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ARCHITECTS

# TRAINING PROGRAM

2025

SYNTHESIS
CENTER FOR RESEARCH AND EDUCATION

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CONSULTING

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# INDEX

# 1. INTRODUCTION

## 1.1 Purpose of the programme

The purpose of this programme is to train Vocational Education and Training (VET) teachers and educational content creators in the use of Design Thinking (DT) as a person-centred methodology for solving complex problems and fostering creativity in the learning process. This approach will enable them to design and facilitate activities that enhance key learner competences, such as empathy, innovation, collaborative work and adaptability to a changing work environment.

In addition, the programme aims to highlight the relevance of DT as a transformative tool for delivering a more inclusive and equitable education. It responds to the needs of learners with specific educational requirements and those from vulnerable minority groups.

By placing learners at the centre of the process, DT enables the creation of educational solutions that recognise diversity, remove barriers and promote the active participation of all learners, thereby generating meaningful learning opportunities that respect and value their contexts and perspectives.

# 1.2 Specific objectives

**Pedagogical transformation:** Equip VET educators and educational product designers with tools and techniques to integrate DT into their teaching practices, promoting experiential learning and active student participation.

**Attention to diversity:** Strengthen the ability of VET educators and educational product designers to identify the specific learning needs of students with functional diversity, special educational needs, or from vulnerable backgrounds, and create personalised experiences that promote their inclusion.

**Student-centered approach:** training educators and those who create educational products to apply empathetic methodologies that place students' needs, aspirations, and backgrounds at the center of the educational process.

**Creative problem solving:** Teach VET educators how to guide learners in identifying real problems, formulating challenges, and creating innovative and viable solutions.

**Team building:** Provide facilitation strategies that promote collaboration among learners, leveraging diversity and varied perspectives to solve problems collectively.

**Preparation for future labour market demands:** Equip VET Educators and educational product designers with knowledge that will enable them to align learning activities with today's labour market demands, such as critical thinking, adaptability, and innovation.

## 1.2 Specific objectives

**Promotion of sustainability and social innovation:** Train VET educators and educational product designers to lead projects with positive impacts on educational and local communities, developing sustainable proposals aligned with environmental and social needs.

**Inclusive and equitable education:** Promote the use of DT to build accessible educational environments, where individual differences become strengths, removing barriers to learning and fostering equal opportunities for all learners.

# 2. CONTEXT

## 2.1 Who is this programme designed for?

This training programme is intended for education professionals working in the field of VET, as well as developers of educational products who wish to deepen their knowledge of innovative methodologies to enhance the learning experience.

# 2.1.1 Participant profile

## Vocational education teachers

- Active VET teachers working directly with students in various fields, from technical training to training in creative or service areas.
- Professionals committed to the continuous improvement of educational quality and inclusion.
- Individuals interested in acquiring practical tools to design learner-focused experiences that encourage active participation and empowerment.


## Developers of educational products

- Creators and designers of educational materials and resources seeking to integrate user-centred approaches.
- Professionals interested in working closely with teachers and students to develop more inclusive and functional tools.

## 2.1.2 Indirect beneficiaries

While the programme directly targets participants, its impact extends to:

- Vocational students: They will benefit from an educational approach more focused on their individual needs and the development of practical competences adapted to both labour and social contexts.
- Social minorities and students with special educational needs: The implementation of DT will help overcome barriers to inclusion and facilitate more accessible, equitable, and personalised experiences.

## 2.1.3 Participant motivation

Participants should be motivated to:

- Adapt their teaching methodologies to a learner-centred approach.
- Innovate in their educational practices to cater for diversity in the classroom.
- Promote an inclusive educational culture that encourages the active participation of all learners, especially those at risk of social exclusion or with special educational needs.

Overall, this programme is aimed at professionals with a vision for change and a commitment to transforming vocational education into a more inclusive, innovative, and meaningful learning environment.

# 2.2 Training needs analysis

To implement DT as a pedagogical tool it is necessary to identify the current gaps, challenges and opportunities faced by VET educators and educational product designers. This analysis will then inform the design of a self-guided training programme that is relevant, accessible and applicable in educational practice.

## 2.2.1 Identified needs and gaps

a) Lack of training in innovative methodologies

- Many VET educators and educational product designers have not received specific training in user/learner-centred approaches like DT.
- There is a reliance on traditional, content-delivery models, which limit the development of practical and creative skills.

b) Limited experience with inclusive design

- Lack of tools and strategies to manage diversity in the classroom, including learners from minority groups, at risk of exclusion, or with special educational needs.
- Promoting empathy and personalisation in pedagogy remains a challenge.

c) Constraints in creating practical solutions

- Little experience in applying structured processes to identify concrete problems and develop applicable solutions tailored to learners' real needs.

## 2.2.2 Key training challenges

a) Diverse educator profiles

VET educators come from a wide variety of fields (technology, services, industry, etc.), making it difficult to offer a one-size-fits-all approach. DT tools must be flexible to adapt to different professional areas.

b) Limited training time

Educators face heavy workloads that limit the time available for in-person training. Flexibility and self-directed learning are essential.

c) Integrating technology

While many educators and educational product designers are familiar with digital tools, not all have experience in using them for creative processes or designing accessible resources for learners.

d) Cultural resistance

Some educators and educational product designers may be reluctant to change their traditional working methods, especially if they do not see the practical benefits of DT in their contexts.

# 2.2.3 Specific challenges in vocational training

**Labour market alignment**
VET learners need to develop transversal skills (problem solving, creativity, collaboration) that are not always emphasised in current curricula.

**Inclusion**
A diverse student population requires tailored strategies that encourage active participation and reduce educational barriers.


**Professional focus**
VET educators and educational product designers need tools that directly connect the phases of DT with real situations encountered in their workplace.


# 2.2.4 Programme focus

To address these challenges, the training program aims to:

1. Provide a clear and structured framework: explaining each phase of DT with specific tools adapted to VET (empathise, define, ideate, prototype, test).
2. Encourage practical reflection: including real examples and self-guided exercises that VET educators and educational product designers can apply directly in their work.

3.Prioritise inclusion and empathy: offering specific modules on learner diversity and design inclusive activities.
4.Ensure flexibility and adaptability: delivering self-paced, digital content, adaptable to each specific part of the education process.

This approach will ensure the effective application of DT, generating a positive impact on educational design and creating learning opportunities for learners, particularly those from vulnerable or minority backgrounds

# 3. EXPECTED LEARNING OUTCOMES

By the end of this DT training programme, participants will have acquired the following competences, skills, and knowledge:

**Competences:**

1.Creativity and innovation: ability to develop novel and practical solutions to complex problems.

2.Problem Solving: ability to address challenges in a structured way, considering both user needs and environmental constraints.

3.Collaboration and teamwork: skills to work in interdisciplinary environments using a participatory approach.

4.Critical and analytical thinking: ability to objectively assess problems and solutions, with a focus on iteration and continuous improvement.

5.Empathy: a deep understanding of the needs and motivations of those affected by the problems addressed.

**Skills:**

1. Application of the DT process: mastery of the process phases: empathise, define, ideate, prototype, and test.
2. Effective communication: clear expression of ideas and solutions targeted to diverse audiences.
3. Project management: competence in organising, planning, and executing design projects, including setting objectives and evaluating outcomes.
4. Use of creative tools: proficiency in techniques such as brainstorming, prototyping, and ideas evaluation.
5. Adaptability: ability to reformulate solutions based on feedback and changing conditions.

**Knowledge:**

1. DT methodology: understanding of its human-centred approach and its applications across business, social and educational contexts.
2. Five stages of the DT model: comprehension of its structure, which combines divergent and convergent phases.
3. Importance of empathy: recognition of users' perspectives as central to generating effective solutions.
4. Innovation and sustainability: awareness of how to create solutions that are effective, viable, and sustainable over time.
5. Inclusive design: knowledge of how to remove barriers in learning design.

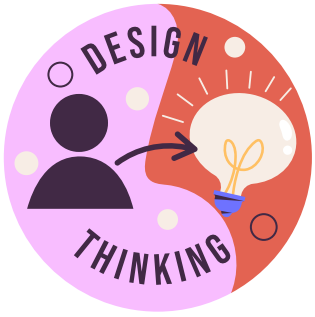
# 4. STRUCTURE OF THE TRAINING MODULES OF THE SELF-LEARNING PROGRAM

The programme is organised into seven self-contained, practical training modules, beginning with a general introduction followed by a detailed examination of each phase of the DT process. The modules have a clear structure to facilitate autonomous learning.

The materials provided - including the manual, supplement, teaching materials, and examples of good practice - are a valuable resource to support the development of educational projects. For those undertaking self-guided learning, we recommend progressing through the content gradually and systematically, completing all proposed activities to ensure full assimilation of the concepts.

**Common features of all modules:**

- Theoretical concepts: mandatory reading from the manual to deepen understanding of the concepts and each step of the methodology.
- Practical format: self-guided exercises to apply newly acquired knowledge.
- Downloadable materials: templates, guides, and examples tailored for VET educators and educational content developers.
- Continuous assessment: final self-assessment sections with key questions and reflections.
- Real-world application: examples and practical VET case studies to contextualise the concepts.









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# Module 0
# Introduction to the programme and Design Thinking methodology


Training program

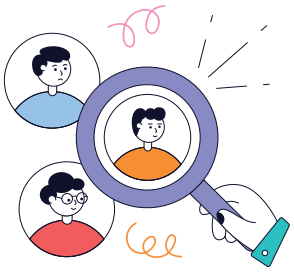
# 1. Module summary

**General objective:**

To familiarise participants with DT methodology and its application in the context of VET (VET), highlighting its impact on inclusive education and creative problem solving.
Participants are encouraged to read this module carefully, paying special attention to new terminology and the main phases of the process. This module can be completed either as a self-guided course or in support of an already identified project.

Estimated duration:
3-4 hours

Format: self-guided



Main resource: theoretical manual

Purpose: This initial module lays the conceptual foundations of DT and connects its methodology to pedagogical goals in VET, with a particular focus on its ability to make education more inclusive and dynamic.

# 2. Module contents

- What is DT and what are its benefits in inclusive education?

Concept and origins of DT
Benefits of a human-centred approach to educational challenge
Applications in inclusive and multicultural settings

- Links between each phase of the process and pedagogical goals:

Empathise: understand learners and their needs
Define: formulate clear and specific educational challenges
Ideate: generate creative responses to those challenges
Prototyping: create tailored tools or strategies
Test: validate solutions with students and adjust based on feedback

# 3. Resources and tools

- Manual: Design Thinking in Vocational Education, Chapter 1: How to understand Design Thinking, or a few words about the nature of DT.
- Supplement: Integration of inclusive communication in VET DT practice.
- Teaching materials: Key techniques and tools to be used aligned to each phase.
- Good practices: Inspiring examples of how some organisations have taken advantage of the benefits of DT with users.

# 4. Proposed activities

**Personal Reflection**

- Purpose: To explore how difficulties can become educational challenges.
- Instructions: Answer the following questions:

What challenges do you observe in your educational practice that could benefit from an approach such as DT?
How do you think empathy could transform your relationship with students?

**Connecting pedagogical phases and objectives**

- Purpose: To identify how the phases of DT relate to inclusive teaching.
- Instructions:

Read the phase descriptions in the handbook.
Create a practical example for each phase as applied to your educational setting.

**Case studies: inclusive education and entrepreneurship projects**

- Purpose: To reflect on the impact of DT in diverse contexts.
- Instructions:

Read chapter 3 from the supplement on how to integrate inclusive communication in VET DT practice, featuring students with diverse educational needs.
Reflect: How might you use DT to design an inclusive activity?

Read about an example VET educational project that has used the DT approach.
Reflect: How might you use DT to create a project related to your area of expertise, focused on entrepreneurship or increased employability?

# 5. Module evaluation and closure

Self-assessment:
Format: Self-reflection questionnaire with open-ended responses.

Key questions:

1. What have you learned about DT and its relationship to inclusive education?
2. What potential do you see in the DT methodology for future business projects?
3. What ideas would you like to implement in your teaching practice?

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## Module 1

# Prepare

Training program

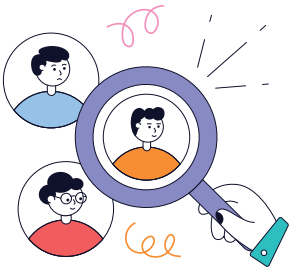
# 1. Module overview

**General objective:**

To lay the necessary to initiate the DT process in educational settings, highlighting the importance of initial diagnostics, effective time and resource management, and the development of collaborative teams.

Estimated duration:
5 - 6 hours

Format: self-guided



Main resource: theoretical manual

# 2. Module contents

1. Initial diagnosis: identifying educational challenges, gaps, and opportunities.
2. Time and resource planning: strategies to structure the process.
3. Building collaborative teams or individual strategies: key considerations for building effective teams and managing individual projects.

# 3. Resources and tools

- Read chapter 2 of the manual, Design Thinking in Vocational Education, dedicated to process preparation and teamwork strategies.
- Teaching materials and project brief templates to help build an overview of the project, and the team alignment map to structure collaboration in group projects.
- Teaching materials: the Project Agenda can be used in all phases, but is most helpful at the beginning. It acts as an organising tool, helping to structure the steps needed to reach the next objective. It also supports the identification of specific challenges that may arise during the project, allowing them to be addressed effectively before moving forward.

# 4. Proposed activities

**Initial diagnosis: identifying the challenges**

- Purpose: To analyse the educational context, identifying problems and opportunities.
- Instructions:

Reflect on the main educational challenges in your setting.

Use a table to classify:
Observed challenges
Opportunities for innovation
Gaps that DT could address

Write a brief summary of the priority challenge to be tackled.

**Preparing the Project Brief**

- Purpose: To facilitate a clear and structured definition of the key aspects of an educational project, helping the team to focus their attention, identify challenges and plan the work. This activity will provide an overview to guide the DT process and foster a shared understanding among team members.

- Preparation:

Material needed: Read the project brief methodology in the teaching materials document and use the project brief template (01_preparation_01_Project_brief).
With your team, read through the general objectives of the educational project and the context in which it will be developed.

- Project brief Instructions:

Briefly describe the educational project's focus.
Identify the primary beneficiaries or users.
Specify any limitations or constraints.
Define the desired outcomes of the project.
Outline the major milestones or key stages.
Review and ensure team agreement on all aspects.
Store the Project Brief in an accessible location.
Use and update the brief throughout the project.

- Expected outcomes: Upon completing this activity, the team will have a clear and structured overview of the project, serving as a guide for the work ahead. The Project Brief will help maintain focus and enable effective monitoring of objectives and expected outcomes throughout the design process.

**Process Planning: Time and Resources**

- Purpose: To develop an initial plan for the project.

- Instructions:

Create a rough timeline for the DT phases (empathise, define, ideate, prototype, test).
List the resources needed for each stage (materials, spaces, technological tools).
Define key performance indicators (KPIs) to measure progress in each phase.

**Creating the Team Alignment Map**

- Purpose: To foster team cohesion and alignment by establishing a clear, shared action plan. This activity will help participants identify objectives, resources, roles and potential risks, ensuring effective collaboration focused on the success of the project.

- Preparation:

Read the methodology for the team alignment map in the teaching materials. Meet with your team and provide each member with a copy of the map template (*01_Preparation_02_team_alignment_map*).
Before starting, briefly review the basic concepts of DT and the context of the educational project, in order to align expectations.

- Instructions for the team alignment map:

Gather as a team.
Define project objectives collaboratively.
List necessary resources and individual roles.
Discuss potential risks and mitigation strategies.
Ensure team alignment and commitment.
Document and regularly update the agreement.

- Expected outcomes: At the end of this activity, the team will have developed an orientation map that serves as a structured guide for collaborative work. It will support communication, task distribution, and adaptability in response to project challenges. This tool will act as a valuable reference point throughout the DT process.

# 5. Module evaluation and closure

Self-assessment:

Format: written reflection and preparation checklist.

Key questions:

1. What educational challenge have you identified and how do you plan to address it?
2. Is your timeline aligned with the phases of DT?
3. Is your team or individual strategy clearly structured to support successful progress?

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## Module 2

# Empathise


Training program

# 1. Module overview

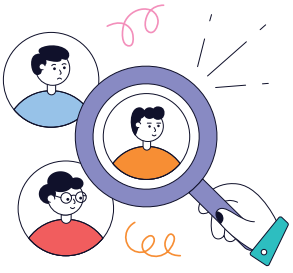
**General objective:**

To understand the needs, interests and contexts of learners and other educational actors, identifying barriers to inclusion and accessibility in order to design human-centred pedagogical solutions.
In this module you will develop the following skills:

- Learn how to conduct effective interviews and observations to gain an in-depth understanding of users' or stakeholders' needs.
- Identify and map emotions, motivations and behaviours through tools such as empathy maps or user diaries.
- Recognise and challenge personal biases to adopt a user-centred perspective.

Estimated duration:
15 - 20 hours

Format: self-guided



Main resource: theoretical manual

Purpose: This module will enable participants to explore methods and tools useful for empathising with learners and educational stakeholders, laying the foundations for more inclusive and people-centred educational design.

# 2. Module contents

1. What it means to empathise in an educational context:
Concept and relevance of empathy as a foundation for understanding students and educators.

2. Methods for collecting information:
Techniques such as interviews, observation, and surveys, adapted specifically for use in educational settings.

3.Identifying barriers to inclusion and accessibility:
Recognition of obstacles to learning along with strategies for overcoming them.

# 3. Resources and tools

- Required reading on the empathy phase in the manual: Design Thinking in Vocational Education, Chapter 3. Stages of the Design Thinking process - 3.1 Empathisation
- All teaching materials and templates from the empathy phase

# 4. Proposed activities

**Personal reflection: understanding empathy**

- Purpose: To internalise the role of empathy in the educational process.

- Instructions:

Reflect on a situation in your teaching or working experience where empathising with a student or colleague enabled you to solve a problem or improve communication.

Write a short paragraph on how you could have deepened that empathy to achieve a better result.

**Understanding needs and contexts**

- Purpose: To facilitate an initial exchange of information, ideas and knowledge among team members around a specific educational issue. This activity will support a deeper understanding of the needs of learners and other educational stakeholders, identify barriers to inclusion, and lay a strong foundation for designing human-centred pedagogical solutions.

- Preparation:

Materials needed: flipcharts or whiteboards, markers, sticky notes, or collaborative digital tools (such as Miro, Jamboard or Padlet).
Identify a specific educational issue or challenge to work on (e.g. barriers to inclusion in the classroom or pedagogical adaptation for students with functional diversity).
Assign a facilitator to lead the session.

- Instructions:

Introduction to the team

Explain the purpose of the Buzz Report to the team (read the methodology 02_Empathise_04_Buzz_reports in the teaching materials): to generate a quick exchange of ideas, knowledge and questions to explore a topic in depth.

Remind them that there are no wrong answers and that the intention is to collect as many ideas as possible.

Round 1: Brainstorming

Initial question: What do we know about this issue?

Each team member writes on sticky notes (or digitally) everything they think they know about the topic.

Paste or record the notes on a common surface, grouping similar ideas together.

The facilitator briefly reviews the emerging categories.

Round 2: Identifying knowledge gaps

Key question: What don't we know but need to know?

The team generates questions or identifies gaps in knowledge.

These questions are written down in a dedicated section of the shared workspace.

Round 3: Sources and resources

Key question: Where can we look for more information?

Participants suggest potential sources of information (relevant individuals, research materials, previous experiences, or online resources).

These sources are ranked according to accessibility or priority.

Discussion and synthesis

The facilitator leads a discussion on emerging patterns:

What do we already know that we can use as a starting point?

What gaps need immediate investigation?

What resources are most viable for deepening understanding?

Documentation and next steps

Organize the collected information into a readable format, such as a document or digital dashboard.

- Define concrete actions to investigate the identified knowledge gaps.
- Assign research or interview responsibilities to key people.

Expected results:

- A shared understanding of the problem, including student needs and associated educational challenges.
- Identification of relevant barriers to inclusion or accessibility.
- A set of guiding questions and information sources to support the next phases of the DT process.
- Strengthening team cohesion and alignment through a clearer understanding of context and shared goals.

**Qualitative open-ended interviews to understand needs and contexts**

- Purpose: To conduct open-ended qualitative interviews to gain an in-depth understanding of the needs, motivations and desires of learners and other educational stakeholders. This activity will gather valuable information that may not be evident in initial observations or meetings, helping to identify barriers to inclusion and accessibility.

Instructions:

- Preparation

Material required:
Template of open-ended questions.
Tools for recording responses (recorder, notebook, or digital application).
List of participants to be interviewed (students, teachers, families, etc.).
Define the specific objective of the interviews: What do you want to understand about the user (e.g. their barriers to inclusion in the classroom, specific learning needs)?

Question design
Design a short interview using the teaching material (02_Empathise_05_Individual_interview_questionnaire).
You may add open-ended questions that explore educational needs, barriers to inclusion, or any other issues of interest.
Conduct the interview with a colleague or simulate an observation of an educational setting, noting down relevant details.

Interviewee selection
Choose a target profile and conduct a second interview, applying the recommendations provided in the manual for effective interviewing.
Identify key individuals who can offer relevant insights (e.g. students with functional diversity, teachers from various disciplines, family members).
Be sure to include a diverse sample to capture multiple perspectives.

- Conducting the interviews

Create a comfortable and safe environment for the interviewee.
Start with general questions to break the ice and progress to more specific topics.
Listen actively, avoiding interrupting, and use follow-up questions to explore responses in greater depth.
Example follow-up questions: "Can you explain that a bit more?" or "How does that situation make you feel?"
Document all information respectfully and ensure confidentiality throughout the process.

- Analysis of the information collected

As a team, review the notes and recordings to identify patterns, recurring themes, and relevant findings.
Sort the information into categories such as: needs, barriers, potential ideas.

- Synthesis and reflection

Create a summary of the main findings.
    - Example: "Most students indicated that they need visual tools to better understand abstract concepts".

Reflect on how these needs can be addressed in the design phase.

- Expected outcomes:

Detailed understanding of users' needs, motivations, and barriers.
Identification of key areas for improving inclusion and accessibility.
Generation of initial ideas for human-centred pedagogical solutions.
Strengthened emotional connection and empathy towards users.

This activity fosters essential elements for success in the empathy phase: active listening, sensitivity to individual needs, and reflective analysis.

**Identification of obstacles and proposals for inclusive solutions**

Purpose: To apply key tools for recognising obstacles in educational settings and design inclusive solutions focused on the needs of educational stakeholders. This activity integrates the use of the SWOT Diagram, Stakeholder Map, the Five Whys technique and Role Play, allowing for an in-depth and collaborative analysis.

Instructions:
1. Preparation
Material required:

Methodology texts and templates for:
SWOT Diagram (02_Empathize_08_SWOT)
Stakeholders Map (02_Empathize_06_Stakeholder_map)
The Five Whys (02_Empathize_09_The_5_whys).
Understanding of the methodology and ample space for Role Play activities (02_Empathize_11_Role_play)

Markers, sticky notes, or collaborative digital tools.

Define an inclusive problem or challenge to work on (e.g. Lack of accessibility in group activities or Learning barriers for students with functional diversity).

2. Stages of the activity

Stage 1: SWOT diagram (Strengths, Weaknesses, Opportunities, and Threats)

- Objective: to identify internal and external factors that affect the chosen educational challenge.
- Instructions:

1. Draw a SWOT matrix with four quadrants.
2. In teams, discuss and record:

Strengths: Existing resources or capacities that support inclusion.
Weaknesses: Internal aspects that hinder inclusion.
Opportunities: External factors that may enhance inclusion.
Threats: External factors that represent barriers.

3. Reflect on how to maximise strengths and opportunities, and how to minimise weaknesses and threats.

1. Reflect on how to maximise strengths and opportunities, and how to minimise weaknesses and threats.

Stage 2: Stakeholder map

- Objective: To identify and prioritise key individuals or groups involved in the problem or its solution, based on their influence and interest.
- Instructions:

1. Read the methodology from the teaching materials and use the template 02_Empathize_06_Stakeholder_map dividing stakeholders into four categories: monitor, keep satisfied, manage closely, keep informed.
2. Discuss how each actor might influence the problem or contribute to solutions.

Stage 3: The Five Whys

- Objective: To uncover the root causes of the specific obstacles identified.
- Instructions:

1. Read the methodology from the teaching materials and the template from 02_Empathize_09_The_5_whys, to guide the exercise.
2. Select an obstacle identified in the SWOT or Stakeholders Map.
3. Ask "Why does this problem occur?" and record the answer.
4. With each answer, ask "Why?" again until you reach five levels of depth.
5. Reflect on the root of the problem and discuss possible solutions.

Stage 4: Role play

- Objective: To experience the perspectives of different stakeholders and explore inclusive solutions.
- Instructions:

1. Read the methodology from the teaching materials and use the template to guide the exercise (02_Empathize_11_Role_play).
2. Create a scenario based on the identified challenge (e.g. a classroom lacking adapted materials).
3. Assign roles to participants (e.g. a student facing barriers, a teacher, a parent, an administrator).
4. Each participant should act out their role, sharing how they perceive the problem and what solutions they would propose from their assigned perspective.
5. Record ideas and perspectives that emerge during the exercise.

Synthesis and final reflection

- As a team, analyse the results of the four tools used.
  - What key obstacles were identified?
  - What inclusive solutions emerged?
  - What actions can be implemented in the short and long term?
- Create a visual or written summary of the findings and proposed solutions.

Expected outcomes:

- Clear identification of internal and external obstacles affecting educational inclusion
- Deeper understanding of the perspectives of diverse educational stakeholders
- Proposals for inclusive solutions, based on in-depth and collaborative analysis
- Strengthened empathy and cooperation among participants

**Observation of natural behaviour in the educational setting**

Purpose: To observe and analyse the natural behaviour of learners and other educational actors in their everyday environment in order to identify challenges, opportunities, and barriers to inclusion. Using structured observation techniques, this activity gathers meaningful data on the context, interactions, and sensory conditions of the educational space.

Instructions:
Preparation

- Reading: Teaching materials
- Observation techniques (*02_Empathize_13_Observation_techniques*)
- Shadowing learning (*02_Empathize_14_Shadowing_learning*)
- Material required
  - Observation template with structured sections for the various techniques
  - Tools for recording observations such as a notebook, audio recorder (if allowed), or camera (ensuring privacy and with consent).
- Selection of the environment:
  - Choose the space to be observed (classroom, corridor, school canteen, laboratory, etc.).
  - Define the purpose of the observation: What do you want to analyse? (e.g. accessibility of the environment, social interaction in the classroom, reactions to sensory input)
- Consent and ethics:
  - Inform participants about the activity and obtain the necessary permissions, ensuring confidentiality.

Stages of the activity

Stage 1: Observation of the environment or context

- Technique: observe physical and spatial conditions.
- Aspects to document:
  - Accessibility: Are there any physical barriers to access or use of the space?
  - Organisation: How are elements distributed?
  - Available resources: Are they adequate and accessible to all users?
  - General conditions: cleanliness, lighting, temperature.
- Example of observation: "The classroom has furniture that makes it difficult for students with reduced mobility to move around".

Stage 2: Observation of social interactions

- Technique: observe how users interact with each other.
- Aspects to document:
  - Dynamics between students: Do they collaborate, compete, ignore?
  - Interaction with the teacher: Is there active participation, questions, clarifications?
  - Inclusion: Do any students seem isolated or excluded?
- Example observation: "One student remained silent during the whole group discussion and seemed disconnected".

Stage 3: Observing user behaviour

- Technique: observe users' in a natural way.
- Aspects to document:
  - Use of space: How do users move and position themselves?
  - Task engagement: What strategies do they use to complete activities?
  - Response to stimuli: How do they respond to new instructions or changes?
- Example observation: "Students avoid using one particular corner of the classroom because it is poorly lit".

Stage 4: Sensory observation

- Technique: analyse sensory stimuli present in the learning environment.
- Aspects to document:
  - Odours: Are they pleasant or unpleasant?
  - Sounds: Is there any excessive noise or auditory distractions?
  - Lighting: Is it sufficient and adequate?
  - Temperature: Is the environment comfortable to work in?
- Example observation: "Noise from the corridor often disrupts concentration in the classroom".

Synthesis and reflection

- As a team, analyse the recorded observations:
  - What common patterns or themes have emerged?
  - What barriers or challenges are most evident?
  - What opportunities for improving the learning environment have been identified?
- Document your findings in a shared format (e.g. Miro, Jamboard, or collaborative document) to support further analysis.

Proposed Actions

- Define possible solutions to the challenges observed:
  - What changes should be made to the setting?
  - How can social interactions be enhanced?
  - What additional resources or adaptations may be required?

Expected outcomes:

- A detailed understanding of the existing environment, interactions, and barriers
- Identification of opportunities for improving accessibility, inclusion and dynamics
- A list of initial proposals for solutions that respond to the observed needs

# 5. Module evaluation and closure

Self-assessment form in annex: The aim of the self-assessment in this phase is to reflect on participants' ability to gain a deep understanding of users' needs, interests and contexts, to identify barriers to inclusion, and to collect key information using the tools and techniques learned.

- Format:
  - Reflective questionnaire with open-ended questions and numerical rating scale.
  - Optional: Visual synthesis activity (mind map or infographic on the findings).
- Estimated duration: 15-20 minutes.

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## Module 3

# Define

Training program

# 1. Module overview

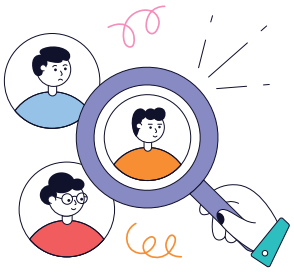
**General objective:**

Users will develop the following skills in the defining phase:

- Synthesising information gathered during the Empathise stage to identify patterns and opportunities
- Formulating clear, user-centred problem statements
- Creating frameworks that stimulate creative problem-solving by encouraging new perspectives and approaches

Estimated duration:
15 - 20 hours

Format: self-guided



Main resource: theoretical manual

Purpose: To translate the information obtained into concrete problems and needs to be solved.

# 2. Module contents

- How to structure the information collected
- Definition of relevant educational problems
- Drafting a clear statement of needs
- Methods and templates for structuring data
- Format for drafting the key problem

# 3. Resources and tools

- Required reading on the defining phase in the manual: *Design Thinking in Vocational Education*, Chapter 3. Stages of the Design Thinking process, 3.2 Defining
- Methodology descriptions and templates for structuring the information from the "Define" phase provided in the "Training Materials" can be used.
- Good practices showing how to translate information from a particular group of people into concrete problems or needs.

# 4. Proposed activities

**Field research**

Purpose: To use field research to deepen the diagnosis of the problem identified during the empathy phase. Direct observation and interaction with users will deepen understanding of the needs and challenges they face.

Instructions:

1. Preparation:

- Materials needed: notebooks, audio recorder (if possible), camera for documentation (respecting privacy and with consent).
- Define the key questions that will guide the research, based on the findings of the empathy phase. Example:
  - How do they use current resources?
  - What challenges do they face on a daily basis?
  - What aspects of the environment do they find most problematic?

2. Fieldwork:

- Make visits to where the users are located (classroom, workshop, community space, etc.).
- Observe behaviours, interactions and possible barriers. Take detailed notes.
- Interview them briefly to clarify doubts or gather additional perspectives.

3. Information synthesis:

- Analyse the data collected to identify patterns or recurring themes.
- Classify the information into categories such as: needs, barriers, key behaviours and opportunities.

4. Expected outcomes:

- A refined diagnosis of the problem based on actual observations.
- Identification of key patterns that will influence the definition of the design challenge.

**ERAF (Environment, Resources, Actors, and Functions) system diagrams**

Purpose: To visualise and structure the key elements of the problem, analyzing complex systems and understand the relationships between different elements within those systems.

Instructions:
Read the teaching material related to ERAF System Diagrams (*03_Define_25_ERAF_system_diagrams*) to gain an introduction to ERAF.
Explain the components of the ERAF diagram:
**E:** Environment (the external factors and influences that impact the system).
**R:** Resources (identify and categorise the resources available within the system, such as materials, funding, expertise, and technology).
**A:** Actors (identify and map out the key stakeholders, organisations, or entities involved in the system).
**F:** Functions (identify and categorise the key functions or activities performed within the system).

Preliminary mapping

As a team, draw a preliminary map of the system related to the identified problem.

Include key actors (students, teachers, families), resources used (materials, technologies), activities (lessons, assessments), and elements of the environment.

Diagram analysis

Identify areas of congestion, disconnection or overload in the system.

Key questions:

Which elements are disconnected?

Which relationships are the weakest or the most conflictive?

Which flows are inefficient or non-existent?

Proposals for improvement

Define specific changes that enhance relationships, activities, or flows within the system under analysis.

Example: Improve communication between students and teachers by implementing a specific digital tool.

Expected outcomes

A clear visual representation of the educational system related to the problem.

Identification of critical areas where the system is inefficient and initial proposals to improve its functioning.

- The findings of the Field Research and System Mapping will be synthesised to formulate the design challenge, ensuring that it is clear, specific and relevant to the identified needs.

**Creation of a Persona**

Purpose: To build a detailed user profile based on the information gathered in the empathy phase, enabling the design process to focus on the user's key needs, characteristics, and behaviours.

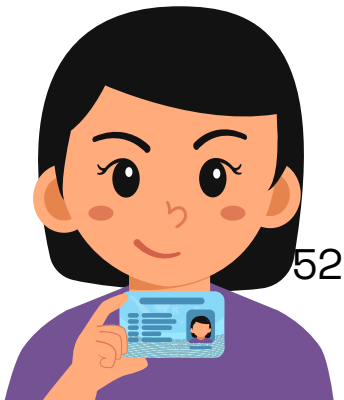
Instructions:

1. Preparation

- Gather key data from the empathy phase (interviews, observations, etc.).
- Using the template from the teaching materials (*03_Define_16_Persona*), create a persona with the following elements:
  - Fictitious name and photo (or drawing)
  - Demographic data (age, gender, role, etc.)
  - Basic behaviour patterns
  - A realistic image of the user
  - Needs and expectations
  - Frustrations and barriers
  - Personal motto/quote

2. Creation of the Persona

- In teams, select a profile and complete the template.
- Example:
  - Name: Laura
  - Role: carpentry student in vocational training
  - Motivation: wants to learn practical skills to find employment
  - Frustration: difficulty accessing resources adapted to their visual learning style.



3.Discussion:

- Analyse how this profile reflects the needs and barriers identified.
- Key question: How can we approach the design challenge to solve this person's frustrations?

Expected Outcome: A clear and empathetic user profile to focus the design.

**Mapping a day in the life of the user**

Purpose: To gain a better understanding of user perspectives and experiences by mapping a typical day to identify critical points, barriers and opportunities in their daily routine. The day in the life tool is commonly used in DT instructions:

1. Preparation

- Read the teaching materials for the *A Day in the Life* activity and use the template divided into time slots (*03_Define_21_A_day_in_the_life*).
- Based on the persona's information, trace the daily activities of the user.

2. Mapping a typical day

- In teams, describe the user's activities in each time slot.
- Include emotions, barriers and key moments.
- Example:
  - Morning: Arrives in the classroom, finds equipment in disarray (frustration).
  - Afternoon: Participates in practical activities, feels motivated (positive emotion).
  - Night: Failure to complete tasks because of missing online resources (barrier).

3.Analysis:

- Identify critical moments where user needs are not being met.
- Key question: What opportunities exist to improve the daily user experience?

Expected Outcome

- Identification of critical points and opportunities throughout the user's day.

**Empathy mapping for deepening understanding**

Purpose: To deepen understanding of the user's thoughts, feelings and behaviours in order to detect patterns and trends.

Instructions

1.Preparation

- Read the teaching materials describing the empathy map activity and use the template divided into sections (*03_Define_17_Empathy_map*):
  - Think: What ideas and concerns does the user have?
  - Say: What do they say out loud?
  - Feel: What emotions do they experience?
  - Do: What actions do they perform?

2. Mapping

- Complete each section based on data obtained in the previous phases.
- Example:
  - They think: "I don't know if I can complete this course."
  - They say: "I need more help with these tools."
  - They feel: Anxiety when facing complex tasks.
  - They do: Searches for videos on YouTube for self-learning.

3. Discussion

- Identify key patterns and how they relate to the problem to be solved.
- Key question: Which areas require more attention in the design challenge?

Expected Outcome: A deeper insight into the user's emotions, thoughts and actions.

**Prioritisation matrix**

Purpose: To determine which needs and solutions are essential, desirable, optional, and not a priority for addressing the design challenge.

Instructions:

1. Preparation:

- Read the teaching materials describing the MoSCoW Prioritisation Matrix and use the template divided into MoSCoW categories (*03_Define_22_MoSCoW_prioritization_matrix*):
  - M (Must have): essential aspects
  - S (Should have): important but not critical aspects
  - C (Could have): optional elements
  - W (Won't have): aspects that will not be included at this time

2. Classification:

- List all needs, barriers and solutions identified thus far.
- In teams, classify each aspect into one of the categories.
- Example:
  - M: resources accessible to all students
  - S: improved classroom lighting
  - C: gamified educational materials
  - W: changes in physical infrastructure

3.Results:

- Create a prioritised list of needs and solutions that will guide subsequent actions.
- Set out a clear prioritisation of needs and solutions, setting the direction of the design challenge.

**Reframing the Problem**

Purpose: To redefine the problem in order to find new perspectives and innovative solutions. This technique helps to overcome biases and limitations in the initial approach.

Instructions:

1. Preparation:

- Read the teaching materials describing problem reframing techniques and either use the template provided (*03_Define_28_Problem_reframing_techniques*) or design your own.
- Materials needed: flipchart or whiteboard, sticky notes.
- Write the problem identified in the empathy phase in the centre of the page.

2.Reframing in different contexts:

- Ask questions that critically address the initial problem:
  - Why does this problem occur?
  - What would happen if we removed certain restrictions?
  - What would the problem look like from the perspective of another key actor?
- Example of reframing:
  - Initial problem: "Students do not use the available technological resources".
  - Reframing:
    - "How can we make resources more intuitive and attractive?"
    - "What barriers prevent students from accessing resources?"

3.Exploring new perspectives

- Discuss the new perspectives generated and assess their relevance for reformulating the design challenge.

Expected outcome: A clearer, more relevant and inspiring design challenge that encourages innovative solutions.

# 5. Module evaluation and closure

Self-assessment in annex: The purpose of the self-assessment in this phase is for participants to reflect on their ability to analyse the information gathered, identify patterns, diagnose problems and formulate a clear and relevant design challenge.

Self-Assessment Format

- Type of format: self-reflection questionnaire with open-ended questions, combined with a numerical rating scale
- Tools: Physical or digital template (Google Forms, editable PDF)
- Estimated duration: 15-20 minutes

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## Module 4

# Ideate

Training program

# 1. Module overview

**General objective:**

- To apply idea generation techniques.
- How to foster a creative and collaborative environment to maximise the quantity and diversity of ideas.
- To evaluate and prioritise ideas based on criteria such as feasibility, desirability and impact.

Purpose: The main purpose of the Ideate phase in DT applied to education is to generate a wide range of creative and practical ideas that respond to the problems identified in the Define phase. This stage seeks to foster creativity, collaboration and critical thinking to design innovative pedagogical solutions that benefit students, teachers and other educational stakeholders. Two phases can be distinguished in this stage, the divergent phase and the convergent phase.

# 2. Module contents

The divergent phase is crucial because it fosters the generation of a wide range of creative and original ideas, free from restrictions or judgements about feasibility. This expansive approach encourages thinking from different perspectives, exploring unconventional solutions, and opening up new possibilities that might not emerge in a more structured environment. In an educational context, this phase is particularly valuable for discovering innovative approaches that respond to the needs of students and other stakeholders, breaking away from traditional solutions.

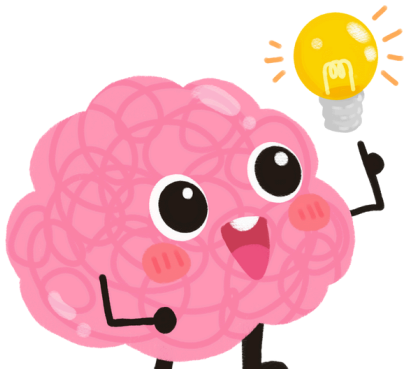
The convergent phase, by contrast, complements and gives meaning to the divergent phase by filtering, prioritising, and refining the ideas generated, ensuring that the final proposals are practical, relevant, and aligned with the previously defined objectives. At this point, critical and analytical thinking takes a central role, enabling the team to identify the most viable and impactful ideas for the educational context. This shift from expansion to focus ensures that solutions are both innovative and applicable, closing the ideation cycle strategically and effectively.

Contents:

- Ideation techniques (brainstorming, SCAMPER, mind maps).
- Promoting creativity in an educational context.
- Filtering and selection of viable ideas.

## 3. Resources and tools

- Required reading on the ideating phase in the manual: *Design Thinking in Vocational Education*, Chapter 3. Stages of the Process, 3.3. Ideation.
- During the Ideate phase, tools and techniques are used that promote both the generation and selection of ideas, adapted to the educational context. Methodology descriptions and templates from the Ideate phase provided in the Training Materials can be used.



# 4. Proposed activities

**Divergent phase: Idea Generation**

At this stage, the aim is to generate as many ideas as possible without judging their feasibility or relevance. The aim is to encourage creativity and explore different perspectives.

**Reverse Brainstorming**

- Purpose: To identify problems and barriers and then generate opposing solutions.
- Instructions:
  - Read the methodology from the teaching materials and use the template provided (*04_Ideate_30_Reverse_brainstorming*)
  - Ask the question in the negative: "How could we make this problem worse?"
  - List as many negative ideas as possible.
  - Transform these negative ideas into positive and constructive solutions.
- Example:
  - Problem: "How to improve communication in the classroom".
  - Negative idea: "Eliminate all interaction between students".
  - Positive solution: "Create dynamics that encourage active interaction".

**Brainstorming 6-5-3**

- Purpose: To generate a large volume of ideas in a limited time.
- Instructions:

1. Read the methodology from the teaching materials (*04_Ideate_33_Brainstorming_6-5-3*)
2. Form teams of 6 people, aiming for diversity in perspectives and experiences.
3. Each participant should write down or draw as many ideas as possible in 5 minutes.
4. After 5 minutes, conclude the idea generation session. Participants should select their three best ideas and record them on their sheets.
5. Each participant should succinctly present their three selected ideas. Allow for brief questions or comments after each presentation.
6. After presentations, each participant should mark which ideas they consider the best. Select those that receive the most votes.

- Expected result: By limiting ideas to the top three, Brainstorming 6-5-3 helps focus on the most promising concepts.

**Thinking outside of the box**

- Purpose: To break with traditional or common ideas.
- Instructions:
  - Read the methodology for the out of the box activity in the teaching materials (*04_Ideate_35_Out_of_the_box*).
  - Pose an absurd or extreme scenario related to the problem.
  - Generate ideas based on this unrestricted scenario.
  - Assess which could be adapted into practical solutions.

Example:
Scenario: "What would happen if there were no physical resources in the classroom?"
Ideas: "Use mobile apps for all learning."

**Pyramid of Associations**

- Purpose: To explore connections between concepts to generate novel ideas.
- Instructions:

1. Read the methodology from the teaching materials and use the template provided (*04_Ideate_32_Pyramid_of_associations*)
2. Select and arrange key concepts: Choose relevant keywords related to the problem and place them on a board to form the base of a pyramid.
3. Create and record associations: Encourage participants to connect these keywords with words, images, or symbols, recording new ideas that emerge from combining adjacent concepts.
4. Build the pyramid: Continue linking concepts upward, culminating in a single key concept at the top that guides solution development.
5. Generate and refine ideas: Use the top concept to brainstorm numerous ideas, then select and develop the best ones into actionable solutions.

- Expected result: A wide network of ideas based on creative partnerships.

**Hot Potato**

- Purpose: To encourage quick and impulsive ideas generation.
- Instructions:

1. Read the methodology from the teaching materials (*04_Ideate_43_Hot_potato*)
2. Form a circle with the team and hand out an object that symbolises the "hot potato".
3. Each participant contributes an idea related to the given challenge as the "hot potato" is passed to them. The idea is to encourage rapid idea generation without judgment or critique.
4. Continue until several rounds have been completed.

- Expected outcomes: Spontaneous and dynamic ideas.

**Convergent phase: selection and refinement of ideas**

In this stage, the objective is to evaluate, prioritise and develop the ideas generated in the divergent phase, focusing on the most viable and effective ones.

**Convergence Map**

- Purpose: To group and prioritise similar ideas.
- Instructions:

1. Read the methodology from the teaching materials (*04_Ideate_38_Convergence_map*)
2. Put all the ideas generated on sticky notes
3. Group similar ideas into categories
4. Prioritise the categories most relevant to the problem defined

- Expected result: An organised list of key ideas to develop.

**Ideation using the Idea Funnel**

- Purpose: To filter ideas to identify the most viable ones.

- Instructions:

1. Read the methodology from the teaching materials (*04_Ideate_45_ideating_with_the_idea_funnel*)
2. Create five progressive filters:

- Filter 1: Is it feasible?
- Filter 2: Does it appeal to users?
- Filter 3: Does it have a significant impact?
- Filter 4: It is aligned with the users´ needs?
- Filter 5: Does it consider what resources are required for development and implementation?

3. Evaluate each idea using the filters.
4. Keep only those ideas that pass through all the filters.

**Analogue Solutions Matrix**

- Purpose: To compare ideas with successful solutions from other contexts.

- Instructions:

1. Read the methodology from the teaching materials (*04_Ideate_31_Analogus_solutions_matrix*)
2. For each idea, make a matrix. List similar examples in other fields or contexts in one column.
3. In the other columns analyse how similar solutions could inspire or improve the selected ideas.

**How Might We?**

- Purpose: To focus the solution on key questions.

- Instructions:
  1. Read the methodology from the teaching materials (*04_Ideate_41_How_might_we*)
  2. Select a promising idea
  3. Rephrase the problem as a question "How might we...?"
  4. Develop the thinking around this question to ensure a focused and actionable approach
- Example:
  - Idea: "Encourage collaboration between students"
  - Question: "How might we create an environment that motivates daily collaboration?"

**Scenario**

- Purpose: To test the applicability of ideas in different contexts.

- Instructions:
  1. Read the methodology from the teaching materials (*04_Ideate_34_Scenarios*)
  2. Identify Key Change Factors: Start by preparing a list of the most important change factors.
  3. Prepare Scenario Matrix: Create a table (use template provided in the teaching materials) where you place selected change factors on axes.
  4. Generating Scenarios: Go through each square in the matrix and consider what could happen in that situation.
  5. Select the Best Scenarios: After analysing all possibilities, choose those that best fit your project. Try to select diverse scenarios, including optimistic and pessimistic variants.

**Mapping ideas using a Dashboard**

- Purpose: To visualise and evaluate selected ideas.

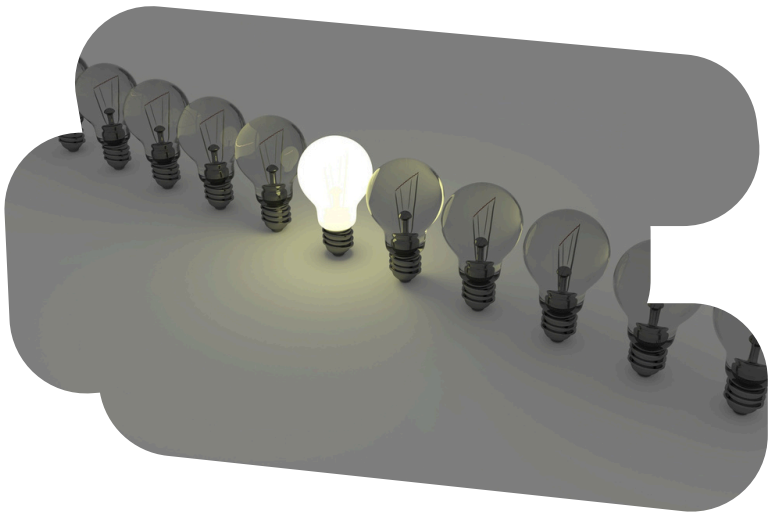
- Instructions:

1. Read the methodology from the teaching materials (*04_Ideate_46_Managing_ideas_with_idea_dashboard*)
2. First, write all the ideas on a physical or digital dashboard
3. Group similar ideas or assign them to relevant categories
4. Create a dashboard with evaluation criteria (impact, feasibility, cost, time)
5. Place the ideas on the board according to their score under each criterion
6. Select the ideas best placed to be developed

# 5. Module evaluation and closure

Self-assessment in annex.

- Format: written reflection and checklist.



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## Module 5

# Prototype

Training program

# 1. Module overview

In the prototyping phase users will develop the following skills:

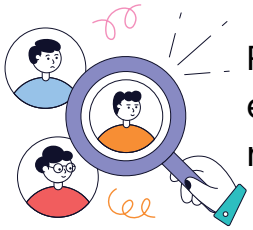
- Transforming abstract ideas into tangible representations using appropriate tools and materials
- Creating both low-fidelity prototypes (sketches, storyboards, mock-ups) and high-fidelity ones (digital models, simulations)
- Iterating quickly based on feedback received

**General objective:**

The aim of this module is to develop tangible or functional representations of selected ideas through the use of rapid and effective prototyping tools and techniques, applied to the context of VET.

Estimated duration:
4 - 6 hours

self-guided training with support from the theoretical manual



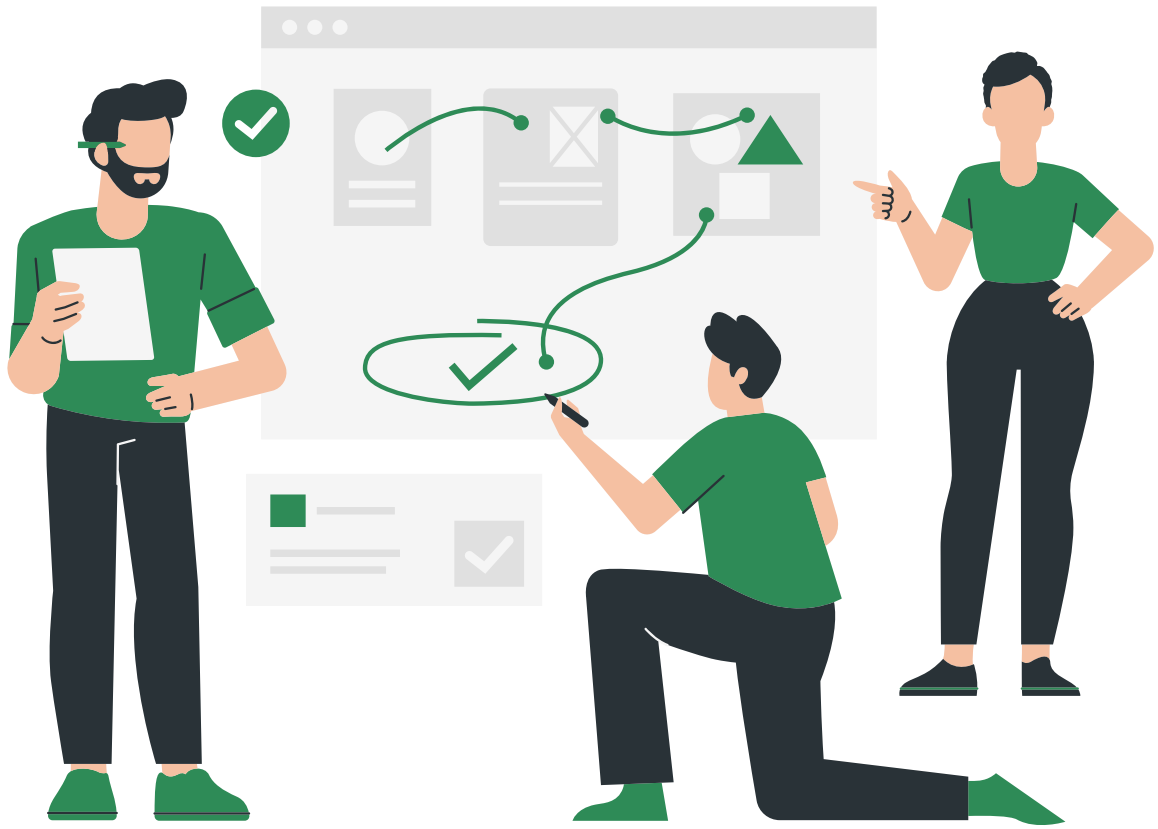
Purpose: To understand what a prototype is in education, explore prototyping formats, and acquire skills to develop rapid and effective prototypes.

# 2. Module contents

1. What is a prototype in education?
2. Types and formats of prototypes (storyboards, mock-ups, wireframes, etc.)
3. Strategies for rapid and practical prototyping

# 3. Resources and tools

- Required reading on the prototyping phase in the manual: *Design Thinking in Vocational Education*, Chapter 3. Stages of the Design Thinking process, 3.4. Prototyping - Creating Solutions
- Teaching materials: Include explanations and examples of prototyping tools.



# 4. Proposed activities

**Initial reflection**

- Purpose: To reflect on the concept and usefulness of prototyping in educational design.

- Instructions:

1. Read the introduction on prototypes in the manual: *Design Thinking in Vocational Education*, Chapter 3. Stages of the Design Thinking process, 3.4. Prototyping - Creating Solutions
2. Answer in your notebook:

- What examples of prototypes could you envisage in your area of VET?
- How can prototypes improve the implementation of ideas in your setting?

**Selection of the prototype format**

- Purpose: To identify the most appropriate prototype format according to the selected idea.

- Instructions:

1. Review the types of prototypes described in the manual and in the teaching materials (storyboards, wireframes, mockups, etc.).
2. Use the Prototype Card (*05_Prototype_48_Prototyping_card*) or the Hypothesis matrix (*05_Prototype_54_Hypothesis_matrix*) to understand the project's purpose and to assist with choosing the prototype format that best suits your project.
3. Justify your choice by writing it down:

- What are the advantages of this format?
- What limitations do you anticipate when using it?

**Rapid prototyping development**

- Purpose: To create a tangible prototype for an educational idea.

- Instructions:

1. Choose an idea generated in the *Ideate phase.*
2. Use simple tools such as paper, markers, design software, or basic materials, to create the following:

- A conceptual sketch
- A wireframe for a digital solution
- A physical mockup or storyboard

3. Document your prototype with photographs or diagrams.

**Activity: Implementation roadmap**

- Purpose: To visualise the steps necessary to implement the prototype.

- Instructions:

1. Read the methodology from the teaching materials describing the Implementation Roadmap (*05_Prototype_49_Implementation_roadmap*)
2. Use the Implementation Roadmap tab to plan:

- Key actions needed to test the prototype
- Resources required
- A tentative timetable

3. Reflect: What aspects of the prototype are priorities for validation?

# 5. Module evaluation and closure

- Self-assessment in annex.

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# Module 6

# Test

Training program

# 1. Module overview

In the Testing phase, participants will develop the following skills:

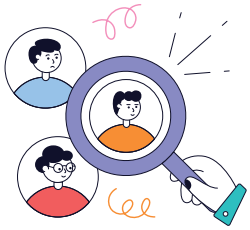
- Designing experiments and tests to validate the effectiveness and usability of the prototype with users.
- Collecting and analysing qualitative and quantitative feedback to refine the solution.
- Identifying areas for improvement based on actual user behaviour when interacting with the prototype.

**General objective:**

The aim of the module is to become familiar with the basic techniques and methods to evaluate the effectiveness of the prototypes developed in the previous phase, and to make adjustments based on user feedback in the context of VET.

Estimated duration:
4 - 6 hours

Self-guided with support from the theoretical manual



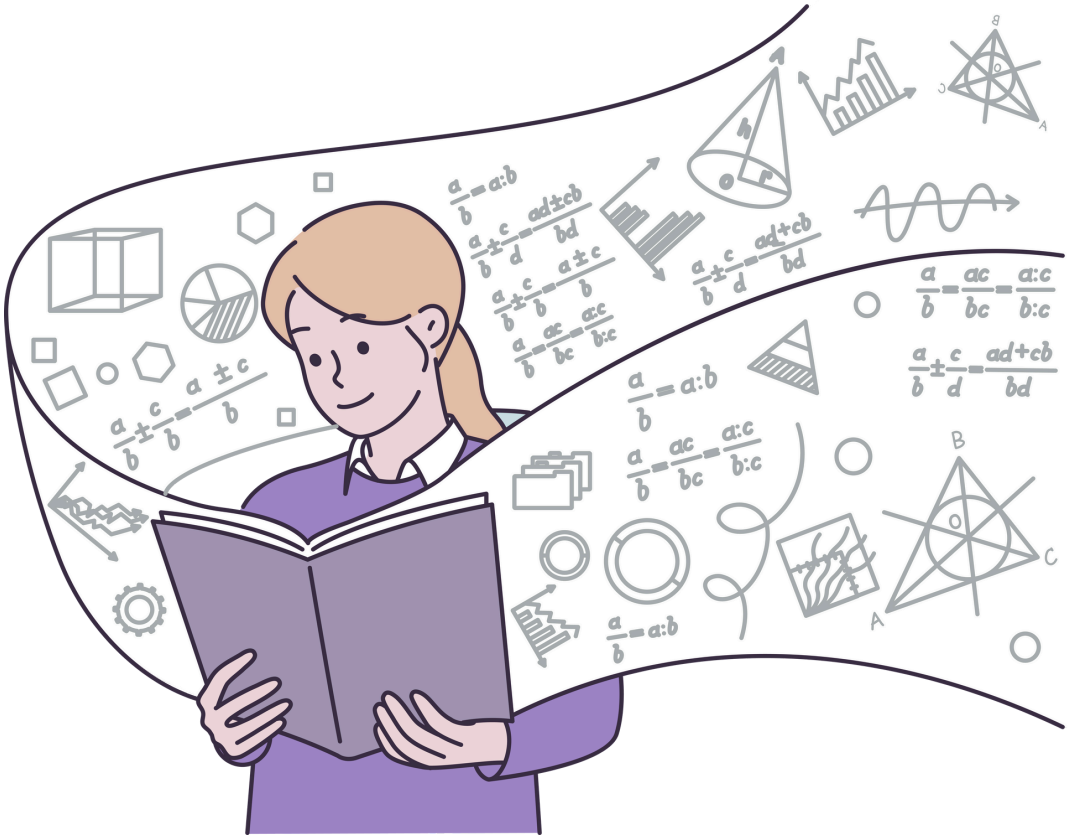
Purpose: To understand methods for testing prototypes in an educational environment, gathering feedback from students and other stakeholders, and iterating solutions based on the data obtained

# 2. Module contents

- Methods for testing prototypes in the classroom and other educational environments.
- How to collect feedback from learners and other stakeholders.
- Iteration and improvement of prototypes.

# 3. Resources and tools

- Required reading on the testing phase in the manual: *Design Thinking in Vocational Education*, Chapter 3. Stages of the Design Thinking process, 3.5. Testing - verification of the solution with users. It includes methods and techniques for testing and feedback collection.



# 4. Proposed activities

**Initial reflection**

- Purpose: To introduce the participant to the concept of testing and feedback in educational design.

- Instructions:

1. Reflect on a past experience where you tested a solution or project with students.
2. Respond:

- How did you get feedback?
- What changes did you make based on the feedback you received?

**Student-centric assessment strategies**

- Purpose: To evaluate a prototype with end-users.

- Instructions:

1. Read the methodology of Student - centric assessment strategies to organise a testing session (*05_Prototype_60_Student_centric_assessment_strategies*)
2. Provide the prototype to a group of students and observe how they interact with it.
3. Document key observations:

- What elements of the prototype are clear or confusing to users?
- Which aspects generate the most interest or frustration?

4. Conduct a short interview with users to get direct feedback

**Gathering feedback using the Think Out Loud technique**

- Purpose: To identify specific problems and opportunities for improvement in the prototype.

- Instructions:

1. Read the methodology describing the Think Out Loud technique in the teaching materials (*05_Prototype_55_Think_Out_Loud*)
2. Select two or three students to participate in the exercise while using the prototype.
3. During the session, ask students to verbalise their thoughts as they interact with the prototype.
4. Document:

- Questions or problems that you mention
- Positive and negative reactions
- Comments on functionality, clarity or relevance

**Iteration based on Feedback**

- Purpose: To improve the prototype using the feedback collected

- Instructions:

1. Use the prototype testing card to identify priority improvements:

- What problems do you need to solve immediately?
- What aspects can be optimised in the future?

2. Make adjustments to the prototype based on documented observations
3. Test the prototype again to verify the improvements made

**Prototype effectiveness assessment**

- Purpose: To determine whether the prototype meets the initial objectives.

- Instructions:

1. Conduct a short survey with students (use the Progress Card template) on:

- The usefulness of the prototype
- What improvements or changes would you suggest
- If they consider that the prototype meets their educational needs

2. Analyse responses to identify patterns and validate the effectiveness of the design.

# 5. Module evaluation and closure

- Self-assessment in annex.

# 5. FINAL CONCLUSIONS AND RECOMMENDATIONS

Before applying the acquired knowledge, it is essential to keep in mind three fundamental pillars:

**1.Understand the students and embrace new perspectives:**

Beyond tools, models, or methods, the real challenge lies in gaining a deep understanding of students and moving beyond your own experiences and the dynamics specific to your institution. This is the essential starting point for generating innovative and transformative ideas.

**PUT YOURSELF IN THEIR SHOES**

**2. Take action and shape your ideas:**

Only through experimentation and action can you move closer to your goals. The sooner you start bringing your ideas to life, the closer you will be to achieving your objectives.

**GET STARTED**

**3.Learn through failure:**

Mistakes will inevitably happen in this process, but instead of fearing them, embrace them as valuable opportunities for learning and growth. Errors are the foundation for meaningful improvement and progress.

**LEARN FROM FAILURE**

# Story: A team-building activity

Before getting to work, we want to share a story about an activity conducted by a CEO with his company's employees. The challenge involved forming teams to create a unique dessert - a symbolic starting point for a new project.

The teams were given a detailed recipe with all the necessary ingredients, tools, preparation times, and steps. Here is the recipe:

*today's recipe!*

# Opera cake with mirror glaze and chocolate mousse

## Ingredients:

For the Joconde cake
- 6 egg whites
- 30 g of sugar
- 250 g of ground almonds
- 250 g icing sugar
- 6 eggs
- 70 g of flour
- 50 g melted butter

For the chocolate ganache
- 200g of high-quality dark chocolate
- 200 ml of cream to whip

For the chocolate mousse
- 200 g of dark chocolate
- 200 ml of cream to whip
- 3 egg whites
- 50 g of sugar

For the coffee cream
- 4 egg yolks
- 200 g of sugar
- 50 ml of water
- 250g unsalted butter at room temperature
- 1 tablespoon coffee extract or espresso concentrate

For the mirror glaze
- 150 g of sugar
- 150 g of glucose syrup
- 75 ml of water
- 100 g of condensed milk
- 150 g of white chocolate
- 10 g of powdered gelatin (or 6 gelatin sheets)
- Black food coloring

For the coffee syrup
- 100 ml of strong coffee
- 50 g of sugar
- 50 ml of coffee liqueur

# Preparation instructions:

First, prepare the Joconde sponge cake:
1. Preheat the oven to 220°C.
2. Beat the egg whites until stiff with the 30 g sugar.
3. In another bowl, mix the ground almonds, the icing sugar and the 6 eggs. Sift the flour over this mixture.
4. Add the melted butter and mix gently.
5. Fold in the whipped egg whites.
6. Spread the dough out thinly on a baking tray lined with baking paper.
7. Bake for 7-9 minutes, until golden brown.

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Next, prepare the coffee syrup:
Heat the coffee with the sugar until the sugar dissolves. Add the coffee liqueur if desired and allow to cool.

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Then, prepare the chocolate ganache:
1. Heat the cream until it boils and pour it over the chopped chocolate.
2. Stir until smooth and homogeneous. Allow to cool slightly before using.

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Prepare the coffee buttercream:
1. Make a syrup with the water and sugar, heating it until it reaches 118°C.
2. Whisk the egg yolks and slowly pour in the hot syrup, continuing to whisk until the mixture cools.
3. Gradually beat in the butter and finally, the coffee extract.

# Preparation instructions:

Prepare the chocolate mousse:
1. Melt the chocolate in a bain-marie and leave to cool.
2. Whip the cream and set aside.
3. Beat the egg whites with the sugar until stiff.
4. Fold the melted chocolate into the whipped cream, and the egg whites into the whipped cream.

Assemble the cake:
1. Cut the Joconde sponge cake into three equal parts.
2. Place a layer of sponge cake in the bottom of a cake tin. Soak with the coffee syrup.
3. Add a layer of coffee buttercream.
4. Place the second layer of sponge cake, soak with more coffee syrup.
5. Spread the chocolate ganache and add the third layer of sponge cake, also soaked in syrup.
6. Cover with the chocolate mousse and smooth the surface. Refrigerate for at least 2 hours

Prepare the mirror glaze:
1. Soak the gelatine in cold water.
2. In a saucepan, heat the sugar, glucose and water to boiling. Remove from the heat and add the gelatine.
3. Add the condensed milk and pour the mixture over the chopped white chocolate. Stir until smooth.
4. Add the black food colouring to make a dark, glossy glaze.
5. Allow to cool to 30-32°C before pouring over the cooled cake.

Final touches:
1. Remove the cake from the tin and place it on a wire rack.
2. Pour the mirror glaze over the cake, covering the entire surface evenly.
3. Allow the glaze to set and decorate to taste.

## Tips

- Accuracy: Temperatures and times are critical in this recipe. Use a thermometer to check the syrup and mirror glaze.
- Patience: Take your time so that each layer is well chilled before moving on to the next.
- Decoration: You can decorate with edible gold leaf, chocolate pearls or whatever you prefer.
- This recipe combines techniques such as whipping egg whites to stiff peaks, making ganache and buttercream, and preparing the mirror glaze, which requires real precision to achieve a perfect finish.

After two full days of preparation, the teams began the challenge, aiming to create the dessert and share it with the rest of the company staff.

The final result was surprising - none of the teams managed to create a dessert of minimum quality or with the expected properties. It was a complete failure.

When asked what they thought went wrong, participants provided the following arguments:

- The recipe was unclear.
- The ingredients were not appropriate.
- They weren't warned about the difficulty.
- The procedures weren't detailed enough.
- The tools used didn't yield good results.

However, none of these arguments were valid. The recipe was detailed, the ingredients were correct, and the tools were fully functional. So, what was the problem?

# Lessons from the CEO

The CEO explained to the employees that any project can be compared to a recipe. If it's the first time somebody works with a new methodology or tool, it's likely to go wrong due to intangible factors such as:

- Experience
- Learning curve
- Skills
- Error tolerance
- Effective communication
- Teamwork
- Learning from mistakes

The CEO left the teams with a series of reflections applicable both to baking and project management:

1. **A recipe doesn't guarantee success:** Following the same instructions can yield vastly different results. It's important to repeat and refine the process to move closer to what you truly want.
2. **Tools aren't magic wands:** It's up to us to learn how to use them effectively, identify where they work best, and practice to improve proficiency.
3. **Unexpected challenges will arise:** Investing in training and preparation equips you to navigate obstacles effectively.
4. **Communicate with your team and users:** Sharing errors, motivations, frustrations, and successes shortens the learning curve.
5. **Choose a leader or mentor:** Starting a new project or methodology is challenging. Having a mentor to guide you through the first steps and a leader to make critical decisions ensures smoother progress.

# Apply these lessons to the Design Thinking project

This story highlights similarities with our DT project. While the methodology offers immense possibilities in education, it's essential to remain grounded and realistic about the challenges of its implementation.

- **Design Thinking doesn't guarantee success:** The process may reveal that the problem has no viable solution or that addressing it is too complex or costly.
- **Avoid preconceived solutions:** If you already have a solution in mind, DT may not be the best fit. It is most effective for open-ended, complex challenges that require exploration and understanding.
- **Tools are a means, not an end:** Tools facilitate dialogue and reflection, helping to document intangible ideas and thoughts.
- **Be flexible:** The DT process is not linear; it's chaotic and intuitive. Adapt resources to suit the evolving needs of each moment.
- **The right team matters:** Choose participants with diverse skills and knowledge and ensure strong leadership to guide the project effectively.

By understanding these points, we can better approach the challenges and opportunities that DT presents in educational contexts.

# 6. ANNEX

## 6.1 Module Evaluation and Closure

🎯 Module 2 - Empathise

❓ Key questions

1.Understanding users and their contexts:

- How clear is your understanding of the users' needs and barriers you analysed?
- Assess your ability to identify key differences between users in terms of needs and expectations (Scale: 1-5).
- What did you discover about users that you had not previously considered?

2. Use of empathy tools

- Which tools (🗣️ open-ended qualitative interviews, 🧩 empathy mapping, 👀 direct observation) were most useful for gathering information?
- How effectively did you apply these tools to get a complete picture of the user?
- What challenges did you encounter in using these techniques and how did you overcome them?

3. Identification of barriers and opportunities:

- What key barriers to inclusion or accessibility did you identify in the educational environment or context?
- What opportunities for improving user experiences did you identify?
- Evaluate how well your findings are aligned with the objectives of the initial project or problem (Scale: 1-5).

4. Reflection on the process:

- What did you learn about the importance of empathising before defining a problem?
- How do you think the findings of this phase will influence the next stages of the DT process?

- Identify a developed or improved during this module (🎧 active listening, 👁️ observation…).

5. Next steps:

- What additional information would you like to collect to strengthen empathy with users?
- What changes would you implement in the empathy process in future projects?

## 🎯 Module 3 - Define

### ❓ Key questions

1. Analysis and diagnosis of the problem:
   - How clear and specific was the problem you identified during this phase?
   - How did you determine the key factors contributing to the problem?
   - Assess your ability to identify patterns and trends from the information collected (Scale: 1-5).
   - Which tools helped you the most in analysing the problem (e.g. 📊 ERAF diagram)?

2. Identification of users and their needs:
   - How well did you define the key users in the context of the problem?
   - What factors did you consider when identifying their needs and barriers?
   - Reflect on your ability to prioritise the needs most relevant to the design of the challenge.

3. Formulation of the design challenge:
   - How clear and actionable do you consider the design challenge you defined to be?
   - Evaluate how well the challenge is aligned with user needs and the educational context (Scale: 1-5).
   - How do you think the design challenge encourages creativity and innovative solutions?

4. Reflection on the process:

- What challenges did you face in synthesising information and how did you overcome them?
- Which tool (e.g. Reframing Problems) do you think was most useful and why?
- What did you learn about the importance of formulating a clear challenge before moving on to the Ideate phase?

5. Next steps:

- What elements of the diagnosed problem do you think could be key to generating creative solutions?
- What would you do differently in future problem definition processes?

## 🎯 Module 4 - Ideate

### ❓ Key questions

1. Reflection on the divergent phase:

- What strategies did you use to generate a large number of ideas?
- How creative do you think the ideas generated by your team were?
- Evaluate your level of participation in the idea generation dynamics (Scale: 1-5).
- What did you learn about the process of unleashing creativity without prejudice?

2. Reflection on the convergent phase:

- What criteria did you use to prioritise and select the most relevant ideas?
- How well aligned are the selected ideas with the needs identified in the define phase?
- Do you feel that the final ideas are practical and feasible in the educational context? Why?

3. Overall evaluation of the module:

- How did the use of tools such as ❓ "How might we...?", 📊 matrix of analogous solutions, or 🗺️ convergence map contribute to the ideation process?
- Which tool or dynamic do you think was most useful for the development of the module?
- Identify a challenge you faced during the Ideate phase and how you solved it.
- What personal or team skills did you identify as key to success in this phase?

4. Next steps:

- What elements or ideas generated are you most excited to prototype?
- What do you think you could improve in future ideation processes?

## 🎯 Module 5 - Prototype

- Reflect on your learning through the following questions:
  - What prototype did I develop and how functional is it?
  - What skills did I learn or improve in this module?
  - How does my prototype relate to the needs identified in the previous phases?

## 🎯 Module 6 - Test

Reflect on your learning in the module by responding to the following questions:

- What did I learn about the importance of feedback and iteration?
- What skills did I develop or improve during the tests?
- What can I do differently in future testing phases?

# 6.2 General evaluation of the training experience

In order to evaluate a self-guided training, in line with the objectives and contents mentioned in the training programme, the following evaluation strategies can be implemented:

🟦 **Assessment of knowledge and skills acquisition**

- Purpose: To measure the level of understanding of key DT concepts.
- Format: **closed questions (multiple choice)** and **open questions**
- The phases of DT
- Tools used in each module
- Specific applications for more vulnerable groups and groups with special needs
- Advantages: it allows a quantitative and qualitative analysis of the acquired knowledge.

✅Closed questions (multiple choice)

1. What is the main objective of the empathise phase in DT?

a) Propose immediate solutions
b) Understanding user needs and contexts
c) Develop rapid prototypes
d) Validate the ideas generated

2. Which tool is suitable for identifying barriers to inclusion in the classroom during the empathise phase?

a) Reverse brainstorming
b) Empathy map
c) Wireframes
d) Hypothesis matrix

3.In the define phase, the design challenge should be:
a) General and broad
b) Focused on a specific solution
c) Clear and actionable
d) Based on assumptions only

4.What technique is used in the ideate phase to generate a wide variety of ideas in a short time?
a) Rapid prototyping
b) Brainstorming 6-5-3
c) Convergence map
d) Implementation roadmap

5.In the prototype phase, the prototypes should be:
a) Final representations of the product
b) Tangible and functional, but simple
c) Complete and detailed
d) Conceptual only

6.Which tool is used in the test phase to collect user feedback?
a) Thinking out loud
b) Wireframes
c) Business model canvas
d) Storyboards

7.What is a key benefit of DT when applied to marginalised groups?
a) Encourages the adoption of standardised solutions
b) Ignores cultural and social barriers
c) Allows the design of solutions adapted to their specific needs
d) Reduces implementation time without including feedback

8.In the define phase, the How Might We activity helps:
a) Formulate open-ended questions to guide ideation
b) Rapid prototyping
c) Identify key users
d) Evaluate the functionality of the final product

9.Which tool is best suited to represent the interactions of a marginalised group with their educational environment?
a) Hypothesis matrix
b) ERAF System Diagram
c) Conceptual sketch
d) Convergence map

10.In the testing phase, iteration means:
a) Discard initial ideas
b) Test the prototype in a single scenario
c) Adjust the prototype based on the feedback received
d) Finalise the prototype without changes

***Answers:*** 1 - b, 2 - b, 3 - c,
4 -b, 5 - b, 6 - a, 7 - c,
8 - a, 9 - b, 10 - c

## 📝 Open questions

1.Empathise phase:
Describe how you would use an Empathy Map to identify the needs of students with functional diversity in a classroom.

2.Define phase:
Formulate a design challenge using the How Might We technique, related to improving inclusion in the classroom.

3.Ideation phase:
Explain how you would use 6-5-3 Brainstorming to generate innovative ideas for an educational project.

4.Prototyping phase:
Design a conceptual prototype for an activity that fosters collaboration in a group with students of different skill levels.

5.Testing phase:
Describe how you would apply the Think-Aloud technique to evaluate a prototype designed for students with special needs.

6.Marginalised groups:
Explain how the Convergence Map can help you prioritise solutions for students at risk of social exclusion.

7.Empathise phase:
Propose how you would conduct a direct observation in the classroom to identify barriers to inclusion that may be affecting a specific group.

8.Prototyping phase:
Describe how you would integrate Paper Prototyping to represent a technology solution in a classroom.

9.Testing phase:
Devise a short survey that you could administer to students to gather their feedback on a prototype.

10.Iteration:
Reflect on how iterations can improve a prototype designed for students with specific educational needs and provide a practical example.

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