

R3.1 – Guidelines on learning module structure and training methodology.

ANNEX II – CHAINs Methodology



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1. Glossary of terms, abbreviations and acronyms

Abbreviation / Acronym / Term	Description
CE	Circular Economy
CHAINS	CHALLENGES INNOVATION teams. Collaborative teams of students of the PackAlliance postgraduate programme to work on a specific industry challenge
EACEA	Education, Audiovisual and Culture Executive Agency
HEI	Higher Education Institution
PackAlliance Hubs	Physical places where the academia-industry collaboration within the project will take place
WP	Work Package

Partner shortname	
P1-Campus Iberus	Partner 1 - Campus Iberus (Spain)
P2-Ecoembes	Partner 2 - Ecoembes (Spain)
P3-AGH	Partner 3 - AGH University of Science and Technology (Poland)
P4-Synthos	Partner 4 - Synthos Group (Poland)
P5-TAMK	Partner 5 - TAMK Tampere University of Applied Sciences (Finland)
P6-Pyroll	Partner 6 - Pyroll Group (Finland)
P7-Proplast	Partner 7 - Consorzio per la promozione della cultura plastica - Proplast (Italy)
P8-UNISA	Partner 8 - Università degli Studi di Salerno (Italy)

2. Introduction

One of the central goals of the PackAlliance project is to create and put into practice an innovative postgraduate programme.

The programme includes training on four thematic modules and a hands-on module that will be carried out preferably in the PackAlliance Hubs. This last hands-on module is based on project-based learning by creating small tutored groups (CHAINS - CHallenges INnovation teams) working on specific real challenges proposed by sectorial representatives to stimulate creative and entrepreneurial spirits.

Following the completion of the four thematic modules training, students will be grouped into 5-person teams. Then, a specific challenge related to CE and plastics packaging will be proposed to each team by industrial members of the partnership. Each CHAIN will work over a period of 2 months, guided by appointed academia and industry mentors, in order to find solutions to the challenges assigned by companies. Expertise, support and resources necessary for the students' work will be provided by the PackAlliance Hubs.

The proposed methodology to be used for and by the CHAINS to work on the challenges is the DIP (Define – Ideate – Prototype) methodology based on Design Thinking. The purpose of this document is the description of the DIP methodology tailored to our 2-month hands-on module.

3. CHAINs methodology steps

3.1 Presentation

The first days are usually dedicated to the members of the Hub making a first contact with the environment and colleagues (members of the Hub itself and company workers with whom they will interact during the 2 months). For this, the following schedule is proposed:

Day 1: Presentation of the project, centre, staff with whom they will work and do team dynamics:

- Brief presentation of each person on the company's team (company Mentor)
- Presentation of the company (mission, vision and values), what is expected of the project and the Hub team and keys to follow (company Mentor).
- More specific information about the company and information related to the project that is already being worked on in the company (company Mentor).
- General rules: Dress code, working hours... (company Mentor)

Team Dynamics

It is essential, when creating multidisciplinary teams, to make it easier for them to get to know each other to avoid the barrier of shame or "what will they say" while working.
(Academic mentor: He must be with the members at all times, guiding the activities and observing how they are and how they relate).

For this purpose, the following exercises are proposed:

- **HBDI questionnaire**

Objective:

To identify the profiles that have been selected. This way we will know who is more experimental, rational, careful or emotional. This way we can take it into account when communicating with them and facilitating relations between the members of the Hub if necessary. It is also very useful for the members themselves to recognize the personalities of their peers and improve their communication from the beginning, avoiding misunderstandings.

It is also interesting to identify the most creative profiles and to know how many there are, in order to create teams in the ideation phase to empower them and help the most rational profiles to get into creative techniques.

(Annexes: Questionnaire and Analysis of results)

Practice

- Questionnaire with 12 multiple choice questions to answer honestly.
- Make it clear that there are no correct or incorrect answers; it is a personality test to facilitate interpersonal relationships.

- **Elevator Pitch**

Objective:

The intention of this exercise is to get to know each other better, to "loosen up" and to create bonds.

Get to know each other and having a fun time is important to relax in the first day.

It is also important that the company knows them and that the members of the Hub get to know the company team so that they trust them and are not "afraid" to ask them any questions.

Practice

An exercise with the following guidelines:

- They have a minute for the following. Tell curious things about themselves including at least:
 - 1 thing they love
 - 1 thing they hate
 - A lie
- The rest of the participants must identify the lie at the end of each presentation

- **Plane crash**

Objective:

We seek to identify roles and personalities. See how they cooperate with each other and if someone dynamites the cooperation and / or the team, if they try to impose themselves or impose their ideas on others.

It is also interesting to identify the "innate leader" who, without imposing his will, helps the team to reach the solution in a constructive way.

Practice:

- The next exercise will consist of creating a team dynamic that tenses the participants
- Set out the exercise and make it clear that there are no right or wrong answers
- (Annexes: Statement of the exercise)

- **Communication and drawings**

Objective:

With this exercise we see the ability of each member to communicate when explaining their drawing, and to understand directions and pay attention to the rest.

In addition, we see who better understand each other and how they react to "good" or "bad" results.

The attitude they have during exercise is also important. It is a "fun" activity in a way, but that does not mean that you should lose focus or break the rules.

They must be aware of the importance of communication and that not all of us think the same way even with the same indications.

Practice:

- Everyone sits in a circle in such a way that no one sees the contents of anyone else's notebook
- Taking turns, the first member of the team draws a simple drawing in their notebook (ex: Some glasses)

- Next, he gives simple instructions breaking down the drawing so that the rest of the classmates draw the same thing as he / she. Each one in his notebook, without seeing the others. (i.e.: Draw a circle, another to its left with a separating finger between them ...)
- When finished, the drawings are compared with each other and with the original
- Next team member's turn

- **Debate**

Objective:

We seek to see the ability of team members to defend ideas that are not their own or that are even contrary to theirs.

We also seek to detect mental speed and the ability to argue, to avoid conflict with the "rival" team. Be able to listen to the other team and respond. Each team should stick together, defending the issue as a united group, cooperating and adding to each other.

Practice:

- 2 teams to argue each other
- Topic and position to defend assigned to each group (it is best if the topics are related to the future challenge)

- **Personal Questions**

Objective:

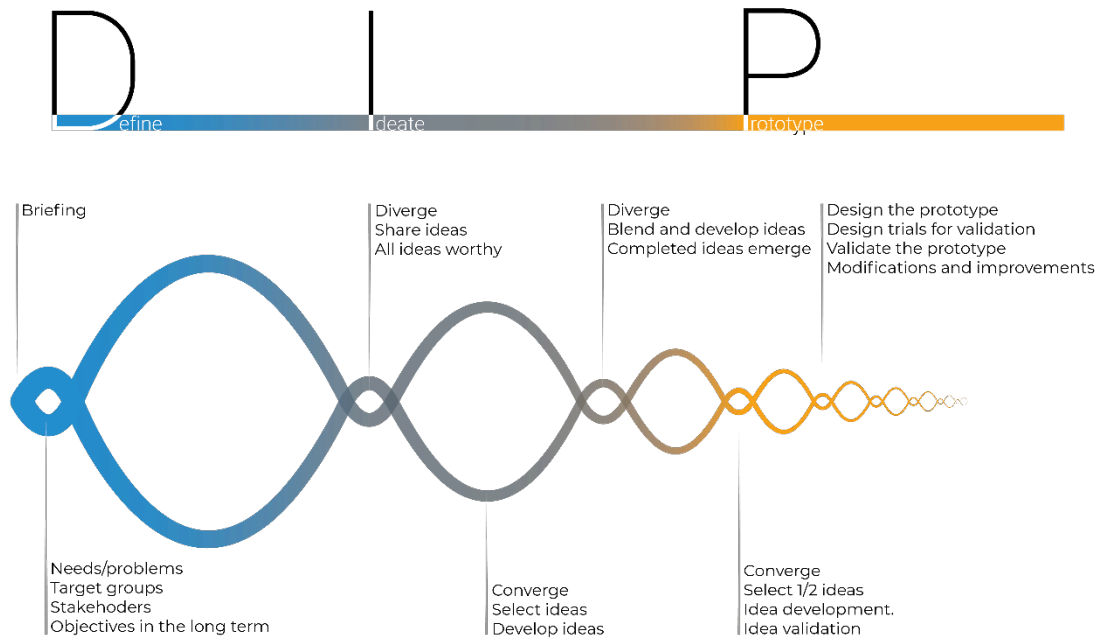
This activity has a similar objective to that of the Elevator Pitch, to learn more about the team members and to get to know each other; have a nice time and disconnect. We will also see who finds it more difficult to open up to others and to whom the least. The idea is to ask them all in order, the ideas grow in intensity. In case you don't have time for all of them, the "important" ones are those in bold.

Practice:

- 19 questions of a personal nature to answer honestly
- There are no right or wrong answers
- (Annexes: List of questions)

Day 2: Explain the methodology that is going to be used, organize the team in a computerized manner (which platform will they use to share files) and locate the main ways to search for information to begin the first phase: Defining phase (Academic mentor: Will be with them all day explaining the theory and guiding them through the process).

It is proposed to use the DIP (Define - Ideate - Prototype) methodology. This methodology is based on Design Thinking, simplifying it so that it is easier and above all faster to assimilate and apply.



As can be seen in the graph, the DIP methodology has three phases, Defining phase, Ideation phase and Prototyping phase.

Based on previous experience, we recommend setting the following deadlines:

- The first week, the presentation and the definition phase
- From the second to the fifth week the Ideation phase
- The last three weeks (from the sixth to the ninth) the Prototyping phase

Each phase will have some Inputs which will be mandatory to start working and some outputs that will help to change the phase and continue with the project. Furthermore, a series of tools are proposed for each phase.

3.2 Definition phase

- Roles:

Company Mentor: He will be the decision maker. The Hub team will show him twice what they are doing, the path and the decisions they are making, and the mentor of the company must give the GO / NO GO to the team if considers that the path or the decisions taken are not in accordance with the company and the project that it has proposed.

They should be short meetings, maximum 20 minutes. Updating of the company Mentor and validation.

Academic mentor: Explain each of the methodologies and make sure that you are applying them correctly. It should not influence the ideas themselves, whether they are "good" or not, only that the process is followed. The ideas should only be generated the members of the Hub.

He should guide them or give them the keys to present efficiently in meetings with the company Mentor in case the team does not know how to do it.

- Inputs:

Well-defined information search lines understood by the entire team.

To start this phase, the team must have fully understood the challenge and divide it into smaller parts.

- Tools:

Initial search for information

As the team is multidisciplinary, each one can start by looking for information in the line with which they feel most comfortable. The purpose is to learn more about the challenge, make the knowledge sought their own and share this information with the rest of the team.

Start at the end

In this exercise we will simulate having two hats, the optimist and the pessimist.

To begin, we will put on the optimistic hat and we will look for the long-term objective we want to reach in order to solve the challenge.

It is not about generating ideas that will solve it but about establishing a common goal for the entire team.

Once that objective is established, we will put on the pessimistic hat and see what could prevent us from achieving this objective, generating a list of problems / impediments / risks.

How might we

Building on the list created in the previous exercise, rephrase those problems with the intention of turning those problems into design opportunities.

Reframe each challenge starting the sentence with: How might we...

Example:

"In the early 1970s, Min Basadur, creative director of Procter & Gamble, had to come up with a soap to rival the popular Colgate-Palmolive soap, Irish Spring, whose design had a green color and an attractive promise of "refreshing."

Basadur thought the P&G team was asking the wrong question (“How can we make better green soap?”) And asked them a series of questions using HMW, culminating in: “How can we create more refreshing soap?” that is, defining the correct problem. By formulating the correct problem, and creating a creative environment with the HWM question, Basadur managed to get hundreds of ideas generated for possible soaps in the following hours, converging around the idea “The coast is refreshing.” Hence a blue and white bar of soap was created, called «Coast», which became a highly successful brand.”

Make a map

This exercise will be divided in two parts:

1. In the first, different population groups are established that the Hub team considers important to address in order to obtain the long-term objective. Groups can be made taking into account the factors that are considered most important (some examples may be: age, social level, technology management, ...)
2. In the second, a Stakeholders Map will be made. Always keeping in mind the established long-term objective, think about who is going to take part in the project and its development. Write each of the stakeholders on a post-it. Once all of them have been found, assess how important each of them is going to have in the project and what their broad interests will be.

Pick a target

When a project is developed, it is not feasible to address the entire population, so the Hub team must choose one or two of the groups created in the previous exercise (the one they consider with the most potential). It does not have to be the group that covers the largest population.

In the same way, they will decide which stakeholders are going to be most important to consider due to their vital importance for the development of the project.

Buyer Persona

For this last exercise, “Buyer Persona”, a template (image below) will be used.

The goal is to populate a template per target group. (In case they did not know how to choose one due to indecision, by filling out this template or a similar one, they should choose the target group with the greatest potential.)

One will also be filled in for each stakeholder selected as "vital" for the development of the project. (It is recommended that they be between 3 and 5, no more.)

<p>Persona</p> <p>Name Physical description - -</p> <p>Age Residence - -</p>	<p>Cultural level</p>	<p>Relationships</p> <p>Communications</p>	
<p>Personality</p>	<p>Interests/Hobbies</p> <p>Fears</p>	<p>Desires</p>	<p>Occupation</p>

- **Outputs:**

At the end of this first phase, the outputs will be: The target group to which the team and the stakeholders considered most influential will be directed, and a small list of the main problems / obstacles of the project reformulated with the How Might We activity.

3.3 Ideation phase

- Roles:

Company Mentor: This phase will be longer in time, so a meeting will be held towards the end of the second week (late Thursday or early Friday) to validate the Hub team's progress and its alignment with the company's interests.

In the last two weeks the Hub teams, will present the most "defined" ideas and the mentor will have to make sure that they fit in with what the company is looking for.

In addition, as fewer ideas are left, together with the academic mentor, the company mentor should help providing the Hub team the necessary tools for Prototyping and user validations (whether materials, contact with suppliers or contact with validators...)

Academic Mentor: The Academic Mentor will be crucial in this phase, he must clearly explain the creativity tools so as many ideas as possible are generated, but also so that a good "filtering" of those ideas and good presentations to the Company Mentor are made. If the company mentor does not understand an idea correctly, he or she may discard it and be lost.

At this stage you will not have to be with the Hub team all the time. You will need to be present at the explanation of each tool and at the beginning of its use (to make sure they have understood and applied it correctly) but then you can leave them "alone" and work on each other. Even if they are working "alone", you should check from time to time that everything is going well.

It is also important at this stage that there is a good communication between the academic mentor and the company mentor. If the Hub team has not understood something or needs help or advice they can talk to any of the mentors.

- Inputs:

In this phase there will be two Inputs: the outputs from the previous phase and the explanation of the keys to boosting team creativity.

These keys are:

- No idea will be judged, as this limits creativity
- Quantity before quality. If we only have one idea, it will be too similar to other people's
- Always share ideas with colleagues. An idea that may seem unimportant to you can give the key to another member of the team.
Everyone thinks differently and that is our best tool.
- Ideas are not final destinations but learning directions. One should not be afraid of generating crazy or absurd ideas.
- An idea may seem crazy or absurd at the beginning of the creative phase and become the solution to the problem once it has been worked on.
- Crazy or absurd ideas have a function: to encourage others to get excited and contribute ideas, to get away from the problem, to generate different conversations, etc.

The positive mood makes the process easier.

- Tools:

Mind Map

Starting from the opportunities identified through the How Might We... The Hub Team

selects those problems that are considered the most important ones, those that, by tackling them, will make it easier and faster for us to reach our long-term goal.

With the selected ones (between 6 and 10 approx.) we start the exercise.

We put one of the phrases in a circle in the centre of a page and the team starts thinking general ideas to solve it. Each one of them will be inside another circle connected with a line to the middle (Example: How might we get people to be critical at news consumption -> Trough education, Banning fake news...)

Once we have obtained a good number of global solutions for the central problem, it is time for using the same methology with the new general solution proposals that have been identified.

(i.e: How might we get people to be critical at news consumption -> Trough education -> Educating kids in the school, creating workshops for adults, Creating a filtering service for Elder people...)

It is important to reach the third level, where ideas are already taking shape and are somewhat more concrete.

It is important to promote "madness" and the creation of absurd ideas in this exercise.

Many ideas come out of this process, so before moving on to the next one, the best ideas must be chosen. Some of them can be mixed even if they come from different sentences.

Crazy 8

With a sheet of paper divided into 8 spaces, each member of the team develops and explains one of the ideas from the previous exercise (the one that seems to have the most potential) by drawing.

It consists of drawing a comic of the idea in 8 minutes, one minute per page space and it must be clear enough for anyone to understand the idea when seeing the drawings.

When the drawings are finished, everyone looks at each other's papers and the ideas are explained.

The ideas with the most potential are voted on again.

Solution sketch

Having only about 3 ideas, among the whole team they are developed further. Each of the ideas is given a title and by column, each idea is explained in 3 post-its.

Depending on how the ideas are, they can be divided into the steps of the process, the components...

The important thing about this process is that ideas are developed to be as complete as possible. All team members must be clear about all ideas.

SWOT

This tool helps to finish developing the ideas completely.

By filling in a table similar to the one in the image, it will be possible to evaluate the pros and cons of each of the ideas and assess which one has more potential.

<div style="text-align: right;">ENVIRONMENTAL FACTORS</div> <div style="text-align: left;">OWN SPECIFIC FACTORS</div>	OPPORTUNITIES -	THREATS -
STRENGTHS -	Strategies to make use of Opportunities through our Strengths <div style="text-align: center;">X</div>	Strategies to prevent Threats through our Strengths <div style="text-align: center;">X</div>
WEAKNESSES -	Strategies to make use of Opportunities to minimize Weaknesses <div style="text-align: center;">X</div>	Strategies to minimize the potential dangers lying in sectors where Weaknesses meet Threats <div style="text-align: center;">X</div>

SWOT strategies

Once this has been done and one or two ideas have been chosen, fill in the central spaces, generating strategies to improve the Strengths and Opportunities and to deal with the Threats and Weaknesses.

<div style="text-align: right;">ENVIRONMENTAL FACTORS</div> <div style="text-align: left;">OWN SPECIFIC FACTORS</div>	OPPORTUNITIES	THREATS
STRENGTHS	Strategies to make use of Opportunities through our Strengths	Strategies to prevent Threats through our Strengths
WEAKNESSES	Strategies to make use of Opportunities to minimize Weaknesses	Strategies to minimize the potential dangers lying in sectors where Weaknesses meet Threats

At the end of this exercise there should be only one idea left.
It is important to keep the company's staff involved at all times so that they can give their approval to the ideas throughout the process.

- **Outputs:**

One or two ideas (depending on what interests the company) defined enough to be clear to the whole team.

3.4 Prototyping phase

- Roles:

Company Mentor: Once the final idea has been validated, it is necessary having a meeting at the end of the first week and two extra meetings on each of the following two weeks. It is important that you make sure that everything develops according to the objectives of the project and the company.

Academic Mentor: In this phase the Hub team will work more independently. The academic mentor will have to ensure that deadlines and objectives are met, and help out at some point if the team requires it.

- Inputs:

The Output from the previous phase and people from outside the project, members of the company and/or representatives of the stakeholders defined as most important in the first phase that allow the team to test their idea and see if it achieves the problem-solution fit well or where it is failing.

It will also be important to have an external supplier or company to help the team make the prototype(s) (this can be prepared in the previous phase as the SWOTs are reached, where the ideas already mark the line of development of the project solution).

- Steps:

Steps to follow:

- Define the idea completely
- Define how the idea should be validated/tested (based on the target group and stakeholders chosen in the first phase). It is better to look for several validators per profile to contrast opinions and find more faults.
- Define the validation/testing process and whether to create forms/record/do interviews... or any extra material other than the prototype
- "Manufacture" the prototype.

Depending on whether the solution is a product, a service, etc. the manufacture of the prototype will vary. A functional prototype may be needed where aesthetics are not important; a formal prototype, where every effort must be made to accurately replicate shapes, colours, textures...; a mixture of the above; a digital prototype in the case of an application/web/online service prototype...; or a staging if it is a face-to-face service.

There are many types of prototypes and it is important to choose the right one for validation/testing to be useful.

- Carrying out the validation/testing
- Collect all the problems or failures detected during the tests and comments from the validators and assess their importance.
- Thinking about how to improve the product/service based on these detected faults.
- Prepare the presentation of the project for the company and make the report.

- Outputs:

As a final output we recommend that each team submit a report on the project and the process followed over the two months.

4. Online CHAINs

Either due to the COVID-19, or the distance between students the chains cannot be developed in person, the methodology should be adapted to an online scenario. The mentors, the university and the company must make an extra effort for develop a scenario where the objectives of the project can be developed. There are tools that help teams to keep collaborating and developing innovative solutions with a cross-cutting point of view even if they work remotely.

We show in this chapter some methodological alternatives, tools and guidelines. It is not a fixed solution or unique methodology that must be followed, each hub and mentor can adapt it and optimize it to the needs and workload of each chain.

SCRUM MEETINGS:

It can be a good practice using some elements from the scrum methodology for developing a structured system for online meetings.

For example:

Daily review: 15' videoconference for sharing the tasks done the day before, the problems that have appeared and plan the tasks for the day.

Weekly meeting: Having a virtual meeting for 1.5 hours where the team and mentors evaluate the performance of the week. They have to share if they have arrived to the proposed objectives, if they have suffered some difficulties and how can the team adapt for the next week its working plan for improving the performance. It is also important for that meeting to stablish some milestones for the work to be done during the following week.

Sprint review: Once per phase (Understanding, define and prototype) the team must have a long meeting (2-3hours) with the stakeholders of the project, the people in charge from the university and the company must attend to this meeting to validate the job done, correct some deviations and stablish the next milestones aligned with the company and university objectives.

These virtual meetings can be done through any platform, but some common advises are:

- Respect the timing: Avoid unproductive meetings
- Prepare in advance the agenda for the weekly and the Sprint review meeting and the content that is going to be presented. For the weekly meeting is not necessary to create specific presentations, it is better to talk and to present the drafts that are being developed.

Some actions or tools that can be useful for the chains if they have to be developed online are:

TOOLS FOR DEFINITION PHASE:

During the definition or understanding phase the students must acquire a complete vision of the structure, objectives pains and gains of the company. This is mandatory if we want to generate a deliverable that can be useful.

It is important to digitalize all kind of materials: internal protocols, welcome guides or other documents that can be used by the students to improve their knowledge of the scenario where they are going to work.

An on-line webinar will be the most useful activity. Once the students have received the first materials and have had a first approximation it is very useful to organize a webinar where managers share the company culture, environment and solve all the doubts that students can already had.

TOOLS FOR IDEATION PHASE:

This is the one of the phases that can be adapted to the online scenario more easily. Platforms like www.miro.com or www.mural.com can be used for generating a virtual space where students can ideate, generate boards, insert virtual post-its, vote and prioritize ideas.

We have been using miro, there are a lot of resources online about how to use and generate online ideation dynamics.

TOOLS FOR PROTOTYPING PHASE:

Prototyping online is for sure the hardest part to adapt to an online scenario. It is true that physical prototypes can not be generated, but there are some other alternatives than can be developed and generate a valuable deliverable for the company:

- Digital packaging renders (CAD software)
- Market analysis: market research, user testing and new lines of development.
(Some other Prototypes can just validate and generate insights about a new product or a working line generating new knowledge and establishing a starting point for new materials)
- Sketch for digital products. (Figma, Marvel and Adobe XD are the best platforms to use)

Annexes

Aircraft accident

Your holidays in the Caribbean has been interrupted by a resounding plane crash, you are one of the survivors onboard an inflatable boat about to sink due to overweight.

A few kilometres away you can see a desert island, which you can reach if you lighten your weight. Below is a list of fifteen items carried by the boat, which you should sort out individually by priority and then discuss as a group how they will start to be released overboard.

Hand in the list of numbered objects (1 the first to be thrown, 15 the last) when analysing the exercise.

- 5 packs of nappies
- 1 revolver without ammunition
- 20 litres of drinking water
- 1 carton of French cigarettes
- The hostess's box containing 500 euros in different currencies
- The aeroplane's pilot's instruction book (600 pages)
- Nylon thread and hooks
- 1 box of 50 condoms
- 2 bottles of gin, one of which has been started
- 1 parachute without instructions
- 1 solid gold lighter
- 1 make-up box with 12 colours and brushes
- 1 box of concentrated food
- 2 oxygen cylinders
- 1 compass

List of personal questions

1. If you could choose anyone in the world, who would you invite to dinner?
2. Would you like to be famous?
3. Before you make a phone call, do you think about what you are going to say? Why?
- 4. What would a perfect day look like to you?**
5. When was the last time you sang alone? And for someone else?
6. If you could live to be 90 and have the body or mind of someone in their 30s for the last 60 years of their life, which would you choose?
- 7. If you could change one thing about how you were brought up, what would it be?**
8. If you could wake up tomorrow enjoying a new skill or quality, what would it be?
- 9. If a crystal ball could tell you the truth about yourself, your life, the future, or anything else, what would you ask it?**
10. Is there anything you've wanted to do for a long time? Why haven't you done it yet?
11. What is the greatest achievement you have made in your life?
- 12. What do you value most in a friend?**
13. What is your most valuable memory?
14. What is your most painful memory?
15. Complete this sentence: "I wish I had someone to share with..."
16. Share an embarrassing moment in your life with your partner.

- 17. Tell your interlocutor something you already like about him/her.**
- 18. Is there anything that seems too serious for you to joke about?**
- 19. Your house catches fire with all your possessions inside. After saving your loved ones and pets, you have time to make one last raid and save one single object. Which one would you choose? Why?**

PROJECT INFO

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Action Type	Knowledge Alliances for higher education
Project Title	PackAlliance: European alliance for innovation training & collaboration towards future packaging
Project starting date	01/01/2020
Project end date	31/12/2022
Project duration	3 years

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PROJECT CONSORTIUM



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