

# ADDET: Apprenticeship for the Development of Design Thinking

## Trainer's guide



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cesie  
the world is only one creature

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## Introduction

Nowadays, problem-solving skills play an important role in coping with complexity and change in today's society (European commission, 2018). These skills can respond to the growing needs of individuals to develop personally and handle obstacles and change. Problem-solving skills apply prior learning and life experiences, looking for new opportunities to learn and develop.

The aim of ADDET is to develop the employability and problem-solving skills and competences of VET students. The specific objectives of the project are:

- To develop problem-solving competences and design thinking mindset for upper secondary and higher VET students through an apprenticeship model
- To develop problem-based learning through an apprenticeship model that will follow a design thinking methodology
- To support VET trainers by developing a trainers' guide addressed to trainers in VET schools and companies that will apply the apprenticeship model and will design, support and evaluate the apprenticeship programme.
- To create VET-company partnerships, experiment and validate the apprenticeship model
- To spread the idea of problem-based learning in apprenticeship by organizing seminars for trainers in VET schools and companies that are interested to apply the apprenticeship model

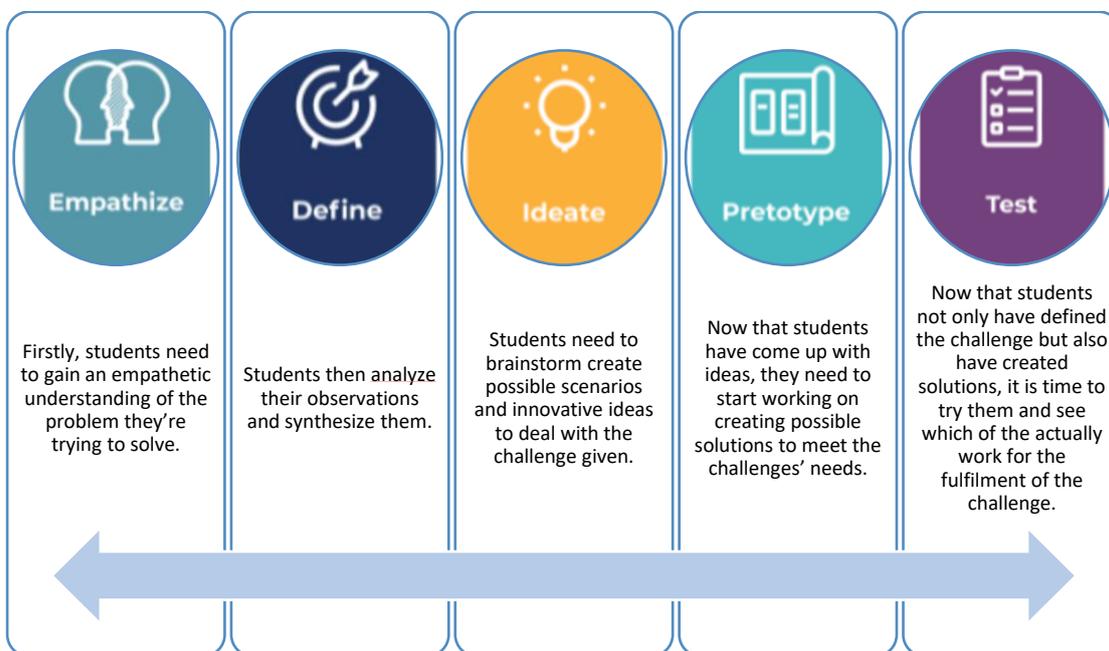
To reach the above-mentioned objectives, partners of ADDET project have created a model for apprenticeship implementation oriented to the acquisition of problem-solving skills and competences which will be based on the design thinking methodology. The objective of the present guide is to support the design, implementation, management, evaluation, and validation of the apprenticeship model. The guide is designed to prepare and train trainers from VET providers and companies, to apply the apprenticeship model and to integrate innovative learning approaches (problem-based learning and design thinking). The guide also includes successful stories from the piloting of the model, as well as instructions and suggestions on how to enhance apprenticeships programmes among new coming enterprises.

## Presentation and monitoring of the apprenticeship model

The aim of ADDET is to develop the employability and problem-solving skills and competences of VET students. For that aim, the project has developed an apprenticeship model for students in upper secondary and higher VET schools, based on the design thinking methodology as well as problem-based learning.

The ADDET apprenticeship is based on open-ended, real problems that a company faces. With the support of trainers, the apprentice is asked to formulate realistic and viable business solutions to address these problems. Through the process of finding solutions for these problems, students are guided through the five stages of Design Thinking.

During the beginning of the apprenticeships, students are taught on the five stages of design thinking (empathise, define, ideate, prototype and test). Each stage of the design thinking methodology applied into the apprenticeship, targets to develop different problem-solving skills: empathise - communication/team building/active listening, define - decision making/research, ideate - creativity/evaluation/planning, prototype - risk management/prioritising, test - adaptability/flexibility/analysis/assessment.



The apprenticeship model includes theoretical foundation and guiding principles for the design, implementation and evaluation of the apprenticeship programme for the development of problem-based skills based on the design thinking methodology.

## OBJECTIVES AND TARGET GROUPS

The main **objective** of the model is to provide an overall guidance of how to develop and implement apprenticeship programs by involving students in the business process with the aim to develop their problem-solving skills through the design thinking structured and holistic approach.

The ADDET model is addressed to companies and trainers of companies, who are involved in apprenticeship projects, students in upper secondary and higher VET schools.

The target groups are further defined within the context of the education systems of the partnership countries: Germany, Greece, Turkey, Italy, Bulgaria, Romania.

The **specific target groups** of the model are: managers, owners and other key decision makers of companies including innovation managers and employees who work with apprentices, and students from upper secondary education and higher VET schools.

The main parties involved in the ADDET apprenticeships are: Business organization – SME, large companies, startups with their managers and employees, VET schools – for upper secondary education and high schools with their students and Teachers and trainers.

It may be the case that participants have to carry out a psychometric evaluation, to identify the role that students are likely to take when working in a group.

## DESIGN THINKING METHODOLOGY

Design thinking is a problem-solving framework. The concept has been around for decades, but in the past five to ten years, IDEO, a design consultancy company, has championed the process as an alternative to a purely analytical approach to problem-solving.

Design thinking is appropriate to solve a great variety of challenges and it is advised to be combined with support, for the company to develop innovation.

Some topics in which Design Thinking is a valuable approach are: Redefining value, Human-centred innovation, Quality of life, Problems affecting diverse groups of people, involves multiple systems, shifting markets and behaviours, coping with rapid social or market changes, Issues relating to corporate culture, Issues relating to new technology, Re-inventing business models, Addressing rapid changes in society, Complex unsolved societal challenges and more.

## COMPETENCE GRID FOR PROBLEM-SOLVING SKILLS AND COMPETENCES

The design thinking methodology focuses on the development of problem-solving skills and competences which can be further divided into the following main groups concerning the process and project-based learning: Knowledge and understanding, cognitive skills in being able to research, identify, analyse, transversal skills and teamwork.

### Objectives of the trainers guide

The trainer's guide is addressed to trainers that design, organize and facilitate apprenticeships, while applying the apprenticeship model. It provides practical information of how trainers can apply the ADDET model with students.

The objectives of the trainers' guide are:

- to prepare and train trainers from VET centers and companies to understand the notion of acquiring problem solving skills in apprenticeship
- to explain the design thinking methodology
- to build capacity of trainers to transfer the problem-solving skills to apprentices
- to present and promote the apprenticeship model developed (O1) - to identify and present successful apprenticeship stories derived by the experimentation phase in partner countries
- to offer a set of instructions, suggestions and successful examples in partners countries to enhance the apprenticeship programme among new coming enterprises
- to demonstrate the wide applicability of the apprenticeship model in every sector and country.

### Problem-Based Learning

The problem-based learning method is a process focusing on student and bringing the apprenticeships to solve problems essentially happening at work. Doing this task while acquiring competences such as teamwork, imagination, problem solving, taking risks, confidence, motivation.

This method is highly valued in vocational education since it consists of earning knowledge, developing teamwork and communication, giving the student an opportunity to develop their skills for their future careers. Apprentices can bring

develop competences during their theoretical learning, by applying their knowledge to elaborate solutions on problem-based learning.

Problem Based Learning (PBL) is important not only for the apprentices but for the employer as well, as it brings benefits to both. While the learner acquires skills and knowledge the employer is able to acquire more skilled employees with experience of the work.

PBL aims to develop critical thinking and development, management skills and assessment. Learners evolve independently as well as in teams, while improving their communication skills. Improvement helps them also take initiatives and demonstrate confidence and efficiency.

The most important goal for mentors/ trainers is to establish a learning process which includes developing technical competences, transversal competences and creative thinking. Those skills bring help individuals as well as organisations develop in the future.

PBL consists of giving each learner a real life open-ended problem and asking them to find a solution to the problem. While executing this challenge, the apprentice will have to develop a method, plan, find the resources, settle the communication between supervisors and colleagues, make decisions and solve problems. This process will have to come out with a certain quality of work.

Autodidact learning is very important, however, in the beginning students need some directives and guidelines while being introduced to problem base learning. Another fundamental part is to support the learner's participation and commitment when they communicate with their group.

The content and plan of problem-based learning lessons may vary depending on the organization interests and the needs of the learners. One of the most important actions for trainers to carry a successful problem-based learning programme is to select the right problem.

The three main challenges used are:

- Making decisions: determinate a solution from different options.
- Problem-solving: determination of errors and concrete solutions.
- Strategic performance: solving more challenging problems, needing a wide outlook and more approaches.

The level, period of time, and other details of the process will be determined by the trainers, depending on various parameters like the period of apprenticeship, the theme, the level of training etc.

## Methodology to use design thinking and problem-based learning

**Problem based learning (PBL)** is a teaching model that permits learners to have a leading and active role in their learning process. This model consists of bringing personal involvement to real world situations. ADDET model includes learners in a project in order for them to take part and develop their skill with a concrete form of learning. In PBL the teacher or trainer acts as a facilitator and the problem is presented and identified in the beginning and not, as in traditional methods, in the end. (Kurt, 2020)

The most important thing to retain are the competences that the learner will develop:

- **Critical thinking:**

their ability to analyse a situation or text and think about a way of solving or developing the content. Critical thinking is not only an essential competence for information society but also for lifelong learning.

- **Problem solving:**

their aptitude for thinking of what the best solution to a given problem would be. For example: if there is a problem, what will the person do to overcome it. Problem solving has to do with sets of skills that bridge education with real life, work with theory, and ideas with action but also embed people in the cycle of the problem, from identification to possible designed experiments.

- **Teamwork and communication:**

their ability to work and exchange information together more effectively, serving a shared mutual goal and perspective and an attitude towards mutual understanding. Teamwork and communication skills also help students stay more focused on the topic and use the maximum of their group potential.

The last thing to retain is that problem-based learning invests on exposing participants to real life problems and to enhance the recognition and identification skills.

**Design thinking** is a methodology that provides a solution-based approach, it is practical and creative and helps with solving difficult problems that are not well defined or unknown, using a human-centred design. Here the significance of the human factor is clear. Solution Based Thinking differs from Problem Based Thinking because its priorities the finding of the right solution rather than identifying the problem.

**Design thinking** has been widely used in companies that thrive in the business sector such as RBNB, NIKE, IBM, NETFLIX and many more. Netflix transformed itself into a

web giant through design thinking in its business, RBNB was going down a decade ago but with design thinking they managed to find out the problem, empathise with their users, find new creative ways to apply new ideas and finally develop much further! As Voltage control writes, “Design thinking is a part of Airbnb’s success; in particular, they built a culture of experimentation”. They also refer to how IBM has seen “a 301% ROI (Return on Investment) by banking on design thinking” and they also offer their design thinking toolkits online here <https://www.ibm.com/design/thinking/>. It is interesting to observe how digital based companies like RBNB have been using design thinking to enhance and reflect on their physical design processes but also to see how corporate giants such as IBM do consider the framework.

### **Benefits of design thinking for a company:**

Why should a company get to know and use this mindset? What are the qualities it has to offer? For sure it will change the mentality of problem solving for the company and it can also contribute in exploring new challenges and alternatives in corporate culture, new technologies, ecology and more.

In general, design thinking:

- Increases thinking flexibility and promotes revision: The phases of design thinking do not have to be followed in precise order which means that one can jump back to any phase of the process and revise
- It is easy to apply: It does not require big amount of resources or expenses
- It is human-centered: The solutions that can be brought up are human- and client-centered and specific
- It prioritized human experience: It zooms in people not in products or services

### **Basic elements**

The basic elements of design thinking are the

- human-centered design
- the playful and creative character
- improving constantly and going back to previous points
- learning by doing
- practical prototyping as a notion of idea and action.

### **Important pillars of the method are**

- creative thinking
- intense collaboration
- fixed plan of action working in cycles implementing innovations and revisions

- and the holistic view. (Talent education, *Design your education, create Tomorrow* 2021)

### **Mindset of Design Thinking (DT)**

The mindset of design thinking can be described as follows:

Developing new alternatives, many prototypes, revisions, and going back to the cycle of the process at any given point, is preferred than deciding on the spot. Identifying the problem in the beginning and not in the end also contributes to the creative mindset of Design Thinking. Participants become active listeners, creative thinkers that seek solutions to future problems, revising their process anytime needed. Learning by doing, and a maker culture are quite supported. (Talent education, *Design your education, create Tomorrow* 2021).

### **Design thinking methodology in Work-based learning:**

Design thinking is a way of acquiring competences by practicing in real life work situation. It particularly fosters creativity, decision making, empathy, teamwork, and collaboration.

The **Trainer** part is important in a twofold aspect, both as a supervisor/evaluator and as a guide. As a guide he/she will have to give advice and listen carefully to the learner in order to give them feedback during the process. Keeping a stable and equal attitude for each student without making judgement and acknowledging the differences of level skills and abilities is very important. A guide tries to keep the compass for the whole of the exploration, setting frameworks, limitations and directions.

As an evaluator, the trainer will give feedback on students' improvement in their work, understanding and knowledge gained. He/she/They will also give feedback on the application of design thinking phases and the approach of the challenges.

The role of the trainer goes beyond traditional training in terms of flexibility and participation. He or she should do a step back and let the participants constructively reflect on their own knowledge, the experiences of the others, the problems and possible solutions. The trainer of design thinking is more like a floating guide who connects all parts of the process, makes sure to follow the theme and serve human centered design.

The role of the trainer is to offer opportunities to the interns and observe them by providing resources that will help them complete the challenge. It is crucial to "break down" each step of Design Thinking to understand how this method will work in a workplace.

## Applying the methods of DT

Solving problems in a creative way is the core. Learning by doing, collaborating, using human feedback and insights, all contribute to the holistic approach of Design Thinking. The method also works in a circular way, and one go back at any phase any time needed.

Focusing on human feedback, improvisation, experimentation and analysing on the spot the pros and cons of prototypes. At the same time insisting in core values such as human centered design, innovation, new possibilities and imagination, creativity, collaboration and communication.

## Application of Design Thinking during apprenticeships

### Preparation phase

In order for the apprenticeship to start, a preparation phase should be implemented. The preparation phase consists of two modules that entail steps to follow meticulously. The first is more theoretical and the second more practical and pragmatic. Both can set the ground for the apprenticeship to work better for the company and the trainees/participants.

In principle, what we want to achieve in the preparation phase is to get totally ready, feel confident, make sure we are effective in terms of planning. At the same time this phase is important in order to self-reflect on values, methods, concepts, people, collaboration, communication, teaching / practicing and evaluating. Following the tables below can help structure the apprenticeship a)before the participants come (theoretical) and when they are in the company (practical).

### Theoretical module:

Steps to follow	Check when already finished
Initial conception of the apprenticeship program	<input type="checkbox"/>
Basic needs of the company for doing this program	<input type="checkbox"/>
Content of the apprenticeship	<input type="checkbox"/>

Basic needs of the apprenticeship itself (people trainers and other professionals, plans, timeplans, software and hardware, courses, materials)	<input type="checkbox"/>
Structuring in time and space (where are we going to work, when, how long, how often, this is a revised and more final timeplan)	<input type="checkbox"/>
Do we meet all factors to move to call of interest?	<input type="checkbox"/>

**Practical module:**

Steps to follow	Check when already finished
Call for interest for students/participants	<input type="checkbox"/>
Selection criteria	<input type="checkbox"/>
List of students/participants	<input type="checkbox"/>
Training of company trainers	<input type="checkbox"/>
Design of the course/apprenticeship structure	<input type="checkbox"/>
Design of the evaluation	<input type="checkbox"/>

After the preparation phase, both theoretical and practical, the apprenticeship is ready to start. The development of plans and structuring will foster creativity, instructional qualities and will allow for in depth development of the design thinking process.

**\* During the preparation phase, the apprenticeship programme design needs to be filled in and be updated during the course of the ADDET apprenticeship.**

An example of how to fill it is given in later chapters of this guide.

## The 5 Phases of Design Thinking

Phase 1 Empathize	Acknowledging and understanding the human factor
Phase 2 Defining	Acknowledging and understanding the problem or issue or challenge
Phase 3 Ideate	Fostering active, creative and intuitive participation
Phase 4 Prototype	Start building possible solutions
Phase 5 Test	Making sure the proposed solutions work, find errors, practice trials and try out, go back and re design where needed.

### Phase 1 Empathize:

#### **Understanding human needs, emotions, desires. Focusing in the target group.**

Here students will work collaboratively with other students, with interns, with employees or in mixed groups. They will conduct research and collect information about the topic/ theme or challenge that has been assigned to them. This will help them better understand the situation or problem they have to deal with in order to approach it effectively.

Empathize is the first stage of the design thinking process. It focuses on empathy as the notion of understanding the others, specifically the people you design for and its importance in order to define the problem, which comes in phase 2. The first step will be to observe, take the information and ask questions if needed in order to be in tune with the needs, wants and objectives. It aims to have a clear idea before advancing to the next step. The notion of empathy here also suggests that we cannot

move forward if we do not understand the needs and objectives of the people we design for, how they think, how they feel, what do they really need or expect, why they feel like this and why their needs are the ones that are described.

The main components of empathizing in practice are: active listening, observation, watching listening and understanding, and substantial engagement with the human factor.

### **Why is this important?**

To finally create and design an efficient solution to the problem we have to understand fully the needs, desires and emotions of the people that consist the target group. Their feedback will define in a good extend our vision and will act as a compass to guide us through the design journey. At the same time it helps unfold needs of people that are not always clear to them and exploring the feelings that give directions to user needs and desires.

### **Steps:**

The trainer should begin with explaining the phase, what empathizing means in the context. Then they should make sure that they explain enough to the students that this phase does not include assumptions, ideas, thoughts, but mapping or documenting or claiming the experience and needs of the people they are going to be involved with. Before starting the trainer can also have a short talk with students, introduce them to the people they are going to interact with, and try to install a positive atmosphere.

### **Suggested activities:**

1.The trainer can motivate students and engage them in the empathize stage through questionnaires or even design them together with students, discuss or do a presentation about how to do interviews and how beneficial they can be in exploring human needs or emotions.

2.The trainer can distribute post-it papers to students that have different colors and ask different questions written on them. Students should write down their responses on the paper after conducting the research, interview, or talk with other people. Questions could be exploring the reasons, feelings and needs and the extend of understanding them by students. For example, handing out post-it papers with the question “ Why did...feel like this?” will make students constructively think about the personal reasons of peoples responses or feedback.

3. The trainer can ask students to prepare and do short presentations to their group, showcasing their research, but also use group feedback.

4. The trainer can ask from students to take part in short debates about the urgency behind empathy and mutual understanding, and then bring examples from their research so far in the group.

5. The trainer can present video interviews to students (from athletes, celebrities, business people, scientists or everyday people) in mute (without sound) and ask students to try to identify? the human emotions that are depicted in the people's expressions and faces, as an exercise to recognize emotions.

6. Mindmaps and concept maps are also interesting forms to use at this phase, to organise ideas before talking with the target group.

7. Creating a diagram with the target group description and the needs, feelings and desires of them can help documenting this process. The trainer can ask students to fill in the following form:

TARGET GROUP	NEEDS	EMOTIONS	DESIRES
Charakteristics and identities.	1.... 2... 3...	1.... 2... 3..	1.... 2... 3..

**Tips:**

- taking notes and writing a description will help the learner put their ideas in order, using a highlighter will also facilitate the organization the main points.
- For the trainer, observing the people and their habits, thinking about them, stepping in their own shoes, and trying to put her or himself in their position as much as possible is critical.
- Lets not forget that empathy is about leaving oneself behind and trying to see the world through the eyes of the other. As design thinkers or trainers we should be able to focus on the experience of the other in order to really understand their needs, find the problems and sketch solutions step by step.
- Take into account the human role because in design thinking humans and their experience are not excluded, the other way around, they become building blocks of our actions.

**Empathize in practice example: The Athens Metro experience**

Here the employees of the company (Attiko Metro in this case) with trainees and volunteers are going to set up questionnaires and oral interviews with metro passengers. The team is going to devise a simple method to find out the current condition of the passengers and their needs. They will eventually find out that passengers get frustrated from the busy moments and particularly in each station, before entering the metro, they often feel insecure.

**Empathize in practice example: Web and Social media management of a certain company**

Here the employees of the company are going to set up questionnaires towards the visitors and subscribers of the social media pages of their customer. They are going to find methods to reach the audience and explore their experience. They will find out that the new design disorients visitors. They will find out that the visitors are often annoyed by the complex new design.

**Empathize in practice example: New smart phone, Confronting the decrease of sales**

Here the employees of the company are going to work with customers of the company departments and stores all over the country. They will conduct interviews and they will not work. Then they are going to do a real-time test of the phone with users at the stores, to claim insights from their experience, showcasing its features and finding ways to understand people's rejecting it. They will find out that the interface of the phone is really distracting from its own features.

**Phase 2 Define:**

Define the problem, open up perspectives!

The second phase is to define the problem by collecting and using all necessary information from the previous phase. Here we start to have a better understanding of the problem- In that respect we slowly form and respond to questions like: what difficulties and barriers are your users coming up against? What patterns do you observe? What is the big user problem that your team needs to solve? Do you

understand why this is the case? What obstacles could you meet in recognising and identifying this problem?

After this reflection step it's time to construct a clear problem statement. This is essential before attempting to ideate or prototype because we first need to define needs and problems and then design upon these. A problem statement is a document/statement of the current condition, the issues met and the actions required to explore and solve these issues. It should contain objective facts and data, not opinions and speculations and it should be easy to read, understand and memorize. The statement should also reflect the process and main idea of human centered design.

### **Why is this important?**

Because it helps us acquire a good focus on the problem and at the same time help us express it in words. The define phase will also help clear out the most important points from the less important ones and will help create a problem statement which is useful, to the point and meaningful. Define phase also inspires the group!

### **Steps:**

The trainer can start explaining the idea of the establishment of a point of view. This is crucial and should reflect a balance between objectivity and opinion where opinion comes second, but is more important than in the previous stage of empathising. Then the trainer can explain the importance of clearing out what the problem is, and the fact that within this process we must do this in advance, and not wait to find this out in the end. Here what makes a huge difference is exactly the fact that the problem is recognised in the beginning, after human feedback. Another element that the trainer could add here is the idea of information literacy. This would help the students understand that finding and collecting information is not enough until you are able to synthesize it in a manner that reflects the best way possible the real problem behind the words of the people interacted with. Presenting a video or showing a presentation about being information literate will help students understand the value of their sources which are primary, in this case, and the value of being able to reconstruct them in a problem statement.

### **Suggested activities:**

1. The trainer can show a video or presentation, or talk about the significance of creating a good problem statement, and perspectives that help students. Focusing here mainly on human centered aspects, and the framework within which the statement should operate. Which are its limits should be seriously considered.
2. The trainer could also do a small exercise with students to help them define words, particularly verbs that they can use in their statements and again

reflect a human centered design, such as feel, believe, think, experience, acquire, enjoy, dislike, have difficulties with ,etc.

3. The trainer can engage groups in peer-to-peer feedback on problem statements and talk about each groups ideas
4. The trainer could ask different groups to interpret problem statements, data collected and then make comparisons.
5. Creating a diagram with the problem statement together with target group needs, desires, and insights can be beneficial. The trainer can ask students to fill in the following form:

TARGET GROUP	NEEDS, EMOTIONS, DESIRES	INSIGHTS	PROBLEM STATEMENT
Characteristics and identities.	1... 2... 3... 4... 5...	1... 2... 3... 4... 5.....	

### Tips:

To ensure a deep understanding of the problem, as trainers, we can ask ourselves some questions that will serve as a base for later.

- What will be the problem for the team to solve ? (Clear and brief description of the problem)
- What are the difficulties and barriers that students will encounter? (Identifying the main keys to solve the problem)
- Can we identify any specific characteristics, unique to this problem?
- Can we identify general characteristics that are shared with other problems-situations we know or encountered previously?

In other words we can first describe the problem and then break it down to key issues in order to unfold our design upon them and avoid generalization.

It is useful to keep in mind that before the Define stage students do not have a clear idea of the problem they need to solve. This stage is of critical significance in order to understand the design goal (Aswan1 et al., 2018).

The main components of define are the establishment of a point of view, and the human feedback collected previously through which the point of view is acquired.

**Define in practice example: The Athens Metro experience**

Here the data collected previously is considered in order to formulate a problem statement such as “The passengers often feel overwhelmed by the big amount of people and additionally this creates stress that they are going to be either robbed, or lost, or get sick. However, we want the passengers to feel safe and cozy.”

**Define in practice example: Web and Social media management of a certain company**

Here the employees will analyse and synthesize the data previously collected and will form a problem statement that is loyal to the point of view they acquired and the customers feedback such as “Visitors are often annoyed by the new design of the page and they seem to need something more friendly and simple, and we want to offer this to them. ”

**Define in practice example: New smart phone, Confronting the decrease of sales**

Here the employees of the company are going to analyse all the visual and audio elements that seem distracting according to the users opinion. They will find out that the reason why this happens is because of the poor interaction between images and sounds. “Our customers find this interface distracting but we want to relaunch this phone with a revised interface”.

**Phase 3 Ideate:**

Creative participation!

Here new ideas and new possible solutions will be formed and collected.

In the empathise stage we met the needs and personalities of the participants, where in the define stage we analysed their needs and formulated concrete problem

statements. The third step is to bring solutions and ideas to creatively approach the problem. The aim is to share solutions within the team without judgment, which means that any possible, even bad idea, is welcomed and should be embraced.

The ideate phase of Design Thinking requires creativity and innovation, which both stand here for new adventurous and expanded versions of ideas, plans, speculations about fixing of problems, which will also manifest in an exciting manner, that can resemble a party of ideas.

### **Why is this important?**

Because it will enable students use their ideas and mindset at their full capacity. At the same time it will enforce creativity, imagination, serendipity and surprise, to lead to the exploration of any possible, even crazy, idea. An open process like this will add quality and creativity to the benefit of the target group involved.

### **Steps:**

The trainer should deeply motivate participants to express their ideas and conceptions without any kind of self-censorship. They can talk about the importance of creativity in idea generation, show videos or presentations about creative thinking and artful thinking or how designers approach their problems in a creative manner. Then the trainer should explain to the students that the goal of this session is to have a pool of ideas. The trainer should prepare a way to collect and save all these ideas on the spot, either by writing down, or visually documenting etc. In the end the trainer can organize a session in the form of a workshop, game, interactive and can be done in a more relaxed setting. They have to explain also that their role will be to facilitate time constraints, and to keep the focus on the important elements.

### **Suggested activities:**

1. **Brainstorming:** Brainstorming is a method to generate ideas to solve design problems. It consists of a collective creative act of thinking and talking, asking and replying, engaging much more than a linear dialogue
2. **Bodystorming:** Expressing ideas with a group, aiming to get a solution in a more performant way. This bodily form of brainstorming puts the stress on the mind, on senses and feelings within a certain space. Bodystorming exposes the body to natural conditions, a mix of simulation and performance.
3. **Mind mapping:** similar to brainstorming, students share their ideas one by one linking each idea and concept to an starting base. A mind map is a diagram used to visually organize information. It is often created around a single concept. Major ideas are linked to the concept, and other ideas branch out from them. It can also turn into an artistic process that brings together information, experience and aesthetics.

4. Dot voting: also known as dotmocracy is a process in which people vote for their favorite alternative. It is widely used to evaluate the ideas that come from brain- or bodystorming .
5. Worse idea challenge: The concept here is to create a reverse brainstorming with ideas that seem silly, too simple, weird or impossible. Although this activity may come off as silly, it will often engage younger audiences in a more effective way (and will...)
6. Create a storyboard: Create a simple story, dividing it in some scenes and sketching one image per scene. In this way, the suggested solution can be seen more as a situation or action and it would be important to set the space, time, characters and events, like a plot.
7. Creation of specific workshops in collaboration with employees , trainees and other experts within the company
8. Creation of specific workshops in collaboration with external partners, communication specialists, company managers, creative directors etc.
9. Creating a diagram of classifying and comparing ideas can be beneficial. The trainer can ask the students to fill this form:

IDEA 1	PROBLEM STATEMENT
PROS:	CONS:
IDEA 2	PROBLEM STATEMENT
PROS:	CONS:

**Tips:**

- Often the solutions we pick can we thoroughly revised so feel free to do so.
- Keep in mind that your learners have the chance to bring on a lot from their personalities and possibly, sketch all together, interesting alternatives of some medium or bad ideas
- Try to open up the solution perspectives

The main components of ideate are the zooming into possible solutions, and the collection of as many ideas and suggestions as possible in order to create a good repository of proposals that could even be combined.

**Ideate in practice example: The Athens Metro experience**

Here the problem statement from the previous phase will be the center of the creative process to find new ideas and possible solutions. The participants in this phase participate in an event of presentations, where each presenter has to show data, experiences or stories from metro passengers of other countries. Then they will all engage in a brainstorming session in smaller groups in order to map out a lot of ideas and inspiration on how to improve safety and its feeling in the metro for the passengers.

**Ideate in practice example: Web and Social media management of a certain company**

Here the employees will engage in a group session of bodystorming in order to understand creatively the feeling of navigation within the webpage and express possible solutions. They will also experience in a similar manner the navigation of suggested interesting websites in order to find out possible ideas or qualities they did not think about before.

**Ideate in practice example: New smart phone, Confronting the decrease of sales**

Here the employees will engage in brainstorm session with a mixed group of colleagues and possible customers, people of all ages and identities. They will map in a gif animation ideas and keywords that come from all of them and the best ones will be selected after mutual agreement.

**Phase 4 Prototype:**

Build prototypes!

Right after ideate its a good moment to turn into experimentation. Here we should put ideas into motion? and practice, with a focus on producing a couple of tangible results as prototypes or mockups. In this phase we have to select the possible solutions to test further and we maybe need to adjust or redesign the prototypes.

The trainer should make clear that this phase does not look for a finished perfect product but either a mockup or a easy trial version of the possible final one.

During prototyping ideas will be modified, improved and tested. For this the most important thing is to look out for the advantages and disadvantages of each prototype.

### **Why is this important?**

Because it will produce a good model of the solution proposed.

### **Steps:**

The trainer here is responsible of facilitating the transition from ideas to tangible results. Trainers should start clearing out that the goal of the phase is producing functioning prototypes. for the facilitation of the transition from the ideas to become tangible so they should It does not matter if they work perfectly, but they have to work. Then the trainer can explain the different aspects of prototyping , for example, in web design, in medicine, in fashion etc and then focus more on what type of prototyping would best serve the problem statement at hand. Before going into action the trainer should check what type of equipment, media or tools are at the disposal of the trainees and share this with them.

### **Suggested activities:**

1. The trainer can show explanatory videos or presentations about the design of mockups in order to bring them at the disposal of the participants
2. The trainer can explain and discuss that mockups can be instructionally used to devise a solution method.
3. The trainer can decide together with participants about types of materials or mediums that are going to be used and start experimenting in group workshops
4. The trainer can show concept maps or videos about hierarchies of concepts, in order to encourage the trainees in the design of central and less central elements
5. The trainer can divide people in groups to work separately, without having contact with other groups' work. In the end the trainer facilitates a debate around pros and cons of each prototype
6. The trainer can engage participants in trial and error sessions where the prototypes are being criticised according to their effectiveness
7. The trainer can give users the prototype to play, observe, experience and test, without explaining anything else before or
8. The trainer can give users the prototype to play, observe, experience and test, after sharing with them the problem statement.

### **Tips:**

- making a board with pros and cons to get a clearer view of what needs to be changed
- Keep in mind that this is an experiment, a model, a prototype which for design thinking is the solid ground for developing further, changes can be made, and improvements can be also applied in the near future.
- focus more on the free experimentation in the beginning and more on criticising in the end
- The prototypes do not have to be expensive, they can be made with cheap and easily accessible materials

The main components of prototyping are the experimentation with alternative ways and approaches, the reclaiming of a variety of solutions from ideate phase and set up in practice, and the selection of the most promising ones.

**Prototype in practice example: The Athens Metro experience**

Here the idea pool from previous phase is going to be reclaimed. The participants will make use of the insights and other aspects that developed or unfolded previously and will design easy small-scale experiments to approach possible solutions or designs around the safety and its perception in the Athens Metro. Some will design mockups with collages on boxes, others will create video mockups, and others will create new furniture and stairs mockups for the stations.

**Prototype in practice example: Web and Social media management of a certain company**

Here the employees will use all experiences and data collected so far, their own ideas will be put in practice and they will develop in pairs prototypes of a new website. Some prototypes are in digital software, others are coding experiments, and others are real website compartments like plugins. They will all together put these in faction and decide a couple to test soon.

**Prototype in practice example: New smart phone, Confronting the decrease of sales**

Here all experience and data are going to be used. The designers of the team will design new versions of the interface, all in a playful manner and not designing any final result. After collective discussion they put in test some of them.

## **Phase 5 Test:**

Run to identify mistakes, bugs, errors !

This is the last phase where the prototype or prototypes will be tested. This could lead to a successful solution but also to going back to previous phases of the design thinking. It's critical to be open and able to see what is working good, having in mind the problem statement. Participants need to be open to new ideas, if the existing ones are not so promising for resolving the challenge. Most often the solution is not found in one design thinking cycle. The test will help collect feedback from people outside of the project and they will give ideas in order to improve the solution.

In the event of a successful prototype, this step is the last one before the development of a new or updated product or service. Testing will contribute to the validation of the design choices, the problem statement, the options that were selected.

### **Why is this important?**

Because the insight of the target group and of colleagues are important and need to be considered in practice. Their feedback on the actual functioning of the prototype can bring important outcomes such as changes that need to be done or choosing the best prototype.

### **Steps:**

The trainer here can show initially videos or material from different disciplines testing their prototypes, such as engineers, graphic designers, scenographers, other companies or scientists. They also have to set the context for the testing, explain who is going to take part, how and why. At the same time the trainer has to make sure that the problem statement and the human needs are still the main focus and considered practically and conceptually. Before starting the testing, the trainer can facilitate the space, set the duration limit, and feedback form that is going to be used by the audience - users of the prototype.

### **Suggested activities:**

1. The trainer facilitates a classic test by users.
2. The trainer can design feedback forms and charts
3. The trainer designs an inspired evaluation method, for example by handing out stickers or colored markers to the users, together with evaluation and feedback forms
4. The trainer can also facilitate video recordings with users testing and then describing their experiences with the prototypes
5. The trainer can facilitate a poll in the end of the testing and a group discussion where the users and the creators come in dialogue.

6. The trainer can facilitate a debate of users after the test, particularly if the results are not showing a specific prototype as favorite. In this case, the creators also participate actively in the debate by asking questions, filling forms with data and opinions etc.
7. Cyclical interrupted process: the trainer can ask the students to go back to any phase he or she asks in order to revise, remember, rethink.

**Tips:**

- Questionnaires can be made for feedback, with a comment section for the learners to write their opinion.
- Also, according to the nature of the group or learners, you may need to find alternative ways to collect their feedback, for example keep notes, record interviews etc
- Live showcasing and testing can always incur in mistakes, showcase sensitivities or imperfections, be ok with that!

The main components of testing are the focus in a tailored solution, the possibility of going back to a previous phase and to redesign, and the improvement that will help the prototypes to advance.

**Test in practice example: The Athens Metro experience**

Here the participants are going to run the experiments, experience the mockups, watch the videos, and conclude which are the best ideas or which is the best idea. They will find two options for the best idea but the one of them has to go back to prototype phase, in order to undergo some changes. After this process they will test it again and decide which they find more efficient: the furniture design, the navigation design or the safety rules?

**Test in practice example: Web and Social media management of a certain company**

Here the team will call also people that do not work with them, possible audience of the website, and they will all engage in collective and individual visiting of the website in all its prototype forms. They will then vote which is, after the test, the most efficient one, and if it needs any changes, from prototyping, even to ideate. If they do not find a good solution there, they will have to go back even to define.

**Test in practice example: New smart phone, Confronting the decrease of sales**

All new interfaces are tested by guests and experts of the team. A poll then is made to find out which one was the best , which was the worse, which could be improved.

### Reflection after the 5 phases:

It's important to collaboratively reflect on the process when its finished, and for that purpose the trainer can ask the students the following questions:

<ul style="list-style-type: none"> <li>• What did you like from this process?</li> </ul>	<p>Focusing on the feelings and satisfaction (or not) of the students during the process, may include the actual practice undertaken, the interaction with the trainer, the interaction of the participants with each other, the activities done, any other aspect they feel like discussing.</p>
<ul style="list-style-type: none"> <li>• Did you meet any difficulties?</li> </ul>	<p>Focusing on challenges the students faced, points they did not understand, other moments or details or aspects of the work they did not find so interesting, engaging or nice.</p>
<ul style="list-style-type: none"> <li>• Do you find a positive aspect to that process?</li> </ul>	<p>Asking if they found useful, new, innovative, compelling content or processes, and not what they liked as in the first question. Plus asking if they find what was done possible to be reclaimed in their future work, if it affected positively their mindset etc.</p>
<ul style="list-style-type: none"> <li>• Would you do things differently next time? If yes, what would you approach differently?</li> </ul>	<p>Asking about specific ideas-alternatives of things that happened, and not asking if they did not like some parts of the program.</p>
<ul style="list-style-type: none"> <li>• What new did you learn throughout this process of the 5</li> </ul>	<p>Asking about specific new knowledge they acquired, in the context of the design thinking and not generally for the program.</p>

phases of design thinking?	
<ul style="list-style-type: none"> <li>• How do you feel about design thinking as a method and as a mindset? What is your honest idea upon your experience with design thinking?</li> </ul>	Focusing on their idea about design thinking after their participation in the program.

It could also be beneficial to organise group feedback sessions between the students and other involved parties and talk in circle, sharing everyone's experiences with the team. Keeping notes from such a process is always helpful for the future.

## Defining objectives and goals

Within educational or instructional work it's imperative to share our thinking and our learning goals with the students. From young learners to mature adults, when students or participants share the understanding of the learning goals, the educational process always functions in a more successful and substantial manner.

According to the work of researchers in Harvard University who have developed since decades the framework TFU (Teaching for understanding, as opposed to teaching - learning for-through remembering only), two core parameters of good teaching or instructing are to initially set a generative topic and then, among other points, to share the educator's goals with the students. Both points are critical because by using a generative topic in the beginning, students' imagination is activated, they receive positive motivation and they can connect with prior knowledge on what they are going to work on. For example, when working with a theme such as "expanding profit through new types of advertisement" the trainer can use a generative topic such as "bridging emotions with economy through new forms of communication" which suggests a interdisciplinary, interconnected with human emotions study of economics or statistics or logistics and talks more directly to the minds of the students. In terms of goals, researchers in Harvard also taking educational theories into account, have concluded that sharing the goal in clear and engaging ways is always beneficial for students, teachers and the understanding of the topic, because it sets a common ground and a solid basis of working in the same direction and with focus on the explored topic. However, the benefits of sharing goals are not limited to educational or understanding ones. Sharing goals brings notions of collaboration, communication, responsibility and continuity within the work of a trainer and their students, and can save time, create the conditions for

quality mutual communication, and foster a certain perception of the trainer in the students minds that is more honest, real and pragmatic.

But how can an educator set problem-solving skill goals and apply them? And moreover, how can one share them and their significance with the students?

First of all the trainer/educator has to be clear about the goals they are going to set. Sometimes, the goals are many and unfold in a complex manner but it is essential to be able to write them down really simply, in the form of a simple sentence. In order to boost this writing process, one can use following structures to start with...and then fill with own goals in a simple sentence:

Example 1. Goal: The students are going to understand that....

Example 2. Goal: The students are going to get introduced in...

Example 3. Goal: The students are going to be able to distinguish this ...from that...

Example 4. Goal: The students are going to apply this....into that....

Example 5. Goal: The students are going to experiment with..

In other words, by using this simple technique one can be sure about the real goal and how to express it clearly (verbs like understand, get introduced in, know, practice, feel, explore, remember, speculate etc) to communicate them to the learner groups.

Additionally, it's important to project or write down these goals in a visible manner to all, , and not just present them orally, and at the same time its suggested to go back to them and remind through the training process.

When it comes to developing problem-solving skills (active listening, analysis, creativity, team building, communication and more) it is usefull to share with students a little bit more about these concepts and how they relate to the life and work in 21 century.

For example, explain why active listening is critical in problem-solving. However, it's not always clear to learners why this can be important. Taking some time and discussing the notions, benefits and urgencies behind these skills is a good idea, particularly with trainees that seem not to totally engaged with these notions .

On the one hand, sharing the goals, in a clean and clear manner, but also engaging trainees in the concepts behind new types of skills they will acquire, will lead to a more substantial work for both parts.

Design thinking is a mindset that can help set, understand, apply their own goals better, reason why it'scritical to set clear goals in the design thinking process, otherwise a) students will move in different directions , or b)set their own goals, or even c)dismiss our goals as unimportant.

One practical way to engage students in the above necessities is to work together and reflect on the 5 stages of design thinking and connect each stage with the skills and qualities that they relate to.

- Empathize, define, ideate, prototype and test.

Therefore, let's unfold these categories together:

**Empathize** relates to mutual understanding and respect, communication qualities and skills, active participation and listening. It also involves social qualities such as team building and respecting differences and the needs of others. Trainers can ask students about their understanding of empathy, and its parameters, like mutual respect, and at the same time trainers can also share with trainees videos, documentaries, artworks, poems, that talk about the notion of empathy.

**Define** relates to decision-making, linguistic and expressive, research and abstraction skills. Trainers can talk about expression, language, the linguistic parameters of thinking and decision making and can additionally talk about subjectivity and objectivity with their students, trying to also cover the notion of common sense.

**Ideate** brings together qualities of creativity, constructivism, designing and planning and representing real problems in real manners. Trainers can spend some time talking or projecting artworks, videos, poems about the notion of the Idea, the concept and how it can emerge from inspiration in the mind but slowly get materialised to a prototype.

**Prototyping** relates to risk management and prioritising. Here trainers can talk with trainees about different notions of prototyping, in design, digital or web design, architecture, art, commerce, advertisement, film, etc. Often students fail to distinguish between prototype and ideate. What they should understand is that they are two stages of the concept making: first thinking about the concept and then experimenting with it.

**Testing** relates to qualities of adaptability, analysis and flexibility. Trainers can explore notions of testing, in design, web design, videogames, clothes, ads, etc in order to help them understand the importance and practice of it.

## Definition of learning outcomes on problem solving

Learning outcomes are a definition of what a learner will be expected to know and present at the end of the learning process. The outcomes are very meaningful in the learning program, moreover in education and training, as they help improve quality and relevance. When the plan of the apprenticeship has been determined, the next step is to establish the skills necessary to achieve the goal. It will also be necessary to put on the right method to complete the tasks.

The learning outcomes are a tool reference used in the *European Qualification Framework* to make the comparison easier and do a transfer of qualifications between countries, systems or even institutions. The *European Qualification framework* established eight levels of outcomes, from the lowest level 1 to the highest level 8 representing the most advanced qualifications. This process was made in order to improve and facilitate the transferability of qualification.

This system helps to clarify the program and make it easier for the people involved. The learning outcomes statements bring benefits for the learner and the trainer, as they have a clear understanding of the goals that need to be set at the beginning. For the training institution, they provide an important reference for quality and input to the review and development. Finally, they benefit the assessor because the learning outcomes approach helps the assessment by applying the criteria of success, failing and even performance.

Learning outcomes should only be focused on the learners and on what their knowledge, understanding and skills will be in the end.

Table: basic structure of learning outcomes:

Learning outcomes				
Actions	Performance criteria	Knowledge	Skills	Competencies
What will the learner will acquire at the end of the apprenticeship.	How the learner will show his/her knowledge, abilities, and competencies.	<b>Theoretical</b> and/or factual.	<b>Cognitive</b> (involving the use of logical, intuitive, and creative thinking) or <b>practical</b> (involving the use of methods, material, tools).	<b>Responsibility</b> and <b>autonomy</b> .

Creating learning outcomes requires analysis and reflecting on the established objectives, benefits and possible alternatives. They can be used to define qualitative

indicators, create curricula or even assessment. The most important are the concrete outcomes or the broader learning outcomes conditional to the benefits or the goals.

The process of defining learning outcomes, needs to be done before the start of the ADDET apprenticeships, together with the mentor from the company and the trainer from the VET school. This process will only be effective with constant communication between learners, vocational education and training stakeholders. Learning outcomes must be clearly written in a few statements, without being overdetailed. However, note that learning outcomes are a useful tool to orient learners and institutions, but do not organize or govern the overall process.

## Methodology for the assessment of the learning outcomes

After establishing the learning outcomes, the next step will be to define the assessment criteria for the learning outcomes, as well as method to evaluate the apprentices retained knowledge.

Assessment tasks support the apprentice into demonstrating achievement of learning outcomes. An efficient assessment needs to match well the learning outcomes with chosen activities in order to determine if the goal has been achieved. They must be well linked without simply concentrating on the input but the process and capabilities.

It will be relevant to use those 4 interrogatives:

- **Who** will assess the apprentice: the trainer, the workplace instructor and the learner (for self-assessment). The combination of the three are here to confirm the quality of the evaluation process.
- **How** learning outcomes will be assessed, as well as where: it is a necessity to know from the beginning what the assessment method will be. The approach is selected depending on the most valid process of each learning outcome. Not to forget to consider the obstacles and difficulties that came out during the program, if any.
- **When** will the assessment be: apprentices will have to be informed to prepare.
- **Which** structures are in place for the evaluation of the quality of assessment: the quality procedures are important as well as the transparent criteria to ensure the reliability of the outcome.

The assessment of learning outcomes in problem-based learning needs data about the learners including, their educational background, work experience, knowledge needs and qualifications. Therefore, it is necessary to gather information from learners about their aptitudes at the beginning. This process is essential to measure their skills. The gathering of information can be done by basic questionnaires, interviews or both.

Assessment of level of competences will help measure their competences' improvement at the end of the apprenticeship. This will permit the trainer to receive information about the strength and weaknesses of the learners, it will help him/her as well to plan relevant activities or aspects of the apprenticeship which will strengthen the learner skills.

Apprenticeships helps learners acquire relevant work knowledge, experience and skills. Evaluation analysis will point out what was efficient or not during the apprenticeship. This will also help apply improvements in the future challenges and update the process aiming at better results.

### **Assessment methods**

The assessment methods are the strategies and tools to evaluate whether the expectations set at the beginning were reached.

There are various assessment possibilities to choose from. All methods have their advantages and disadvantages, and some of them will be more relevant than others depending on the type of learning outcomes. It is also important to know that mixing different types of evaluation methods will permit to get a wider range of results.

### **Assessment criteria**

Assessment criteria are information specifying the standard that should be met and the confirmation that will be collected to show the achievement of learning outcomes.

The aim of the assessment criteria is to provide explicit standards of achievement for ever learning outcome. They must explain what the learner is expected to provide to demonstrate that the learning outcome was successfully met. However, it important to make the distinction with the current assessment tasks. In brief, the assessment criteria explain how the task will be evaluated.

We can define three types of assessment criteria:

- Threshold standards explain to the learner what are the rules in order to show the accomplishment of the learning outcome, specifically the minimum requirements for finishing successfully the apprenticeship.

- Grading criteria gather the overall description of the standard demanded for success of established-grade or degree classification.
- General criteria bring general outcome descriptors that can be accomplished. Learners will be evaluated within a performance range and marks designated accordingly. These type of criteria are used to evaluate for referencing, language skill, quality of critical thinking etc.

### **Writing assessment criteria**

Writing assessment criteria goes the as same as developing learning outcomes: being clear and brief in order for the trainer and learner to understand.

Methods of assessment of learning outcomes:

#### **Multiple Choice Questions (MCQs)**

A classic method aiming to evaluate a large range of knowledges rapidly which also takes into account the level of understanding, analysis and problem solving skills. However, MCQs need a bit of time to develop from case studies or research papers. Also, it is simple to analyze the results as they are relevant for self-assessment, while they also offer great reliability, validity and manageability. Feedback for learners is rapid as well. The risk is to receive assessment only for trivial knowledge. To reduce time, an assessment group can be formed, where they can brainstorm and the assessor can develop a bunch of assessment questions for the group.

#### **Short answer questions**

Another classic method with the potential for measuring analysis, application of knowledge, problem-solving and evaluative skills. Simpler to create than the MCQs but still a bit time consuming.

#### **Projects, Group Projects and Dissertations**

Great potential for covering a large range of practical, analytical and interpretative skills. Projects, Group Projects and Dissertations allow for a large application of knowledge, and helps apply relevant skills to situations. Group projects offer a measure of teamwork attitude and leadership. Evaluation for feedback can be shorten with only peer and self-assessment and presentations. Learning acquirement can be elevated especially if reflective learning is part of the criteria. Differences between assessors' evaluation is allowed, however, applying criteria will reduce variability .

### **Presentations**

This method evaluates, preparation, understanding, knowledge, organization aptitude, information and oral communication skills. Assessment can be made simultaneously by peers, trainers or by the learners themselves. Evaluation of the ability to effectively answer questions and debating can be added.

### **Orals**

Orals are made to assess communication, understanding, aptitude to react fast while being pressured as well as knowledge of procedures. This is one of the most efficient for direct feedback. These are usually used to ensure reliability and validity.

### **Poster sessions**

Assess the aptitude to present and interpret at the same time in an more original and attractive way. The risk is to be less concentrated on the content by being attracted to the design of the presentation, however, this can be controlled by using criteria, The Feedback potential are from trainers, self and peers. The used of criteria lessen variability.

## Example of how to fill in the apprenticeship programme design template

The following shows an example of how to fill in the apprenticeship programme design. The empty template can be found in the next chapter.

A reminder that during the preparation phase, the design must be fulfilled by the company mentor, together with the student and the responsible teacher from the school.

<b>Step 1. Objectives and goals</b> <i>Define the main objectives and goals of your apprenticeship program.</i>			
Design thinking and product packaging challenges			
<b>Mentor: (Name/Surname)</b>			
Nikos Voyiatzis			
<b>Step 2. Learning outcomes</b> <i>Define the learning outcomes. You can use the following table.</i>			
Tasks	Performance criteria	Knowledge gained	Skills/competencies gained
Create a paper prototype of new versions of existing packages	Creative skills, Engagement, collaboration	Understand the role of a prototype	Handcrafts, communication and collaboration
Understand new ways of thinking for the design process	Ability for reflection, group feedback, Analysis and synthesis of data	Learn new thinking and learning method	Pattern recognition, abstraction, Critical reflection
<b>Step 3. Assessment criteria</b> <i>Define the assessment criteria and methods to find out if apprentices have achieved the learning outcome.</i>			
Interview with student. Assessment of prototypes, Live feedback from testing. Final discussion			
<b>Step 4. Description of the proposed challenge (background info, resources available, tips)</b>			
The design thinking into product packaging session offers an in depth exploration			

of the challenges that product design and product packaging are characterised by. As designers try to fulfill the needs of the clients (people and companies) they often get misoriented from the previous packaging of each product.

This session offers a platform to deal with this challenge and prepare designers for a fruitful in depth exploration of new possibilities.

The available recourses for the session are:

Archival material from the previous package designs

Prototypes and rejected prototypes of previous packages.

Research into audience needs in word documents and Google forms.

Interviews with previous designers of the company but also interview of other international designers.

The tips we offer to the participants are coming from the companies long experience and relate to trial and error, rejection of other variations of prototypes and our very human client based experience and group critique.

### Step 5. Methodology

Initially we will introduce the topic to the group through this presentation...

Then we are going to offer two group lectures from international designers.

Then we are going to give hands on workshops to the group of participants.

Then we are going to go through the design thinking methods one by one in order to come up with interesting prototypes and to critique them in groups.

We, at the end, are going to group critique the prototypes and vote for the best one.,

### Step 6. Support given to the learner

#### Timeframe for the implementation of activities

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
<b>Preparation</b>	x							
<b>Implementation</b>		x	x	x	x	x		
<b>Evaluation</b>				x			x	x

## Sharing experiences and recommendations

ADDET model and guide was pilot tested during the project lifetime. Each partner, involved 5 students, who undertook their apprenticeships following the ADDET model. This chapter presents successful stories from the implementation in partner countries.

For partners: To report the successful stories, please use the following template. Max. 1 page.

<b>Title</b>  <i>Please give a title to your story.</i>
<b>Description</b>  <i>Describe the processes of the ADDET apprenticeship, how was it implemented? How did you use design thinking in the learning experience? What was the objective of the apprenticeship? How was the student supported? What did the student learn?</i>
<b>Lessons learned</b>  <i>What went well? What was the impact of the ADDET apprenticeship? What went wrong? What obstacles did you face?</i>
<b>Conclusions, suggestions for further evolvement of the ADDET apprenticeship.</b>

## Template for the apprenticeship programme design

<b>Step 1. Objectives and goals</b> <i>Define the main objectives and goals of you apprenticeship program.</i>			
<b>Mentor: (Name/Surname)</b>			
<b>Step 2. Learning outcomes</b> <i>Define the learning outcomes. You can use the following table.</i>			
<b>Tasks</b>	<b>Performance criteria</b>	<b>Knowledge gained</b>	<b>Skills/competencies gained</b>
<b>Step 3. Assessment criteria</b> <i>Define the assessment criteria and methods to find out if apprentices have achieved the learning outcome.</i>			
<b>Step 4. Description of the proposed challenge (background info, resources available, tips)</b>			
<b>Step 5. Methodology</b> <i>Describe the methodology you used during the apprenticeships.</i>			

<b>Step 6. Support given to the learner</b>								
<b>Timeframe for the implementation of activities</b>								
	<b>Wee k 1</b>	<b>Wee k 2</b>	<b>Wee k 3</b>	<b>Wee k 4</b>	<b>Wee k 5</b>	<b>Wee k 6</b>	<b>Week 7</b>	<b>Week 8</b>
<b>Preparation</b>								
<b>Implementatio n</b>								
<b>Evaluation</b>								

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