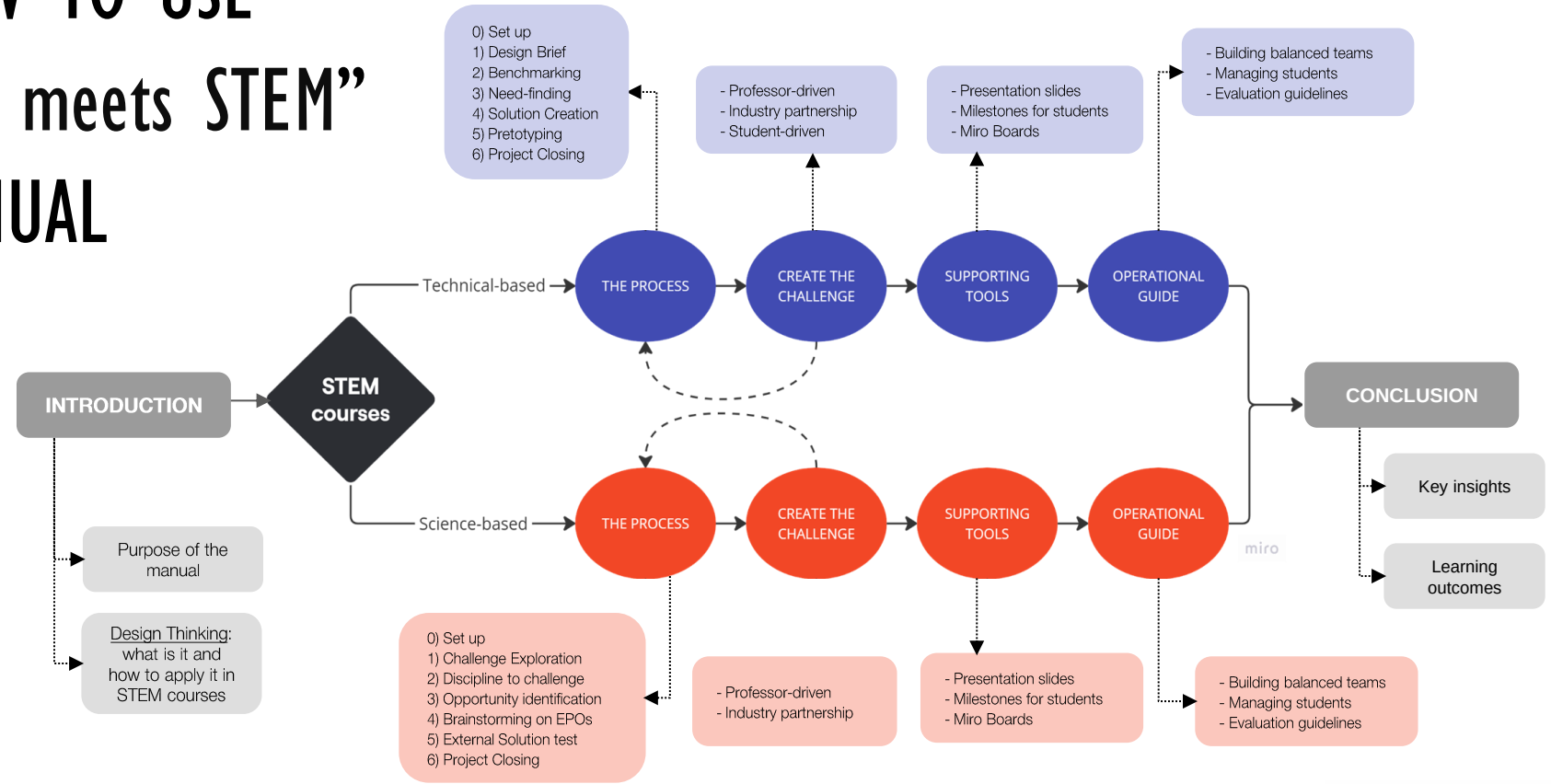
PROJECT CLOSING

TOOLS

Miro board
Mission 6
Presentation slides
Evaluation tool

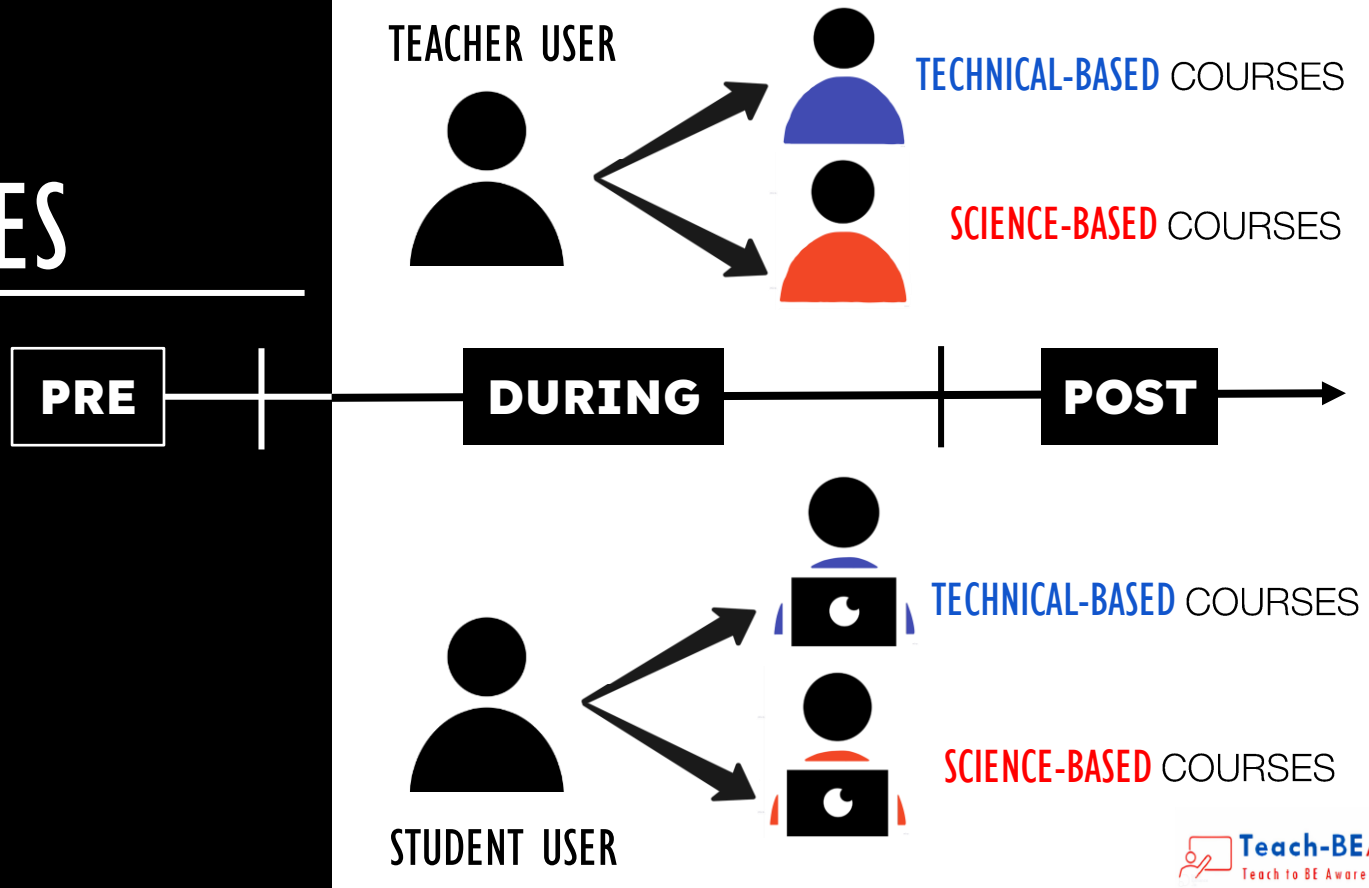
Co-funded by the European Union

HOW TO USE "DT meets STEM" MANUAL



Teach-BEASTs
Teach to BE Aware STudents

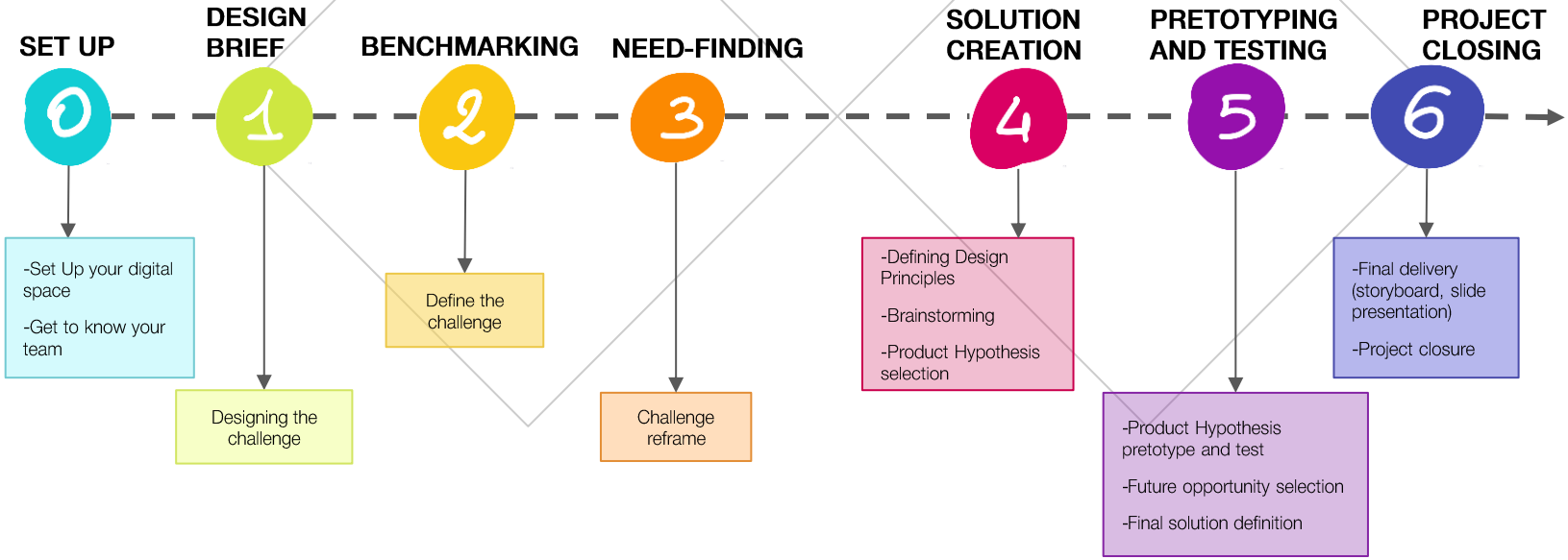
TWO DIFFERENT PERSPECTIVES



Teach-BEASTs
Teach to BE Aware STudents

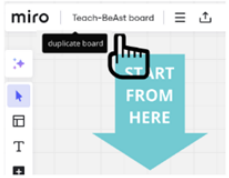
TECHNICAL-BASED COURSES

THE STUDENT LEARNING PROCESS



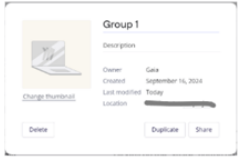
LET'S START!

SET UP YOUR TEAM'S DIGITAL SPACE

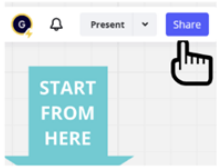


1. **Register on** www.miro.com

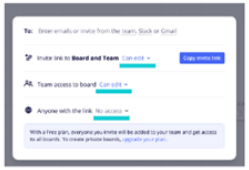
2. **Make a copy of this board for your team** (one person per team only), clicking on the board name on the top left of your screen.



3. **Name the board "Gruppo X [team number] - TB"**, clicking again on the board name.



4. **Share the board with all your team mates and your professor**, clicking on the "Share" button on the top right of your screen.



5. Invite your professor and your team mates via mail, **making sure the sharing settings are correct** (as shown above).

6. Check out the **Course Syllabus to keep track of each phase timing and deadlines**.

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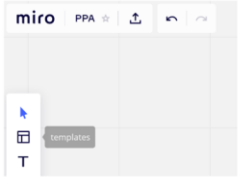
GET TO KNOW MIRO

Take your time to explore MIRO: it's a quite intuitive tool, but if you'd like to use it like a pro you can find many videos online which display all its functionality, for example this one.



Tip: In the toolbar on the left, you can browse through many templates you'll might find useful.

This is your workspace: feel free to personalize it, add tools and organize the whole space according to how it works better for you and your team!

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Teach-BEASTs
Teach to BE Aware STudents

GET TO KNOW YOUR TEAM!

Member Card (one per participant)

Double click to write your name here

REPLACE EACH QUESTION WITH YOUR ANSWER

Snap a picture of your funniest face and place it here

What is your field of interest?

If you were an animal, which animal would you be?

If you could meet a celebrity (not necessarily a living one) who would it be and why?

Place here a photo of what you see outside your window

What do you expect from this course?

What's your superpower that can help you in this challenge?

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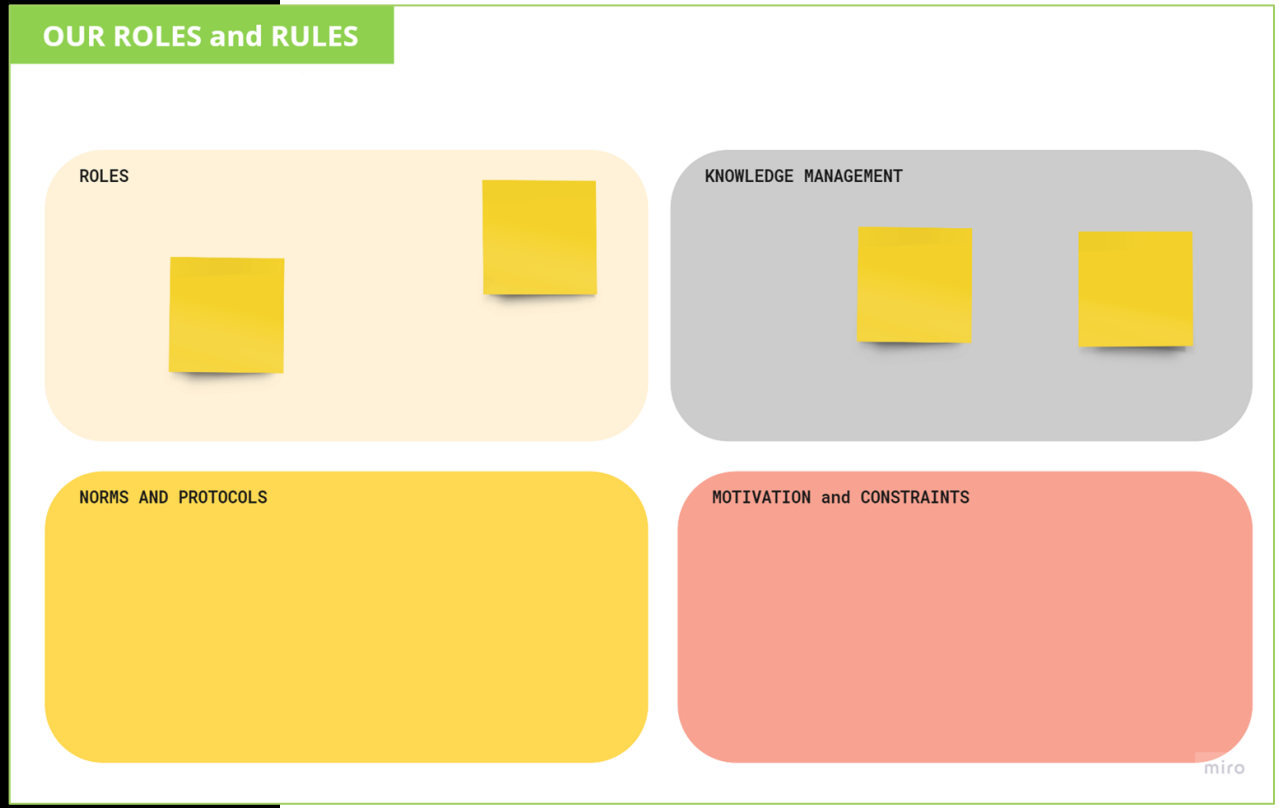
OUR FLAG

DRAW HERE YOUR TEAM'S FLAG

miro

SET YOUR ROLES AND RULES



DESIGN BRIEF

What is it?

A **Design Brief** is a document outlining the key information necessary to initiate a project. It defines the challenge, project aspirations, objectives, constraints, and assumptions, along with performance metrics to evaluate success. This serves as the foundation for guiding the project team's efforts.

How to do it?

Start by clearly defining the project challenge. Analyse the current situation, set specific objectives using the SMART approach, and identify any constraints or assumptions. Lastly, break down objectives into measurable performance metrics and document everything in a concise format, ensuring the brief is no longer than two pages.

DESIGN BRIEF

WALLET CHALLENGE

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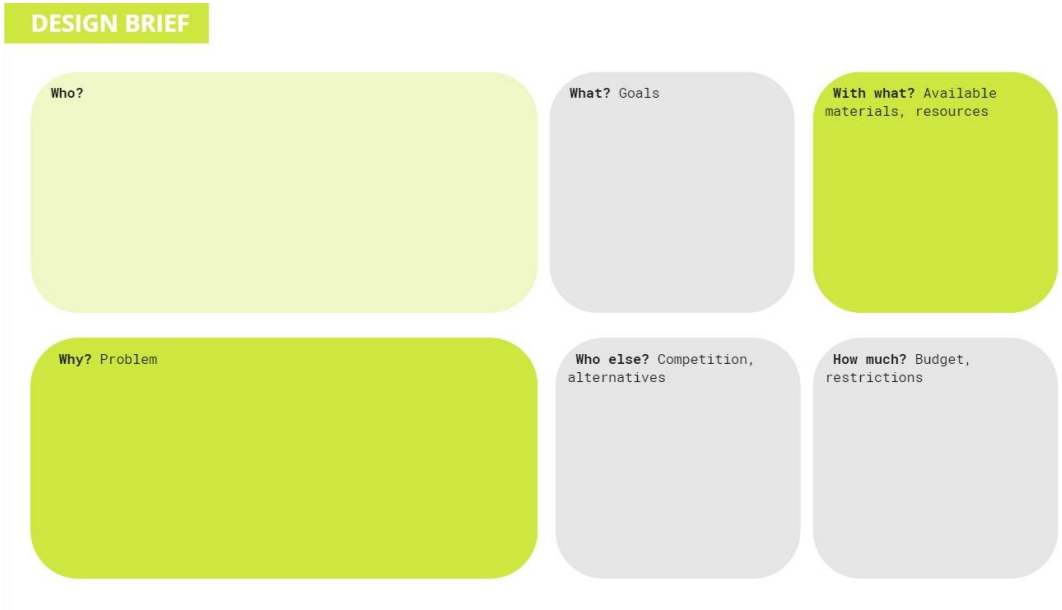
Design Brief

Listen carefully to the challenge proposed by the instructor and work with your team to develop the design brief.



PAUSE

Time needed: 5 minutes

ACTORS MAP

What is it?

The **actor map** maps out all the actors, called stakeholders, directly and indirectly connected to the company. Stakeholders can be users, customers, service providers, partners, institution representatives, etc...

How to do it?

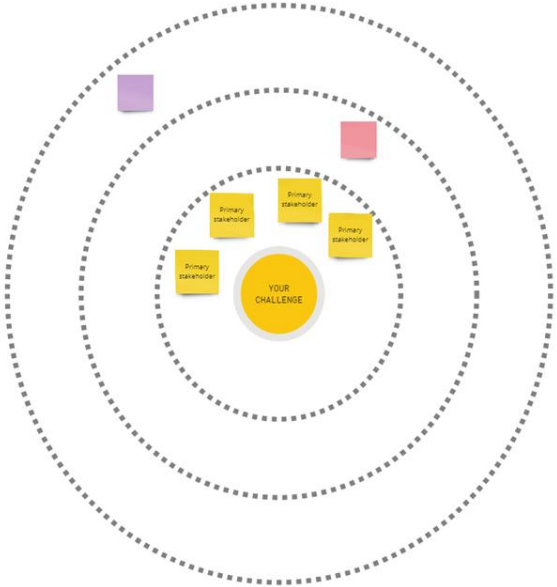
Start from the inner ring placing the stakeholders who have a core role.

Place in the external rings the actors who are less directly related to the challenge but need to be taken into consideration. Update it as you progress.

ACTORS MAP

ACTORS MAP

Map the stakeholders connected to your challenge.
Stakeholders can be users, customers, service providers, partners, institution representatives, etc...
Start from the inner ring placing the stakeholders who have a core role.
Place in the external rings the actors who are less directly related to the challenge but need to be taken into consideration.



BENCHMARK

What is it?

Benchmarking is the process of researching how others have addressed similar challenges, analysing relevant trends, technologies, and products to gather insights. It helps identify potential solutions and best practices that can guide the team's approach to the current project.

How to do it?

Start by exploring various sources to see how similar problems have been solved, focusing on solutions that are relevant to your challenge. Create a comprehensive archive of potential solutions but prioritise the most impactful ones due to limited time. Use organised tools and templates to capture and present your findings efficiently.

BENCHMARK

BENCHMARK

Collect here interesting case studies and existing solutions to your challenge.
Can you find any emerging pattern? Feel free to re-arrange them in a matrix

Name (link) what is it (in a tweet) why it is interesting?	Name (link) what is it (in a tweet) why it is interesting?	Name (link) what is it (in a tweet) why it is interesting?	Name (link) what is it (in a tweet) why it is interesting?	Name (link) what is it (in a tweet) why it is interesting?	Name (link) what is it (in a tweet) why it is interesting?

PRO TIPS:
Incorporate the link to the online resource
After collecting the material, try to rearrange the contents in a map or diagram. Do you see anything interesting?

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Teach to BE Aware STudents

COMPETITORS MAP

What is it?

The **competitors map** is used to study both direct and indirect competitors to understand their solutions, how they communicate value, and what sets them apart. It helps identify strategies for differentiation and market positioning.

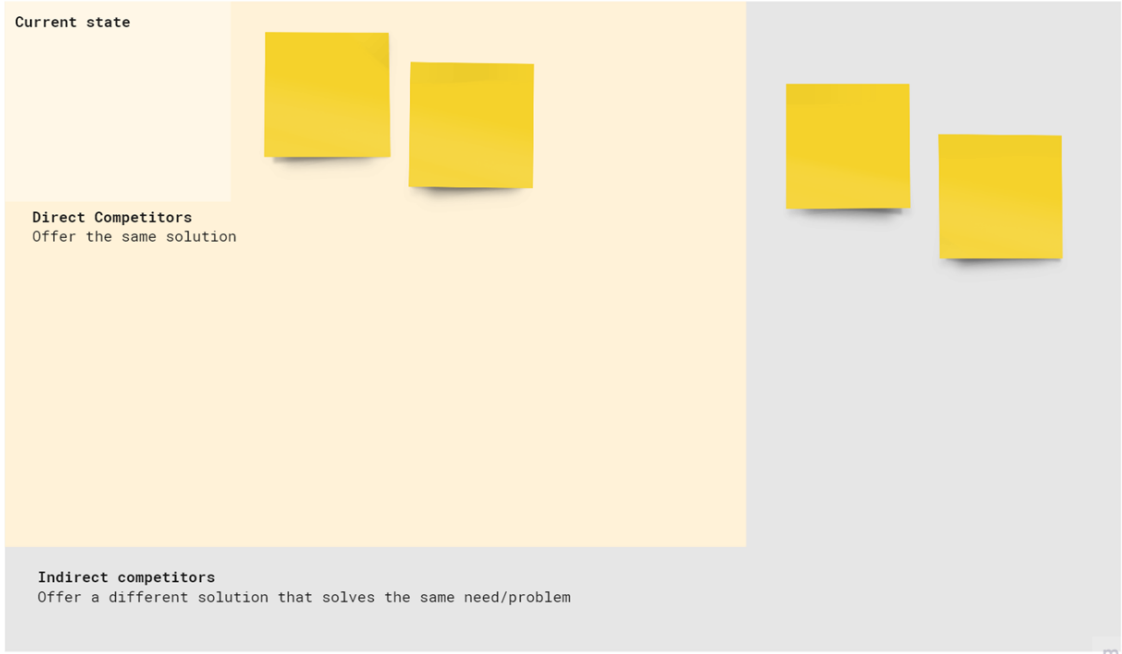
How to do it?

Begin by analysing direct competitors, focusing on their offerings, value propositions, and differentiation strategies. Then, expand your research to include indirect competitors who meet the same needs with alternative solutions. Stay focused on insights relevant to your project's challenge while keeping an open mind for potential opportunities.

COMPETITORS MAP

COMPETITORS MAP

Identify other's strengths and weaknesses, asses recognized good practices.



STEEP: Trend analysis

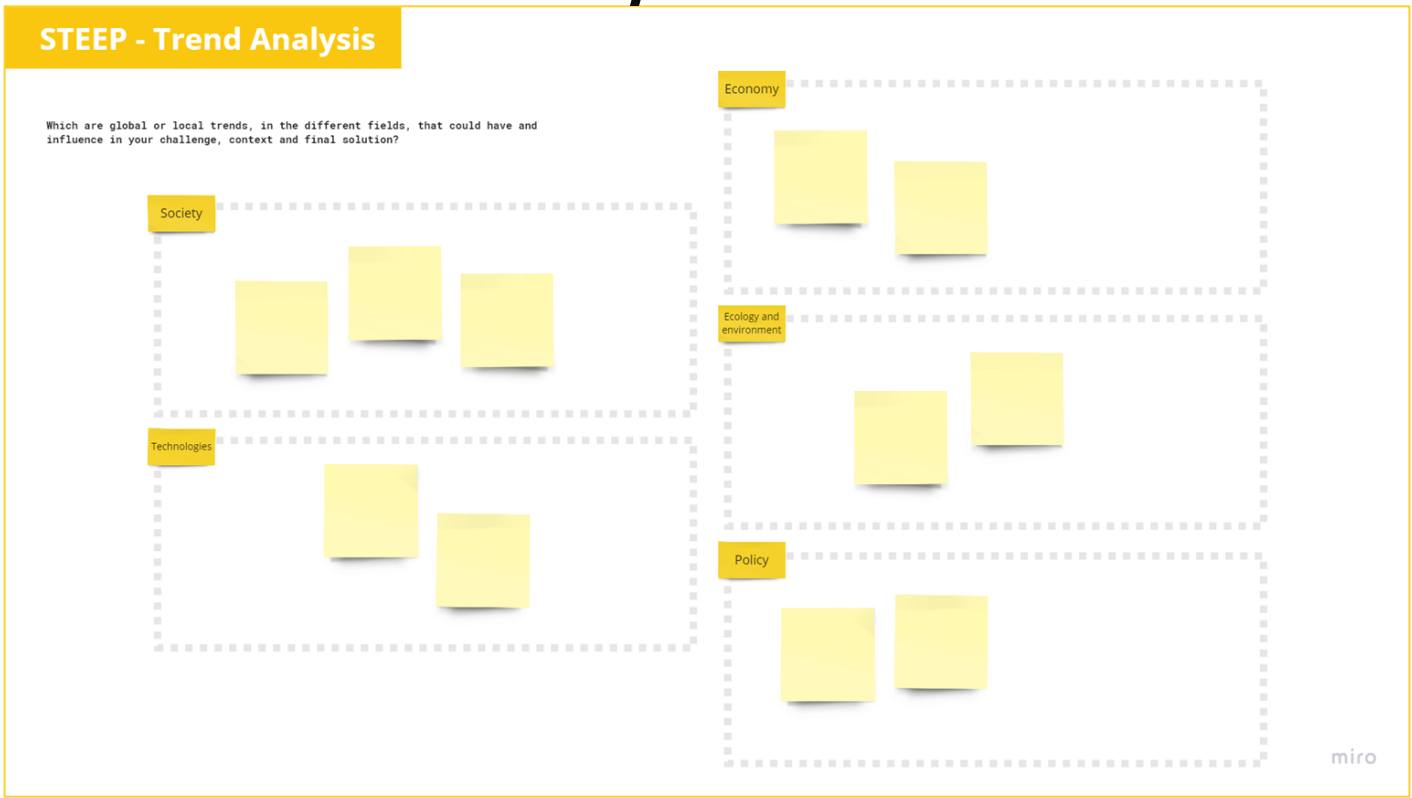
What is it?

Trend analysis involves studying current social, technological, economic, environmental, and legal trends that impact the project. It helps identify emerging opportunities, risks, and influences that could shape the project's approach and outcomes.

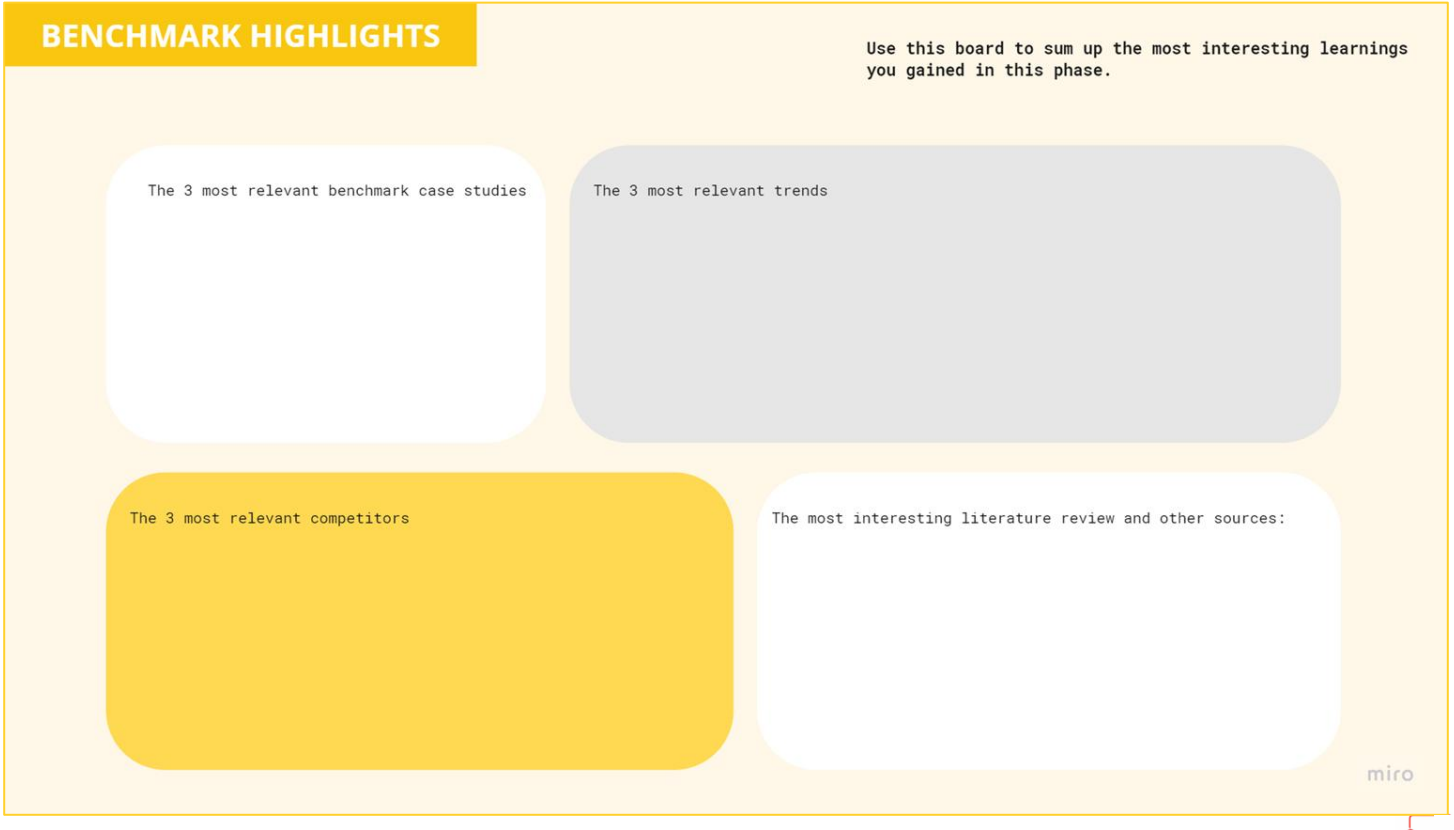
How to do it?

Research social, technological, and economic trends, along with sustainability concerns and legal changes, that directly or indirectly affect your topic. Look for patterns and emerging technologies and assess how current economic conditions or regulations might influence your project.

STEEP: Trend analysis



BENCHMARK HIGHLIGHTS



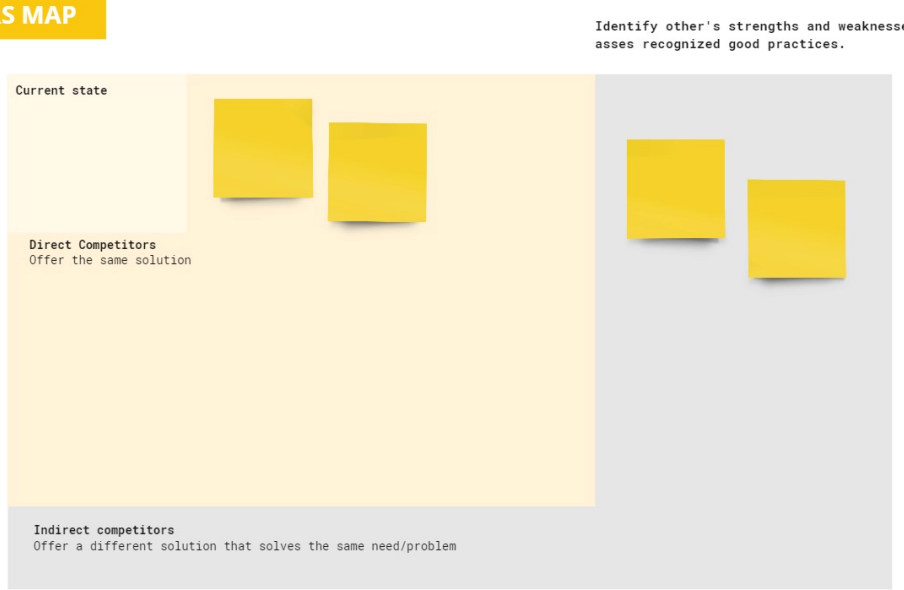
Competitors Map

Teach-BEASTs
Teach to BE Aware STudents

Competitors Map

Who are your competitors? Explore online and brainstorm to understand how various solutions address the needs you've identified.

COMPETITORS MAP



PAUSE

Time needed: 5 minutes

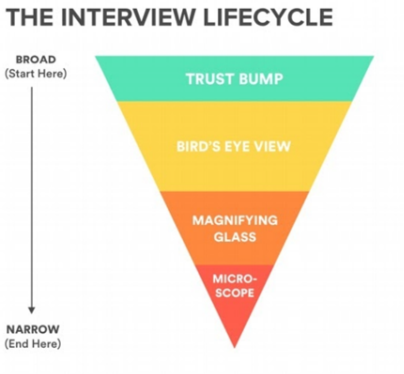
INTERVIEW GUIDELINES

INTERVIEW GUIDELINES

Use the following frame to define with your team a common guideline for interviewing your user.

Keep in mind this is a general structure, feel free to adapt it according to your specific challenge and to add questions "on-the-go" as your user mentions interesting themes.

Also, keep in mind that you'll might want to discover different things from different users.



INTRODUCE YOURSELF AND YOUR SCOPE

We are a team of students working on a university research project about ... (our project is supported by the company X /TBD with the company/)

We would like to interview you because we want to investigate your experience about ...

The data we collect will be used internally, and we won't share your personal data such as name age etc...

If you agree, we would like to record the conversation/take some pictures etc...

GET TO KNOW YOUR USER

1. Tell me about your typical day
2. Tell me about that time when you did/saw/used...
3. Can you tell me more about...? Can you show me how...
4. Why...why....why...why...why....
5. Is there anything you would like to add?
6. So if I understood correctly you said... (Wrap up)

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INTERVIEW CARD

What is it?

An **Interview Card** is a tool for documenting key insights from user interviews. It helps capture important quotes, summarize observations, and highlight "nuggets" of information that can guide the project by reflecting users' needs and behaviours.

How to do it?

After each interview, record key takeaways such as memorable quotes, observations, and insights. Summarize the conversation in a concise manner and highlight any surprising findings or recurring themes. Keep the cards updated to inform ongoing project decisions

INTERVIEW CARD

INTERVIEW CARD

Once you identified what you want to explore with your user, use this template during the interview to keep track of the most relevant elements from the conversation with your user (create a copy of the template and use one for each interviewee)
Feel free to adapt the frame with the crucial informations for your challenge

NAME

Role

About him/her
...

Paste here a picture of your user (ask for permission!)

FEELINGS

What does he/she think, how does he/she feel about it, what does he/she desire, what does he/she are afraid of?

UNEXPECTED THINGS

Contradictions, questions, things we didn't know before!

Key quotes:

"a very interesting quote!" -Name

"a very interesting quote!" - Name

"a very interesting quote!" - Name

PROBLEMS

Which painpoints does he/she experience?

NEEDS (remember they are VERBS)

INTERVIEW CARD

Once you identified what you want to explore with your user, use this template during the interview to keep track of the most relevant elements from the conversation with your user (create a copy of the template and use one for each interviewee)
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"a very interesting quote!" - Name

PROBLEMS

Which painpoints does he/she experience?

NEEDS (remember they are VERBS)

Teach-BEASTs
Teach to BE Aware STudents

OBSERVATION FRAME (AEIOU)

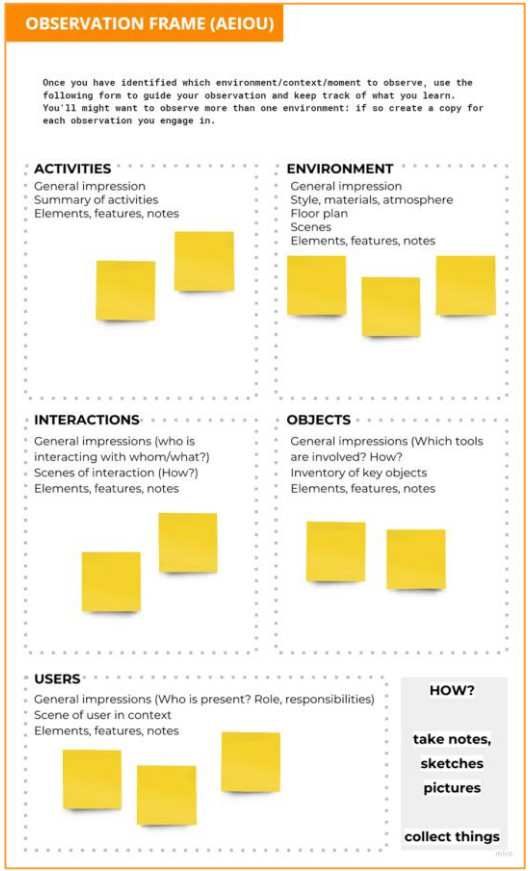
What is it?

The **AEIOU** framework is an observation tool used to capture insights during fieldwork. It stands for Activities, Environments, Interactions, Objects, and Users, and helps structure your observations for better understanding of user behaviour and context.

How to do it?

While observing users, document the activities they engage in, the environments they operate in, how they interact with others, the objects they use, and who the users are. Organise these observations into the AEIOU categories to identify patterns or unexpected behaviours. This structured approach helps surface hidden needs and drives empathetic insights.

OBSERVATION FRAME (AEIOU)



AFFINITY DIAGRAM

What is it?

An **Affinity Diagram** is a tool used to organize and group individual statements, observations, or ideas into categories based on their relationships. It helps reveal patterns, themes, and connections in the collected data, enabling teams to focus on key insights.

How to do it?

After gathering needs from interviews, write each need on sticky notes or cards. Then, group similar needs together, looking for connections or emerging themes. As patterns appear, categorize them under broader headings. This visual clustering makes it easier to identify core insights that can drive the project forward.

AFFINITY DIAGRAM

AFFINITY DIAGRAM

While you share back your learnings with your team, identify recurring topics and themes by grouping together quotes and evidences.

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PERSONAS

What is it?

Personas are fictional, detailed profiles that represent key types of users based on research. They bring users' stories, behaviours, needs, and frustrations to life, helping guide the design process with empathy.

How to do it?

Using the insights from your research, create a vivid description of each persona, focusing on specific behaviours, needs, and pain points. Include personal stories, motivations, and frustrations that directly relate to the project's challenge. Ensure each persona is a relatable character, not just a list of traits, so the design team can empathize with them throughout the project.

PERSONAS

PERSONAS

Now that you have a much more clear picture of your users it is time to syntethize your learnings in personas.
Remember: **a personas represent a group of people with similar habits and behaviours**, even if from their ID cards they look like they have nothing to share.

Start from the 2 most relevant stakeholders you have identified, and later make sure you have a persona for each most relevant need you identified.
As for the interview cards, feel free to add details to the structure that are relevant for you.

NAME AND KEY ChARACTERISTIC
(es. John the traditionalist)

Prepresent here your persona (use a picture or a drawing)

"A representative quote"

About him/her and his/her context
...

He/she likes
...

He/she dislikes
...

His/her aim or desire
...

How does he/she relate with the challenge? Which are his/her habits regarding it?
...

What is important to him/her?
...

Which are his/her fears, painpoints and frustrations?
...

NEED
REMEMBER THAT NEEDS ARE VERBS

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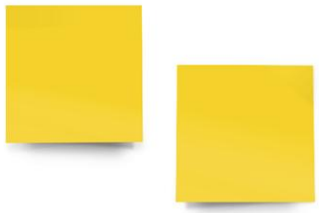
RECAP STORYBOARD

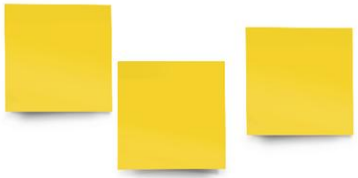
RECAP STORYBOARD

Use the following space to organize your work so far.
Use post it to discuss with your team relevant content before moving to actual slides.

Challenge



Context



Needs

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09.00 — 09.15

DAY 2

WELCOME!

Grow your own food	You have traveled to more than 5 countries	You have learned a dance in the last 12 months	You have a driving license	You like to cook
You are not on Instagram	You have run a marathon	You have been to ESADE's Rambla de Innovación before	You're going on vacation next month.	You have a pet
You have a favorite color when using post-its	Yoy play a musical instrument	**bingo**	You wear black shoes today	You speak three or more languages.
You are left-handed	You have read all the Harry Potter books.	You play sports	You don't have a driver's license	You have seen the EuroVision contest this year
You have to explain your favorite music genre to others because it is unique.	You can tell a joke spontaneously	You've had a crazy idea about a topic lately and you want to share it.	You paint or draw as a hobby	You have heard of or have experience with Design Thinking?

Fuente: Adaptado del DFGN

Teach-BEASTs
Teach to BE Aware STudents

Agenda DAY 2

09.00 - 09.15	Day 2 Opening & plan for the day
09.15 – 10.00	Session 5 : Tools for creating and testing the solution (Solution Space)
10.00 – 11.00	Session 6: Course Transformation: Syllabus improvement with PBL (I)
11.00 - 11.30	*Coffee break*
11.30 - 13.00	Session 7 : Course Transformation: Syllabus improvement with PBL (II)
13.00 - 14.30	*Lunch break*
14.30 – 15.30	Session 7 : Course Transformation: Syllabus improvement with PBL (II)
15.30 – 16.00	Session 8 : Course transformation: Create Supporting slides
16.00 - 16.30	*Coffee break*
16.30 - 17.30	Session 10: Challenge development
17.30 – 18.00	Day 2 close and wrap up

Teach-BEASTs
Teach to BE Aware STudents

TOOLS FOR STUDENTS

miro

What is it?

An online whiteboard with templates for DT process

Technical-based courses:
https://miro.com/app/board/uXjVLPnGSk0=/?share_link_id=626323210028

Science-based courses:
https://miro.com/app/board/uXjVLPnybPY=/?share_link_id=453446907949

Missions

What is it?

An instructions manual which explains to students what they need to do to apply the different tools in their project.

Teach-BEASTs
Teach to BE Aware STudents

TOOLS FOR STUDENTS

miro

0 SET UP

TOOLS

Miro board
MISSION 1
Course syllabus

1 DESIGN BRIEF

TOOLS

Miro board
MISSION 1
Design Brief

2 BENCHMARKING

TOOLS

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Actors Map
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STEEP Trends Analysis

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Pretotype and test template
Technical data sheet

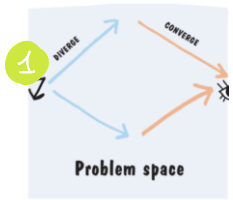
6 PROJECT CLOSING

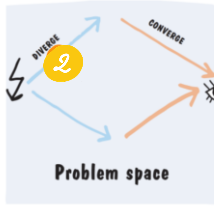
TOOLS

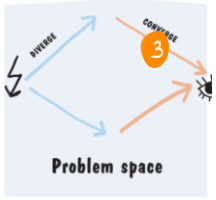
MISSION 6
Presentation storyboard
Individual reflection doc
Reflective diary template

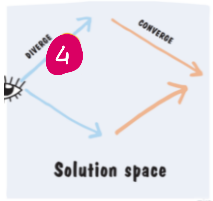
TOOLS FOR STUDENTS

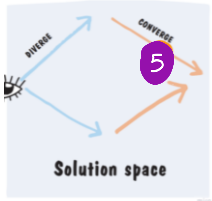
miro

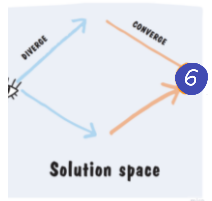












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SET UP

TOOLS

Miro board
MISSION 1
Course syllabus

DESIGN BRIEF

TOOLS

Miro board
MISSION 1
Design Brief

BENCHMARKING

TOOLS

MISSION 2
Actors Map
Benchmark
Competitors map
STEEP Trends Analysis

NEED/FINDING

TOOLS

MISSION 3
Interview Cards
AEIOU Frame
Affinity Diagram
Personas

SOLUTION CREATION

TOOLS

MISSION 4
Design Principles
Brainstorming

PRETOTYPING AND TESTING

TOOLS

MISSION 5
Pretotype and test template
Technical data sheet

PROJECT CLOSING

TOOLS

MISSION 6
Presentation storyboard
Individual reflection doc
Reflective diary template

TOOLS FOR PROFESSORS

DT meets STEM manual

Insert QR to manual

SCAN ME

Supporting slide deck

Insert QR to manual

SCAN ME

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Day 2
Session 5
09.15 – 10.00

TOOLS FOR SOLUTION SPACE

DESIGN PRINCIPLES

What is it?

Design principles are guiding strategies that emerge from research and insights. They are specific, actionable directives used to evaluate and inspire potential solutions during the design process, helping teams focus on meaningful opportunities and discard irrelevant ideas.

How to do it?

Start by reviewing the challenge, research findings, and personas. Identify key topics or themes and transform them into insights that reflect emotions, behaviours, and expectations. Then, write clear and memorable principles, focusing on project-specific guidelines rather than generic statements. Use real quotes and examples to make them intuitive.

DESIGN PRINCIPLES

DESIGN PRINCIPLES

Create a new board for every design principle you come up with.

REPRESENTATIVE IMAGE

DESIGN PRINCIPLE n. X

Title

Description

Evidences

Quotes, observations...

miro

BRAINSTORMING

What is it?

Brainstorming is a creative technique used to generate a large quantity of ideas in a short time. It encourages open, non-judgmental sharing of ideas to spark innovation and collaboration among team members.

How to do it?

Set a timer for 5 minutes of individual ideation, where each team member writes down their ideas using distinct colours. Afterward, share ideas without judgment, allowing new concepts to emerge through group discussion. Organize the ideas by themes or similarities to identify patterns and prioritize promising directions for development.

BRAINSTORMING

BRAINSTORMING

HOW TO GENERATE FUTURE HYPOTHESIS IN 4 STEPS: HYPOTHESIS IN 4 STEPS:

1- Set a timer and allow 5 minutes of individual ideation.

2- Once the 5 minutes are over, allow 2 extra minutes if ideas still flow.

3- **Once all the participant have written down the future hypothesis, share them among the team.** One member at a time, briefly describe the FH you have written/illustrated. IT'S NOT A MOMENT TO JUDGE OR DISCUSS THE IDEAS.

Usually during this share back phase new ideas or strategies to improve someone else's idea come up: Write down your new ideas on a new post it, and share it afterwards within the team.

4- Cluster similar future hypothesis.

Keep in mind the BRAINSTORMING GOLDEN RULES as you go:

1. Encourage wild ideas
2. Defer judgment
3. Go for volume
4. Build on the ideas of others
5. One conversation at a time
6. Be visual* ← *USE THE "PEN" TOOL OR MAKE A QUICK SKETCH BY HAND, AND TAKE A PICTURE OF IT
7. Stay on topic
8. Headline, give it a title
9. One idea = one post it

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PRODUCT HYPOTHESIS SELECTION

What is it?

A **Product Future Hypothesis** (FH) is a potential solution or idea generated during brainstorming, selected based on its potential to teach the team something valuable about user needs. It serves as a testable assumption to guide early experimentation.

How to do it?

Select the top three Future Hypotheses by voting on the ideas with the most learning potential. For each selected FH, decide what you want to learn and plan a quick experiment (pretotype) to test it. The pretotype should be a simple, fast way to gauge interest or validate assumptions, like showing a mockup or getting quick feedback from users.

PRETOTYPE AND TEST

What is it?

Pretotyping is a quick, low-fidelity version of your concept used to **test** a Product Hypothesis. It helps validate specific needs, gather user feedback, and uncover new questions, focusing on learning rather than polishing the final product.

How to do it?

Create a rough, simple version of your idea that can be quickly tested. Prepare by defining what you want to learn, build the pretotype, and test it with users to collect feedback. Keep it focused, build early, and reflect on the results to refine your approach. The goal is to learn from user reactions, not to present a finished product. Repeat the process as needed for deeper insights.

PRETOTYPE AND TEST

PRODUCT HYPOTHESIS PRETOTYPE AND TEST

PRETOTYPE NAME

PASTE HERE AN IMAGE
OF YOUR PRETOTYPE

USER AND NEEDS

Whom is your FH for? And for what?

ASSUMPTION: WHAT DO YOU EXPECT?

e.g. people would love to personalize their working environment...

TESTED ON WHOM? HOW?

...

WHAT WORKED +

WHAT DIDN'T -

NEW QUESTIONS ?

NEW IDEAS !

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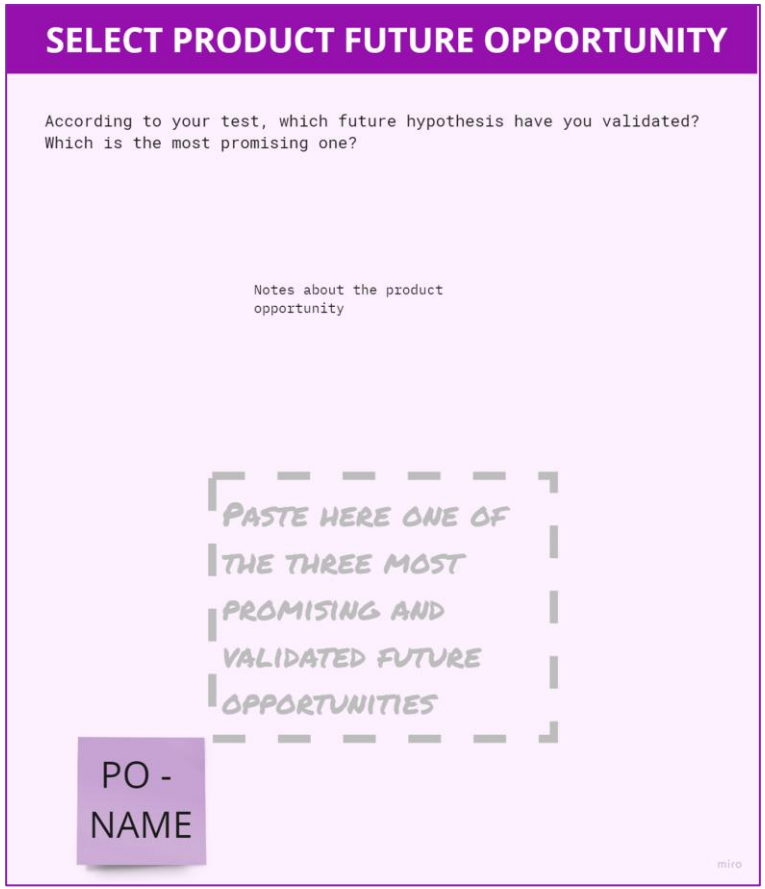
BEST PRODUCT OPPORTUNITY



Testing

Collaborate with your partner to develop a low-resolution prototype aimed at answering a specific question or conveying an idea.

rough
NASA “moon mission”

rapid
IDEO surgical tool

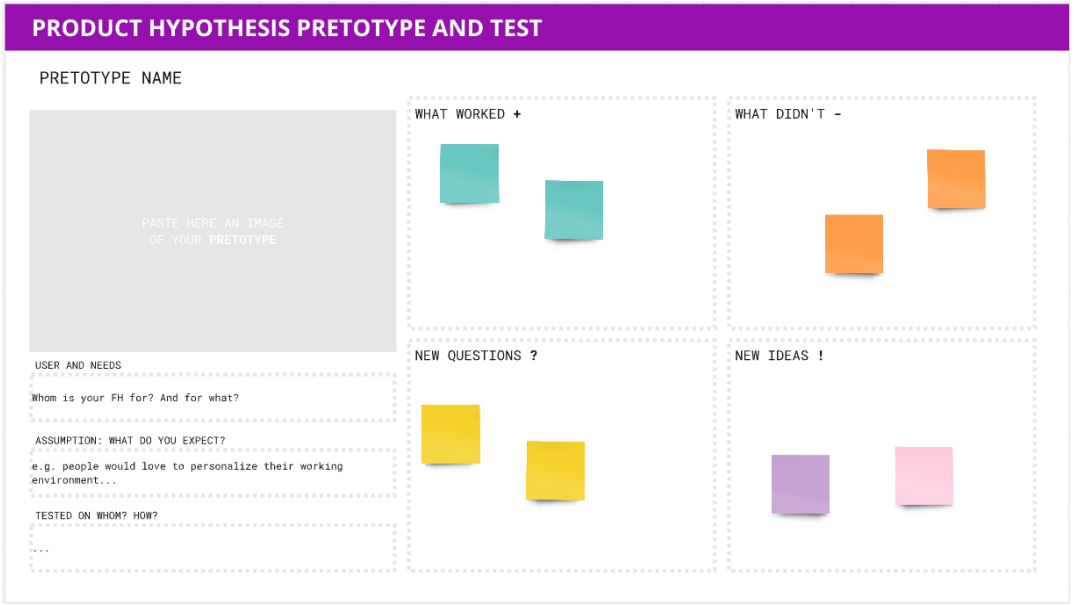
right
Feynman and the O-Ring

PAUSE

Time needed: 10 minutes

Testing

It's time to test your idea, gather feedback, and make final adjustments to your solution. Find someone to test your prototype with, collect feedback on your idea, and refine the final details.



PAUSE

Time needed: 15 minutes

SOLUTION VISION

What is it?

The **Solution Vision** is a technical data sheet document that presents the chosen solution's key technical features, including product characteristics and pricing. It acts like a product identity card for client presentation.

How to do it?

Start from the most implementable solution from previous exploration. Compile the product's technical details and pricing into a clear, concise board. Then, report the solution vision of the product in understandable and clarifying terms.

Erasmus+
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Erasmus+ Programme, Key Action 2: Strategic Partnerships for higher education

SOLUTION VISION

TECHNICAL DATA SHEET

Use this space to describe the proposed solution.
It can either be a description, a visual representation...

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ECONOMIC EVALUATION

What is it?

The **Economic Evaluation** is a document that assesses the financial viability of the proposed solution. It includes cost analysis, pricing strategy, and budget alignment to ensure the solution is feasible within the client's financial constraints.

How to do it?

Analyse the costs associated with the proposed solution, including materials, labour, and development expenses. Compare these costs against the client's budget and determine pricing strategies. Develop this evaluation alongside the technological solution to balance financial feasibility and technical innovation.

Erasmus+
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Erasmus+ Programme, Key Action 2: Strategic Partnerships for higher education

ECONOMIC EVALUATION

Cost estimation

COSTS

REVENUE

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Erasmus+
Project n: 2022-1-PL01-KA220-HED-000089791
Erasmus+ Programme, Key Action 2: Strategic Partnerships for higher education

Day 2
Session 7
11.30 – 13.00

COURSE TRANSFORMATION I
SYLLABUS IMPROVEMENT

Transformation of sylabus subject-matter content

ACTIVITY 70 min

1. **Review your syllabus in terms of STRUCTURE (ECTS, no of students/teams, form of classes, students' profile, learning outcomes).**
2. **Identify the key content areas or themes** from your current syllabus that can be transformed into problem-solving or project-based units.
3. **List the major topics or units** in your course, then reframe each as a problem to be solved or as part of a project-based learning (PBL) component.
4. **Align** your subject-matter content selected with your journey (Tech or Science).

Transformation of sylabus subject-matter content

ACTIVITY 15 min

1. **Review your syllabus in terms of STRUCTURE (ECTS, no of students/teams, form of classes, students' profile, learning outcomes).**
2. **Identify the key content areas or themes** from your current syllabus that can be transformed into problem-solving or project-based units.
3. **List the major topics or units** in your course, then reframe each as a problem to be solved or as part of a project-based learning (PBL) component.
4. **Align** your subject-matter content selected with your journey (Tech or Science).

Real-World Learning Outcomes Alignment

ACTIVITY 15 min

1. **Ideate real-word challenge(s)** relevant to your course /discipline (e.g. climate change, healthcare, etc.)
2. **Identify key competencies or profesional skills** your students need to tackle these challenges
3. **Revise your current learning outcomes** to ensure they are directly linked to the skills and knowledge needed to address these real-word challenges

Example – part 1 (5 min.)

Ideate Real-World Challenge(s) Relevant to Your Course

Example

- In a **Civil Engineering course**, a real-world **challenge** could be ***designing sustainable, disaster-resistant housing for regions prone to earthquakes***.

Example

- For a **Biology course**, the **challenge** could be ***creating solutions to reduce the impact of invasive species on local ecosystems***.

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Example – part 2 (5 min.)

Identify Key Competencies or Professional Skills Your Students Need to Tackle These Challenges

- **Example (Civil Engineering)**: Competencies needed could include **structural analysis**, **sustainable materials**, **teamwork**, and **project management**.
- **Example (Biology)**: Students would need skills in **ecological research**, **data analysis**, **problem-solving**, and **environmental policy knowledge**.

Example – part 3 (5 min.)

Revise Your Current Learning Outcomes to Ensure They Are Linked to These Skills

- **Example (Civil Engineering)**:
  Before: "Students will understand principles of building design."
  After: "Students will apply principles of structural design and sustainable building materials to develop earthquake-resistant housing solutions."
- **Example (Biology)**:
  Before: "Students will understand the impact of invasive species."
  After: "Students will research and analyze the impact of invasive species and propose strategies to mitigate their effects on local ecosystems."

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Transformation of sylabus subject-matter content

ACTIVITY 45 min

1. Review your syllabus in terms of STRUCTURE (ECTS, no of students/teams, form of classes, students' profile, learning outcomes).
2. **Identify the key content areas or themes** from your current syllabus that can be transformed into project-based units.
3. **List the major topics or units** in your course, then reframe each as part of a project-based learning (PBL) component.
4. **Align** your subject-matter content selected with your journey (Tech or Science).

Transformation of Syllabus Subject-matter content *cont.*

ACTIVITY 45 min

When reorganizing the content remember about areas that are related to following issues:

- **Challenge statement** formulation and understanding.
- **Teams' organization**
- **Resources** students will need to use to solve the challenge.
- **Project milestones**, that will break the challenge into smaller, actionable tasks or milestones that align with the content areas.
- **Time frame** for planned tasks.
- **Key points** in the project where students will **present their work** and **receive feedback** from peers and instructors.
- **Opportunities** for students to **revise their work** based on feedback collected before moving on to the next milestone.
- **Points** in the course where **reflection will be a key component**, encouraging students to **think about their learning process, not just the final product**.

EXAMPLE

Personal Business Model – Course Roadmap

What will you do?
- Discover interests
- Identify your personality
- List your skills and areas of knowledge
- Identify values
- Specify workplace preferences

Get to know yourself!

What will you do?
- Learn what PBMC is and how to use it in career and learning path design
- Analyze job postings
- Map dream job position with PBMC
- Describe segments of PBMC in more detail

Understanding of a Dream Job

What will you do?
- Collect additional info on job
- Explore the ecosystem of the job with GenAI Tools
- Synthetize collected information and prepare final version of PBMC for occupation

Extending Job Position Description

What will you do?
- Identify the gaps between your personal resources and job requirements
- Think how you can reduce the gaps as much as possible

Gap Analysis

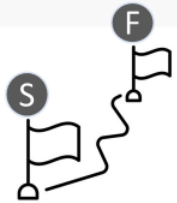
What will you do?
- Deliver short self-presentation to the audience
- Collect feedback

Elevator Pitch

What will you do?
- Prepare Career Development Plan according to template
- Upload Plan on the Moodle platform

Project Part

S → 1 → 2 → 3 → 4 → 5 → F



1. Professional Identity Defined
2. Dream Job Position Mapped with PBMC
3. PBMC for Job Position elaborated
4. Personal Resources Gaps Identified
5. Elevator Pitch Presented

Day 2
Session 8
14.30 – 15.00

COURSE TRANSFORMATION
Create supporting slides

Structuring the Content of the Slide Deck

ACTIVITY 15 min

1. Review your transformed syllabus and identify **key content phases** that will guide students through the problem-solving or PBL process.
2. For each phase, draft **one or two slides** that introduce the content, focusing on how it connects to real-world problems.
3. Ensure each slide emphasizes **learning objectives**, the **problem or challenge** to be addressed, and how students will engage with the content through activities or projects.
4. Share your initial slide structure with a peer and gather feedback on clarity and organization.

Embedding Interactive Elements

ACTIVITY 15 min

1. **Choose a section** of your syllabus where students will iterate on a project or prototype.
2. **Design interactive elements** for your slide deck (e.g., embedded questions, polls, or activities) that encourage students to reflect on their progress and gather feedback.
3. For each interactive slide, **outline how students will use the feedback to refine their work**, and provide space for student reflection or discussion.
4. **Test your interactive slides** with a peer and gather feedback on their effectiveness and ease of use.

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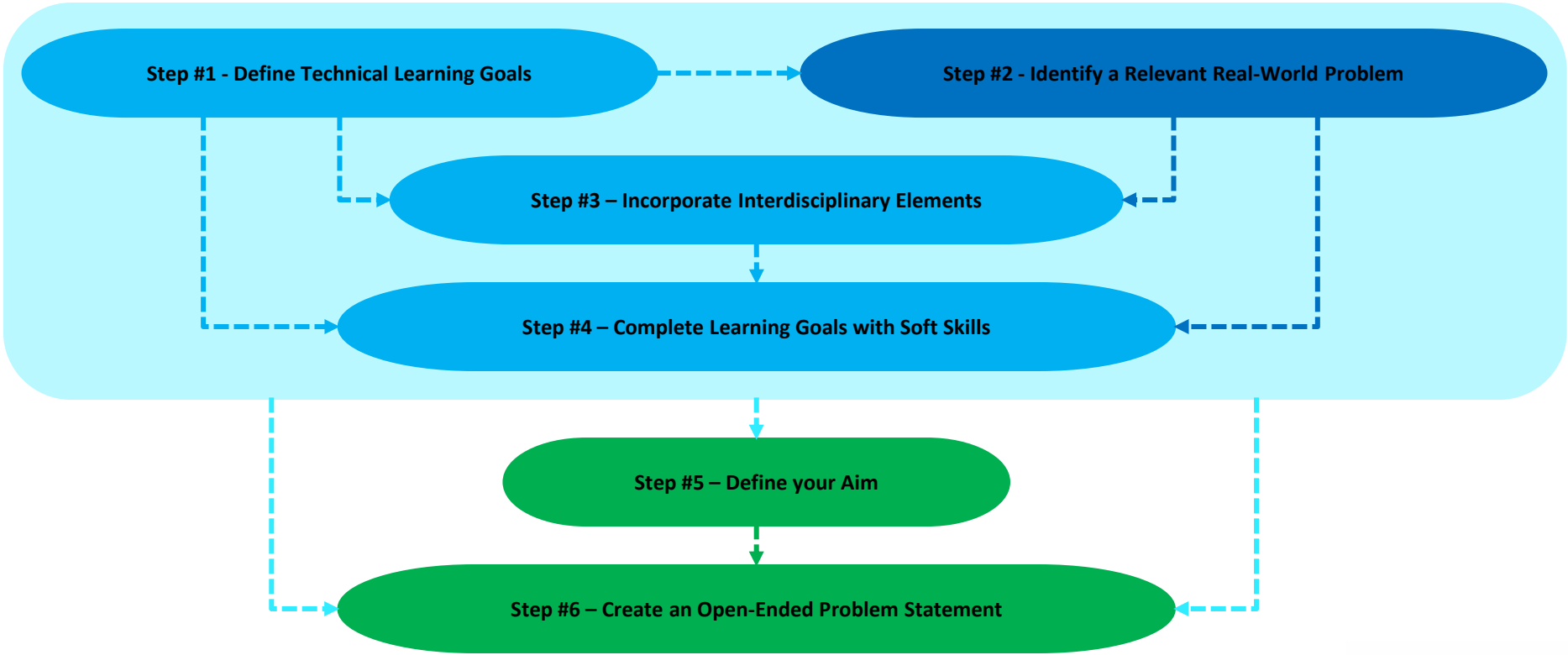
Day 2
Session 9
15.30 – 17.00

CHALLENGE DEVELOPMENT

STEM Innovation Challenge definition

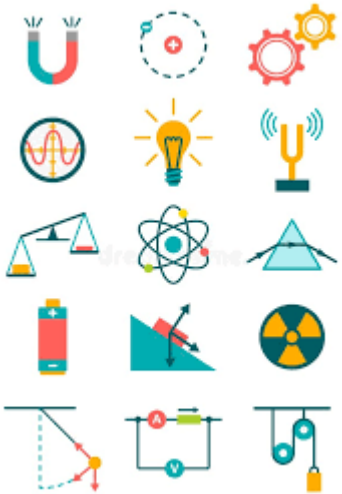


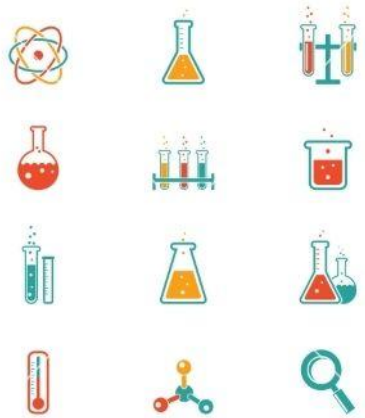
Step #1 - Define Technical Learning Goals

Before creating challenges, it's crucial to align them with **specific learning objectives**.

Content Mastery: Ensure that challenges will need to incorporate key STEM concepts teach in your course

(e.g., forces in physics, chemical reactions, coding basics…).





CONTEXT – Knowledge

The increasing amount of knowledge that is created everyday

- Leads to Specialization
- Means Complex Knowledge

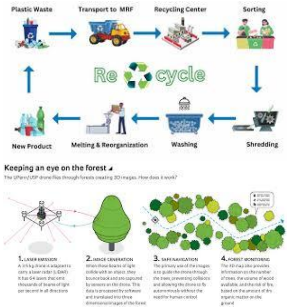
Step #2 - Identify a Relevant Real-World Problem

The second step of a STEM innovation challenge should be rooted in **addressing a real-world issue**.

This helps to motivate participants, making them more engaging and demonstrates practical applications, making the challenge relevant and impactful for students.

The problem can be found in three different ways:

- **Challenges created by professors**: professors define/choose a real problem and present it to class.
- **Challenges presented by firms or other organizations**:
  - Entities raised by professors.
  - Entities raised by students.



Example 1: “Develop a system that reduces plastic waste in urban areas using sustainable materials or innovative recycling methods.”

Example 2: “Develop a drone that can monitor forest health, using engineering to design the drone, technology for sensors and data collection, and biology for understanding environmental indicators.”

CONTEXT – Knowledge & Problems

The increasing amount of knowledge that is created everyday

Leads to Specialization

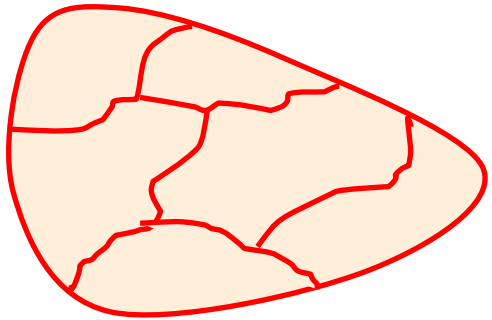
Means Complex Knowledge

Because the Problems are increasingly Systemic

They are Complex Problems

Requiring Complex Knowledge to be solved

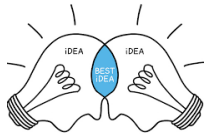
A System
a set of interdependent elements



Interactivity
Iteractivity

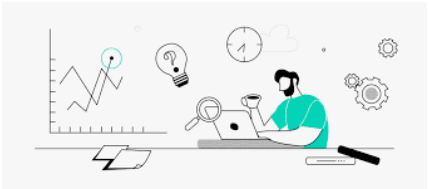
Note 1: Universities can **help teachers and students** in adopting STEM Innovation Challenges in partnership with other entities with some organizational measures as data bases with contacts, online forms for applications for challenges, and for applications for grants.

Note 2: Universities facing the actual **trend to develop a more intense collaboration with other organizations**, namely firms, can get a relevant contribute through challenges, because they serves the interest of the different entities in a concrete and practical way.



Note 3: STEM Innovation Challenges can also help **Research Centers** in different ways:

- To find interesting **students for research activities**.
- To find interesting **students for other activities** in addition to research (information search, diagramming, to make repetitive analysis, to make applications to grants, etc.).
- To find **new and fresh perspectives** over the researches under development or in conception.

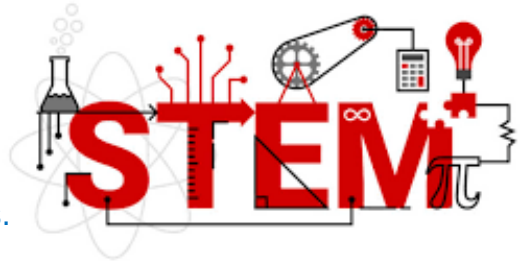


Step #3 – Incorporate Interdisciplinary Elements

STEM innovation challenges should **leverage multiple disciplines** to solve problems.

A challenge should require participants to integrate knowledge from different STEM areas, such as:

- **Science:** Applying scientific principles like physics, chemistry, or biology.
- **Technology:** Using software, coding, or digital tools.
- **Engineering:** Designing and building prototypes.
- **Mathematics:** Using calculations, modelling, or data analysis to justify decisions.



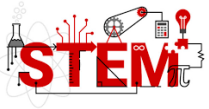
Because the **amount and diversity** of **knowledge** necessary to solve the problem we talk in **TEAMS**
to deal with the **STEM Innovation Challenge...**

CONTEXT – But what kind of TEAMS?

These **teams** has to be **Innovation Systems** (**Learning Systems** is another name).

The requirements for **successful Innovations Systems** are:

- They need **Competences***.
- **Several** competences.
- **Complementary** competences.
- That **cooperate** between them.
- To be **innovative** (create innovations).
- **Relevant** innovations.
- Successful in the **market**.



Very difficult to achieve and to keep successful → **Proof**

↓

Change of Paradigm

*** Competences:** capacity to answer concrete questions and solve concrete problems.

Step #4 – Complete Learning Goals with Soft Skills

Beyond the hard skills, nowadays the **labour market demands professionals with strong soft skills** too.

The challenge can be a beautiful opportunity to enable the development of this kind of skills by students, as for example:

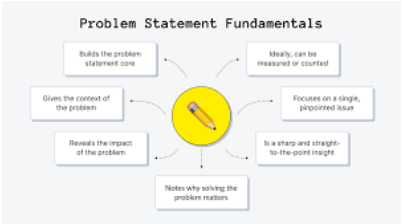
- **Problem-Solving Skills:** Focus on challenges that encourage critical thinking, innovation, and real-world problem solving.
- **Collaboration & Communication:** Design tasks that require teamwork and effective communication, which are vital in STEM fields.
- **Creativity and Innovation:** Allow space for open-ended solutions, fostering creativity.

Challenges involving different entit es and/or disciplines/courses, can provide rich experiences, new contacts, improved relationships, ar e capability of teams (team building) for the students involved.

Step #5 – Define your Aim

Different projects in different scientific areas can have various aims:

- The aim of the process can be **to develop several solutions** from the same challenge until a **unique solution** is gained.
- Can be **to achieve different perspectives** on a challenge, e.g. problem definition, problem solving process, knowledge(s) to use, etc.
- Can be **to compare different approaches** in terms of time, costs, resources involved, etc.
- Can be **to integrate different parts of the project**, developed by different teams to shorten time and costs.



Step #6 – Create an Open-Ended Problem Statement

Allow **flexibility** in how participants can approach the challenge.

The problem statement should encourage **multiple solutions**, fostering innovation.

The ideal, is **to present to students a need**, the challenge to be generic and not an already given problem.

Characteristics of a **good problem statement:**

- **Broad enough** to allow creative thinking.
- **Focused enough** to provide structure.
- Leads to both **practical and innovative solutions**.

Example Problem Statement: “How can we use AI and robotics to improve food security in urban areas?”

Do You remember the **Changes of PARADIGM?**

Day 2
Session 10
17.00 – 17.30

CHALLENGE DEVELOPMENT

STEM Innovation Challenge definition

Step #1 - Define Technical Learning Goals

Contents from your course?

Step #2 - Identify a Relevant Real-World Problem

- Created/choosed by professor
- From firm raised by professor
- From firm raised by students

Firm

Step #3 - Incorporate Interdisciplinary Elements

- Engineering?
- Technology?
- Science?
- Mathematics?

Step #4 - Complete Learning Goals with Soft Skills

- Problem Solving Skils
- Collaboration & Communication
- Creativity & Innovation

Step #5 - Define your Aim

- Develop several solutions → To gain unique solution
- Achieve different perspectives
- Compare different approaches
- Integrate different parts of the project

Lets Create a STEM Innovation Challenge!!!

Step #6 - Create an Open-Ended Problem Statement

- Broad enough to allow creative thinking
- Focused enough to provide structure
- Leads to both practical and innovative solutions

Example Problem Statement: How can we use AI and robotics to improve food security in urban areas?

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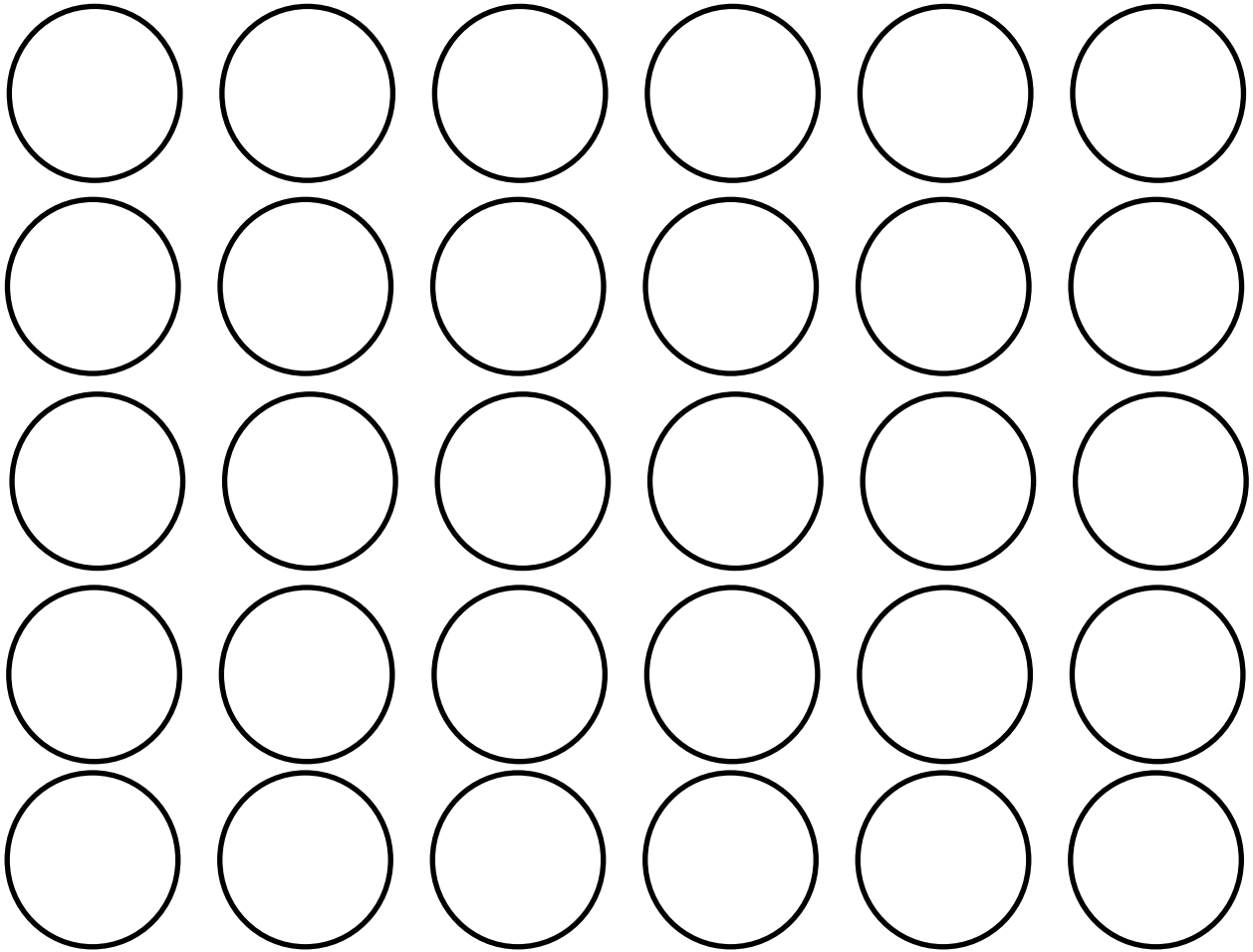
09.00 – 09.15

DAY 3

WELCOME!

IDEO Circles Challenge

ACTIVITY 5 min



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Teach-BEASTs
Teach to BE Aware STudents

Agenda DAY 3

October 23rd, 2024

Venue: Fusion Point, Rambla of Innovation, ESADE Campus Sant Cugat

09.00 - 09.15	Day 3 Opening & plan for the day Esade
09.15 - 11.00	Session 11: Evaluation of PBL courses UNIBO
11.00 - 11.30	*Coffee break*
11.30 - 13.00	Session 12: Course transformation cont. UNIBO
13.00 - 15.00	*Lunch break*
15.00 - 16.00	Session 13: Supporting structure Esade
16.00 - 16.15	*Coffee break*
16.15 - 16.45	Session 14: Share & Feedback: Course Transformation Esade
16.45 - 18.00	Workshop close and feedback Esade

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Day 3
Session 11
09.15 – 11.00

EVALUATION IN PBL COURSES

Session 11 Objectives

1. What are the challenges in the evaluation of PBL?
2. How can those challenges be overcomed?
3. What tools are avaiable in the toolkit?
4. What is experiential learning?
5. How to evaluate an individual refelction?

Session 11 Agenda

09.15 – 09.30 Groupwork excercise

09.30 – 10.00 The rationale of evaluating PBL

10.00 – 10.20 Evaluating an individual reflection

10.20 – 10.30 Experiencing reflective writing

10.30 – 11.00 Develope your own evaluation

Evaluation on the fly

Form Groups: Divide into 5 groups.

Design Phase: Spend 5 minutes designing the best paper airplane you can. The goal is for it to fly as far as possible. You can use information avaiable online.

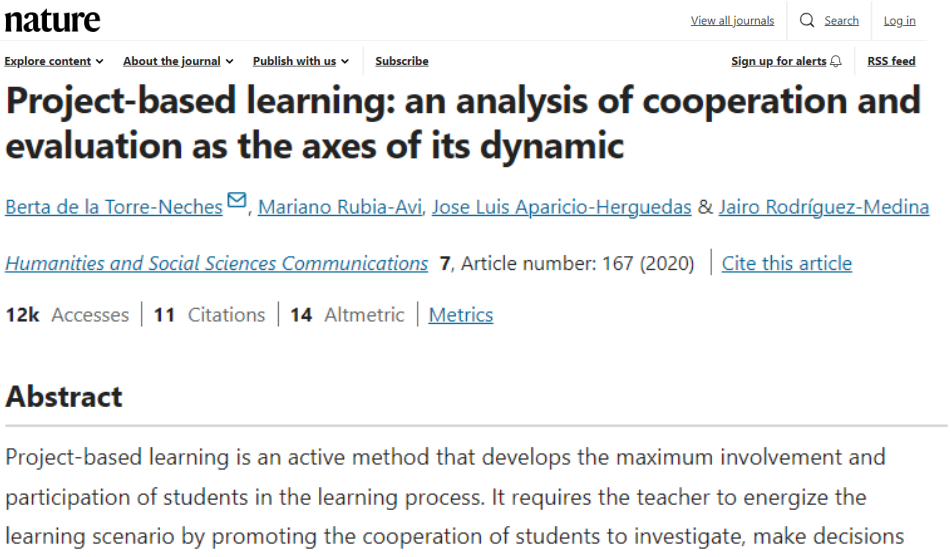
Create Your Airplane: Using a sheet of paper, build your airplane in 3 minutes. Make sure it's unique and easy to identify.

Wait for Instructions: Once finished, wait for further instructions from the facilitator.

PAUSE

Time needed: **10** minutes

EVALUATION IS AN ONGOING DISCUSSION



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Project-based learning: an analysis of cooperation and evaluation as the axes of its dynamic

Berta de la Torre-Neches, Mariano Rubia-Avi, Jose Luis Aparicio-Herguedas & Jairo Rodríguez-Medina

Humanities and Social Sciences Communications **7**, Article number: 167 (2020) | Cite this article

12k Accesses | **11** Citations | **14** Altmetric | Metrics

Abstract

Project-based learning is an active method that develops the maximum involvement and participation of students in the learning process. It requires the teacher to energize the learning scenario by promoting the cooperation of students to investigate, make decisions

- Evaluation should offer the students opportunities to **learn through the evaluation process.**
- The students describe **imbalances in the efforts** made to carry out the assignments.
- Students engage in **different experiences and dynamics**.
- Students **acquire skills and attitudes** hard to evaluate.

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GOALS FOR EVALUATION

Goal 1 Compare

Provide a mark which can be fitted in the current evaluation system.

Goal 2 Individual

Account for individual efforts.

Goal 3 Group

Account for group results.

Goal 4 Learn

Enhance students learning.

Goal 5 Skill & Attitude

Account for skills and attitudes developed.

Tool 1: Output Evaluation

Group Evaluation

Create a group evaluation, which will evaluate the final output of the course. It might be:

- Writte Report
- Presentation
- Multimedia Content
- Prototype or Product

Evaluation Grid

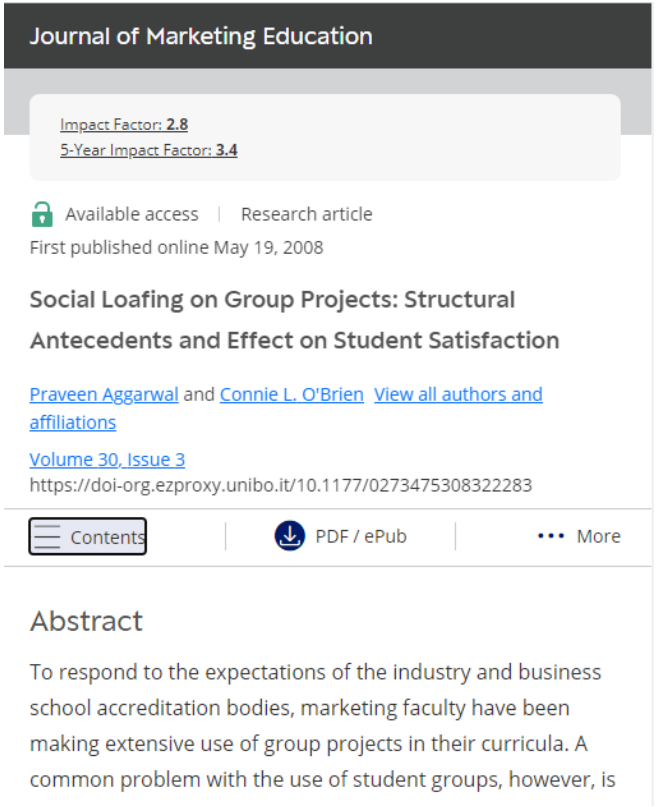
Create a detailed rubric that outlines the key components to be assessed, such as creativity, presentation skills, and adherence to guidelines. Share this rubric with the students in advance.

Tool 1: Output Evaluation

Criteria	Rubric	Evaluation
Content	Is the context accurately represented? Does it cover all relevant needs? Are the organizational processes clearly analyzed and mapped? Are the stakeholders correctly presented, and have all their needs been identified? Are the performances properly designed? Does it use simulation elements to support the design?	The context is well represented, and the needs identified during prototyping are generally reported, although the food truck prototype does not delve into why some customers might not buy food from the truck. What are the hidden needs and obstacles? The company's needs are well described. There is no evidence of process mapping. The solution is interesting and relevant to the context, even though the make-or-buy analysis is not detailed. How long would it take a person to conduct the market analyses that would be outsourced to the software? Is this cost, multiplied by 8 openings, greater or less than the investment in the software plus the remaining analysis cost? The assessment of the organizational impact of the solution â€" in the context of a lack of delegation capability â€" is not thoroughly explored. The performance design is superficial
Methodological rigor	Are the relevant tools used correctly? Is the pertinent literature cited and used?	The tools are used correctly, although the results of the qualitative pretotypes could have benefited from quotes to reinforce the findings. The Business Model Canvas (BMC) is missing, although it was shared with the company during the presentation. Why was it valuable for the presentation but not for the report? There are no references to the literature.
Creativity and independent contribution	Did the team manage to go beyond what was asked? Is what was presented surprising or remarkable in some way?	The executive summary provides a clear and effective overview of the project. The social impact of the project is considered. The infographic is aesthetically pleasing and provides relevant information about the solution. The video promotes and narrates the details of the solution but does not focus on the company's needs.
Work organization	Is it clear who did what and how the project was organized? Was the time that the team and individuals spent on the project reported?	The division of roles is clearly defined. The time allocated by each member to each individual activity is reported.
Presentation	Is the presentation clear and well-prepared? Are all materials polished? Does the presentation present a plausible story for the organization's evolution?	The presentation is clear and well-prepared. It effectively presents the solution, starting from the company's needs.
Final Grade	**27**	

This is what we call social loafing

Tool 2: Peer Evaluation



Journal of Marketing Education

Impact Factor: **2.8**
5-Year Impact Factor: **3.4**

Available access | Research article

First published online May 19, 2008

Social Loafing on Group Projects: Structural Antecedents and Effect on Student Satisfaction

Praveen Aggarwal and Connie L. O'Brien View all authors and affiliations

Volume 30, Issue 3
https://doi-org.ezproxy.unibo.it/10.1177/0273475308322283

Contents | PDF / ePub | More

Abstract

To respond to the expectations of the industry and business school accreditation bodies, marketing faculty have been making extensive use of group projects in their curricula. A common problem with the use of student groups, however, is

Evaluate your mates on a 1 to 10 scale

TEAM:						
		To A	To B	To C	To D	To E
From A	Collaboration and Teamwork	-				
	Communication and Clarity	-				
	Responsibility and Accountability	-				
	SCORE		#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
From B	Collaboration and Teamwork		-			
	Communication and Clarity		-			
	Responsibility and Accountability		-			
	SCORE	#DIV/0!		#DIV/0!	#DIV/0!	#DIV/0!
From C	Collaboration and Teamwork			-		
	Communication and Clarity			-		
	Responsibility and Accountability			-		
	SCORE	#DIV/0!	#DIV/0!		#DIV/0!	#DIV/0!

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WHEN STUDENTS ENGAGE IN P.B.L.

THEY LEARN PROJECT MANAGEMENT

THEY GROW MORE EMPATHETIC

THEY BECOME SYSTEMS THINKERS

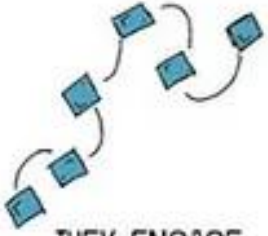
THEY BECOME HACKERS AND REBELS

THEY BECOME EXPLORERS

THEY BECOME WILDLY AND UNABASHDELY DIFFERENT

THEY ARE MORE ENGAGED IN THE LEARNING

THEY BECOME PROBLEM-SOLVERS



THEY ENGAGE IN ITERATIVE THINKING

THEY THINK DIVERGENTLY

THINKING OUTSIDE THE BOX BY THINKING DIFFERENTLY ABOUT THE BOX

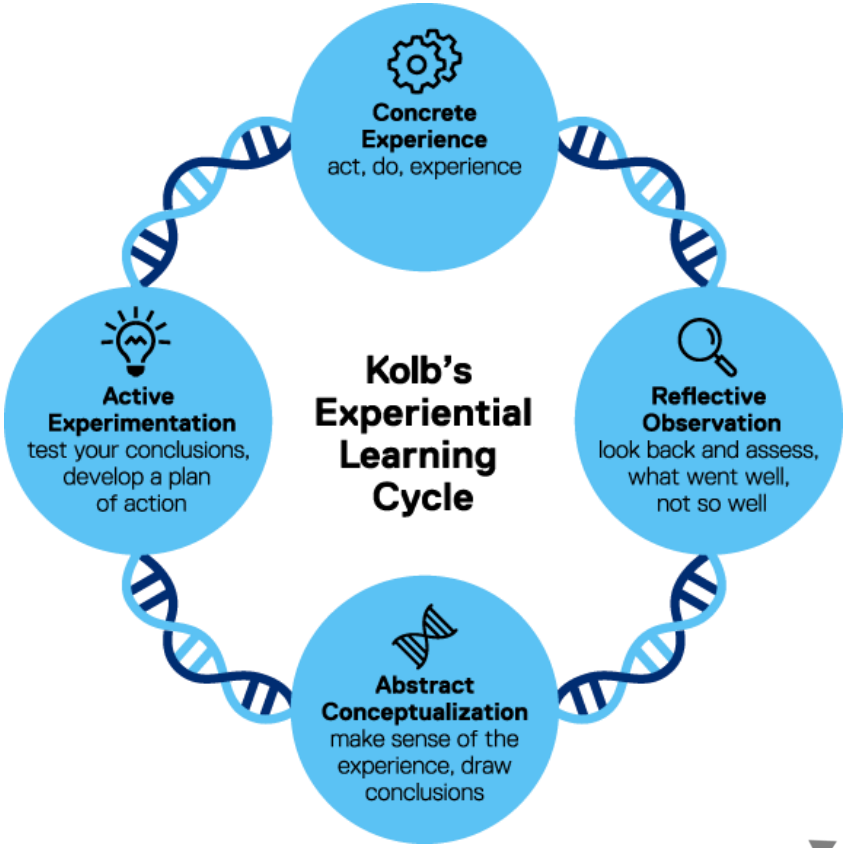
THEY MAKE DEEP CONNECTIONS BETWEEN IDEAS

THEY ARE READY FOR THE CREATIVE ECONOMY

THEY LEARN TO TAKE CREATIVE RISKS

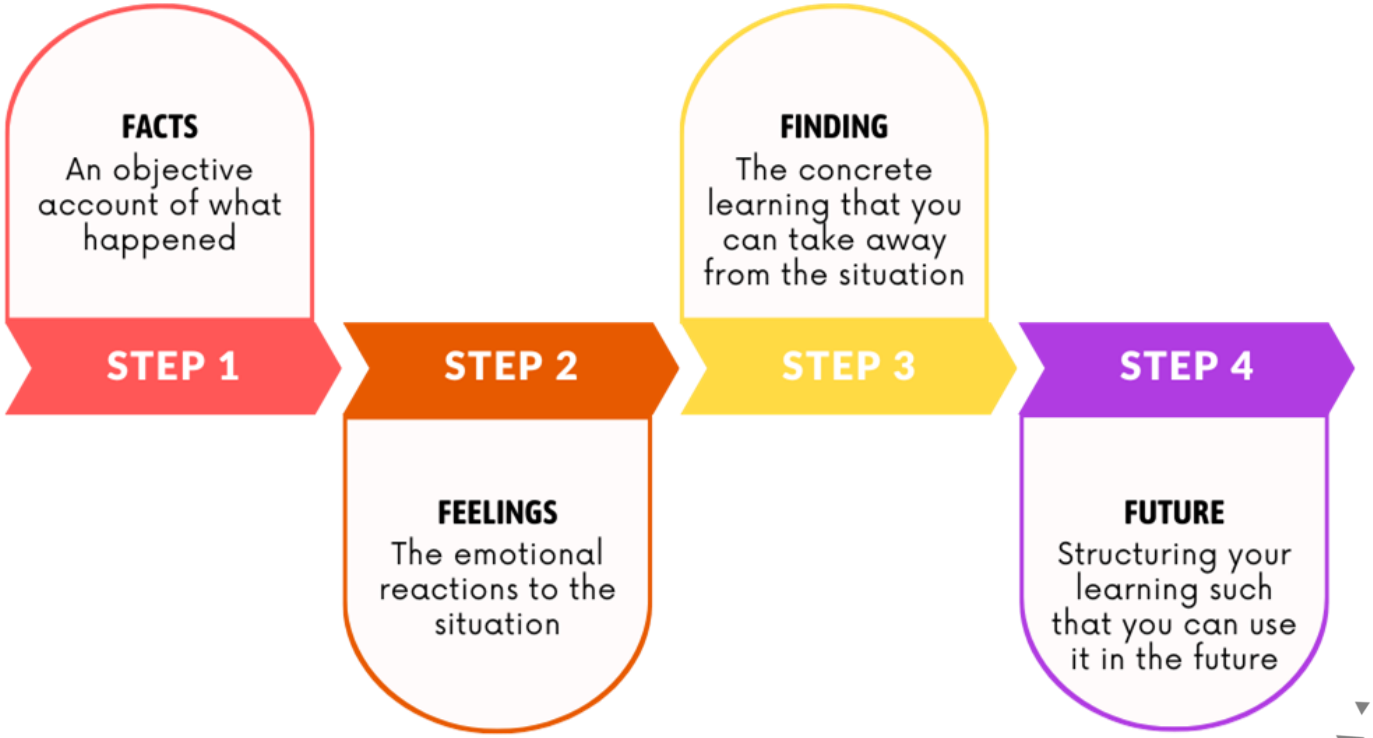
JOHN SPENCER

Experiential Learning



J. Dewey, 1938
D. Kolb, 1984
G. Gibbs, 1988

Four F's of Active Reviewing



Adapted from Roger Greenaway's 'The Active Reviewing Cycle'

Supporting tool: Reflective Diary

Phase	Supporting questions	Milestone 1	Milestone 2	Milestone 3
FACT	*What specific activities did you conduct? Describe in detail what happened during these activities. Focus only on objective facts: What have you been doing? How did people respond? Did you notice any interesting facts? What was one of the challenges you faced while doing this activity? How did you figure out the solution?*			
FEELINGS	*How did you feel during these activities? Reflect on your emotions and reactions. How did other people involved feel during the activities? Observe and describe their emotional responses*			
FINDING	*Based on what happened and how people felt, what did you learn during these activities? Abstract from what you observed and consider how you can generalize these learnings. What broader insights can you draw from your experiences?*			
FUTURE	*How will you apply what you have learned in the future? Think about how you can apply these lessons to other challenges you face. How can what you learned in this activity be applied to your life and work? What advice would you give to another group working on this activity based on your experiences and insights?*			

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Tool 3: Final Reflection

Individual Reflection

Rationale: Experience plus reflection equals learning. - John Dewey

Experiential learning transcends mere participation in activities, demanding reflection, critical analysis, and synthesis to maximize the effectiveness of your course experiences and prepare you for your future professional life. This guide aims to facilitate a deep, personal reflection on your journey throughout the course, inviting you to explore the learnings and insights gained from your diverse experiences, contemplate your professional and personal growth, and identify strategies to further enhance your learning. We encourage you to approach this reflection not as a routine task, but as a valuable opportunity to create a meaningful record of your experiences, consolidate your knowledge, and recognize your progress. By engaging in this reflective process, you'll be better equipped to connect theory with practice, identify patterns in your learning and decision-making, develop critical thinking skills essential for your professional future, and cultivate self-awareness and emotional intelligence. To make the most of this document, set aside dedicated time for reflection, review your course materials, notes, and experiences, consider both successes and challenges, be honest and specific in your observations, and focus on actionable insights for future growth. Remember, the depth and quality of your reflection directly impact the value you'll derive from this exercise, so embrace this opportunity to gain clarity on your progress and chart a course for your continued development as a professional. For more information on the significance of reflective practice in experiential learning, please refer to the annex.

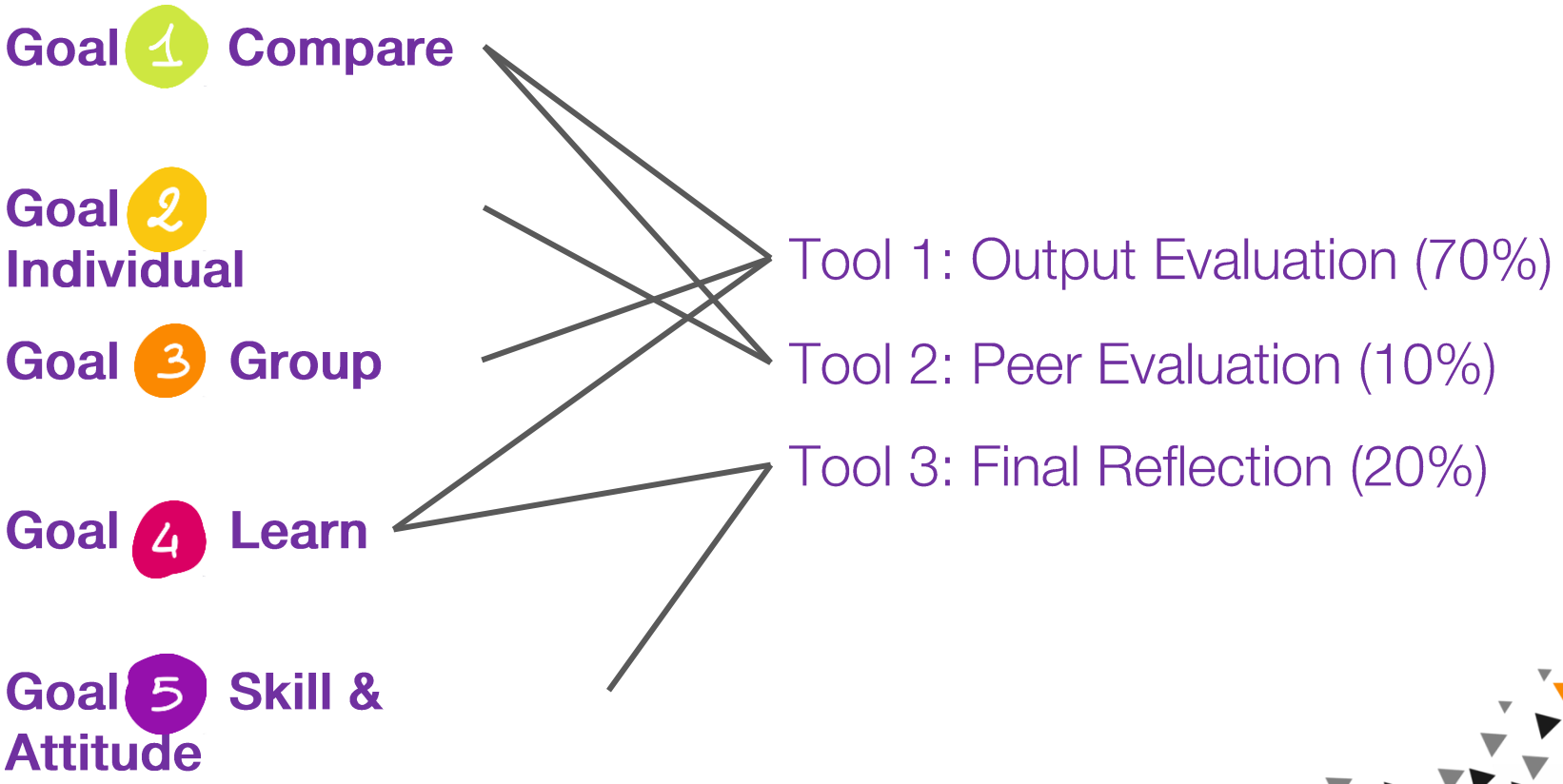
Design Thinking Mindset

Before writing the Individual Reflection, it is suggested that the Design Thinking Mindset questionnaire, available at https://designthinkingmindset.unibo.it/, be completed to support the reflection on different components of design thinking.

Format

Your reflective paper should capture the essence of your learning journey throughout the

- Ask students to fill a **two pages reflection**
- Use the **provided instructions**
- Provide clear guidelines for **evaluations based on**:
  - Variety
  - Depth
  - Relevance


Goal 1 Compare
Goal 2 Individual
Goal 3 Group
Goal 4 Learn
Goal 5 Skill & Attitude
Tool 1: Output Evaluation (70%)
Tool 2: Peer Evaluation (10%)
Tool 3: Final Reflection (20%)

Evaluate the reflections

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Evaluate the reflection

You will be provided with a set of Reflections. Read them individually, and then discuss in your group the evaluation of each dimension using the following template:

Variety - Evaluate the range of aspects the learner has included in their reflection.

Depth - Assess how thoroughly the learner has reflected on each aspect presented:

- Have they provided specific examples to support their reflections?
- Have they abstracted and generalised their conclusions?
- Have they considered how to apply their learnings in future situations?

Relevance - Determine the applicability of the reflected aspects to the student's professional life:

- Has the learner connected their reflections to the course content?
- Have they built upon the theoretical material and frameworks provided during the course?
- Are their insights relevant to their future professional development?

PAUSE

Time needed: **20** minutes

Reflect the evaluations

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Reflect the evaluation

Using the following question, reflect on what you learnt in the previous experience

FACT

What specific activities did you conduct? Describe in detail what happened during these activities. Focus only on objective facts: What have you been doing? How did people respond? Did you notice any interesting facts? What was one of the challenges you faced while doing this activity? How did you figure out the solution?

FEELINGS

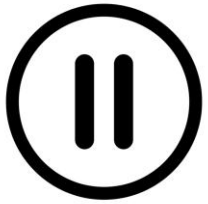
How did you feel during these activities? Reflect on your emotions and reactions. How did other people involved feel during the activities? Observe and describe their emotional responses

FINDING

Based on what happened and how people felt, what did you learn during these activities? Abstract from what you observed and consider how you can generalize these learnings. What broader insights can you draw from your experiences?

FUTURE

How will you apply what you have learned in the future? Think about how you can apply these lessons to other challenges you face. How can what you learned in this activity be applied to your life and work? What advice would you give to another group working on this activity based on your experiences and insights?



Time needed: **10** minutes

Day 3
Session 12
11.30 – 13.00

COURSE TRANSFORMATION
Evaluation

Day 3
Session 13
15.00 – 15.45

SUPPORT MANAGING STUDENTS THROUGH PROJECT JOURNEY

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Manage Students

1. Set clear expectations
2. Open communication
3. Promote collaboration
4. Identify and adress challenges

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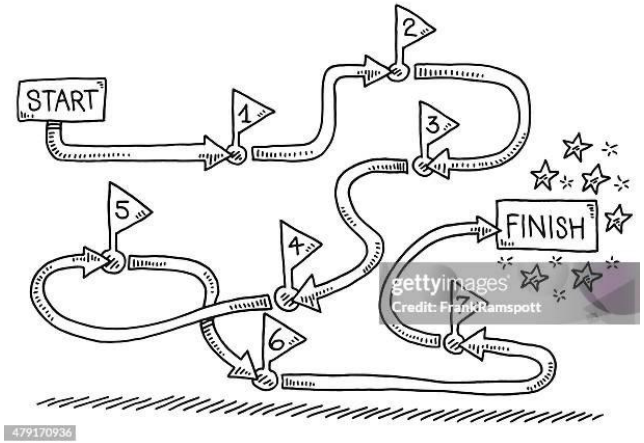
Manage Students

Set clear expectations

1. Learning objectives
2. Timeline: course plan
3. Deliverables
4. Evaluation criteria



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Design Thinking

STRUCTURE

LEARNING OBJECTIVES

1. Apply the Design Thinking methodology in order to solve business and societal problems.
2. Identify market opportunities based on desirabilty: understand how to explore unmet user needs.
3. Create solutions that are desirable.
4. Validate your ideas: create early prototypes and experiments to get initial feedback for your ideas.

MUTI-DIMENSIONAL LEARNING	EXPECTED LEARNINGS
KNOWLEDGE What we know and understand	• Design Thinking methodology and process. • Human centric design techniques. • Experiments for learning
SKILLS AND COMPETENCIES How we use this knowledge	• Creativity, innovation and entrepreneurship skills • Collaboration and teamwork skills • Communication skills
VALUES, ATTRIBUTES AND ATTITUDE How we behave and engage	• Growth mindset • Empathy • Learning to learn

Course Plan 2024

STRUCTURE

1	2	3	4	5	6	7	8	9
Kick-off and Explore challenge	Explore the challenge.	Learnings from research and Define opportunity	Ideation and Storyboard	Prototype	Prepare and run user tests	Insights and Iteration	Iteration	Final presentation

Interviews

User Tests

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Design Thinking

STRUCTURE

EVALUATION

The final grade is made up as follows:

30%

Assignments during the course

30%

Final deliverable

10%

Peer evaluation

30%

Individual assignment

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Manage Students

1. Set clear expectations
2. Open communication
3. Promote collaboration
4. Identify and adress challenges

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Manage Students

Open communication

1. Adress doubts
2. Feedback
3. Check-ins

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Manage Students

Feedback

1. Be Specific and Actionable

Specificity: Instead of general comments like “Good job,” provide detailed feedback. For example, “Your analysis in the second paragraph was strong because you used relevant evidence.”
Actionable Steps: Offer clear, actionable steps for improvement. For instance, “To strengthen your argument, consider adding more data to support your claims.”

2. Balance Positive and Constructive Feedback

Highlight Strengths: Start by acknowledging what the student or team did well. This builds confidence and reinforces good practices.
Constructive Criticism: Follow up with areas for improvement, but frame them positively. For example, “Your presentation was engaging. To make it even better, try to incorporate more visual aids.”

3. Encourage Self-Reflection

Self-Assessment: Before giving your feedback, ask students to reflect on their own work. This makes them more receptive to your comments and helps them develop critical thinking skills.
Guided Reflection: Provide questions or prompts to guide their self-assessment, such as “What part of your project are you most proud of?” or “What challenges did you face?”

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Manage Students Feedback

4. Create a Trusting Environment

Open Dialogue: Foster an environment where students feel safe to ask questions and make mistakes. This encourages them to view feedback as a tool for learning rather than criticism.
Regular Check-Ins: Schedule regular feedback sessions to discuss progress and address any concerns early on.

5. Use a Growth Mindset Approach

Effort and Improvement: Praise effort and progress rather than innate ability. For example, “I can see you’ve put a lot of effort into this project, and your research skills have really improved.”
Encourage Persistence: Emphasize that mistakes are part of the learning process and encourage students to keep trying.

6. Timely and Contextual Feedback

Immediate Feedback: Provide feedback as soon as possible after the task. This helps students connect your comments with their actions.
Contextual Relevance: Tailor your feedback to the specific task and the individual or team’s needs.

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Manage Students

Feedback

7. Incorporate Peer Feedback

Peer Reviews: Encourage students to give feedback to each other. This not only helps them learn to critique constructively but also to receive feedback from multiple perspectives.
Structured Sessions: Guide peer feedback sessions with clear criteria and examples of constructive comments.

8. Avoid the “Feedback Sandwich”

Direct Approach: Instead of the traditional “feedback sandwich” (positive-negative-positive), be direct but supportive. Acknowledge strengths, address areas for improvement, and provide a clear path forward.

Manage Students

1. Set clear expectations
2. Open communication
3. Promote collaboration
4. Identify and adress challenges

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Manage Students

Promote collaboration

Autonomy

Guided

miro

Missions

Teach-BEASTs
Teach to BE Aware STudents

Manage Students

Promote collaboration

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Manage Students

1. Set clear expectations
2. Open communication
3. Promote collaboration
4. Identify and adress challenges

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Manage Students

Identify and adress challenges

1. Time Management
2. Group conflict

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Manage Students

Group conflict

Conflict is a clash between individuals that arises out of a difference in opinions, attitudes, interests, behaviors, or perceptions there of.
(Glasl, F.)

Conflict is part of human nature

Conflict is a driver of change

Source: Adapted from ESADE Fusion Point Coaches Training in collaboration with DFGN, Fusion Point, March 2023

Manage Students

Group vs Team

A team can be defined as a small number of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they hold themselves mutually accountable.
(Katzenbach, Smith 2005)

Teamwork is essential for performance

Good teamwork is a guarantee for conflict

Source: Adapted from ESADE Fusion Point Coaches Training in collaboration with DFGN, Fusion Point, March 2023

Manage Students

Group conflict

It is NOT avoiding, hiding, ignoring or eliminating conflict.

Handling conflict in the best possible way to transform the frustrating energy and destructive dynamics into creative energy and nurturing relationships.

Source: Adapted from ESADE Fusion Point Coaches Training in collaboration with DFGN, Fusion Point, March 2023

Design Thinking

STRUCTURE

1. Time
2. Faculty team
3. Student teams
4. Project Challenge
5. Learning objectives
6. Evaluation

1. Managing students during project journey
2. Ongoing evaluation and feedback
3. Manage challenge owner

1. Evaluation and feedback

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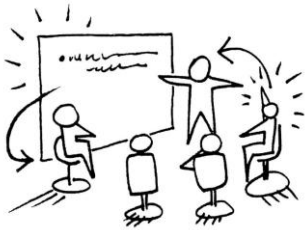
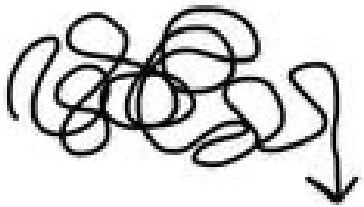
Manage Course

Resources

Your Roles



"Lecturer"
Knowledge



Facilitator of
the ourse

Coach
Team through
the process

Source: https://gamestorming.com/tag/facilitation/

Your Roles: Coach

“Design thinking coaching is about helping teams to recognize and then realize their potential.” (HPI,2022)

Your Roles

You are the jelly!

Hold the team together

Absorb shocks

Ensure everyone is on the same page

Source: ESADE Fusion Point Coaches Training in collaboration with DFGN, Fusion Point, March 2023

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Different modes of coaching

INSTRUCTING

The coach makes decision about the direction and next steps, without much discussion

SHOWING

The coach invites questions and input from team before making decisions. The coach shows or explains what to do next through examples

SUPPORTING

The coach frames a situation by presenting limits and options. The team discusses and makes own decision, with the guidance and support of the coach

ENTRUSTING

The coach allows the team full freedom to explore options and then carry them out, and reflect on learnings afterwards.

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Different modes of coaching

INSTRUCTING

" I want you to…"
"Now you are going to…"

SHOWING

"Let me show you…"
"Here is an example…"
"Lets do it together…"
"You should continue with this…"

SUPPORTING

"What might be the best way forward…?"
"Can you show me…?"
"Here are the options. What do you want to do…?"
"What you are struggling with…?"

ENTRUSTING

"How do you want to proceed…?"
"Why did you choose that…?"
"Why don't you try it out…?"
"Let's talk about what happened…"

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10 RULES OF COACHING

Design Factory Global Network

1. Help the team discover their intrinsic motivation

Let their interests be a driving force. The team will succeed best if we understand their motivations, and empower them with ownership.

2. Ask questions

The role of the coach is not to provide solutions or to make decisions, our job is to ask the right questions to help the team progress.

3. Coach towards goals

Coaching (vs. facilitation) is a goal-oriented activity. The team should set their own goal, the coach's job is to help them get there by supporting their process.

4. Keep the team on the same page

Coaching and asking the right questions will help the team stay in an aligned mindset during the process. This relates to for example divergent and convergent mindset, alignment in goals and aligned understanding of the problem or an idea.

5. Create psychological safety

Model behaviour that creates a safe space for creativity by providing encouragement, neutral feedback without judgement and expressing interest towards their ideas. Ambiguity is often the culprit for (internal) friction, and individual's progress is to be able to identify that.

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10 RULES OF COACHING

Design Factory Global Network

6. Engage the team in reflection and feedback

Reflection is a powerful in making learning more explicit. Giving feedback helps team members recognise each others' efforts, increase a sense of belonging and improve team performance.

7. Facilitate team dynamics

Help the team to use their full potential. Different disciplines and quieter voices sometimes need help in being recognised. Conflict is inherent in teamwork. Facilitate conflict resolution and emphasise that conflict should not be personal and only relate to e.g. a task or process.

8. Provide resources

Find and or ensure the team finds the resources they need to proceed. This may mean knowledge, an extra pair of hands, methods, materials etc.

9. Be explicit about your role

Often coaches have also domain expertise to bring to the table. Be explicit if and when you switch hats.

10. Be responsive

Sometimes you have to change your tactic. Be creative.

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10 RULES OF COACHING

6. Engage the team in reflection and feedback

Reflection is a powerful in making learning more explicit. Giving feedback helps team members recognise each others' efforts, increase a sense of belonging and improve team performance.

7. Facilitate team dynamics

Help the team to use their full potential. Different disciplines and quieter voices sometimes need help in being recognised. Conflict is inherent in teamwork. Facilitate conflict resolution and emphasise that conflict should not be personal and only relate to e.g. a task or process.

8. Provide resources

Find and or ensure the team finds the resources they need to proceed. This may mean knowledge, an extra pair of hands, methods, materials etc.

9. Be explicit about your role

Often coaches have also domain expertise to bring to the table. Be explicit if and when you switch hats.

10. Be responsive

Sometimes you have to change your tactic. Be creative.

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COACHING TIPS AND TOOLS

Support the team in keeping track of time

Make sure they progress and intervene when analysis paralysis sets in. Help them to make decisions by providing different perspectives. Give them a specific time frame to give them a deadline. Emphasise that making 'a' decision is more important then making 'the right' decision.

Ask questions

The rationale for asking questions is that the team can uncover information about or for themselves. Asking the right questions enables teams to access knowledge they did not know they had. It can be helpful to think about the first word: open-ended questions often begin with "what," "how," "who," "where," and "when."

Give a specific target

Always try to give the team a target, which is either a specific goal/number based (like 30 questions) or time based. That takes them away from quality requirements.

Encourage disengaged team members

If some participants are disengaged, give them whiteboard markers, post-it notes, ask them to stand up around the whiteboard etc. Having the tools in hand and standing up/being active often empowers them.

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COACHING TIPS AND TOOLS

Design Factory Global Network

Don't force it

Sometimes a break is the most useful method. It may give the team time to reflect and give clarity.

Encourage creativity

Even the wildest ideas can be scaled back. To prompt creativity you can suggest e.g. the following methods: Mash-Up Innovation, 'Random word' by Edward de Bono any other lateral thinking strategies, worst solution ideation and flipping it back, 100 ideas etc.

Listen

Have no prejudgement, listen actively, align yourself with the team's perspective and seek clarification. Explore whether there might be more behind the words than is actually being said.

Champion quick and dirty prototypes

The reason for prototyping especially in the early stage is to communicate and explore. Encourage the team to forget any technical concerns and emphasise that the prototype should be of low-resolution. Often teams take more time to decide not to prototype than it takes the time to make the lowest resolution prototype.

Agenda DAY 3

October 23rd, 2024 Venue: Fusion Point, Rambla of Innovation, ESADE Campus Sant Cugat

09.00 - 09.15	Day 3 Opening & plan for the day Esade
09.15 - 11.00	Session 11: Evaluation of PBL courses UNIBO
11.00 - 11.30	*Coffee break*
11.30 - 13.00	Session 12: Course transformation cont. UNIBO
13.00 - 15.00	*Lunch break*
15.00 - 16.00	Session 13: Supporting structure Esade
16.00 - 16.15	*Coffee break*
16.15 - 16.45	Session 14: Share & Feedback: Course Transformation Esade
16.45 - 18.00	Workshop close and feedback Esade

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Day 3
Session 14
16.30 – 16.45

SHARE CONTENT Q&A

Day 3
Session 14
16.45 – 17.00

YOUR CONTRIBUTION COUNTS!

How to share your work with us

Before uploading your material:

- Highlight changes made to your syllabus, in order to help us identify them;
- Take pictures of the notes you took on your booklet that you're considering relevant to let us understand the process you've been through during the workshop;
- Collect the new supporting material you developed for your STEM course;

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How to share your work with us

How to upload your material:

- Join the shared folder we created;
- Find your team;
- Get into your personal folder (the one with your name);
- Upload the material required;

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How to share your work with us

SHARED FOLDER WHERE TO UPLOAD YOUR WORK

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Brief recap

Useful material to implement PBL into your course:

- "DT meets STEM" manual (first draft);
- "Teach-BeAst Barcelona training master slide" slide deck used during the workshop;
- Evaluation Tools;
- Link to: Miro boards;
- "Missions", guidelines documents for students explaining DT stages and tools.
- Link to: Syllabus example updated with PBL process;
- Your notes in the personal Booklet

Day 3

WORKSHOP FEEDBACK

Feedback. Day 3

I learnt…

I liked…

I wish…

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THANK YOU

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