E³UDRES²

Engaged and Entrepreneurial European University as Driver for European Smart and Sustainable Regions

3. E³UDRES² Learners & Educators

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Inhoud

1. Introduction

The focus in the growth document of E³UDRES² was mainly building the foundations in WP3. A basic concept for the l Living Lab was developed and a workflow within the team members was organised.

Going to 1,5 year of E³UDRES², this document looks back at the last 6 months in WP3. Building up from the foundations, the concept of the I Living Lab deepened and got translated in practical applications to be used in the I Living Lab. Besides this, a lot of time was invested in coaching and training our continuously growing team of Educational Entrepreneurs and building both our regional and European community.

As a result of these choices, this report focuses mostly on the perspective of Educational Entrepreneurs, as they are keys in the success of the I Living Labs. They are the first point of contact for a learner, so they are the best ambassadors of E³UDRES². The learning path of an educational entrepreneur, from teacher/lecturer to facilitator is described.

When taking that much time in training and coaching our team members, a E³UDRES²culture is being built as well. When having a specific culture, a start is made for a sustainable network in the future.

Participants of the project are definitely not where they should be, but growth and improvement continue as the learners are expected to develop as well. This document will, therefore, describe that constant growth, including both the improvements that have been made and also the challenges WP3 members have come across.

2. The future university

2.1 We are E³UDRES². Let's Make Sense

We live in a rapidly changing society in which agility, creativity, cooperation, and self-confidence must become the new DNA of passionate young talents and entrepreneurs. These future nomads are of all ages, identities and cultural backgrounds. They will become moving 'minds' who are active in various functions, fields, and sectors. They will become authentic entrepreneurs full of ideas and the urge to change. That's why we invite them to be part of this new golden generation with a growth mindset and the skills to make change happen.

As mentioned by the European University Association (2021), the "evolution into 'knowledge societies' has placed universities at the epicenter of human creativity and learning, critical to our planet surviving and thriving". The referred document makes a forecast for 2030, predicting that "universities will develop their capacity to evolve and become drivers of societal change" (European University Association, 2021, p.5).

The EUDRES alliance, and WP3, aim to respond to this challenge by connecting higher education institutions with the regions in which they are integrated and, above all, with global society, creating and promoting working and learning synergies.

2.2. Because We care!

That is why we need change agents who dare to think differently. And who have the skills to work together on tomorrow's challenges. Change agents who are Future Talents that take on complex local challenges with an open mind. Who work in cross-cultural teams with entrepreneurs, experts, artists, policy makers and visionaries on a promising and inclusive region?

In the future, working and learning will merge into one. From teaching we are transforming to educational entrepreneurship. We need to think less in silos and more in terms of collaboration. Lifelong learning is the new norm. That's why we want to offer these young and restless Moving Minds a new way of learning.

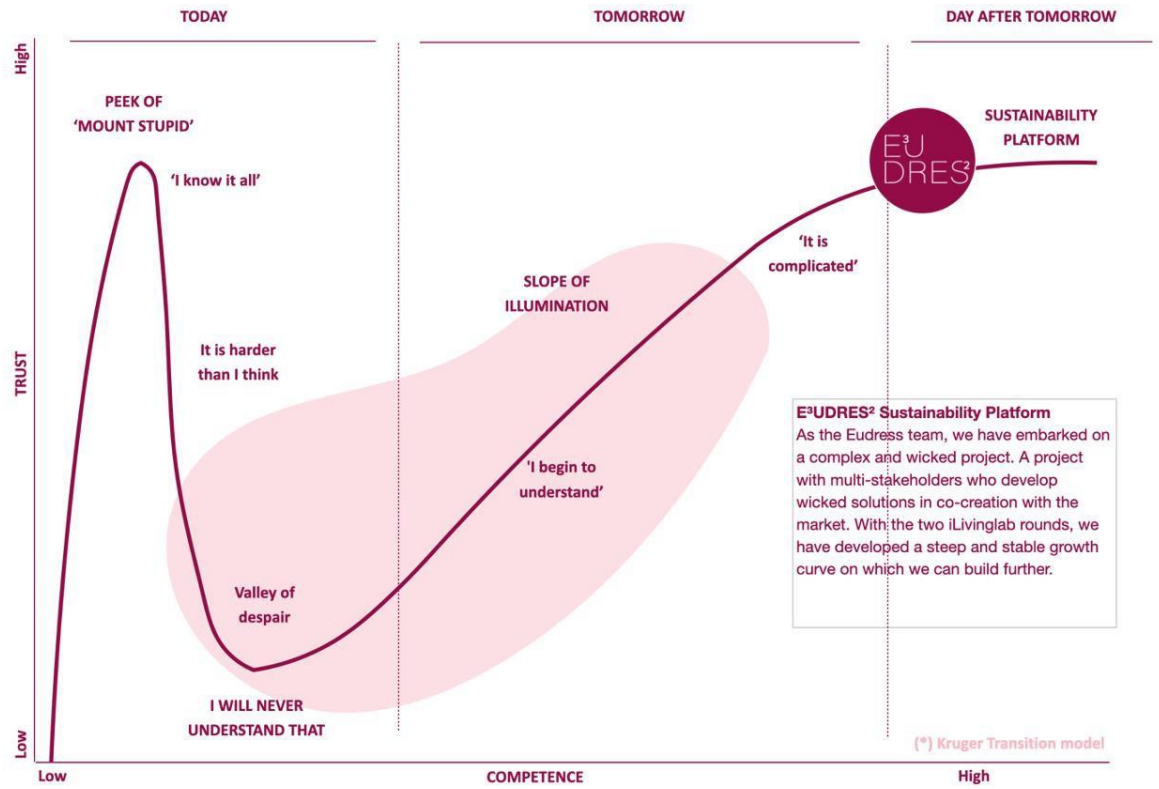
2.3 Challenge Based learning

An I Living Lab is as a "Saled Bowl" for students, educational entrepreneurs, and challenge owners who want to prepare themselves for a very fast-changing world in which technology and disruptive business design offer unprecedented opportunities to innovate and change. To have an impact on the society in which you live, learn, and work.

Challenge based learning is an active way of learning that gives you better retention of knowledge, enhances your motivation, and encourages you to develop skills that are essential for your personal development and for the labor market in the 21st century. Working in an I Living Lab triggers you to develop your future skills. These are competences that offer significant added value on the labor market: analytical and problem-solving thinking, dealing creatively with obstacles, learning to deal with uncertainties, being able to adapt to an ever-changing reality, and creating sense. Considering the speed at which new technologies continue to emerge, digital and technological transformation is not a one-and-done process. It's needs new LEADERSHIP with new qualities: Adaptability, Creativity, Curiosity, and Comfort with Ambiguity.

2.4 The Donut economy

Today's challenges are urgent and complex. The planet is warming up. Agriculture is looking for new resources. Young people long for prospects. Healthcare is yearning for connection. Companies are looking for industry 4.0 talents with not only technical skills but also with an entrepreneurial mindset. Gaps between people are getting deeper. There are no ready-made answers to these questions. Everything is connected. It takes inspiration, courage, and insight to stand up and act. Today's change-makers search for solutions together, they are prepared to act.



Model 1 Kruger Transition model

Although the destination is well established in the E³UDRES² project, the path is made step by step.

Having finalized the first I Living Labs, it was time for the T-Shaped Innovators team to stop, reflect, and move forward. To achieve these goals, an Action Day was planned and took place on January 25, 2022, via Microsoft Teams, all day long.

We believe that what we are seeking to build is an ambitious, complex, and is made through a series of setbacks and advances. Reflecting and thinking ahead, so that we can continue the future steps more consolidated and strengthened, is essential.

The Action Day targeted the outcomes of feedforward, of which we highlight (Hirsch, 2017):

- regenerates talent: "The most effective kind of feedforward helps people see opportunities for growth-ways they could take on new opportunities and roles."
- expands possibilities: expanding what's possible, rather than simply pointing out problems
- directs to a particular situation: identifying specific, concrete, tailor-made aspects of the situation which can be worked on

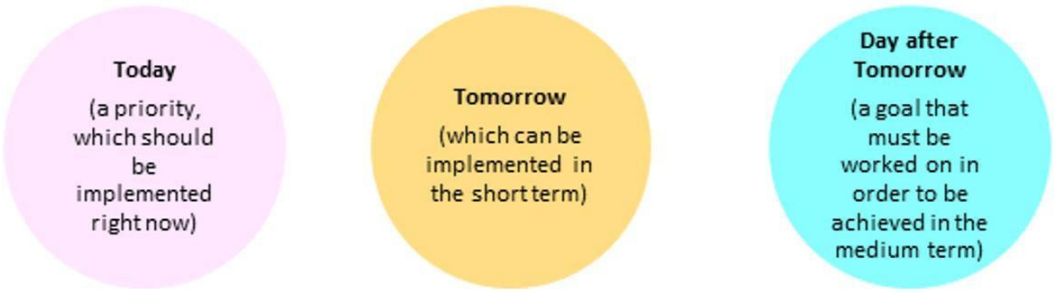
The agenda of this Action Day, had the following six issues, which will be developed in section 2 of this report:

1. **Administrative flow:** Process of time management, how can the students subscribe, how much time should there be between the subscription and the start of the ILL, … To start with the application, when students apply, they don't know a lot about the topics. Some of the students found out in the first meeting that the topic is not really what they expected. We need to describe the ILL in advance;
2. **Comfort EE's:** Everything that increases the confidence of the EE's – the timetable, the schedule, the timetable, the schedule, the organization and distribution of tasks, and better transparency of the organizational structure. A good didactive perspective/ methodological concept for the next ILL – a structure to go through the 6 weeks - a quality standard for the ILL and a view about the learning outcome;

3. **Student Engagement:** Why do students drop out? How can we identify topics for the I Living Labs? How can we promote the ILL at other universities. How can we organize the schedule and timetables and communicate this with students so they know how an I Living Lab will fit into their personal working schedule? Why don't the students understand with is wanted from them? All the administrative follow-up;
4. **Curriculum embedding:** Moving the ILL into the curriculum and making sure it's feasible for the students. 6 ETS' in 6 weeks, which means between 150 hours till 180 hours in 6 weeks is a lot of time;
5. **Team management:** An additional guidebook to help the EE's to manage the team, form and nurture connections between the students and the EE's, and with other stakeholders;
6. In depth solutions through design thinking.

During the Action Day, the topics mentioned were presented in an atmosphere of transparency and commitment to the E³UDRES² project. There was room for discussion and for clarification of aspects that should be better worked on. The day concluded with concrete action plans for the future.

This future was always thought of in three different times:



This way of acting helped the team to identify priority aspects and opportunities for change that should be implemented early on. It also helped them to list issues, procedures, or discussion topics that are important for the success of the project and that deserve future attention.

At the Action Day it was also possible to understand which area of expertise each T-Shaped innovator has and what their specific interest and intrinsic motivation is, which enabled the creation of synergies and the creation of more focused teams.

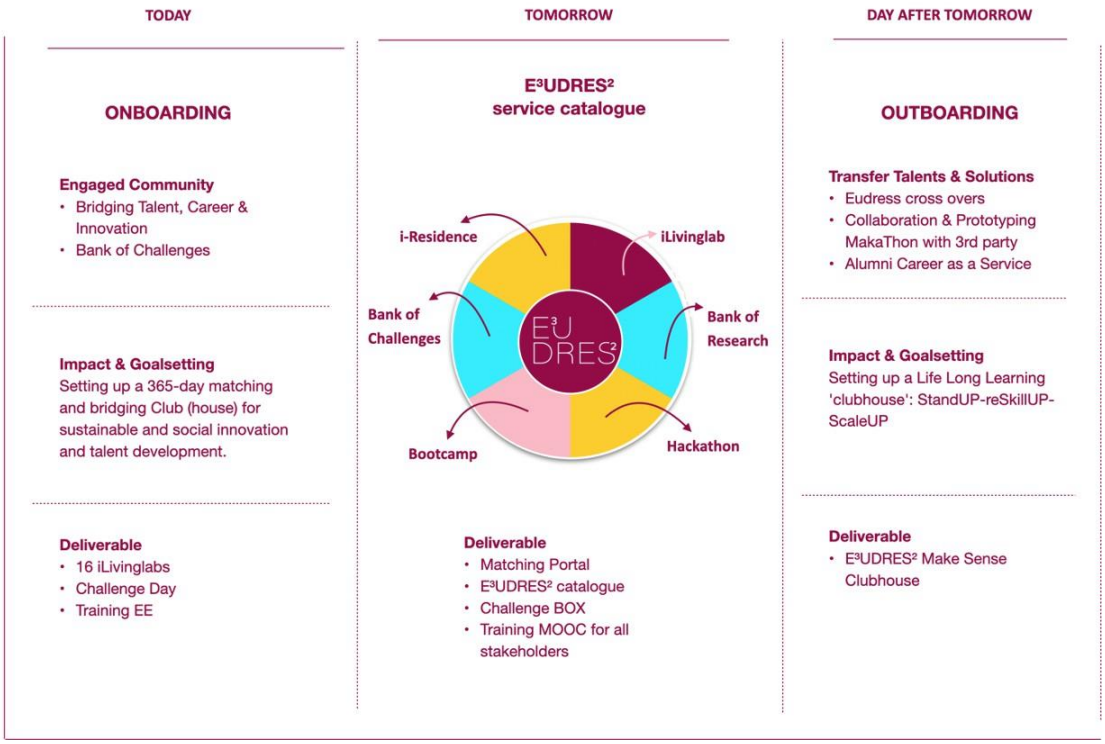
2.6 Multi Stakeholder Engagement Journey

A world in transition often leads to feelings of fear, uncertainty, and doubt. During this FUD - Fear, Uncertainty, and Doubt - people need connection. This connectedness is a powerful lever for impact drive innovation. E³UDRES² is a stakeholder connector with the aim of anchoring sustainable impact innovation in (g)local regions. E³UDRES² connects four different stakeholders, each with their own personal ambition to drive innovation and impact. The strength of E³UDRES² lies exactly at the intersection of these "What's in it for me?" drivers. There, E³UDRES² acts as a lever which turns four different stakeholders into ONE team with the aim of creating sustainable impactful innovation.

Collaboration, Creativity, and Confidence form the basis of a **New Growth Mindse**t. In our I Living Labs, learning is an active process, in which we gain knowledge from our experiences and interactions with our local region and challenges that lie ahead. The learning process in a E³UDRES² I Living Lab is something we must manage as a team by planning, by exploring, and by self-evaluating. The Educational Entrepreneurs guides this process so students can learn better and be the driver of their own future in a motivating and effective way.

This stimulates lifelong learning for the whole team. Everything changes continuously and challenges us every day to be agile. We must dare to be fast. We must make decisions. And above all we must dare to fail. Something we do not like to do.

The following figure intends to represent the course of Work Package (WP) 3, within the scope of the E³UDRES² project.



At this moment (**today**), what we have accomplished has allowed students, teachers, external stakeholders, and institutions to interact to make it possible to achieve the 11 ILL of the first round and 16 ILL of the second round.

For this to happen, it was necessary to create a model capable of withstanding this enormous challenge.

The I Living Labs arise from challenges that Educational Entrepreneurs (EE) and external stakeholders propose (based on the needs of the regions) and in 6 weeks, the ILL team, through the methodology of design thinking, idealizes and prototypes solutions. For this to be possible, it was necessary to train and qualify the EE for the dynamization of the ILL.

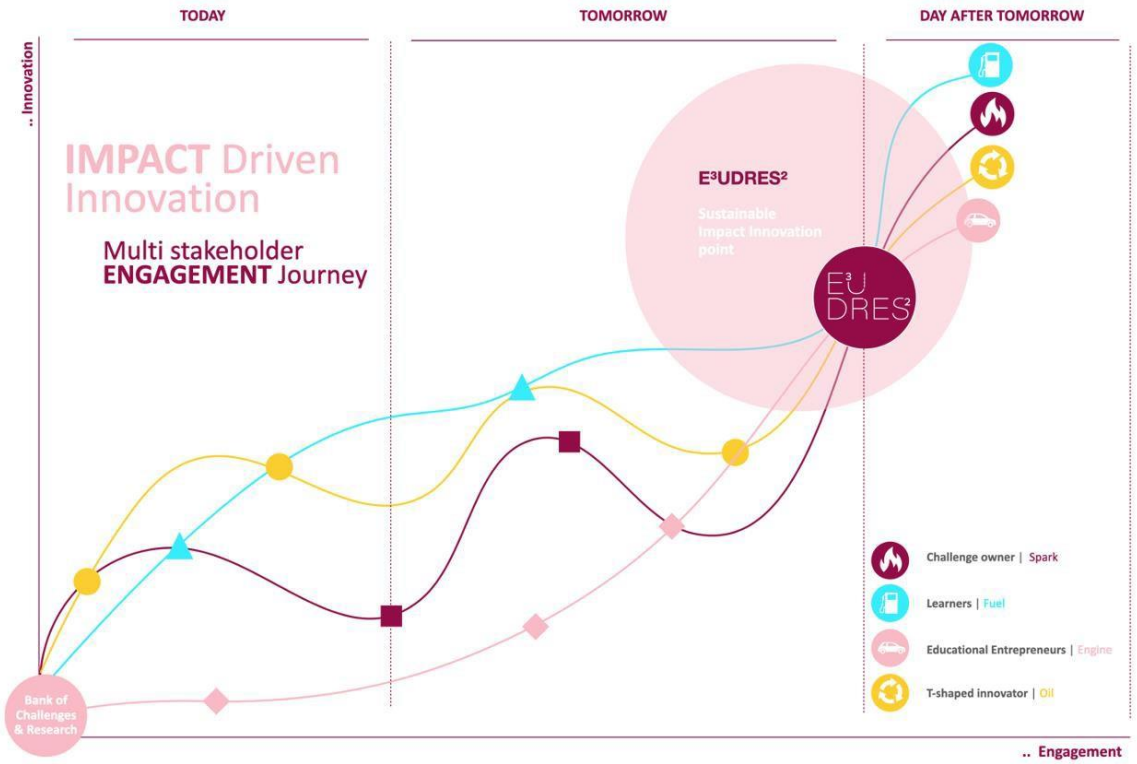
It was also necessary to ensure the existence of a common communication platform capable of supporting all these dynamics. The selected platform was Basecamp.

Although it is a giant step to be able, in an academic context, to have this experience, we know that we can do better. In this way, in the future we will work to articulate the different WP of the project, as they are interconnected and allow the continuity of work.

Depending on the purpose, **tomorrow**, we will work to improve the articulation with WP4 (research), which can deepen some concept or idea in terms of research, and with WP5 (entrepreneurship) that can continue the work started at ILL, in initiatives like Bootcamps and Hackathons. The training of academic communities is also essential. In this way, we propose to work towards the expansion of training and the offering of training modules to all stakeholders in the future, to involve more people and make this way of teaching and learning the new paradigm of universities of the future (**day after tomorrow**).

2.7 Innovation & Engagement

The challenge within I Living Labs consists of connecting innovation and engagement of totally different stakeholders: the student, the educational entrepreneur (teacher), the T-shaped innovator, and the challenge owner. Each of these stakeholders has a different 'What's in it for me?'. In the diagram below, we outline this Multi stakeholder Journey.



Model 2 Customer Journey model

1. The Challenge Owners are the **spark that initiates the change**. They share their challenges and are open to new ways of finding solutions. They are convinced that change starts from the inside and can be realized by working together in a multi-disciplinary way. They know it is time to discover new opportunities and let new ideas flow.
2. The Learners are the **fuel that energises the project.** They put all their creative energy and innovative thinking and precious time into make their regions smarter and sustainable.
3. The Education Entrepreneurs **are the engine that keeps everything moving**. They are the heart of every I Living Lab. They guide students through the amazing world of Design Thinking and give space to develop their future skills.
4. The T-shaped Innovators **are the oil that makes sure everything runs smoothly.** They are the smart bridge builders between the different stakeholders and connect innovation and engagement.

2.8 It's all about Matchmaking

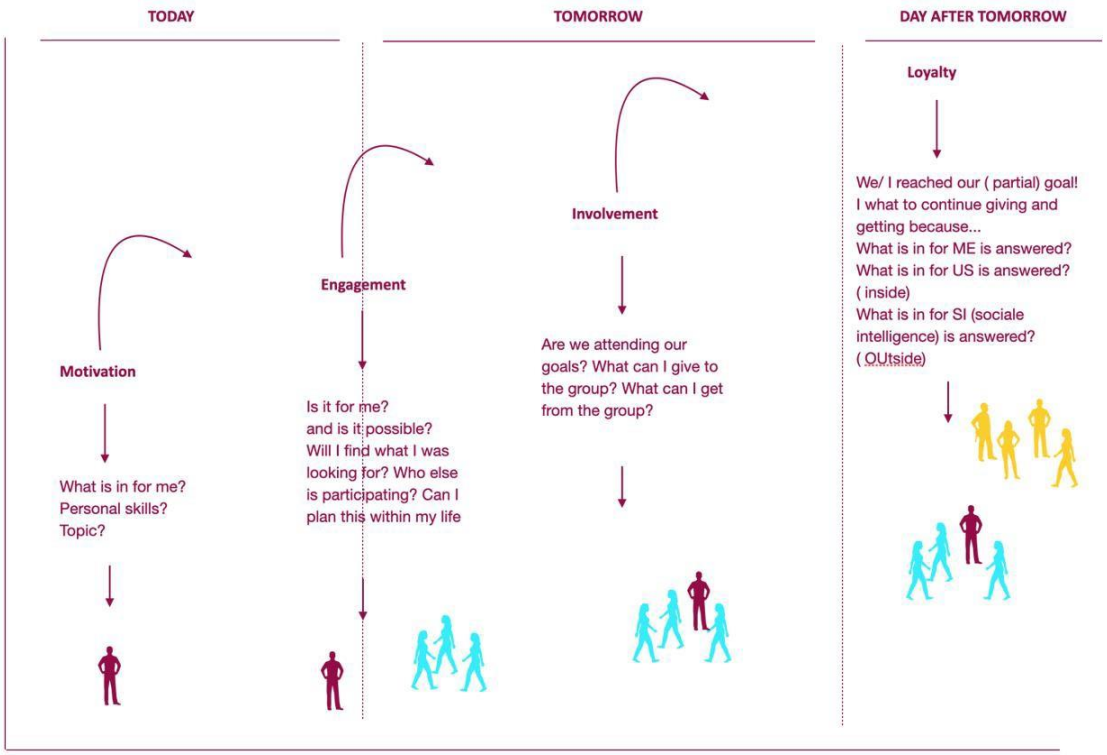
Each of the stakeholders has a different learning and innovation ambition. And that is a good thing! After all, diversity is the driving force of innovation. But a commonality is also needed. What makes a multi-stakeholder team successful in creating sustainable innovation that has impact on the (g)local region. Every good team needs a common starting point and a common goal. This 'What's in it for us?' is crucial for connecting the individual customer journeys of the stakeholders. Therefore, in the coming months, E³UDRES² wants to focus strongly on the creation of a 'common platform':

- E³UDRES² has the ambition to set up a Bank of Challenges as a common starting point;
- E³UDRES² wants to develop a roadmap for the four different stakeholders;
- E³UDRES² wants to set up a 'clubhouse' for a 365-day hybrid onboarding.

	Today	Tomorrow	Day after Tomorrow
Bank of Challenges & Research	• The "onboarding" of the challenge is done "afterwards" based on a challenge initiated by the Educational Entrepreneurs. • The Learners choose an I Living Lab within the three clusters (AI, Wellbeing, Circular) based on 3 choices; • The teams are matched based on an online selection form.	• Together with the local regions, we want to set up a Bank of Challenges that engages various (in/ex)-stakeholders to share their challenges; • This Bank of Challenges is a joint initiative of SME, StartUPs, and Public Institutions.	• Challenges are chosen based on a voting system (Tripadvisor / IndieGOGO / GoFundME).
365 On- & Outboarding	• A web form with choice lists and an allocation team formation based on 1st choice for learners.	• 365 Engagement process set up for a continuous in- & out take and an alumni program	• An On- & Outboarding platform with access to E³UDRES² curated training modules.
Clubhouse	• A BaseCamp platform where teams can share content and communicated	• A Make Sense Clubhouse that is accessible to every student and stakeholder.	• E³UDRES² wants to become a 'Green House'-network of physical and online clubhouses working on sustainable innovation.

2.9 On- & Outboarding

Helping people to develop their sense of "competency, autonomy, and connection" increases people's intrinsic motivation to do their work and regulate their behavior. The outcome is perceived personal growth. Creating a mental sense of "the whole moving forward" increases people's investment and exceptional behaviors towards individual and collective performance leaps. The outcome is real collective growth. From science we know that the first does not lead to the second. Both are different worlds in which different things are done with and said to different people.



Model 3 On-& Outboarding Story & Survey

2.10 Act as ONE TEAM

WP3 involves a vast team, which grows throughout the project. This feature brings challenges and requires the team to keep all participants active, committed to the project, and motivated for its development and for the development of the project. Considering that every four to six months WP3 integrates new actors (EE, external stakeholders, and students), there must be a model capable of sustaining all these dynamics that, at the same time, can support and maintain the stimulus of all other participants who previously integrated the project.

2.11 And why is it so important to keep the team motivated?

It is known that the involvement of the participants positively influences the success of the project. The intention of the E³UDRES² project is to exceed the current dimension of the project, move to a new paradigm, that of future universities. Due to the pandemic situation, this objective of keeping the team involved has

become more challenging, since it depends on dynamics carried out in a virtual environment. In order to respond to these challenges, the following strategies were implemented:

- establishment of regular contacts between the international team, with an informative moment and a Q&A space;
- biweekly meetings between the T-Shaped Innovators and the WP3 Institutional Coordinators;
- biweekly meetings between T-Shaped Innovators and Educational Entrepreneurs;
- establishment of regular contacts within the national team, to assess the situation and dynamize facilitating strategies at institutional and/or local level;
- identification of T-SI as coaches of the EE that are promoting the ILL;
- gradual integration of the EE into the ILL, considering that after training and before autonomously implementing the ILL, the EE can become "buddies" of the existing ILL;
- involvement of students, stakeholders, and EE to actively participate in WP3 events, such as: kick-off events and closing events. An International Engagement Circus is also planned, to be held from 26 to 28 April 2022, which will include the participation of all those involved;
- common communication support, by mail or through the Basecamp platform, so that the information is known to everyone.

Given the expected impact on higher education institutions, it is essential to keep academic communities informed and involved in a project that aims to be integrative, inclusive, and global. Although activities in this area have been carried out, this is an aspect to be reinforced.

References

European University Association. (2021). *Universities without walls: A vision for 2030* (European U). https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework

Hirsch, J. (2017). The feedback fix: Dump the Past, Embrace the Future, and Lead the Way to Change. Rowman & Littlefield.

3. Core topics

3.1 Didactic basic concept

The guiding idea for the European University E³UDRES² was developed based on the fact that currently the world's innovative power is bundled in a few metropolitan regions, where leading universities are engaged to be successful in international rankings. The quality and sustainability of teaching often play a subordinate role. Cooperation with global corporations usually counts for more than the exchange of knowledge with regional business and society. Rural regions are hardly considered in these contexts, although a large part of the population lives there. Therefore, E³UDRES² aims at the promotion of "Smart & Sustainable European Regions" and develops as a socially engaged and entrepreneurial alliance exemplary concepts for problem-based learning, mission-oriented research, human-centred innovation and promotes an open knowledge exchange with society.
To be able to implement this project, the so-called I Living Labs (ILLs) were designed as a central didactic element. The "I" stands for international, intercultural, innovative, and intensive. These labs are offered as online collaborations with a duration of 6-8 weeks and a workload of 6 ECTS for students of all network partners. In these labs, following the method of design thinking, solutions for societal challenges are worked on. In interdisciplinary and trans-European teams, students at all involved universities are accompanied by specifically prepared "Educational Entrepreneurs". The problems are introduced by regional partners from all member countries.
The participative (further) development of the labs, the intended integration into existing curricula, the further training of teachers who accompany learning processes as coaches, as well as the joint selection of problems demand great commitment from all participants, but also create diverse opportunities for the intended transformation processes.
This new didactic concept was developed using the experiences of the first round of setting I Living Labs into action and on research with and the feedback of students, Educational Entrepreneurs (EEs) and T-Shaped Innovators. All this input was used on a collaborative "Action Day" (25.01.2022) where the T-Shaped innovators of the work package 3 together looked at this data and created ideas based on that. The process of evolving the concept of the I Living Lab can also be seen as an ongoing iterative process of prototyping, testing, and using insights for more advanced prototypes.
The main goal of the relaunch of the didactic concept was to provide information and give structure to the educational entrepreneurs, and consequently to the students, to achieve the same level of quality for each I Living Lab and at the same time increase the comfort of the educational entrepreneurs. During the "Action Day" workshop, the entire team decided on steps that could be taken immediately (quick wins), some that should be taken for the next round of ILLs, and some that were categorized as future ideas.

Guides to the I Living Labs
Based on the in the workshop agreed tasks, two guides were developed. One for the educational entrepreneurs and one for the students. These guides provide a good overview of all phases of the I Living Lab (pre-preparation, preparation and duration including the specific elements of the ILL such as starting event, showdown, and call to research), the timeline, the infrastructure for working in an I Living Lab as well as the feedback and assessment in an ILL. You will find all details in the annexe of the report.
To provide some background information the phase of the preparation, the schedule and infrastructure are described.

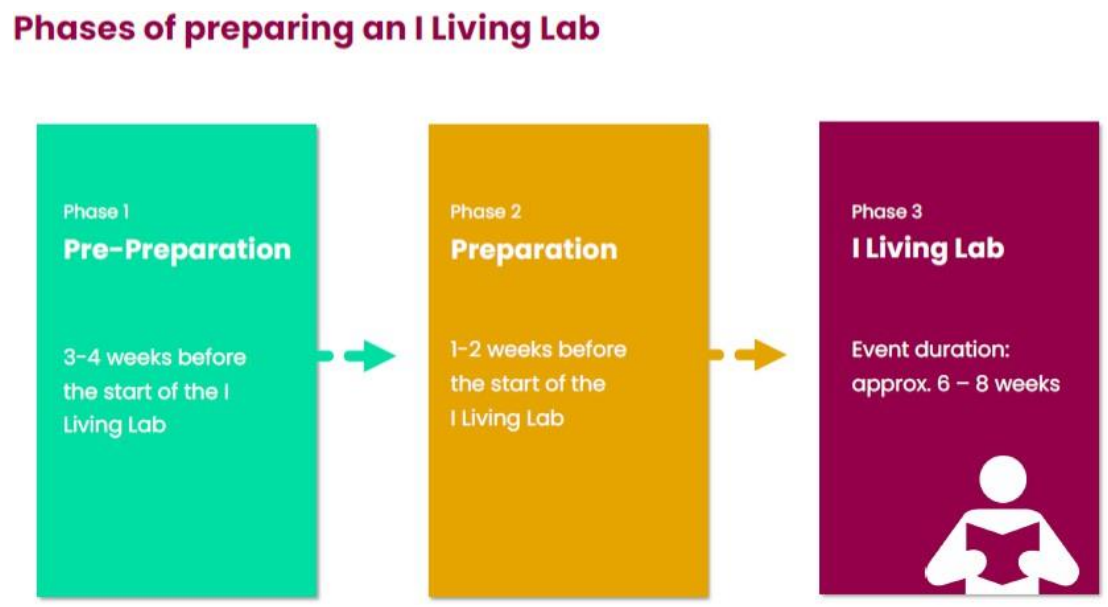


Figure: Overview of the preparation phases for an I Living Lab

The goal of the Pre-Preparation phase is to develop the topics of the ILLs and the marketing activities so that students gain information that will motivate them to participate in an I Living Lab.
- The topics for the ILLs refer to regional problems or challenges and/or are introduced by people "on site" (stakeholders). Thus, the ambition to develop "Smart & Sustainable European Regions" is implemented. These stakeholders are also involved in the process of the ILLs and give feedback to the students.
Throughout the preparation phase videos with accompanying written information provide the necessary know how for the next steps.
- Students receive basic information on the topic of future skills and the approach of design thinking in advance, which corresponds to the procedure of the inverted classroom model.
During the duration of the I Living Lab students and all those involved in the ILL follow the principles of Design Thinking. This promotes creative "out of the box" thinking. The ILLs thus offer the optimal framework for (further) evolving ideas in intensive cooperation.

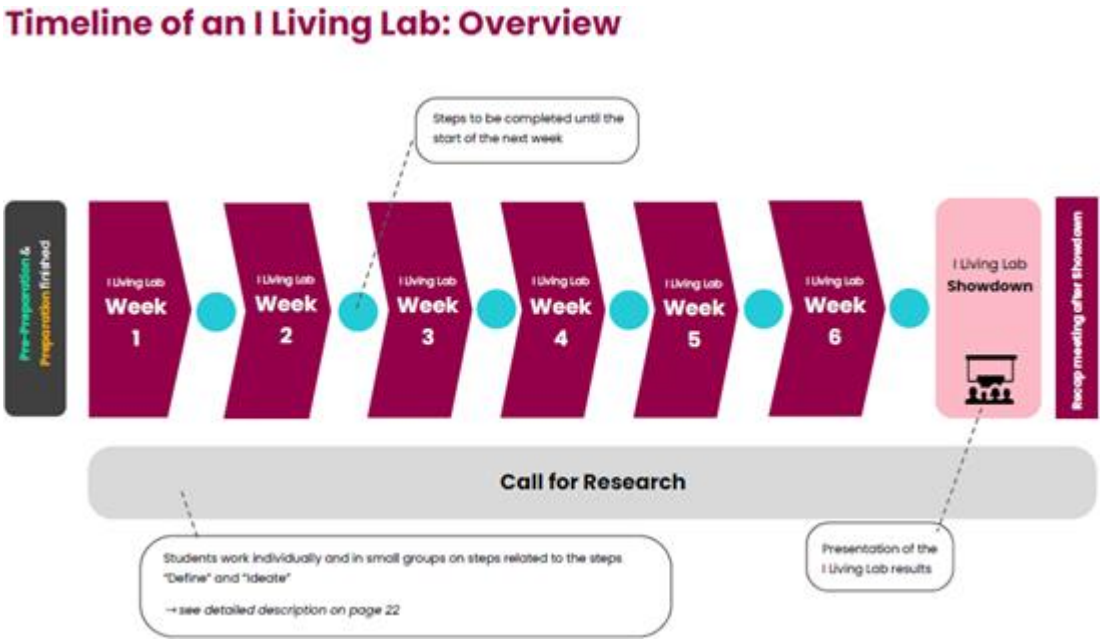


Figure: Timeline of an I Living Lab

- Students follow a "call to research" between the weekly online meetings, i.e., they research background information on the topic of ILL, interview stakeholders, potential target groups and experts. They also present ideas and prototypes to different people, get feedback, and receive important impulses. This interaction can result in inputs for a specification or even partial reorientation of the ILL's topic. An essential focus is on the support of the students. They are guided by the Educational Entrepreneurs to work very independently - alone and in small groups.
- Students give insights from the "call to research" in each meeting, where they then get feedback from the other students and the Educational Entrepreneurs. Each joint meeting is thus very intensively designed by the students themselves.
- Students regularly reflect on what they are doing in ILL: they keep an e-portfolio with which they continuously document their learning process. In a bi-weekly exchange with fellow students, they reflect on these entries in the e-portfolio and thus gain an additional external perspective of their actions.
- The final grade is created in an intensive dialogue with the Educational Entrepreneurs with a mixture of self-assessment and feedback: A starting point is a final entry for the e-portfolio, in which students review their learning and development process once again. Based also on other entries, an interim discussion conducted with the Educational Entrepreneurs, feedback within the synchronous meetings, students justify a grade that is appropriate from their point of view. For this purpose, they enter a dialogue with the educational entrepreneurs, who communicate their perceptions in an appreciative manner - in the discourse, an agreement on the grade is then reached.

Figure: Overview of the infrastructure for working in an I Living Lab

The new structure on Basecamp provides a better overview for all involved participants and encourages to open and transparent communication. 2.1
This didactic concept of the ILLs touches topics of innovative university didactics and the promotion of (social) entrepreneurship. During and after the second round of I Living Labs the iteration process will gain new power and a lot of new insights to use!
The full guides for Educational Entrepreneurs and learners can be found in Annex 5 and 6.

3.2 Curriculum embedding

3.2.1 Engaging of ILLs in study process of partnering institutions

One of the main objectives for the sustainability of the project results is introduction of changes in the existing organisational systems of the project partner institutions.

I Living Labs (ILLs) have already been conducted and developed in two rounds so far, with 2nd round currently being conducted from March to May 2022. Work has already been done on preparing the ILL concept, developing training for EEs and involving students in ILLs. After the first round of ILLs in January 2022, it was agreed to bring in some developments needed to improve the organisation of the next rounds of ILLs.

This part is mainly dedicated to the following topics:

- *combining the different approaches of the partner institutions;*
- *challenges faced until the start of preparation for the 3rd round of ILLs;*
- *scenarios for the introduction into the curricula of the partner institutions.*

Having finalised the 1st round of E³UDRES² I Living Labs, feedback from Educational Entrepreneurs and involved students was collected providing the background for challenges faced and factors to be improved. T-Shaped Innovators had the opportunity to assess whether (and how) I Living Labs could become an integral part of the learning and study process at partner universities. Since all universities faced various challenges and unknowns in 1st round, an evaluation of the current process (assessments for students, inclusion of ILL in the transcript) was needed before implementing any further changes.

T-Shaped Innovators from all partnering institutions filled out a matrix (created by T-Shaped Innovators from Vidzeme University of Applied Sciences) identifying the most important factors that are crucial for future development and permanent embedding of ILLs in the curriculum. The analysis of the data obtained forms the basis for the creation of an ideal vs. realistic scenario so that partner universities can integrate I Living Labs into the core curriculum using a maximally unified model.

In matrix mentioned above, universities were asked to look at the process from a perspective of **3-STEP**:

STEP 1: DESCRIPTION OF CURRENT SITUATION, CHALLENGES IDENTIFIED & STEPS DONE FOR THE 1st ROUND OF ILLs

Please describe how ILL was included in the study process - was it an optional course? What was a procedure to include ILL in semester? Do students receive additional confirmation from the university that they have completed the course (certificate)? What was the most challenging part in whole process?

STEP 2: POSSIBLE SOLUTIONS DISCUSSED OR COULD BE IMPLEMENTED IN YOUR UNIVERSITY FOR THE NEXT ROUNDS

Please list and describe possible solutions you have thought about or discussed with your study administration or university management staff regarding ILLs as permanent part of study process. Is it decided for which year students ILL should be available? Would it be in mandatory or optional part of curricula? If it is separate course, what amount of ECTS would be the most suitable for such course? Would it be possible to include ILL in existing courses - how that could be done?

STEP 3: CHALLENGES FOR ALL PARTNERS

Please think about possible future challenges which could occur to any partner institution, regardless of the current status of the ILL in the study program. What challenges would occur, if we make ILLs as sustainable part of our future consortium after the end of project?

Engaging of ILLs in study processes of partnering institutions			
FACTORS or CRITERIA	**WHAT EACH PARTNER HAS?**	**WHAT EACH PARTNER SHOULD CONSIDER?**	**STEP 3: CHALLENGES FOR ALL PARTNERS**
STEP 1: DESCRIPTION OF CURRENT SITUATION, CHALLENGES IDENTIFIED & STEPS DONE FOR THE 1st ROUND OF ILLs			
Starting and ending date and time of the ILL			
Time of the lectures - time zone differences			
In the evenings			
During the day			
Number of students enrolled			
Billable hours for EE			
Any other Factor or Criteria identified can be added here			
STEP 2: POSSIBLE SOLUTIONS DISCUSSED OR COULD BE IMPLEMENT IN YOUR UNIVERSITY FOR THE NEXT ROUNDS			
Identifying existing courses, where Design Thinking method is / can be used (Autumn 2022)			
Creation of separate course module, where interdisciplinary students can apply (like Summer school?)			
Development of course description (Handbook and course materials)			
Credit points (from 6 to 4 ECTS)			
Getting credit points approved by study system			
Any other Factor or Criteria identified can be added here			

Matrix for partnering institutions

3.2.2 Challenges until the start of preparations for the 3rd round of ILLs and suggestions for the organisation of ILLs by partner institutions

- **Start and end dates**

Partners have identified difficulties to organize start or end time on particular date that suits everyone due to semester times, holidays, bank holidays, etc.

Suggestion: At least twice a year: 1) Autumn semester (September-January), 2) Spring Semester: (February-June)

- **Time of lectures**

Different time zone effects

Suggestion: Weekdays from 8:30AM-7PM

- **Enrolment of students** (time and place of enrolment for ILLs)

Some partner institutions have identified that the enrolment time is not suitable for all due to exams, midterms, etc.

Careful selection should be made to ensure that all partner institutions are still targeting an enrolment platform at one partner institution.

During enrolment: It should be apparent how many students have enrolled from one institution and the possibility to see vacancy. The duration of the ILL should also be visible.

Suggestion: Open registration for students and close it when the group is complete. Leave visible, but no registration possible (until … date).

- **Place in the curricula**

Each partner institution has handled this differently. There is no common approach. Different number of hours per 6 ECTS (150-162; MATE 60-96). Enrolment for only one course and recognition of 6 ECTS for students from other universities has caused problems for several partners.

Suggestion: 5 different scenarios should be developed.

- **Topicality**

The great variety and complex (different level) description of ILL topics discourages and deters students from applying. If, after applying, they are forced to participate in an ILL that is not in the TOP 3 of their choice, this may be a reason for drop out of the ILL.

Suggestion: Unite topics under three main themes – CE, AI and Well-being & Active aging: for example, if at the moment there are 18 I-Living Labs running in 2nd round with specific thematic focus (and the number of these should be increased each round) and one team is working on the solution, instead there could be 6 thematic ILLs (with at least 3 student teams) working on the same challenge. These 6 thematic ILLs should be selected from the most popular ILLs (based on student applications) of 1st and 2nd rounds.

- **Staffing**

Some partners identify difficulties to convince new EEs to join ILLs due to the limited billable hours. There is also no incentive to hold this new position because there are no widely recognised and established titles. There are only practical titles for academic staff. No name for the new form of staff member.

Suggestion: The online training courses on Design Thinking set up under E³UDRES² should be opened to other teachers in all partner institutions to attract and mobilise more people to to work as EE. More actions should be taken to publicise the EE position and make it more attractive to apply for this position. Some suggestions for the renaming of the EE position: Process manager? Mentor? Hybrid teacher? Learning guide? Learning conductor? Learning coach?

- **Opening and closing events**

After a long period of working only in distance learning, students (and also academic staff) would like an opportunity to meet at least once a semester face to face.

Suggestion: Considering that each partner institution might have s different starting time for ILLs, the opening event can be organized in an interactive way and prepared in advance (introduction video). This makes it possible

to start ILL at the most convenient time and still ensure the support of the EEs at the opening of the ILLs. The closing event can be organised twice a year - at the end of ILLs as face-to-face session in one of the partner countries – like the GRAND PRIX.

3.2.3 Creating IDEAL vs REALISTIC scenarios for introducing ILLs into curricula by different partner institutions

During the process of analysing the matrices completed by the partners, several scenarios for further development of ILLs were identified. Each scenario was evaluated based on factors such as timing, sustainability, enrolment, place in curricula and others.

1. **Scenario: ILL as course in elective study part**

It should be a course of free choice (6 ECTS). This approach offers the possibility to run it on time which is outside of normal lecturing time and to increase the motivation of the students, as it is an elective course that is not compulsory. *Problem: The course is an elective and cannot be chosen because of the topics. This could also be the reason for students dropping out.*

Timing – can be organized more freely as no specific time has to be set

Student enrolment – freely

Sustainability – can be distracted by other competing events (intensive weeks, Erasmus, TACO, etc.)

2. **Scenario: ILL in existing courses of mandatory study part**

By integrating ILL into existing courses as part of the degree programme (6 ECTS), one of the partner institutions can be the organiser of the respective ILL. This requires careful planning and structural changes in existing courses – at least problem solution as task should fit (Design Thinking as the only tool can be problem). *The problem may occur in very homogenous (e.g. engineering) programmes.*

Timing – as this scenario involves students and at least one EE from another university, students from partner institutions should adapt to the study schedule of the university which organises the ILL.

Place in curricula – can only be organized once a year, a different course every semester.

Sustainability – if the academic staff of 'used' courses do not become EEs, they might have difficulties to include ILL part in description of the existing courses. Internal inconsistency. Later there may be problems with the accreditation process.

3. **Scenario: ILL as NEW course in mandatory study part**

Creation of a separate course in several degree programmes (5-6 ECTS) that focuses on a transdisciplinary approach to future skills training through different trendy techniques such as Design Thinking, etc. This can be done by transforming existing courses e.g., project courses or other management skills developing courses, into ILL course.

The course description has already been developed for second round of ILLs. *Problem: Finding suitable courses for exchange into ILL courses. The eligibility for exchange should be assessed against the requirements in each partner country.*

This approach can reach the largest number of students per partner institution.

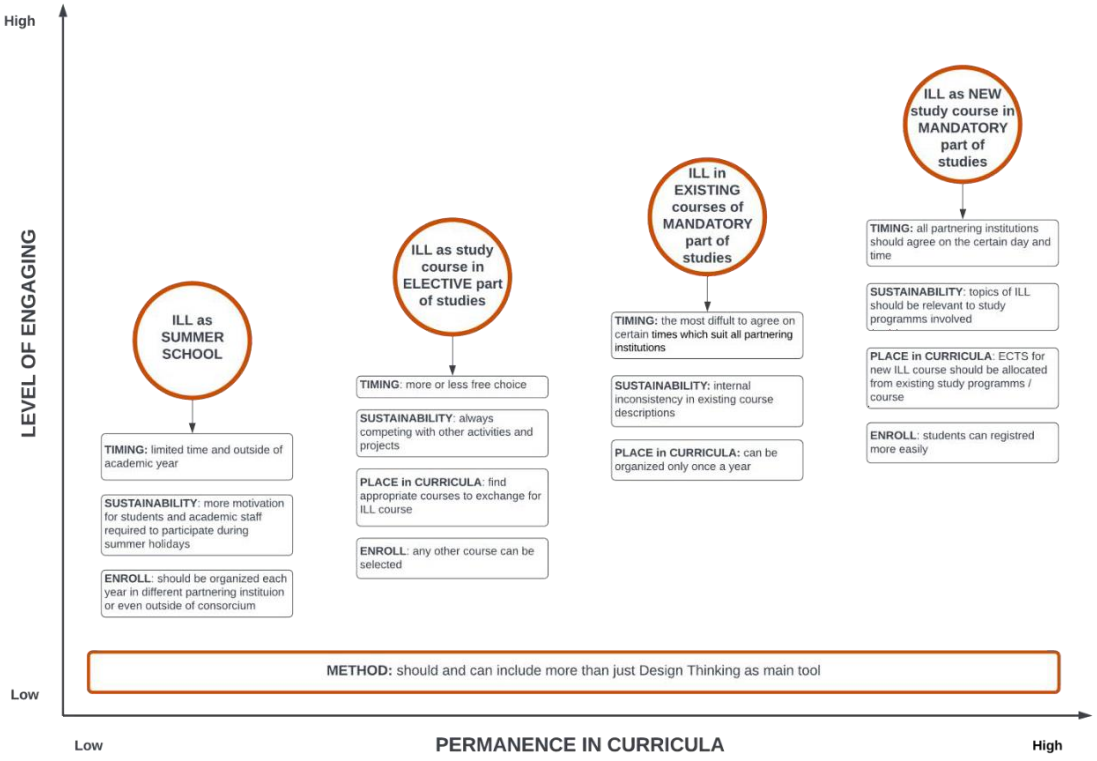
Sustainability – Long-term development, but regular topics for ILLs need to be established according to the study programmes involved (*if different from* E³UDRES² *mainstream*).

4. **Scenario: Summer school format as independent part**

As an elective module (micro-credential) (5 to 6 ECTS) focused on the transdisciplinary approach in partner institutions. Due to the different format (1 to 2 weeks, 1 month), it should be organised differently. The summer is only two months long and most of academic staff are on holiday.

This approach can lead to a relatively large number of students per partner institution

Sustainability – long-term development, needs to have more motivation for students to participate during summer, instead of relaxing or earning money for next round of studies.



Ranking of scenarios based on the level of engaging and permanence in curricula

The overall ranking was based on the level of engaging and permanence in the partner institutions. The ranking made identifies the most appropriate scenario from the data collected during the analysis of current processes and expectations, nevertheless further discussions should take place in focus groups to verify if the ideal scenario is the realistic one for the implementation.

3.3 Student Engagement

The successful development of I-Living Labs (ILL) depends on the involvement of different actors of the academic community.

Students play a crucial role in developing I-Living Labs, especially in developing the E3UDRES2 alliance and the concept of universities of the future.

For this reason, the involvement of students in the development of I-Living Labs is a focus of attention of this project, aiming for more and better participation, minimising dropouts and maximising the impact on learning, the development of future skills and the impact for building smart and sustainable regions.

In the scope of student involvement, we highlight three key moments/ stages, which we will develop:

- in the dissemination and communication for student enrolment;

- in the application to the ILL;

- during the ILL.

For each of these moments/stages, the problems identified are explained based on the experience of the first I-Living Labs, which was widely discussed by the T-Shaped Innovators team. The evaluation analysis and the contributions referred by the Educational Entrepreneurs (EE) that have boosted the ILL were included.

3.3.1 In the dissemination and communication for student enrolment stage

ILLs are new to most academic communities. Therefore, it is essential that the communication and dissemination of this initiative may be enlightening regarding its definition (what is it about?), organisation (how does it work?), skills development (what does it promote?) and advantages of its participation.

Currently, the opportunities for initiatives are immense, so clear communication of the added value of participation in the ILL is crucial.

Specifically, regarding communication, we highlight the importance of general communication, with information about the initiative, but accompanied by specific information regarding its integration as a pedagogical experience.

The following table explains the problems identified in developing the first ILL and sets out the action plan proposed so that this process could be improved concerning the second ILL.

<table>
<tr><th>Stage</th><th>Problems identified by the T-SI</th><th>Problems identified
(according to EE's evaluation from https://3.basecamp.com/4163249/buckets/24529761/vaults/4277930805)</th></tr>
<tr><td rowspan="3">Communication and selection</td><td>Students do not know what an ILL is</td><td rowspan="3">Much more clarity even before the project starts: when will happen what, the students can decide if that fits their schedule.
Clear expectations on how the grades are going to be given. The same understanding among EEs, our role, and how we will work with our students.
Have agenda with a date and time before the ILL begins, clear goals, what are students supposed to work on (not what the result should look like, but focus on future skills and the process itself).
Student recruitment, by making it earlier and providing beforehand both more information related to the specific topics of the ILL and a timetable for all ILL during the semester.</td></tr>
<tr><td>Students do not know how much involvement/work time they will need.</td></tr>
<tr><td>Students do not know how the ILL will be recognised in the curricular pathway.</td></tr>
<tr><th colspan="3">Action Plan</th></tr>
<tr><td colspan="3">1. Before the selection stage, each partner should provide:
a) factual information about:</td></tr>
</table>

- ILL in the institutional network, social media (WP6 articulation); - study guide of the ILL; - plan each ILL (dates, hours, recognition in the curriculum or as an extra activity…) **b)** the dissemination of each ILL's pitches per semester; **c)** meetings with T-SI, EE and students to clarify the practicalities of the ILL study guide and to compromise students.

The plan described was implemented, and the following activities were carried out:

- dissemination of the ILL initiative by the social networks and mails of the different institutions, under different formats in order to reach more audiences;

- explanation of the initial ILL challenges, schedules and videos capable of activating the participation of students in the link https://www.e3udres2.ucll.be/en-gb/i-living-labs;

- scheduling of clarification sessions directed to students and teachers, dynamized in each higher education institution that is part of the E3UDRES2 alliance;

- involvement of the EE in attracting students, encouraging them to share experiences and bringing this new reality closer to the academic community;

- Regular meetings with the HEIs' boards and course coordinators, in each HEI, in order to identify strategies to promote student participation and involvement, minimising dropouts.

3.3.2 In the application to the ILL

After knowing what an ILL is and how it works, students will have to express their intention to participate.

In the first ILL, it was found that the HEI worked on the selection of students and their enrolment independently, given that the typical application platform was little known.

In addition to this aspect, some of the ILL teams needed to improve their constitution to fulfil the initially proposed: having a diversity of students with different nationalities, coming from different institutions and courses, to enrich the look at the initial challenge from different perspectives, naturally considering what students registered as preferences.

The following table identifies the problems and establishes the action plan proposed and put into practice prior to developing the second ILL.

Stage	**Problems identified** **T-SI**
Application	Multiples platforms to register students (from each partner and the ILL)
	Data missing
	ILL groups are not heterogeneous
	Due to the uneven application of students to the different ILLs, there were cases when the student was not assigned to any of the 3 chosen topics, but a totally different one. This was

	necessary to find enough students for each ILL and also providing them the required multinationality. However that scheme has caused several dropouts, which was challenging to communicate and handle

Action Plan

1. The application form should:

a) be the same for all partners;

b) include: name, HEI, course, year, institutional mail, alternative mail, phone number (not mandatory) and authorization for using personal data by the project team for communication to the student;

c) in some HEI, an institutional platform is needed in order to give credits at the end of the ILL. In these cases, Make it even more clear for students, that there are 2 registration platforms:

- the central Eudres webpage, which helps project managers to guide each student to their ILL
- the local, university educational administration system, in order to give credits at the end of the ILL. Because of practical issues, not all HEIs will have 16 different courses for ILLs, only a couple (for the courses of the local EEs). We should make it clear for students, that registering to a given lab at the local educational admin system does not guarantee to be a part of that.

2. During the online registration

a) the platform should show how many 'places' are left for that Institution (thus providing multinationality)

b) create a database of students original choices (1st, 2nd and 3rd place). That would help EEs/T-SI to see, what type of topics have a higher interest among students.

3. Forming the ILL groups:

a) according to the students' interest (indication of 3 priorities options in the form);

b) considering the multidisciplinarity and different origins of the students.

The plan was implemented, with the following activities:

- students from the different HEIs registered on a single platform, available at the link: https://www.e3udres2.ucll.be/inschrijfformulier;

- the submission form included more elements that would allow for a better distribution of students among the teams;

- the teams were formed and validated by the T-SI and EE;

- according to an identified need, the teams were adjusted prior to the start of the ILL.

3.3.3 During the ILL

Considering the experience acquired with the ILL first edition, some students' dropout took place after they start their participation at the ILL, which was interpreted as a lack of commitment to the design thinking type of academic enrolment. Many students express their difficulties in following the ILL synchronous meetings, due to:

Late schedule, after a full day of classes;

Late schedule, with overlap with professional duties for working students;

Too much work and tasks to perform in a short period.

Need for in presence activities to engage as a learning community.

These students' concerns were recognized as weaknesses of the ILL functioning by the Educational Entrepreneurs, in their answers to the evaluation quest, by the end of the ILL path.

Educational Entrepreneurs stressed the need for more weeks to develop properly the design thinking approach and to enhance students engagement among the ILL leaning community. In some of the EE's views, we should consider shortening the 6 ECTS goal to 3 ECTS, to face the lack of time for students involvement, while the ILL is not embedded in the study plans.

<table>
<tr><td>Stage</td><td>Problems identified

T-SI</td><td>Problems identified

(EE evaluation from https://3.basecamp.com/4163249/buckets/24529761/vaults/4277930805)</td></tr>
<tr><td rowspan="2">ILL running</td><td>Students' dropout</td><td rowspan="2">The late hour's schedule is not too favorable to work; many students were already tired after a day of classes at school.

For the students: Spread the living lab sessions over a more extended period: at least 8-10 weeks. This gives the students more space/time to do the tasks and dive deeper into the subject. They have to learn many new things in a brief period. If the student's work is limited to a window time of 6 weeks, the course must be shortened to 3 ECTS because we cannot put on them more pressure as they have other assignments as students.

As students mentioned, 2-4 more weeks would have helped.

The study course should be shortened to 3 ECTS but more intensive collaborative work activities.
At least one week of studies must be provided in "on-site" form, where students meet "face to face" each other and teachers, stakeholders, advisors and can investigate in detail the field and/or topic in a particular location.</td></tr>
<tr><td>Keep students' engaged.</td></tr>
<tr><td colspan="3">Action Plan</td></tr>
<tr><td colspan="3">1. Kick-off event should be focused on the students' active involvement;

2. Communication process (avoiding dropout):

a) EEs contact the student;

b) EEs communicate the T-SI coachers;

c) The T-SI coachers contact the T-SI from the student HEI (if needed);

d) T-SI from the student HEI contact the student again and inform EE's and T-SI about the student's decision (if needed).</td></tr>
</table>

3. T-SI coachers make a state of progress meeting with EE and share involvement strategies every two weeks;

4. If possible, each partner promotes international weeks.

The plan was implemented, with the following activities:

The closing event was conceived as a showdown day, giving the floor/screen to students and to some EE, stressing good practices engaging students. The voice of the students clearly listened on the showdown day, which took place on December 17, 2021. The video may be watched at Teams Sankt-Pôlten.

The communication process was straightened in the first weeks of the ILL second edition (after March 7, 2022). EEs, T-SI coachers and the T-SI team contacted each other to get in touch with students that didn't appear in the starting event, or that missed the first synchronous meetings.

T-SI coachers and EE's meetings are scheduled each two weeks. The meeting meetings can be found on Teams Sankt-Pôlten. A shared Excel form to register students' presence in synchronous sessions was settled.

An international meeting, with the participation of students, EEs, T-SI, and stakeholders of each partner HEI will take place at UCLL, on April 26-28 (International Engagement Circus, at https://www.e3udres2.ucll.be/international-engagement-circus). More International weeks will be delivered while the COVID crisis is being controlled.

3.4 Solutions through design thinking

I-Living Labs (ILL) are developed and organised as processes in the managerial and engineering sense. From a very high level, one instance of ILL can be seen as a variation of Waterfall development process [1], allowing tailoring and customisation of specific phases.

The overview of main activities and roles involved in the ILL is depicted in Figure 1 which outlines the main (unidirectional) path from the broadest starting point (represented by the Domains [2]: Circular Economy, Wellbeing and active ageing, Human contribution to AI) and until the exit deliverable represented by the Product in the sense of Design Thinking methodology [3].

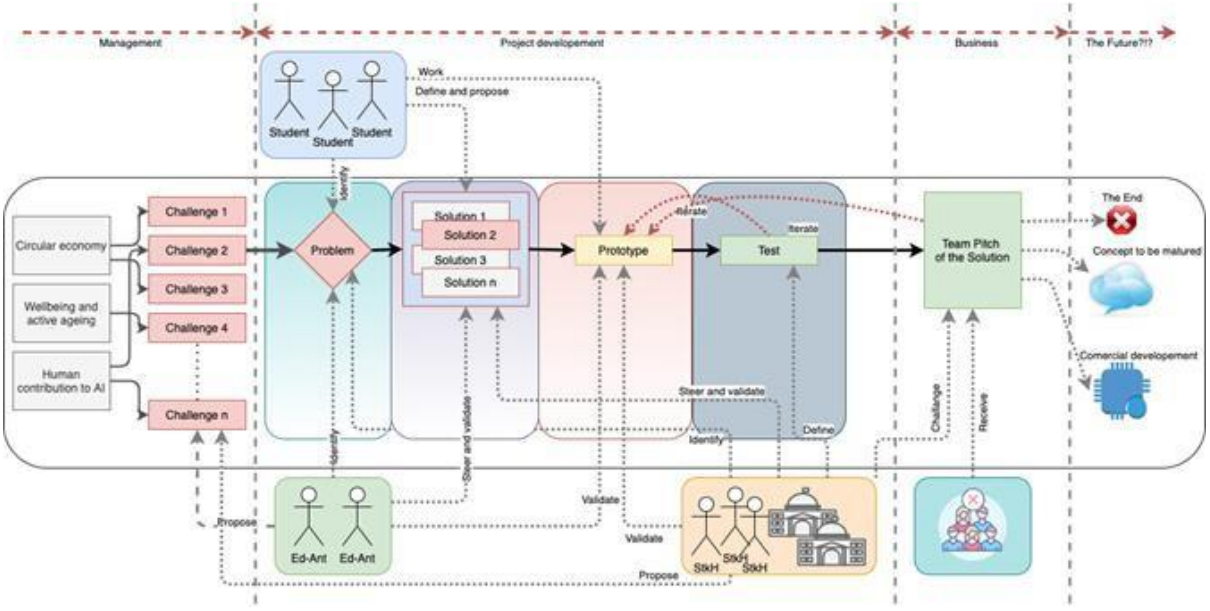


Figure 1. The E3UDRES2 I-Living Labs Process

The entire flow can be split, from a temporal point of view, into three main stages. At the beginning there were the managerial processes and activities which defined the Domains and the basic roles involved into an ILL: T-Shaped Innovator(s), Educational Entrepreneur(s), students and (external) Stakeholders. The main part of the effort is dedicated to "Project development", followed by the "Business" activities represented by the "Solution and Product Pitch" and having at the end a variety of future paths.

3.4.1 Design Thinking Process And Its Integration In I-Living Labs

The first publication that "enforced" the term design thinking was the book with the same name from 1987, written by Peter G. Rowe, Professor of Architecture and Urban Design at Harvard university [4]. It was popularized in recent years, first by the design consultancy company IDEO, and then by outlets such as the TED conferences or the Harvard Business Review journal [5].

The Hasso Plattner Institute of Design at Stanford [6] and others define Design Thinking as a five-stage user-centric process for solving wicked problems and innovating. The five stages are: **Empathize** (researching the pains and needs of the users in an empathetic way), **Define** (summarizing the previous findings to extract and pinpoint the users' problems), **Ideate** (generating crazy ideas, outside the box, which can solve the users' problems), **Prototype** (building real, although possibly low-fidelity versions of the final product), and **Test** (try the prototype with potential users and challenge initial assumptions). These stages do not have to be sequential - designers frequently return to previous steps to measure and adjust.

As part of the I-Living Lab philosophy, the co-creation process is based on the methodology of design thinking, as it is a methodology that ensures learning for the unknown. It involves researching the challenge, empathising with stakeholders, defining the problem, ideating as many solutions as possible and prototyping and testing them [7].

The extended design thinking process includes 7 stages: define – research – ideate – prototype – select – implement - learn (feedback). Although the learning stage appears to be the last of the seven, it occurs throughout the design process. The ability to learn from each stage enhances the development of design thinking and helps to generate radical and successful designs [8].

Also, the design thinking is the first of the 10 learning outcomes, which are one of the foundations of an I-Living Lab (co-creation, transdisciplinary, stakeholders, learning outcomes, assessment). Students will use this learning outcome to measure if they are able to apply design thinking methods in order to use concrete methods to carry out creative development processes [3].

State-of-the-art literature brings different criticism towards applicability of design thinking as it only reinforces the development of product without bringing any innovative aspects for the process development [9].

3.4.2 Improvement points on applying Design Thinking in the ILL

The idea of structuring a process for the development of ILL is a necessary one. What we can change on the application and presentation of design thinking could be:

1) The presentation of the necessity of applying a process should be switched from the Digital Skills training into the Design Thinking training.

Proposition: refactor Design Thinking training into "process development training".

2) Design Thinking should present the intricacies of the process (the basic understanding) and the application of this concept in the ILL.

3) The Digital Skills training should take out the concept of the process. Great consistency will be achieved if presented together with Design Thinking.

4) Personas - need to be better defined - which are the roles of each participant - TSI, EE, Learner etc. - how do they work together?

5) Role objectives - what, how they overlap, support, intersect etc.

6) Decision taking - a clear management structure based on planning and deadlines should be implemented in the development of ILL.

Also several open discussion points were identified in the application of Design Thinking in ILL:

1) Prototype is not acquired, testing and evaluation could be applied after each phase. The development cycle is not closed by testing - students should be able to ideate-prototype-test and then ideate again.

Proposition: Allow choosing different processes (eg. Agile, Design Sprint etc.).

2) Do the students have the possibility to also build a prototype of their solution found in ILL?

Proposition: this is related to the possibility of offering the students a follow-up in which to construct their prototype.

3) Are 6 weeks enough to come up with a prototype?

Proposition 1: The ILL could go for 12 weeks to allow more time for building a prototype.

Proposition 2: Apply for another project that could offer the possibility to build the prototype.

3.4.3 Conclusions:

For the scope of E³UDRES², Design Thinking, with its broad interpretation and flexibility is suitable for carrying out most of the activities, both during planning and developing the entire EUDRES project and also during the structuring and implementation of individual ILLs.

Because the ILLs focus on interdisciplinarity, one should identify the main field for each ILL and some secondary (support fields). For those ILLs where the main focus is on engineering related topics and/or when the deliverables are by products of engineering activities, care should be exercised for not overusing Design Thinking. DT is the process for running the entire ILL, but specific activities (phases) could be executed with other processes/methodologies such as Agile or V-Cycle(for SW dev) or even Waterfall (for civil engineering).

It is the responsibility of the EEs to steer the ILL towards suitable processes for specific activities.

Disclaimer

Part of the content from section 2.4 has been included also in the paper "*International Innovative Labs – I-Living-Labs*", was presented during EDUCON2022 – IEEE Global Engineering Education Conference, "Digital Transformation for Sustainable Engineering Education", March 2022.

References

[1] I. Sommerville, Software Engineering, 9th edition. Boston: Pearson, 2010.

[2] D. Andone, R.Vasiu, R. Bogdan, V. Mihaescu, S. Vert, A. Iovanovici, V. Ciupe, F. Dragan, International Innovative Labs – I-Living-Labs, EDUCON, 2022

[3] K. D. Elsbach and I. Stigliani, 'Design Thinking and Organizational Culture: A Review and Framework for Future Research', J. Manag., vol. 44, no. 6, pp. 2274–2306, Jul. 2018, doi: 10.1177/0149206317744252

[4] P. G. Rowe, Design Thinking. Cambridge, MA, USA: MIT Press, 1987.

[5] L. Kimbell, 'Rethinking Design Thinking: Part I', Des. Cult., vol. 3, no. 3, pp. 285–306, Nov. 2011, doi: 10.2752/175470811X13071166525216.

[6] S. Kim, K. Song, B. Lockee, and J. Burton, 'What is Gamification in Learning and Education?', in Gamification in Learning and Education: Enjoy Learning Like Gaming, S. Kim, K. Song, B. Lockee, and J. Burton, Eds. Cham: Springer International Publishing, 2018, pp. 25–38. doi: 10.1007/978-3-319-47283-6_4.

[7] U.-D. Ehlers and S. A. Kellermann, 'Future Skills: The future of learning and higher education', Karlsruhe, Mar. 2019. Accessed: Dec. 12, 2021. [Online]. Available: https://www.learntechlib.org/p/208249/

[8] C. Burnay, I. J. Jureta, and S. Faulkner, 'What stakeholders will or will not say: A theoretical and empirical study of topic importance in Requirements Engineering elicitation interviews', Inf. Syst., vol. 46, pp. 61–81, Dec. 2014, doi: 10.1016/j.is.2014.05.006.

[9] Kipum Lee, Critique of Design Thinking in Organizations: Strongholds and Shortcomings of the Making Paradigm, She Ji: The Journal of Design, Economics, and Innovation

Volume 7, Issue 4, Winter 2021, 497-515. Available:
https://www.sciencedirect.com/science/article/pii/S2405872621001106

3.5 Administration flow

The administration of E^{3}UDRES^2 project is very critical for a successful implementation in the six (6) partner universities and engagement with the leadership. Thus, various platforms are used in the project depending on our need and pre-existing systems to enable a smooth flow of work within the following teams:

- the E^{3}UDRES^2 project management team,
- the University's Educational Department,
- Learners (Students) in the ILLs,
- Follow-up (Logbooks, portfolios, evaluation, for next generation ILLs).

The E^{3}UDRES^2 project management team uses Microsoft Teams platform to participate in events and meetings as well as to access dedicated folders created by the University of St. Pölten. As a general experience, we concluded that accessing MS Teams is not always straightforward for university staff, and even more difficult for students sometimes. But once the access is given, the well-structured file folders and the built-in recording system make it a viable platform for project management meetings. Care should be taken if university e-mail addresses are changing, or users have multiple MS Teams accounts.

Another major challenge is that each of the six (6) partner universities' educational departments have different platforms run by their educational directors and student offices. The project allows them to use these platforms where ILL courses are announced in time, schedules are created with fellow EE partners, and clarification on ECT credits and grades are shared. On various platforms, students also get re-directed to the E^{3}UDRES^2 website where they can obtain detailed information on basic schedule (incl. workload) of an ILL, the expected learning outcomes, upcoming ILLs and challenges available, and how to apply. Students are thus able to make a choice on whether to register to participate. Registration is required through the respective university's platform. The EE's and T-SI's from each university have access to information about students such as their graduating year, courses of study, etc. which they share with the project management team. However, finding a balance between the different institutions' rules such as registration, grades, allocation of ECTs, and assessment methods has been a major challenge. Timing has proved to be a particularly critical parameter, since universities have different registration periods for the semesters. Currently, a 'double registration' system is necessary. Once the student

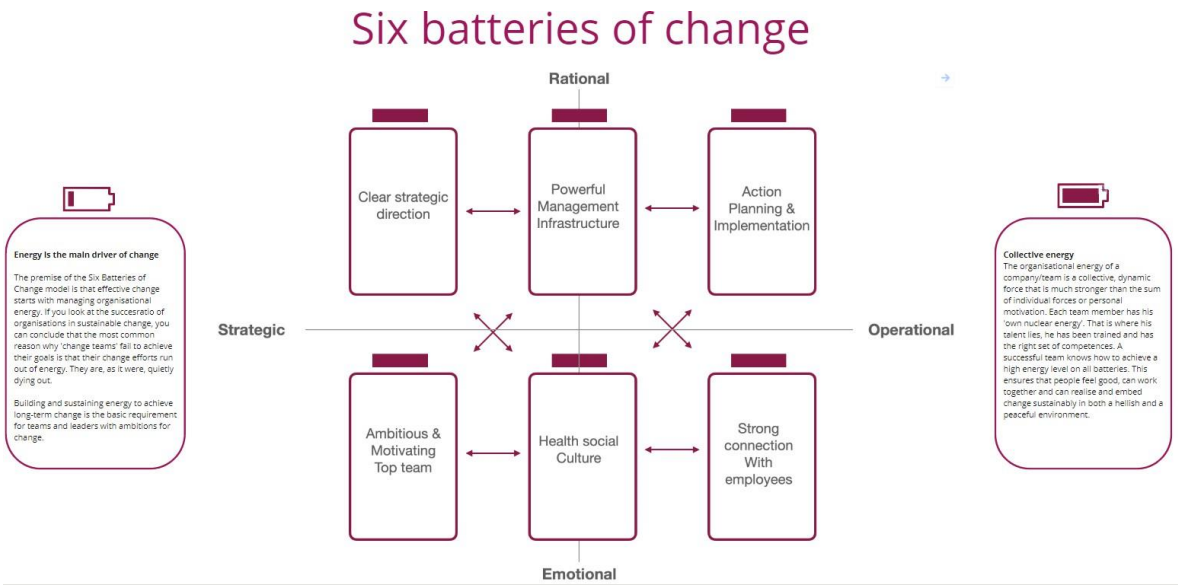
registers at the local admin system in order to get credits at the end of the ILL, and then registers at the ILL's main site to be visible for the whole project. There is a need to create a more detailed central platform where students can see how many free places are available at the Lab they prefer. At the moment, there is no such limit in the system, which can create situations when the student is taken to a different lab from the preferred one.

Upon enrolment, Learners (Students) are registered on Basecamp (https://3.basecamp.com/) where they can access all the learning materials uploaded in the dedicated folders as well as upload any materials required. Communication of all ILL activities, including all tasks with their deadlines, and the involved colleagues is also established on this platform. On the Learners Camp, there is a message board that is used to welcome learners, share news and events from E^{3}UDRES^2, and post questionnaires to be completed by learners. The respective I Living Lab Camps provide overviews of planned schedules and schedule team meetings with the whole group on the agreed online platform i.e., MS Teams, Google Meet, Discord, etc in advance. A well-organized, systematic meeting platform for all ILLs for future use has been proposed by the team. In both Basecamp and MS teams, the organization and management of documents are user-friendly. According to the practical experiences in our project, BaseCamp was an optimum solution for managing the ILLs. It is advisable for all institutions to double-check their accessibility to BaseCamp, to provide it for the future when EUDRES project ends.

Follow-up activities such as updating Logbooks/E-portfolios (360° reflection with a reflection partner) and adjusting assessment to project guidelines are carried out on Basecamp and MS Teams. Logbooks have offered a clear overview of learners' goals and allowed the responsible EEs to follow and give feedback to learners. It is experienced that there is a difference in the use of logbooks among students. Those learners who come from the engineering field, sometimes feel it less tangible, and thus treat it as a necessary nuisance. But in different scientific fields, students got really involved in creating logbook posts and others are active in giving feedback to them. It was agreed that the Educational Entrepreneurs who manage their ILLs have the freedom to choose either a logbook or a portfolio as an outcome of the ILL.

3.6 Team Management

The Team Management factor of the E^{3}UDRES^2 is a critical factor. Each of the six (6) partner universities have to work together to a University of the Future. Due to the lack of possibilities in face-to-face meetings, all meetings were held online. This means that a team of people from 6 different countries, backgrounds, habits, culture need to work together. In every company or institute working together as a team is a challenge but to do this across borders in an online environment is a tough task. To manage our E^{3}UDRES^2 team we started 2022 with a workshop to see how the team members corresponded to 6 batteries of change. This was our first step together to work in a real team mentality. This experience let to getting to know each other in a different way and provided us with the fighting spirit to embrace the challenges ahead.



The Factsheet action day created an opening for all team members. This resulted in a new working strategy that was implemented immediately.

We rethought the structure of all WP3 meetings. One of the remarks of the group was that the workers meeting of Tuesday was an “extra” meeting. The meeting discussed topics that sometimes where on the agenda of the Friday meetings as well. So decisions could be refined but also turned back. This resulted in some resentment. So we took this feedback and changed the concept of the meetings. As from march 2022 we have the following meetings.

- 2-weekly T-SHI meeting

Every other Friday afternoon we have a T-SHI meeting. During the first hour we discuss operational topics as for example the planning of the start event, the show down event, planning of tasks,… The next 2 hours we reserve for innovation. We use this time in group, specific teams or by ourselves to think about, work on or prepare certain topics.

- 2-weekly EE meeting

Every other Friday afternoon we have a EE meeting. We use the same concept as with the T-SHI meetings. The first hour is specific time for operational topics. The second part of the meeting can be used for all other related topics, as preparation of ILL, sharing insights & tips in breakout rooms.

Our goal is to grow to a team of WP3 E^3UDRES^2 team members that is not bounded by physically or mentally boundaries in any way. For this reason we have created an International Engagement Circus that will take place from 26th until the 28th of April 2022.

4. Training

We used our experience of the first round of ILL to adapt and change to process of the second ILL. The goal of the E³UDRES² project is that all members will co-ideate new concepts and approaches, co-create new knowledge, provide good practice and share experience on their sound integration within I-Living-Labs for future universities in smart and sustainable regions. At the regional and national levels all members of the alliance already offer good practices towards E³UDRES² vision, mission and goal. So we did our job and used all good practices to make the necessary adaptions to the ILL process.

We adjusted the flow for to ONBOARD the Educational Entrepreneurs. We dismissed the baggage, kept the good, finetuned some topics and introduced some new possibilities. The feedback from the first round learned us that the Educational Entrepreneurs did not really know what was expected from them. So this time the Educations Entrepreneurs started in a new flow that prepares them for facilitating an I Living Lab.

4.1 EE 2nd generation – 15th October 2021

4.1.1 Structure

We changed the structure in to the following steps:

- Kick-off meeting with the presentation of E³UDRES² and the role of I Living Lab in connection to the region
- Game phase
  We changed the Game phase not only in the timing of the process but also the concept.
  The concept of the Game was changed to not follow every step of this Game but still search together to find new challenges. The Game day was held on 1/10/2021. We asked the EE's what they thought was crucial as a good EE.

- Training phase
    - Training modules and meetings
      We slightly adapted the training modules. The EE's followed these modules and got the opportunity to ask questions during the Training day on 15/1/2021.
    - Experience-based training in I Living Lab – running an I Living Lab designed by a senior Educational Entrepreneur
      We received a lot of remarks regarding to the needs of the EE's for more experience-based information of the first EE's. Due to this reason we introduced the buddy system. This system gives the opportunity to the new EE's to follow all the steps of an ILL and share this experience with the old EE's.
- Development phase
    - We kept the existing 2 -weekly meetings for all the Educational Entrepreneurs; sharing ideas, building a learning community, exchanging best practices

4.1.2 Evaluation

We had a wonderful online show down event on 15/12/2021.

This event gave all actors of the ILL energy to give it our best to start our next round of ILL.

4.2 EE 3rd generation – February 2022

4.2.1 Structure

The structure was greatly changed to the following:

- We organised a welcome day on 7/2/2022 for all 3rd round EE's.
  This meeting replaces our old the kick-off meeting and Game phase. Our welcome day had the following goal. A brief explanation about the concept of an ILL and to hear experiences from existing EE's to taste some ingredients of an ILL.

- Training phase
  We asked the EE's to follow the training modules during the period of 7/2/2022 and 18/2/2022. On the 18th of February we created the possibility to ask questions regarding to all training modules in a Q&A session during the innovation time of the 2-weekly EE meeting. You can find more information about the innovation time of the 2-weelky meetings in 5.2.2.

- Buddy phase
  We received a lot of good remarks about the possibility of being a buddy in the ILL. To give this experience to this group of EE's, we kept this idea and even broadened this more. Every 3rd round EE got the option to choose an ILL as they preferred. We will see after the 2nd round of ILL how they experienced the buddy system.

4.2.2 Evaluation by the EE's

At this moment the 2nd round of ILL is ongoing. We are excited to see all the results during our next show down event of 9/5/2022.

4.3 Evaluation of the students

Working with the innovative approach of ILLs, our team has recognized at a very early stage that the traditional university evaluation systems might not fit the best in this case. Therefore, we looked for all possible techniques for the evaluation of the activities, which took place in these ILLs.

There was also an asymmetry among the six higher education institutions concerning study credits. In three institutions, there was an option to assign credits to students without giving grades to them. The reasons of this was different (in some cases the optional courses can be taken without passing an exam, though the amount of credits gained that way is limited). In the rest of the universities, this option was not feasible, because their educational legislation requires earning a grade to give credits to students.

We have reached a consensus that in Eudres network, involvement is a crucially important factor. Students (learners) are better involved in ILLs if their evaluation is not only focusing on tangible, 'hard' outputs like a prototype or a business model. We should also appreciate their own personal development during the ILL.

A very good example was an ILL where all learners were asked to evaluate their peers anonymously on a simple scheme, based on several factors (participation, activity, teamwork, etc.). When all learners made that assessment, the two educational entrepreneurs conducted private interviews with each learner. EEs showed the learner the evaluation of other group members and made a final decision on the evaluation grade. Generally, the experience was that students gave reasonable and fair evaluation about each other.

Another pilot idea has been worked out. This is designed for the evaluation of the development in Future Skills. The idea was that each learner chooses a few future skill fields at the beginning of their ILL. After completing the course, the evaluation of these skills will be carried out with verbal assessment. This is a technique in pedagogy applied when soft skills are involved, or in situations when the learner is a novice in the field. Most of students were beginners and did not take part in an ILL before. There were pre-determined aspects, like '*Level of the chosen skill at the beginning of the ILL*'; '*Level of the chosen skill at the end of the ILL'*; '*Challenges with the skill development*' and some others. For each aspect, there was a scale for analyzing the degree of development, for example:

Development of the skill

- was closely related to the topic of the ILL
- was facilitated by the ILL team members
- was continuous / intermittent / terminated at some point

During the evaluation at least one of these categories should be highlighted. As a summary of the textual evaluation, learners might receive some written assessment as well, which better fits the ILL whole concept.

The pilot evaluation scheme is still being developed. Due to the diversity of scientific fields, EEs and learners at the current stage, the scheme has not been implemented yet. However, it gives a wider outlook for EEs that helps diversify the tools they are currently using in the evaluation system.

5. I Liv Labs

5.1 1st I-LL (8th November – 15th December 2021)

5.1.1 THE FIRST I-LIVING-LABS IMPLEMENTATION AND EXPERIENCES - CASE STUDIES

Case Study 1: The I-Living Lab (ILL) 5 "How Microalgae & Robotics can help with agro-wastes valorization"

The I-Living Lab (ILL) "How Microalgae & Robotics can help with agro-wastes valorisation" was formed as an interdisciplinary unit – part of the Circular Economy project branch, and was coordinated by two Educational Entrepreneurs (EEs): from Politehnica University of Timișoara and from Polytechnic Institute of Setúbal, supported by the T-Shaped innovators.

The EEs held several meetings before starting the ILL in order to define the challenge and to organize the running of the lab. A short video pitch was created to summarize the aspects of this ILL as a promotional presentation for the students.

The preliminary discussions were centred around the research conducted towards the optimization of microalgae cultivation and the EEs recognized one bottleneck being the monitoring of the growth process – which is now conducted manually, it is time consuming and does not produce enough data points for a competent optimization analysis. This challenge was identified as being solvable using robotics/mechatronics methods and technology, so the EEs agreed this is a suitable problem to be addressed and developed into a concept solution during the ILL. It was also considered that external stakeholders could be interested in implementing this solution on a small or large scale.

The EEs decided to have bi-weekly synchronous sessions with the students in order to provide support and to guide them in solving the challenge, taking into account a possible heterogenous group of students (related to their academic background) and the fact that the science fields brought together in this ILL are usually far apart in terms of approach and results.

The ILL started with introducing the concept, structure and other organizational aspects. An ice-breaker session was conducted in order for the students and EEs to get to know each other. The expectations of students and EEs were brought into view, together with a summary of all members' background and current activities.

The preferred tools for collaborative work were presented (Basecamp, Mural etc.) alongside with the deliverables expected from the students.

Since this ILL is oriented towards future and sustainable education, the students were presented with – and asked to choose from – 1 or 2 future skills that they want to develop during this ILL. Another transversal challenge the students received was to start a logbook describing themselves and to give and receive feedback to and from their ILL colleagues.

The students were previously briefly introduced to the ILL challenge, during the general opening session organized by the project staff before ILLs started. Everybody noticed that a deeper understanding is needed so this was a great opportunity to enter the Empathize phase of the Design Thinking process – which was agreed to be followed during the ILL. This proved to be a more time-consuming part than initially expected, since the students had little or no background in at least one of the ILL base topics (microalgae cultivation and robotics/mechatronics).

Once the lab's challenge was clear, the Define phase started and conducted to the condensed set of features and requirements that their solution should adopt. At the same time, discussions led towards expanding the view on the subject beyond lab confines, into the economic and cultural aspects of the agro-wastes produced by wine and tomato industries around the world.

The Ideate phase soon followed and here, the full potential of a multidisciplinary, multicultural and truly engaged group of students sparkled up. Envisioning more than one solution for the challenge, we agreed to split the students into two teams that could take their own path towards possible results.

The teams started gathering more information and focused to converge their members' ideas towards a co-created concept, aimed at solving the challenge.

The two teams selected identical approaches in organizing their work environments, by creating communication groups and meeting several times a week thus complementing the synchronous sessions.

Their concept prototypes started to gain shape and weight, principles and technological aspects were understood better and the provisional solutions were stabilized. The students also realized the entrepreneurial potential of their solutions, so they also proposed ways to scale up these concepts.

Of course, the teams' ideas needed to be put to the Test, so the students encountered the reality, by having an important stakeholder from the microalgae industry in one synchronous session. The teams presented their concepts and received feedback, ideas and a state-of-the-art short presentation from the stakeholder. Following a bi-directional Q&A session, the teams realized what aspects need to be improved for their solution and so, the feedback received was incorporated into their next (and final) Iteration of their concept solution – during this ILL.

Once these final solutions were refined, the teams proceeded to create short pitch videos aimed at potentially interested parties. Videos being delivered, the students concentrated to organize and compile their final portfolio in order to showcase their individual parcourse during the ILL and to demonstrate the advancements they made towards their initially chosen skills.

The last week was reserved for the completion of the students' deliverables, the one-on-one assessment as well as preparation and participating in the showdown event which concluded this round of ILL running.

Since the proposed solutions were accepted as feasible and attractive by the external stakeholder, both EEs and the students agreed that at least one concept should be further developed into a physical lab-scale demonstrator, during the next 6 months. This effort is expected to pay off with at least a deeper interdisciplinary experience for the students involved and with scientific results for the EEs [3].

Case Study 2: The I-Living Lab (ILL) 6 "How might we use Artificial Intelligence to improve the Cultural Tourism Experience in European cities"

The I-Living Lab (ILL) "How might we use Artificial Intelligence to improve the Cultural Tourism Experience in European cities", part of the Human Contribution to Artificial Intelligence area of the E3UDRES2 project, was coordinated by three Educational Entrepreneurs (EEs) from Politehnica University of Timisoara (Romania) and from Vidzeme University of Applied Sciences (Latvia).

The EEs organized several meetings, before the start of the ILL, to decide on the topic of the design process. Because Timisoara (Romania) is going to be European Capital of Culture in 2023 and Valmiera (Latvia) is a candidate on the shortlist for European Capital of Culture in 2027, the EEs decided to explore artificial intelligence in the context of cultural tourism, with practical applicability on Timisoara. They made a promotional video and advertised the ILL to potential student participants.

In addition, a detailed plan was made for the ILL. The EEs decided to have bi-weekly synchronous sessions with the students, late in the evenings, after the students' work and study programmes. The platforms for collaboration were set up, namely Basecamp, Mural, Teams etc.

At the first meeting, only 5 out of 7 students that registered showed up, but these 5 remained until the end and were very active. The EEs and the students presented themselves to each other. The concept, structure and other organizational aspects were introduced. Students were required to choose 2-3 future skills that they would like to work on. Also, they were presented with the logbook, a tool they would use for the rest of the ILL in order to keep track of what they learned, to give and receive feedback and to post their homework.

The next meetings were organized similarly to a Remote Design Sprint process. The EEs decided to use this process because it gives students a clear framework in which to produce maximum results in a reasonable amount of time. The official Design Sprint Mural template was used to realize the activities and track the results throughout the entire ILL.

The team started from a long-term goal that they constructed together: In two years, tourists will benefit from innovative, accessible and seamless cultural experiences that can be easily replicated by cities everywhere. A stakeholder from Timisoara's Tourism Center was present in an online meeting and was interviewed by the EEs. As such, students were able to get many details regarding the pains and needs of the stakeholders, but they also

saw how a user interview should be performed. Between the meetings, students were requested to interview friends and colleagues about tourists' issues.

A session was also run with a tourism professional from Latvia, in order to discover the basics of cultural tourism. Based on all the findings, several How Might We questions were created and a mapping process was run. In the end, the students decided to focus on a mobile app for tourists that would allow them to take selfies and apply culture-based filters using artificial intelligence techniques.

A session was dedicated to exploring the ways one can use artificial intelligence in the culture and heritage areas, where two AI specialists presented concepts, algorithms and platforms that the students might want to explore further. The students also presented their own research in this field in the form of Lightning Demos.

In the next step, the students were guided through an ideation process, which implied doing several exercises, such as Crazy 8s or Bad Sketching. With their creativity hyped up, the students were required to make a detailed solution sketch. All these activities were done individually, some synchronously, others asynchronously.

The next step meant taking a decision on the final to-be-implemented idea. After several rounds of discussions and voting, the students proceeded to draw, collaboratively, the detailed storyboard of the mobile application. The storyboard described all the steps, from searching for a city to visit and downloading a mobile app for it, to unlocking AI-based selfie filters when visiting the landmarks of the city and sending virtual postcards to the loved one or sharing the filtered selfies on social media.

The students then organized themselves, with the help of the EEs, for implementing a prototype of the application. For this, the Figma platform was used, because it allowed students to quickly prototype the mobile application and also show the users a clickable prototype of the application that behaved very closely to a real app. Two synchronous meetings were dedicated to this step, in order to obtain involvement and alignment in the team. Most of the actual implementation was done asynchronously - the students collaborated in Figma for the prototype and discussed in their own private channel on Discord.

The testing phase meant the end of the process. Students were taught briefly in the previous meetings on how to moderate a user testing interview, so in the actual user testing session we had 2 users that tested the app, both stakeholders. The students were able to take a lot of notes from the verbal feedback of the users and imagined the ways in which they could improve the prototype. They also went back in the process and questioned the long-term goal and initial assumptions to see if they still stand.

Figure 4. Screenshots from the final prototype of ILL 6 [3]

The last week of the ILL was dedicated to finishing up the deliverables and participating in the closing event, with all the other ILLs [3].

Case Study 3: The I-Living Lab (ILL) 7 "How to Improve Healthcare Access for Elderly through Digitalization"

For the I-Living-Lab (ILL) "How to Improve Healthcare Access for Elderly through Digitalization", a team of three Educational Entrepreneurs (EEs) was formed, from Politehnica University of Timisoara, and from the St. Pölten University of Applied Sciences.

In preparation of the ILL, the EEs met several times to define the challenge and to design the presentation and promotion of the ILL for the students. A storyboard was drafted, deciding on presenting elderly people in the European Union and how due to limited mobility and public transport options they have reduced healthcare access. Discussing how digital tools could be used to help, the EEs reached some conclusions: during the Corona pandemic digitalisation reached a peak; the isolation of elderly people also reached a peak; elderly people used less health care services; elderly people need guidance in order to be able to use digital tools to their advantage. When drafting the final script for the ILL presentation video, the EEs presented the problem (social exclusion of elderly; lack of public transport; lack of healthcare services; shortages of doctors), proposed a solution through digitalization, citing the Council of the European Union who recently concluded that there is an urgent "need to improve digital skills and the accessibility of digital services." and that the "access to essential services, including digital communication is a social right for all people regardless of their age [18]. The Council's objective which suits this ILL most is to contribute to reducing social isolation through high quality, accessible and easy to use forms of digital communication. Based on all this, the EEs defined the ILL challenge as follows: "How might we use digitization to improve health care access for elderly people with limited mobility?".

As the date of the starting of the ILL was approaching, EEs had several meetings in preparation of the structure and the activities of our ILL. They decided to have 6 meetings, besides the official opening and closing events of the ILLs, but also encouraging the students participating in the ILL to meet independently each week and discuss their weekly tasks.

The first week was dedicated to the introduction to the ILL concept and structure, presenting Future Skills, understanding expectations from EEs and students, but also a good opportunity to get acquainted through an ice-breaker activity prepared by the EEs. Students were already introduced to the challenge during the official opening session of the ILLs. Organizational aspects were also presented and debated, such as the dates of meetings, presentation of the basecamp environment, explaining the final assessment and showcasing the logbook which the students needed to complete during their ILL experience. After presenting and explaining the future skills, students were given the task to choose 2-3 future skills that they want to work on during the ILL and write a short paragraph explaining their reasons. The first challenge related task was also presented, students

had to contact stakeholders (face to face, online meetings, email, phone calls), empathising with elderly people, associations, health professionals in order to see what the challenges are aligning them with the ILL challenge. EEs suggested students split in two groups for the two types of target groups.

In order to further engage the students and for reasons of strengthening the group, EEs decided to continue thereafter each week with short 10 minutes/session ice-breaker activities, prepared in rotation by pairs of students. The students got to further bond by creating themselves a WhatsApp group and meeting weekly on Microsoft Teams.

The second week was designed having the empathizing phase in mind of the design thinking process. Students presented their initial reports on their findings and deeper understanding of the ILL's target group. The findings were debated amongst the students and the EEs. The process of design thinking was thoroughly explained, with practical examples of parts from the ILL which suit each of the process steps. An emphasis was put on explaining the six hats used in design thinking (blue hat – process, green hat – creativity, white hat – facts, yellow hat – benefits, red hat – feelings, black hat – cautions) and students were given an activity to discuss in groups questions and issues that may arise when they wear one specific thinking hat.

The third week was the conclusion of the empathising phase, where students presented the conclusions of the interviews of stakeholders. Since they had already met between themselves, EEs could hear a common understanding of the target groups for the ILL. The define phase was also initiated, as students created sticky notes in Mural, identifying the results of their empathise activity and furthermore starting to create the personas related to the challenge.

In the fourth week, together with the EEs, the students defined the personas and started the ideation phase, discussing several solutions, thinking how those solutions could be used by the defined personas and then choosing only one solution to be further developed in prototyping.

In the fifth week, the students present the prototype which they have been working on for the proposed solution and they start storyboarding for their product presentation.

Finally, in the sixth week, students get and give feedback in relation to the future skills chosen by them at the beginning of the ILL and present their product both to the EEs and to stakeholders. This is part of the testing phase and students can further improve their product based on the feedback received. Before the conclusion of the ILL, one on one sessions between EEs and students were conducted for evaluation and general feedback [3].

5.1.2 Work documents for ILL

The ILL Guide for students and EE are referred in the topic of the didactic basic concept and can be found on Teams Sankt-Pôlten.

5.1.3 Assessment from EE

After the first round of the ILLs ended, the EEs were asked to fill in a document whose purpose was to record what had taken place at the ILL.

The document (in annexe) had the following specific goals:

1) Identify the constitution and characterization of the team (EE, students and external stakeholders);

2) Contextualize the initial challenge, relating it to the needs of the region and definition of the end-user;

3) Collect evidence regarding how co-creation and transdisciplinarity were achieved;

4) Collect data on future skills developed by participants;

5) Evaluate, from the EE's point of view, what went well and what can be improved in the ILL

The following tables summarise the main contributions regarding the mentioned topics from EE's answers.

Transdisciplinary content
In the ILL, transdisciplinarity was assured in several ways, which enhanced social and academic interactions and collaborative work. First of all, the EEs pairs came from different professional and educational backgrounds. Students also came from various courses and faculties, mixing several scientific areas. Furthermore, the challenges were formulated in a way that already demanded transdisciplinary thinking. Students were encouraged to develop a good understanding of working environments and the professional mindsets of their target groups and their fellow team members.

Co-creation method
The Design Thinking Approach enhanced the co-creation process using the material provided in the EE training sessions. This methodology improved autonomy and allowed the students to take control over the ILL process. The Educational Entrepreneurs took the role of learning facilitators. Group and individual sessions were organized to reach the aims of each ILL. As the primary method for co-creation during ILLs, Design Thinking assignments and activities had been structured and executed in online collaborative tools, such as MURAL and different tools from BaseCamp.

Engagement with External stakeholders
A weakness that may be improved in subsequent editions is that there were no external stakeholders in some ILL. In the ILL with external stakeholders, in some cases, they: a) Took part in a one-minute pitch carried out at the beginning of the semester and public ally presented in a wonder.me platform session (in an event on the 21st of September 2021). b) Participated in an interview with the learners, in which they had the opportunity to ask questions related to the challenge. c) Reflected and gave feedback after the stage of creating the prototype.

Which future skills do participants acquire?
Students have chosen 2 -to 3 personal goals/future skills at the beginning of the ILL, defining their learning purposes. All future skills can be linked to the ILL, but the emphasis was on decision, reflection, self-efficacy, cooperation, sense-making and Design Thinking competence.

All participating students acquired skills in communication: to communicate unique ideas to a group of others, especially in a foreign language (English). They all developed more knowledge about different cultural and academic environments and personal skills like how to engage with the team and motivate others to come to a final solution.

Finally, for most students, the collaboration towards a project was a new learning experience, which they found challenging. Students state that they have learned a lot from each other.

Which aspects worked very well in the ILL?

Considering the Educational Entrepreneurs' answers, several topics were referred strong features of the ILL:

a) The Design Thinking methodology, in general;
b) The expectation about the ILL;
c) Teambuilding, collaborative work and students engagement;
d) Personal development;
e) Assessment (portfolio and feedback and reflection);
f) Small group size of the group was around six students;
g) Microsoft Teams as a communication platform and videoconferences;
h) Pedagogical strategies include planning together and checking lists; icebreakers, warm-up and, especially, cool down games, empathy maps, interviews, virtual whiteboard, and virtual platforms such as Mural, Zoom, GoogleDocs, and BaseCamp;.
i) Closing event/showdown day;
j) Teamwork between EE.

Which aspects didn't work?

Considering the Educational Entrepreneurs' answers, several topics were referred weak features of the ILL:

a) Clear expectations from the students and EE's at the end of the ILL;
b) Student's assessment and difficulties in grading;
c) Different time zones;
d) Student recruitment;
e) Student engagement to do the various tasks (Logbook, Basecamp, Future skills, 360-degree evaluation, reflection and Design Thinking methodology;
f) Duration of the ILL (6 weeks were too short);
g) Clarification of the articulation of the learning experience and Design Thinking;
h) The online format of the ILL;
i) Different understanding of individual work and responsibilities from the students;
j) The balance between facilitation and teaching.

What would you change in the approach?

The Educational Entrepreneurs suggested some changes, some of them were already integrated into the second round of the ILLs. The leading suggestions are transcribed as follows:

- In the define phase of the Design Thinking process, I would not tell the students to formulate the problem but rather let them define and ideate together on which aspect they would like to focus on. I would not make changes in the rules of the "game" during the process of the ILL. The time is too short; as students mentioned, 2 to 4 more weeks would have helped.
- Clear expectations on the evaluation and task sharing between EE's + using more of a blended way of teaching.
- Most importantly, we would like to make some remarks on the following aspects: (i) Student recruitment; (ii) Assessment accomplishments; (iii) Scheduling of synchronous sessions including time and duration; (iv) International week(s); (v) ILL teaching weeks; (vi) Education entrepreneur recruitment. Our comments for improvement will be explained below as a commitment to take action.
- We will teach Design Thinking more explicitly.
- From the point of the EE: preparation of the ILL: form the teams earlier, give the EE more time to get to know each other, build trust, and define their challenge and external stakeholders. For the students: Spread the live lab sessions over a more extended period: at least 8- to 10 weeks. This gives the students more space/time to do the tasks and dive deeper into the subject. They have to learn many new things in a brief period.
- Much more clarity even before the project starts: when will happen what, so that the students can decide if that fits their schedule. Clear expectations on how the grades are going to be given. The same understanding among EEs is what our role is and how we will work with our students. Although our approach so far was to give authority to the students to work on the project independently, we realized that some of the themes need more strict guidance and follow-up during the process. Maybe there should be a clear definition of the responsibility of the EEs in terms of technical part and future skills part, and the students are informed accordingly.

To sum up, we did foresee a facilitating phase and a review phase in our concept, but we did not plan this. We started with an in-depth evaluation by asking the EE's to fill in the questionnaire. The results of this questionnaire led us to look really at the training concept. This was one of the topics of the Factsheet Action Day of 25/1/2022.

We did not have enough time to plan more review and development phases between the first and second round of ILLs. Educational Entrepreneurs also receive targeted workshops, such as workshops for Design Thinking, Pitching, and Coaching, to further grow in facilitating an I Living Lab. This is a learning point that needs to have more attention in the project's next phase. This was also discussed at the Factsheet Action Day of 25/1/2022.

5.1.4 Student Evaluation (pre and post)

This report is dedicated to the evaluation of the first round of the I Living Labs (ILLs) in winter 2021 with a focus on the acquisition of Future Work Skills. The goal of the analysis is to show whether and to what extent the I Living Labs fulfil its purpose: To enable people with different professional backgrounds to work successfully in teams and to acquire or develop interdisciplinary competencies in the process. To pursue this research interest, a cohort of students was interviewed twice in the form of a panel survey on their self-assessment of existing Future Work Skills. The results of the present statistical analysis are to serve the quality assurance and development of the I Living Labs.

Survey Design & Methodology

Central questions and operationalization

This report attempts to provide answers to the following questions:

- Does participation in an ILL contribute to the (further) development of interdisciplinary competencies (operationalized as Future Work Skills) of the participants?
- To what extent are the participants' expectations of the ILL fulfilled?
- How do the participants evaluate the interdisciplinary project work?

To measure whether and to what extent the ILL achieves the set goals, the extent of competence acquisition during this period is crucial. To determine this competence development, a longitudinal survey (panel design) with two measurement points was obvious. A comparison of the competence level before the start of ILL (measurement time t0) with the competence level at the end of the ILL (measurement time t1) allows conclusions to be drawn about the development of knowledge gain and thus the ability to work in an interdisciplinary team. For practicable reasons (availability of data) and applicable data protection regulations, the level of competence could be surveyed in the form of a subjective self-assessment of existing generic competences. The future work skills were operationalized as generic competencies.

Methodology and instrument

The described interest in knowledge suggests a quantitative methodological approach, the study was conducted by means of an online survey using closed questionnaire items in the form of a panel (self-assessment Future Work Skills). As already derived in the chapter on central questions and operationalization, the repeated measurement of the competence level serves to record a competence development from the beginning of the study to the end of the ILL:

- Measurement time t0: ILL participants are interviewed BEFORE the start of the ILL.
- Time of measurement t1: ILL participants are surveyed at the END of the ILL.

Instrument: Online questionnaire for self-assessment of competences

An online questionnaire was designed to determine the level of competences. The content of the questionnaire is strongly oriented towards the professional competences of the Institute for the Future of the University of Phoenix (Davis et al., 2011). These so-called future skills focus on those interdisciplinary skills that will be relevant in the future labour market, regardless of the sector. The list of IFTF Future Skills can be found in the appendix (Annex 9). The questionnaire items were formulated as closed statements and provided with 6-point response scales. The complete questionnaire used for the ILL evaluation can also be found in the appendix.

Methodological critique

The quantitative methodological procedure that applies to the present survey design (online survey using closed questionnaire items) serves the numerical representation of empirical facts, which can only do insufficient justice to the object under investigation, especially since the subjective self-assessment of acquired competences leaves much room for interpretation and suggests decisive effects due to individual personality structures of the

respondents. The method of questioning is fundamentally dependent on self-referential information from the participants and these in turn are dependent on their memory and self-knowledge. This makes the survey more prone to arbitrary bias and error than other objective methods of data collection such as counting. However, the occurrence of sources of measurement error can never be completely ruled out, and compared to qualitative empirical methods, the quantitative approach is characterised not only by the higher degree of objectivity, external validity, and representativeness, but also by comparability. Practical reasons such as the time-economic advantages of data collection, in addition to the adequacy of the instrument for answering the underlying questions, also spoke in favour of choosing the online survey as the survey instrument.

Results

The results chapter is divided into three parts. The first part includes the presentation of the individual competences set for self-assessment. The second part focuses on the development of competences over the course of the ILL and the statistical correlations that were examined (comparisons of mean values and correlations). The third and last part shows the expectations of the participants, which were openly collected (in advance, as well as their fulfilment after completion of the ILL).

Participation of ILL participants

19 participants took part in the initial evaluation before the start of the ILL, and 21 valid participants took part in the final evaluation at the end of the ILL.

Table 1: Overview of participant count

Group	Frequency	Percent
Start	19	47,5%
End	21	52,5%
Total	40	100%

Unfortunately, while merging the data from the various measurements (t0, t1), only two cases could be assigned based on the participants' individual anonymised self-coding. This makes the case analysis more difficult, but as an alternative, group co-value comparisons of the start and end evaluations could be calculated.

Future Work Skills at a glance

In the following, all competences of the self-assessment items are presented in detail. Boxplots visualizing the distribution of the answers to the categories "1 = strongly agree" to "6 = strongly disagree" provide a meaningful overview in the direct comparison of the start and end evaluation. The detailed distribution of the answers to the categories "1 = strongly agree" to "6 = strongly disagree" can be found in Annex 9.

Wilcoxon analyses was performed to indicate that difference between start and end group were statistically significant. If there was a significance, we calculated the effect size r. In the following, we present the results of each item as boxplot. However, we only describe significant results.

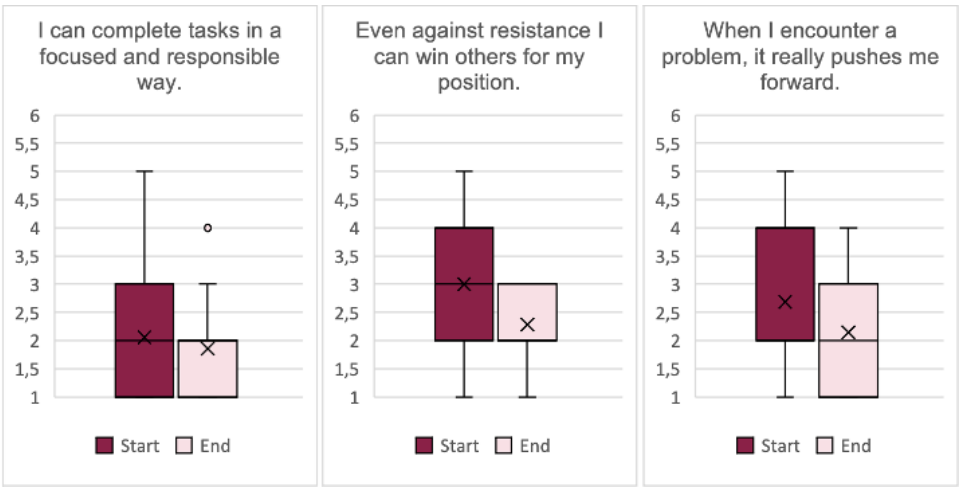


Figure 1: Boxplots visualizing the data for each question. N=40; Start n=19 / End n=21.

Figure 1 (left) shows the participants agree significantly more with the statement 'I can complete tasks in a focused and responsible way' at the end of the ILL than at the start, U (N1=19, N2=21) = 605.5; z = -2.06; p = 0.04; r=0.29. According to Cohen (1992), this difference is weak.

The same tendence can be seen for the statement 'When I encounter a problem, it really pushes me forward' (see Figure 1 (right)). Participants agreed significantly more with the statement at the end than at the start, U (N1=19, N2=21) = 442.5; z = -3.71; p = 0.0002; r=0.52. According to Cohen (1992), this difference is strong.

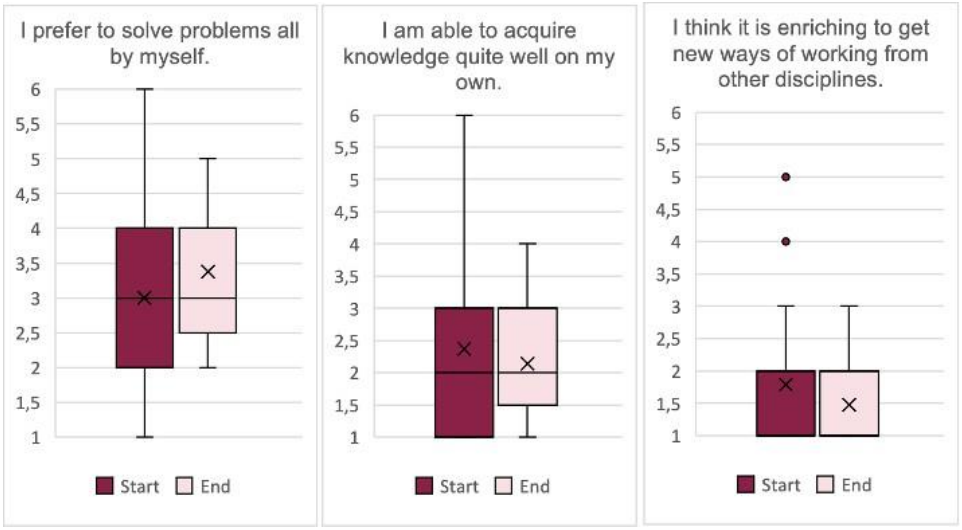


Figure 2: Boxplots visualizing the data for each question. N=40; Start n=19 / End n=21.

For the statements 'I am able to acquire knowledge quite well on my on' (see Figure 2 (middle)), the self-assessment tended to show better agreement at the end than at the start, U (N1=19, N2=21) = 503.5; z = -3.09; p = 0.002; r=0.43. According to Cohen (1992), this difference is medium.

Figure 3: Boxplots visualizing the data for each question. N=40; Start n=19 / End n=21.

Figure 3 (middle) shows that the agreement at the beginning has a significant higher value than the one at the end showing the higher agreement for the statement 'I am good at handling conflict situations' at the end, U (N1=19, N2=21) = 473; z = -3.40; p = 0.0007; r=0.48. According to Cohen (1992), this difference is medium.

Figure 4: Boxplots visualizing the data for each question. N=40; Start n=19 / End n=21.

For the statements 'I perceive different working styles as mutually enriching' (see Figure 4 (right)), the self-assessment tended to show better agreement at the end than at the start, U (N1=19, N2=21) = 503.5; z = -3.09; p = 0.002; r=0.43. According to Cohen (1992), this difference is medium.

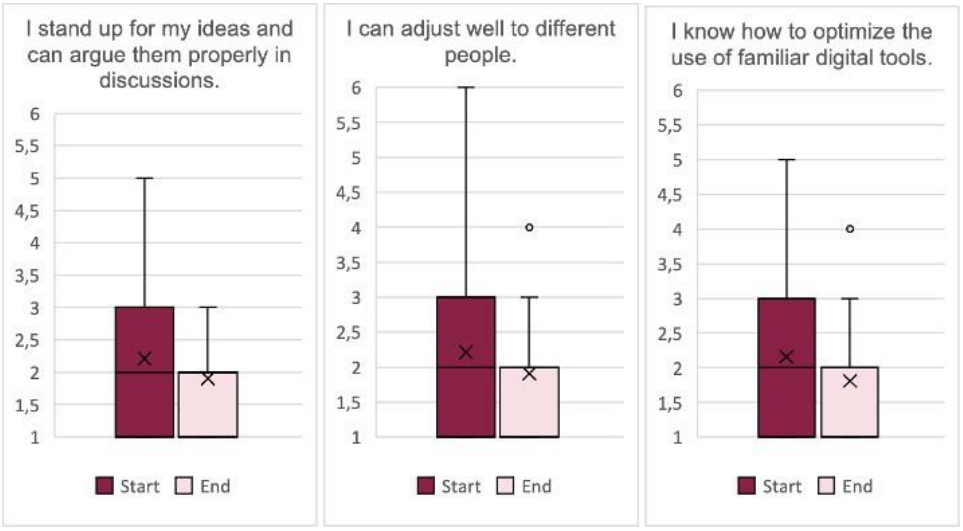


Figure 5: Boxplots visualizing the data for each question. N=40; Start n=19 / End n=21.

Figure 5 (left) shows the participants agree significantly more with the statement 'I stand up for my ideas and can argue them properly in discussions' at the end of the ILL than at the start, U (N1=19, N2=21) = 565.5; z = -2.49; p = 0.01; r=0.34. According to Cohen (1992), this difference is medium.

The same tendence can be seen for the statement 'I know how to optimize the use of familiar digital tools' (see Figure 5 (right)). Participants agreed significantly more with the statement at the end than at the start, U (N1=19, N2=21) = 585.5; z = -2.27; p = 0.02; r=0.32. According to Cohen (1992), this difference is medium.

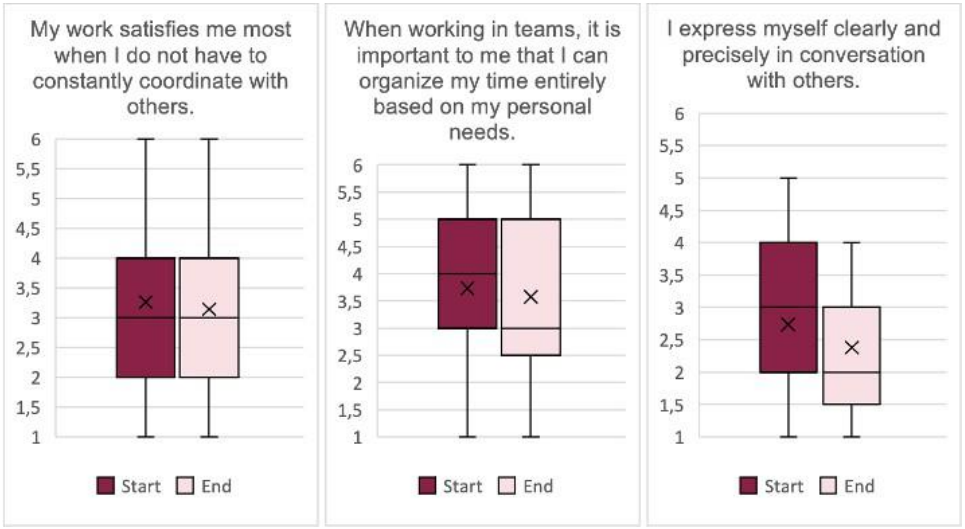


Figure 6: Boxplots visualizing the data for each question. N=40; Start n=19 / End n=21.

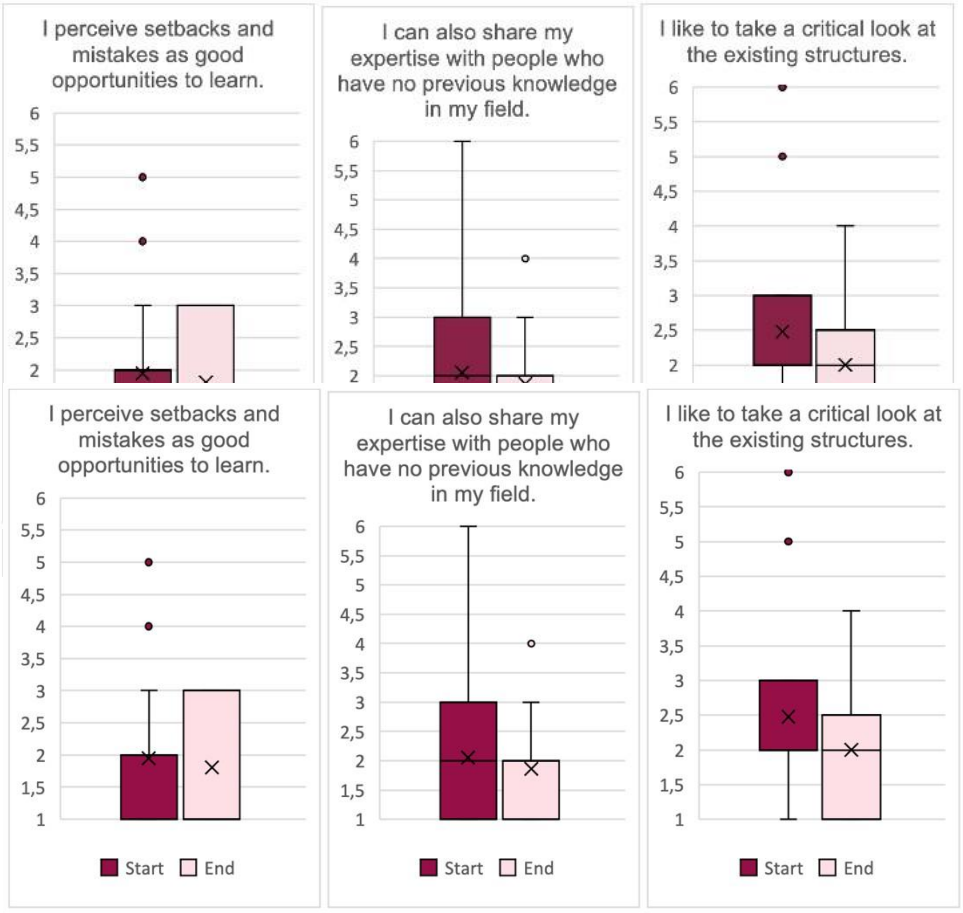


Figure 7: Boxplots visualizing the data for each question. N=40; Start n=19 / End n=21.

Figure 7 (left) shows the participants agree significantly more with the statement 'I am able to judge my own achievements well' at the end of the ILL than at the start, U (N1=19, N2=21) = 513; z = -2.98; p = 0.003; r=0.42. According to Cohen (1992), this difference is medium.

The same tendence can be seen for the statement 'I prefer to solve problems in interaction with others' (see Figure 7 (right)). Participants agreed significantly more with the statement at the end than at the start, U (N1=19, N2=21) = 453; z = -3.62; p = 0.0003; r=0.51. According to Cohen (1992), this difference is strong.

Figure 8: Boxplots visualizing the data for each question. N=40; Start n=19 / End n=21.

For the statements 'II like to take a critical look at the existing structures' (see Figure 8 (right)), the self-assessment tended to show better agreement at the end than at the start, U (N1=19, N2=21) = 483.5; z = -3.31; p = 0.0009; r=0.46. According to Cohen (1992), this difference is medium.

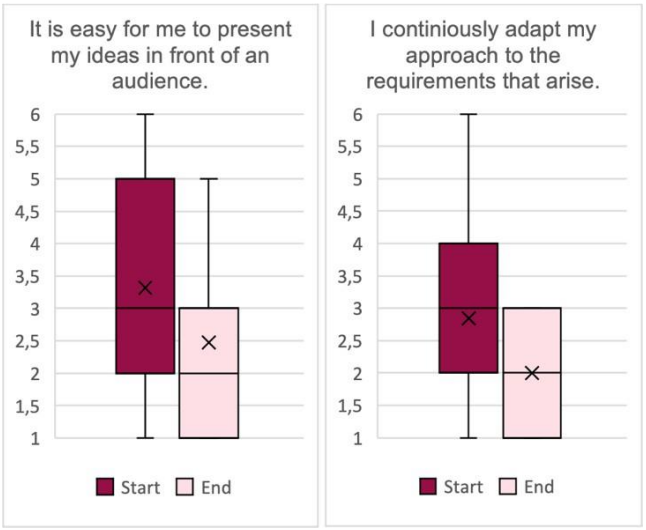


Figure 9: Boxplots visualizing the data for each question. N=40; Start n=19 / End n=21.

Figure 9 (left) shows the participants agree significantly more with the statement 'I is easy for me to present my ideas in front of an audience' at the end of the ILL than at the start, U (N1=19, N2=21) = 419.5; z = -3.86; p = 0.0001; r=0.54. According to Cohen (1992), this difference is strong.

The same tendence can be seen for the statement 'I continuously adapt my approach to the requirements that arise' (see Figure 9 (right)). Participants agreed significantly more with the statement at the end than at the start, U (N1=19, N2=21) = 441.5; z = -3.69; p = 0.0002; r=0.52. According to Cohen (1992), this difference is strong.

Overall evaluation at the end of the ILL

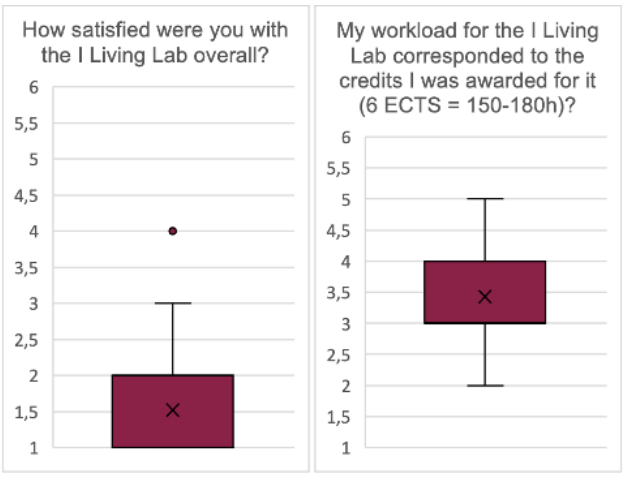


Figure 10: Boxplots visualizing the data for the question focusing on the overall evaluation at the end. N=21.

At the end of the ILL, the participants were asked how they evaluated the ILL overall in retrospect. Figure 10 shows that the ILLs are rated (very) good. Differentiation between ILLs was not possible due to the low participation.

When asked about the workload and consistency with the 6 ECTS, close to 40% of respondents expressed their disagreement. Only about 10% of the students agreed with the consistency between the number of ECTS and the work requested in the ILL.

In Table 2, mean values with standard deviations for all self-assessment statements are presented. The mean values are shown for the self-assessment at the beginning of the ILL (start) and at the end of the ILL (end). In addition, the results of the Wilcoxon Test are also shown.

Table 2: Overview of mean values with standard deviations and results of Wilcoxon Test (U and if significant the effect size r) for all self-assessment statements.

	Start	End	Wilcoxon Test U / r
S1: I can complete tasks in a focused and responsible way.	2.05 (SD: 1.08)	1.86 (SD: 0.79)	605.5 / 0.29
S2: Even against resistance I can win others for my position.	3.00 (SD: 0.94)	2.28 (SD: 0.64)	249
S3: When I encounter a problem, it really pushes me forward.	2.68 (SD: 1.42)	2.14 (SD: 1.01)	442.5 / 0.52
S4: I prefer to solve problems all by myself.	3.00 (SD: 1.15)	3.38 (SD: 1.07)	146
S5: I am able to acquire knowledge quite well on my own.	2.37 (SD: 1.38)	2.14 (SD: 0.91)	503 / 0.43
S6: I think it is enriching to get new ways of working from other disciplines.	1.79 (SD: 1.18)	1.48 (SD: 0.68)	837
S7: It is easy for me to ask for help when I am stuck with a problem.	2.84 (SD: 1.74)	1.81 (SD: 1.08)	614
S8: I am good at handling conflict situations.	2.53 (SD: 1.50)	2.29 (SD: 1.10)	473 / 0.48
S9: My work satisfies my most when I work mainly alone.	2.84 (SD: 1.26)	3.00 (SD: 1.22)	297
S10: I question the status quo.	2.95 (SD: 1.27)	2.90 (SD: 1.18)	247
S11: I can react flexibly and goal-oriented to changing project requirements.	2.58 (SD: 1.07)	2.10 (SD: 0.62)	383.5
S12: I perceive different working styles as mutually enriching.	2.26 (SD: 1.19)	2.19 (SD: 0.98)	503.5 / 0.43
S13: I stand up for my ideas and can argue them properly in discussions.	2.21 (SD: 1.28)	1.90 (SD: 0.70)	565.5 / 0.35
S14: I can adjust well to different people.	2.21 (SD: 1.58)	1.90 (SD:0.94)	655
S15: I know how to optimize the use of familiar digital tools.	2.16 (SD: 1.01)	1.81 (SD: 0.81)	585.5 / 0.32
S16: My work satisfies me most when I do not have to constantly coordinate with others.	3.26 (SD: 1.37)	3.14 (SD:1.42)	207
S17: When working in teams, it is important to me that I can organize my time entirely based on my personal needs.	3.74 (SD: 1.48)	3.57 (SD: 1.53)	174.5
S18: I express myself clearly and precisely in conversation with others.	2.74 (SD: 1.32)	2.38 (SD:1.07)	400.5
S19: I am able to judge my own achievements well.	2.31 (SD: 1.29)	2.19 (SD: 1.08)	513 / 0.42
S20: It motivates me to develop and implement new ideas.	1.84 (SD: 1.17)	1.52 (SD: 0.75)	806.5
S21: I prefer to solve problems in interaction with others.	2.74 (SD: 1.28)	2.05 (SD: 0.97)	453 / 0.51
S22: I perceive setbacks and mistakes as good opportunities to learn.	1.95 (SD: 1.22)	1.81 (SD: 0.93)	704.5

S23: I can also share my expertise with people who have no previous knowledge in my field.	2.05 (SD: 1.22)	1.86 (SD: 0.85)	625.5
S24: I like to take a critical look at the existing structures.	2.47 (SD: 1.31)	2.00 (SD: 0.87)	483.5 / 0.46
S25: It is easy for me to present my ideas in front of an audience.	3.32 (SD: 1.89)	2.48 (SD: 1.40)	419.5 / 0.54
S26: I continuously adapt my approach to the requirements that arise.	2.84 (SD: 1.38)	2.00 (SD: 0.84)	441.5 / 0.52
How satisfied were you with the I Living Lab overall?	-	1.52 (SD: 0.87)	-
My workload for the I Living Lab corresponded to the credits I was awarded for it (6 ECTS = 150-180h)?	-	3.43 (SD: 0.87)	-

Expectations BEFORE and AFTER the ILL

At the beginning of the ILL, the participants were openly asked which of their skills they expected to contribute to the ILL. After the end of the ILL, the participants were openly asked to what extent their expectations of the ILL were fulfilled and which specific skills from their own discipline were they able to bring in. Figure 11 shows the complete list of answers.

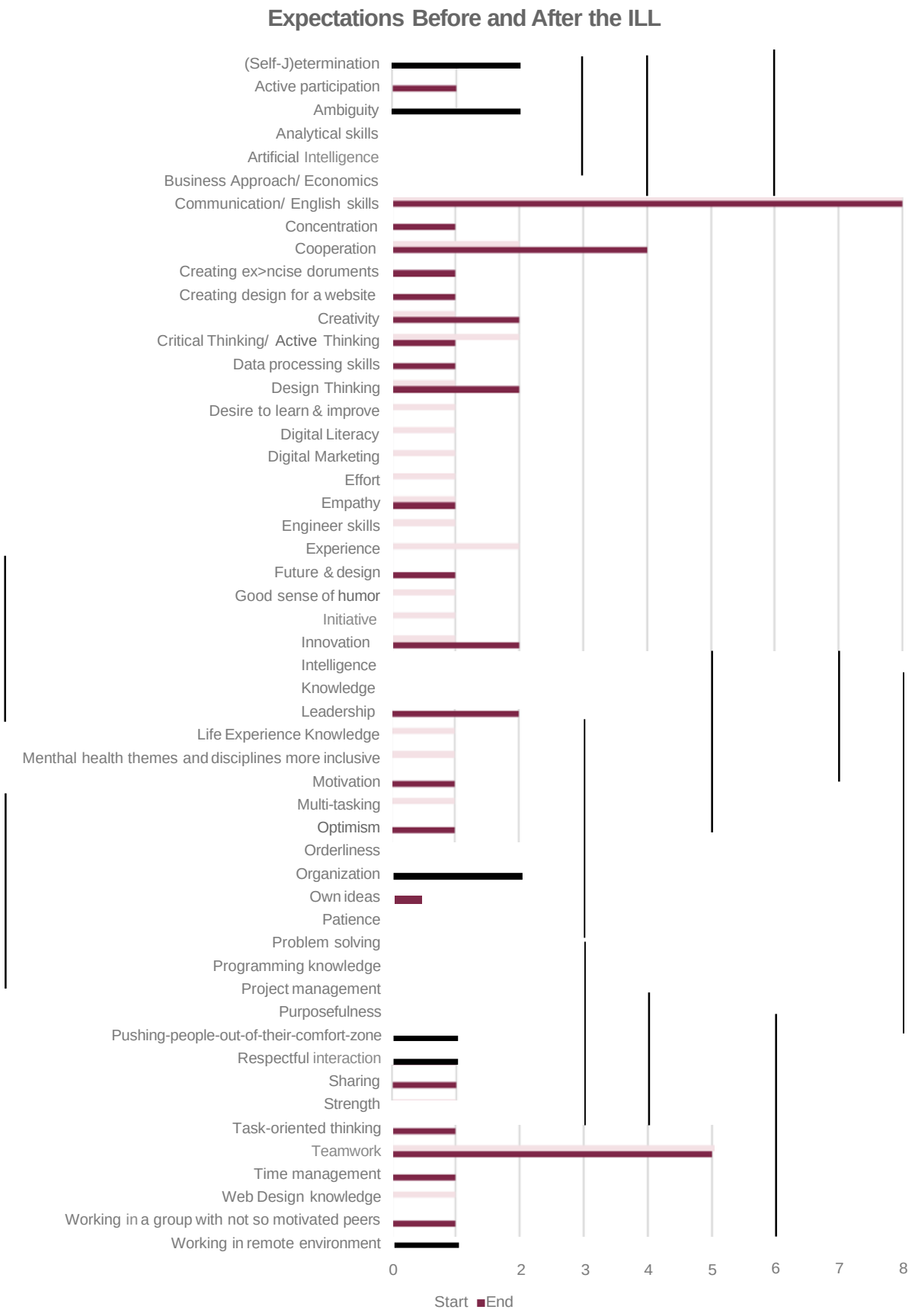


Figure 11: The expectations of the ILL learners at the start compared to the end of ILL. N=40; Start n=19 / End n=21.

The three best moments during the ILL journey

After the end of the ILL, the participants were openly asked about their three best moments during their ILL journey. Figure 12 shows the complete list, identical/similar mentions have been combined.

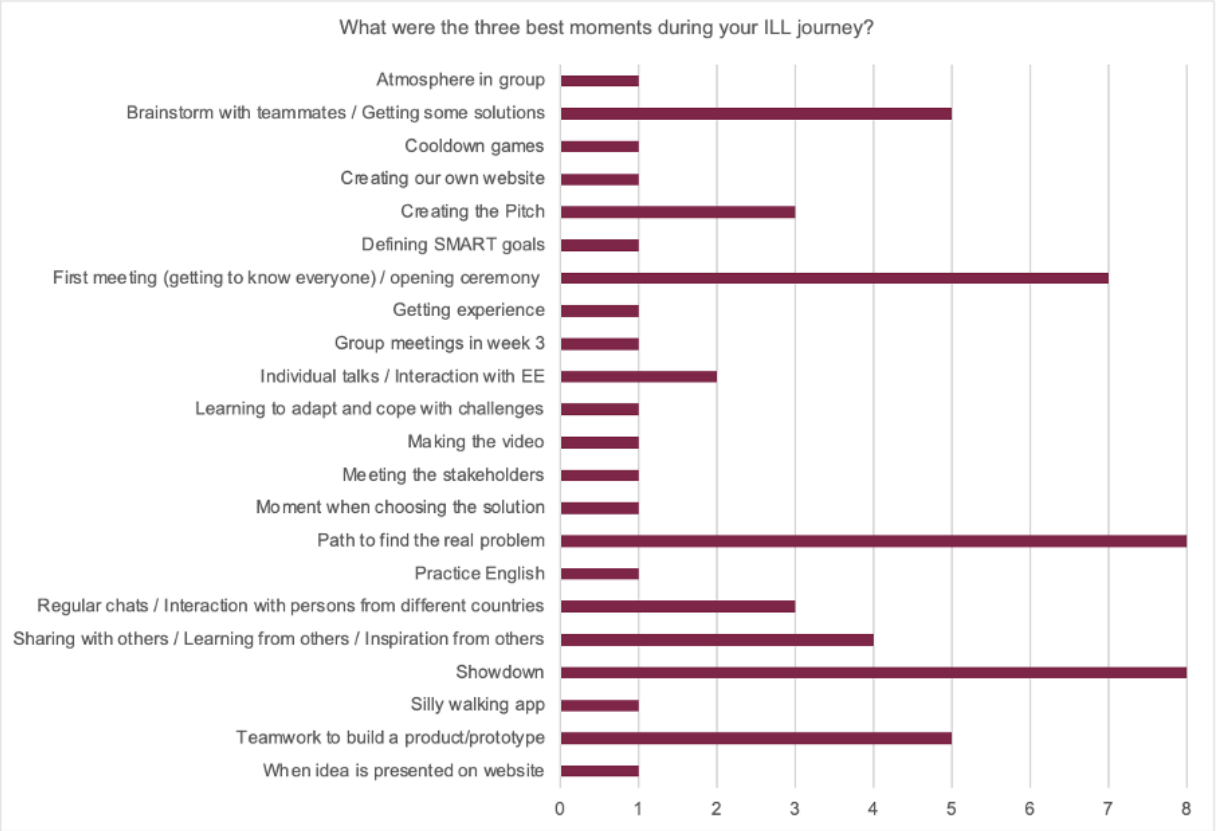


Figure 12: The three best moments of the ILL learners at the end of the ILL. N=21.

Suggestions for Improving the ILLs

In addition, participants were openly asked to the suggestions they have for improving the ILLs. Here is the complete list:

- More time for the video and posters (more advance notice)
- Longer time frames for the whole ILL, since only a month is too tight of a schedule to be able to develop the idea and ourselves fully.
- Communication more with teams and students about what is going to happen. Don't change final end results you expect from teams. For example, the unexpected 1min video pitch.
- More focus on the unique skills each participant brings
- I think it was great :)
- More guidelines and stricter rules to make students participate more during the sessions
- More user-friendly platform/website (basecamp)
- 2 meetings in a week
- Personal contact when possible
- Duration: one semester at least
- Honestly, it works well as I see it. In my opinion, the one thing, which could make the projects a bit more exciting, would be to have more creative tasks during the project, like the 1-minute-long video.
- Keep up the good work :)

- More stakeholders should join our projects.
- The possibility of making us unite in person in one of the universities for a period of time (one week or 2/3 days for example) to work together.
- More interaction with the external stakeholder
- I have no suggestions
- I would adjust the timetable to a more pleasant timing if the class! I know it is difficult due to 6 different universities. I would also recommend to give more information about the course before because this would attract more students!
- I really liked the way it was, the only thing I probably want to change would be to have more time for implementing the prototype and more exactly more time to handle with all our ideas and to manage to make the best presentation of our product.
- Start earlier with the project. Always explain the task clearly and in advance. For example, at the end of the course, say that you need to do ...
- Timing, classes were taken a bit late, and the start of prototyping can be earlier, not just the final week and a half. Here might be one week furthermore.
- Communicate transparent what has to be done like video creation, google forms etc., do not mess-up the showdown event with boring discussions and tools nobody has ever used before, it just confuses people.
- Maybe bit more structure at the start of ILL lab.

Summary

The individual competences that were assessed before and after the ILL on the basis of a self-assessment by the participants show a positive development of the Future Work Skills overall. Of 26 formulated statements on existing competences, around 92% were rated better after the ILL than before the ILL (focusing only on the mean values)! Only two statements received better ratings beforehand:

- S4: I prefer to solve problems all by myself.
- S9: My work satisfies my most when I work mainly alone.

These two statements counteract the aspect of teamwork and that a stronger rejection after the ILL is to be interpreted as positive competence development.

For the following Future Work Skills statements, significant positive agreements were noted during the ILL evaluation:

- S1: I can complete tasks in a focused and responsible way.
- S3: When I encounter a problem, it really pushes me forward.
- S5: I am able to acquire knowledge quite well on my own.
- S8: I am good at handling conflict situations.
- S12: I perceive different working styles as mutually enriching.
- S13: I stand up for my ideas and can argue them properly in discussions.
- S15: I know how to optimize the use of familiar digital tools.
- S19: I am able to judge my own achievements well.
- S21: I prefer to solve problems in interaction with others.
- S24: I like to take a critical look at the existing structures.
- S25: It is easy for me to present my ideas in front of an audience.
- S26: I continuously adapt my approach to the requirements that arise.

The expectations of the participants varied in terms of type and demand, so it is not surprising that a wide range of fulfilled to unfulfilled expectations was also surveyed in the final survey. Overall, a positive trend can be derived from the open text messages, even if for some it was unclear in advance what the content of the ILL was geared towards and consequently there was a certain "element of surprise". The following aspects can be summarised in this regard:

- The ILL was useful in terms of fostering teamwork and cooperation.
- The personal development ("perspective broadened").
- The communication skills and language gains.

Overall, the ILL was well evaluated (final overall rating of 1.52 on a 6-point response scale).

5.2 2nd I-LL (7th March – 29th April 2022)

We are very happy that we are in the middle of running our 2nd round of ILL. We started this round of ILL on the 7th of March with a wonderful starting event. At a specific time we had more than 120 participants in this online zoom meeting.

Due to the Easter holiday period the ILL will run not 6 weeks but 9 weeks. We hope all 16 ILL's will provide a wonderful result that they can show to everybody on our special show down event of 9/5/2022.

5.2.1 Program & Participants

We started with the following 16 ILL that all have 2 EE's. The 1th generation EE's mixed with the 2nd generation to make sure all experience is distributed between all ILL. We preserved the buddy system for the 3rd generation of EE's.

We have more than 160 students that subscribed to follow an ILL.

Challenge
How might we use digitization to improve health care access for elderly people with limited mobility?
Healthy Lifestyles for Youngsters
Living Lab on the Students' Mental Health
How might we use Artificial Intelligence to improve the Cultural Tourism Experience in European cities?
How to make E-Mobility sustainable by applying the principles of circular economy? New concept, students
How robotics can help the microalgae cultivation in bio-waste recycling
Building an energy sustainable campus
Physical power by smart food
AI and robots in wellbeing for disabled people
Studentparticipation in E³UDRES²
Talent Gardening: How can artificial intelligence help individuals and organizations thrive
Waste Audit – Wooden pallets
Know the air you breath
BaroXmedia - Projection Mapping Stift Melk
Bridging Talents & Careers
SmartCampus. Energy efficiency on University Campus.

All the learners (students, EE's and stakeholders) that work together in an ILL have the following tools.

- A basecamp for every ILL
- A basecamp for all the learners with global information, as for example the Learner's study guide. Learners Camp (basecamp.com)
- A basecamp only for the students so they can chat on the campfire with other students ILL students only (basecamp.com)

6. Meetings

6.1 Meetings minutes of the T-shaped Innovators – Holiday Makers

Date of meetings:

- 1 October 2021
- 15 October 2021
- 29 October 2021
- 26 November 2021
- 3 December 2021
- 10 December 2021
- 21 January 2022
- 4 February 2022
- 18 February 2022
- 4 March 2022

All the meeting minutes can be found on Teams Sankt-Pôlten.

6.2 Meetings minutes of the Workers

Date of meetings:

- 5 October 2021
- 19 October 2021
- 2 November 2021
- 16 November 2021

All the meeting minutes can be found on Teams Sankt-Pôlten.

6.3 Meetings minutes of the Educational Entrepreneurs

Date of meetings:

- 8 October 2021
- 22 October 2021
- Due to the ILL no structural meetings in November 2021
- 3 December 2021
- 17 December 2021
- 28 January 2022
- 11 February 2022
- 25 February 2022
- Due to the ILL less structural meeting in March 2022
- 25 March 2022 – agenda

All the meeting minutes can be found on Teams Sankt-Pôlten.

7. From here to where: conclusion so far

The Educator's I Living Lab as practice-based, citizen science, design research

After one year, E3UDRES2 is running 18 I Living Labs of 6 ECTs run by teacher teams of two partners, involving students from six countries and external stakeholders.

These external stakeholders collaborate throughout the whole process of the I living lab starting from the very beginning of the problem definition as challenge owner to implementer and evaluator (Hakley, 2013)

The development of the I Living lab is a research process combining thought, creativity and intuition to gather, apply and analyze data in a systemic way to generate new knowledge (Migchelbrink, 2008).

8. Bibliography

Ambrose, G., Harris, P. (2010). Basics Design 08: Design Thinking. AVA Publishing SA (p. 10-18)

Amin Maalouf (2001). On Identity. London: Harvill Panther.

Baumgartner, P. (2004). The Zen Art of Teaching-Communication and Interactions in Education. In Proceedings of the International Workshop ICL2004, Villach/Austria. Vol. 29, (p. 2004).

Graham, Allen and Ure, 2005. Benefits and challenges of blended learning environments. Encyclopedia of information Science and technology.

Haklay, M., 2013, Citizen Science and Volunteered Geographic Information – overview and typology of participation in Sui, D.Z., Elwood, S. and M.F. Goodchild (eds.), 2013.

Ehlers, U. -D. (2010). Open ECBCheck – Quality for eCapacity Building: Community Based, Low Cost Certification for E-Learning. Essen: Universität Duisburg, Essen.

Ehlers, U. D. (2020). Future Skills: The future of learning and higher education. BoD–Books on Demand.

Ehlers, U. -D. (2020). Future Skills -The future of learning and higher education. international Springer Book Series "Future Higher Education – Zukunft der Hochschulbildung", edited by Prof. Dr. Ulf-Daniel Ehlers, Karlsruhe, Germany, (Book Series: ISSN 2662-5768).

E³UDRES² (2020). EPLUS2020. Call EAC-A02-2019. ERASMUS+ Call for proposals.

European Union (2018). Employment and Social Developments in Europe: annual review 2018. https://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=8110.

Learn to Learn by Teaching 2. 2015. Adult Learning Book. L2LbyT2 Consortium

OECD (2018). The future of education and skills Education 2030: The future we want. https://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf

Sandell, E. & Tupy,S. (2015). Where Cultural Competency Begins: Changes in Undergraduate Students' Intercultural Competency. International Journal of Teaching and Learning in Higher Education, 27(3), 364–381. http://www.isetl.org/ijtlhe/

Schneider, M. & Preckel, F. 2017. Variables associated with achievement in higher education: A systematic review of meta-analyses. Psychological Bulletin, 143(6), 565-600

U4IoT. 2019. Living Lab Methodology Handbook. U4IoT Consortium.

Westerlund, M., Leminen, S., & Habib, C. 2018. Key Constructs and a Definition of Living Labs as Innovation Platforms. Technology Innovation Management Review, 8(12): 51-62.

https://sdgs.un.org/goals/goal4

Cohen, Jacob. „A power primer." Psychological bulletin 112.1 (1992): 155.

Davies, Anna, Fidler, Devin, & Gorbis Marina. "Future Work Skills 2020." Institute for the future for University of Phoenix Research Institute 2011. https://www.iftf.org/uploads/media/SR-1382A_UPRI_future_work_skills_sm.pdf.

9. Annexes

1. Action Day Factsheet
2. 1st I-LL - Kick off 8th November 2021
3. 1st I-LL - Closing event 15th December 2021
4. E^3UDRES^2 Certificate Participant – ILL
5. Guide to I-Living Lab
6. I-Living Lab Learners Guide
7. Planning meetings S1 2022
8. Start Event 7 March 22
9. Student Evaluation

Annex 1: Action Day Factsheet

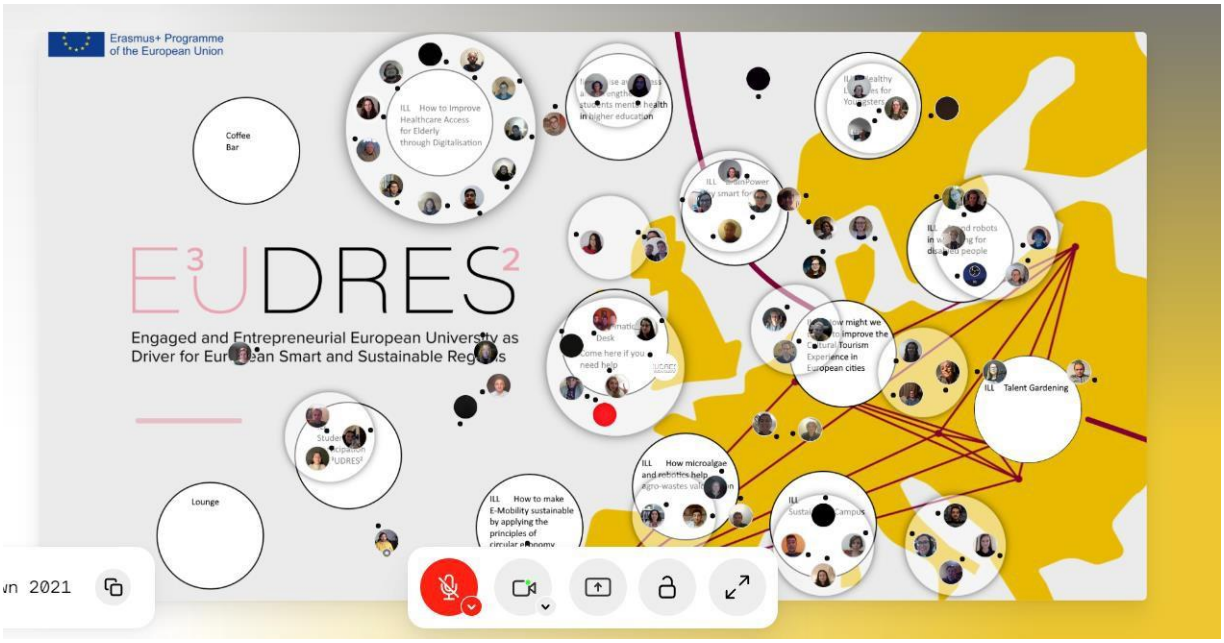
ACTION DAY.pdf

Annex 2: 1ste ILL Kick off 8th November 2021

iLivinglab opening event nov8.pdf

Annex 3: 1st I-LL - Closing event 15th December 2021

We had a wonderful online show down event on 15/12/2021.



This event gave all actors of the ILL energy to give it our best to start our next round of ILL.

Annex 4: E3UDRES2 Certificate Participant – ILL

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Annex 5: Guide to I-Living Lab

Guide to I Living Labs (1).pdf

Annex 6: I-Living Lab Learners Guide

i_living_lab_learners_guide (1).pdf

Annex 7: Planning meetings S1 2022

Planning meetings S1 2022.xlsx

Annex 8: Start Event 7 March 2022

070322 Start Event keynote 7mrt.pptx

Annex 9 – Student Evaluation

Future Skills of IFTF

- Sense-making: ability to determine the deeper meaning or significance of what is being expressed
- Social intelligence: ability to connect to others in a deep and direct way, to sense and stimulate reactions and desired interactions
- Novel & adaptive thinking: proficiency at thinking and coming up with solutions and responses beyond that which is rote or rule-based
- Cross-cultural competency: ability to operate in different cultural settings
- Computational thinking: ability to translate vast amounts of data into abstract concepts and to understand data-based reasoning
- New-media literacy: ability to critically assess and develop content that uses new media forms, and to leverage these media
- Transdisciplinarity: literacy in and ability to understand concepts across multiple disciplines persuasive communication
- Design mindset: ability to represent and develop tasks and work processes for desired outcomes
- Cognitive load management: ability to discriminate and filter information for importance, and to understand how to maximize cognitive functioning using a variety of tools and techniques
- Virtual collaboration: ability to work productively, drive engagement, and demonstrate presence as a member of a virtual team

(Davis et al., 2011, pp. 10–16)

ILL Evaluation – Questionnaire

Section A: Introduction

A2. First of all, we would like to learn about your expectations towards the ILL. What specific skills from your own discipline do you want to contribute to the ILL? Please list the three most important ones.

Section B: Self-evaluation statements

Please let us know your thoughts on the following statements - they are placed in random order. There are no wrong or right responses, feel free to go with your first intent.

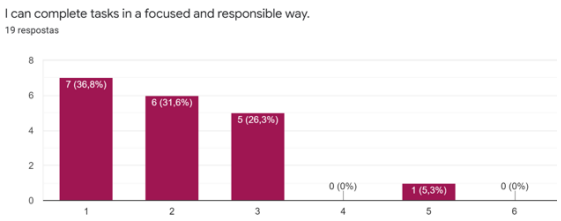
- I can complete tasks in a focused and responsible way.
- Even against resistance I can win others for my position.
- When I encounter a problem, it really pushes me forward.
- I prefer to solve problems all by myself.
- I am able to acquire knowledge quite well on my own.
- I think it is enriching to get new ways of working from other disciplines.
- It is easy for me to ask for help when I am stuck with a problem.
- I am good at handling conflict situations.
- My work satisfies my most when I work mainly alone.
- I question the status quo.

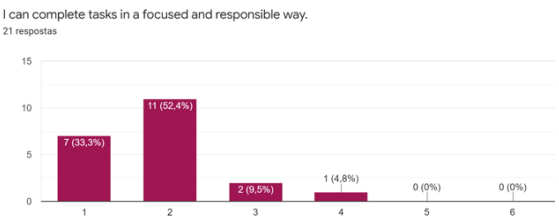
- I can react flexibly and goal-oriented to changing project requirements.
- I perceive different working styles as mutually enriching.
- I stand up for my ideas and can argue them properly in discussions.
- I can adjust well to different people.
- I know how to optimize the use of familiar digital tools.
- My work satisfies me most when I do not have to constantly coordinate with others.
- When working in teams, it is important to me that I can organize my time entirely based on my personal needs.
- I express myself clearly and precisely in conversation with others.
- I am able to judge my own achievements well.
- It motivates me to develop and implement new ideas.
- I prefer to solve problems in interaction with others.
- I perceive setbacks and mistakes as good opportunities to learn.
- I can also share my expertise with people who have no previous knowledge in my field.
- I like to take a critical look at the existing structures.
- It is easy for me to present my ideas in front of an audience.
- I continuously adapt my approach to the requirements that arise.

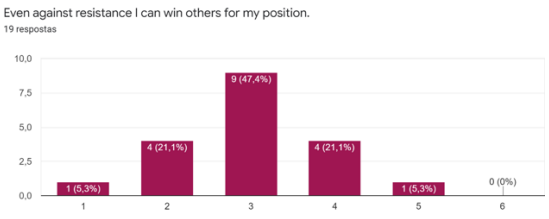
Section C: Satisfaction & Workload

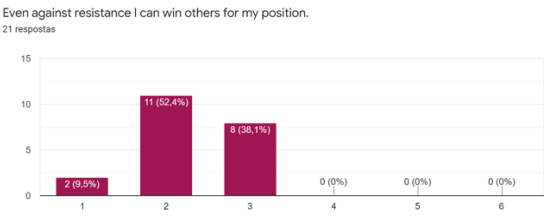
- Which I Living Lab did you participate in?
- How satisfied were you with the I Living Lab overall? Please explain your choice.
- My workload for the I Living Lab corresponded to the credits I was awarded for it (6 ECTS = 150-180h)?
- What were the three best moments during your ILL journey?
- What suggestions do you have for improving the ILLs?

Data of Self-evaluation Statements



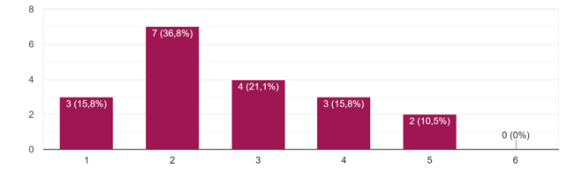






When I encounter a problem, it really pushes me forward.

19 respostas



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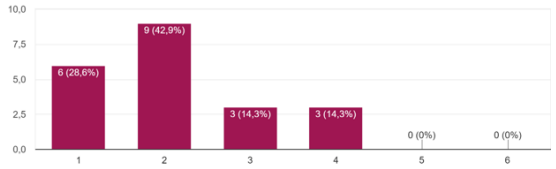
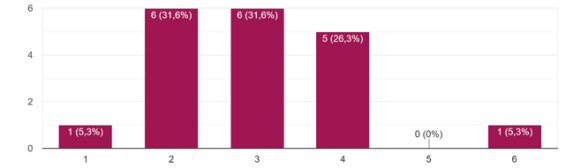


I prefer to solve problems all by myself.

19 respostas



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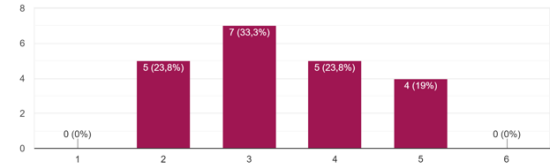

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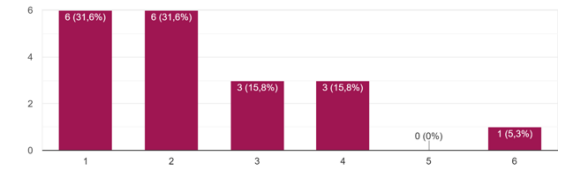

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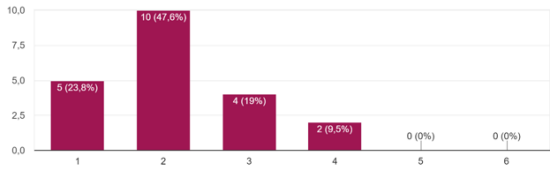

I think it is enriching to get new ways of working from other disciplines.

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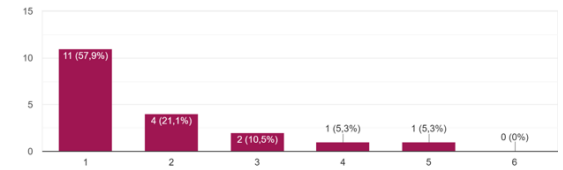

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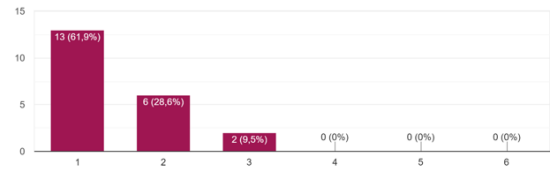

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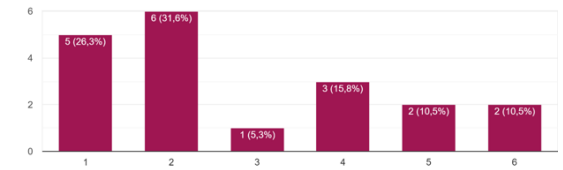

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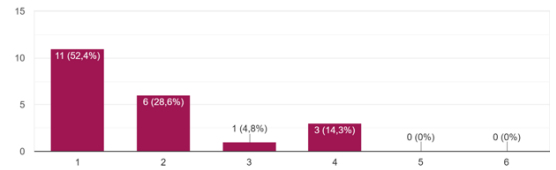
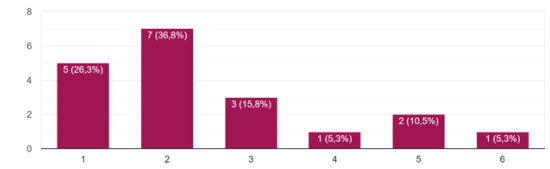


I am good at handling conflict situations.

19 respostas



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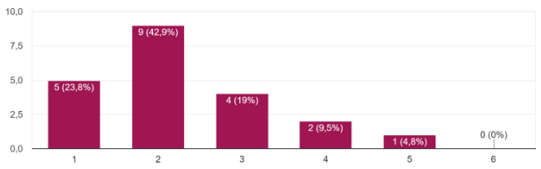

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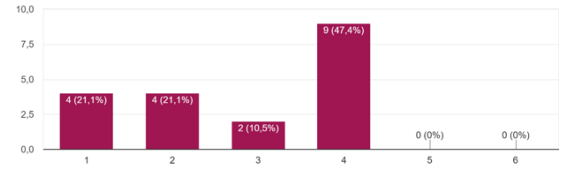

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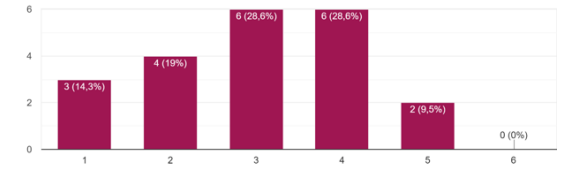

I question the status quo.
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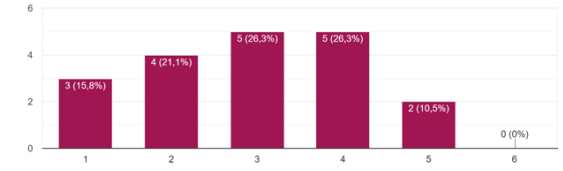

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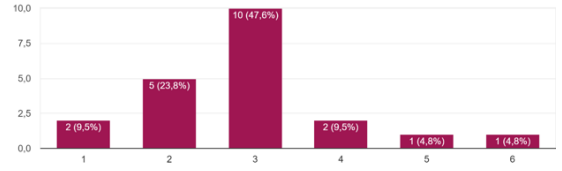
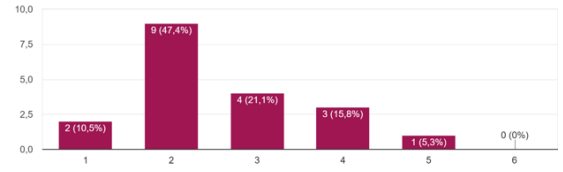


I can react flexibly and goal-oriented to changing project requirements.
19 respostas



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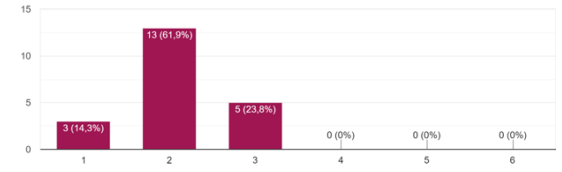
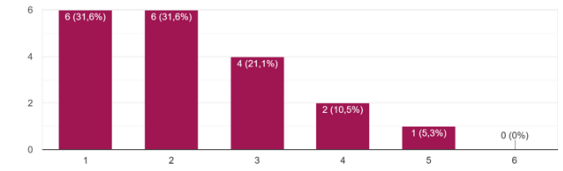


I perceive different working styles as mutually enriching.
19 respostas



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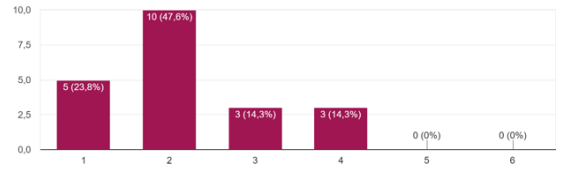
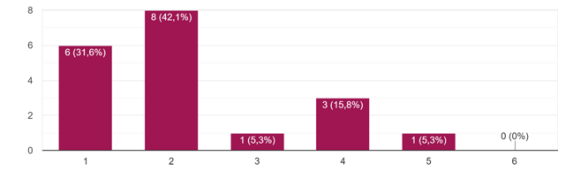


I stand up for my ideas and can argue them properly in discussions.
19 respostas



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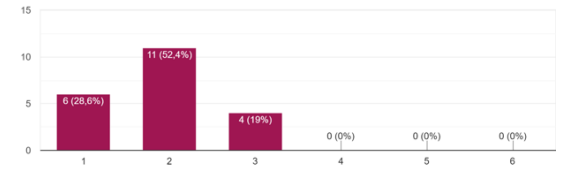
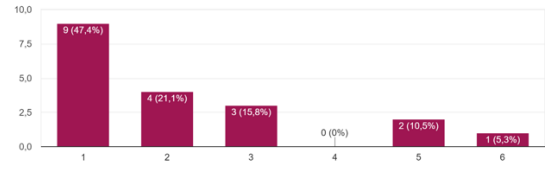


I can adjust well to different people.
19 respostas



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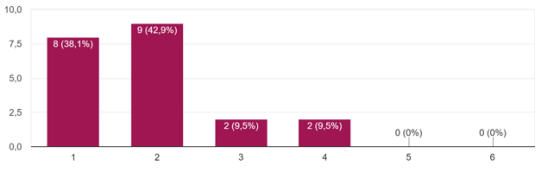
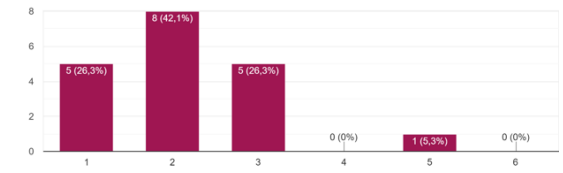


I know how to optimize the use of familiar digital tools.
19 respostas



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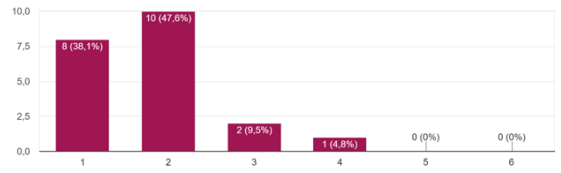

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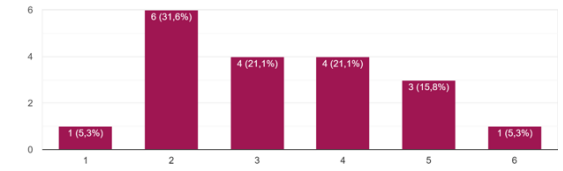
19 respostas



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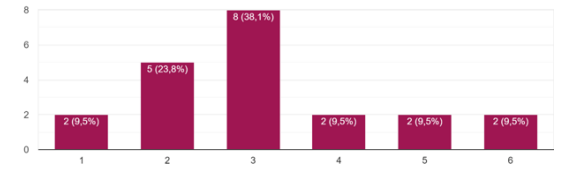
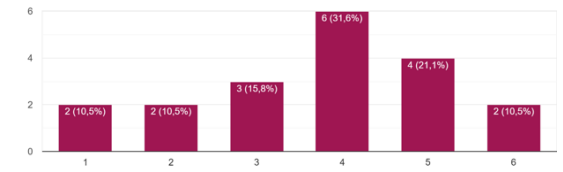


When working in teams, it is important to me that I can organize my time entirely based on my personal needs.
19 respostas



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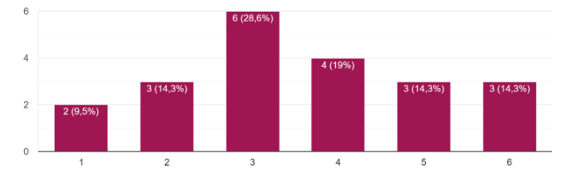
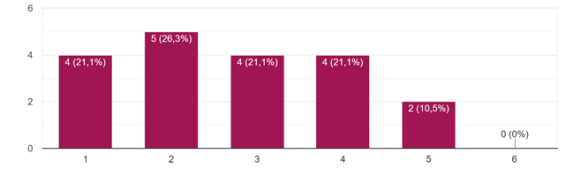


I express myself clearly and precisely in conversation with others.
19 respostas



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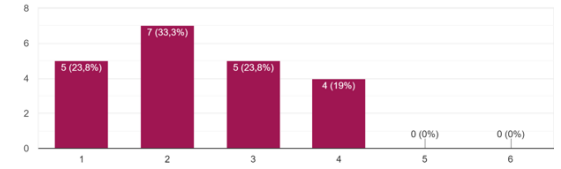
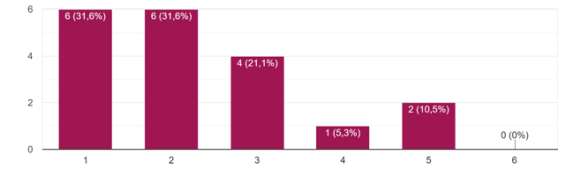


I am able to judge my own achievements well.
19 respostas



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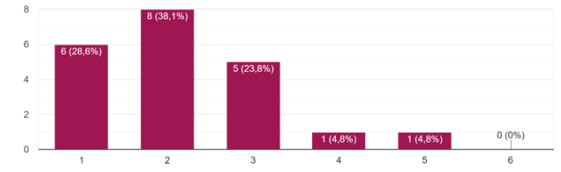
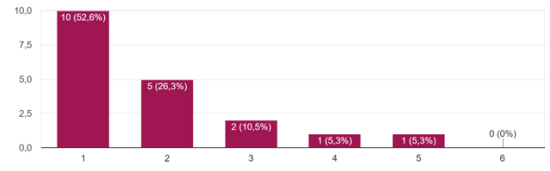


It motivates me to develop and implement new ideas.
19 respostas



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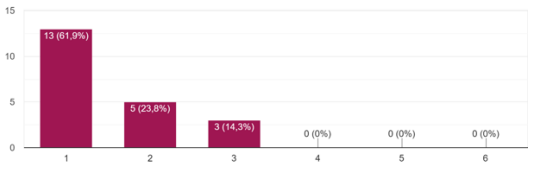
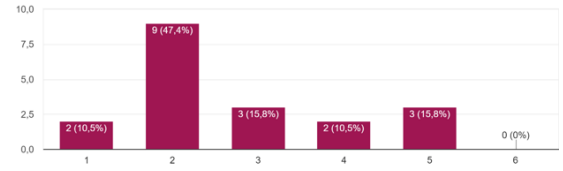


I prefer to solve problems in interaction with others.
19 respostas



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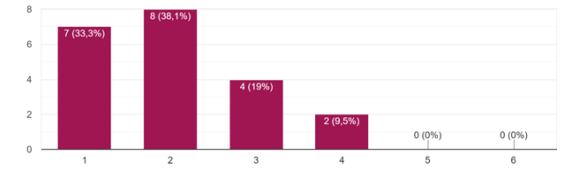
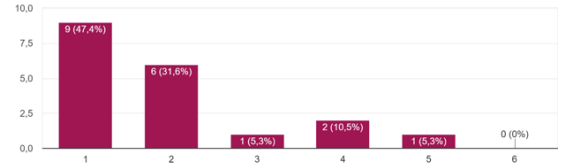


I perceive setbacks and mistakes as good opportunities to learn.
19 respostas



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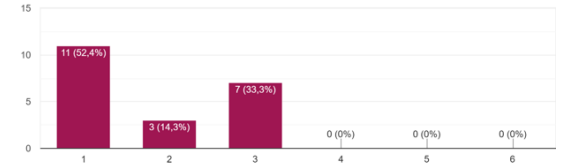
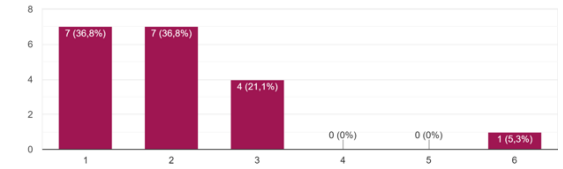


I can also share my expertise with people who have no previous knowledge in my field.
19 respostas



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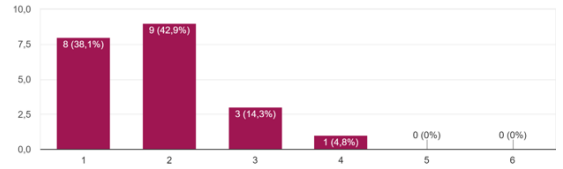
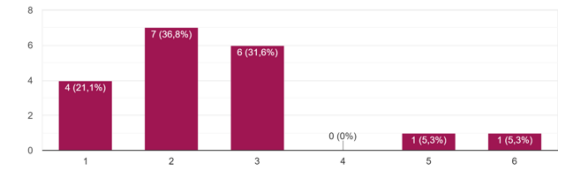


I like to take a critical look at the existing structures.
19 respostas



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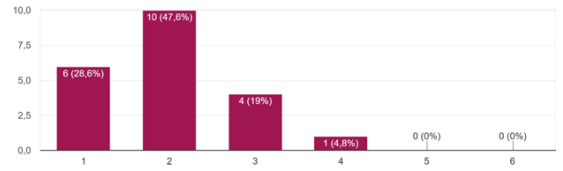
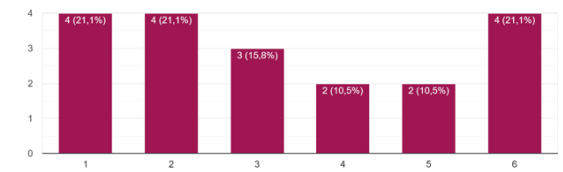


It is easy for me to present my ideas in front of an audience.
19 respostas



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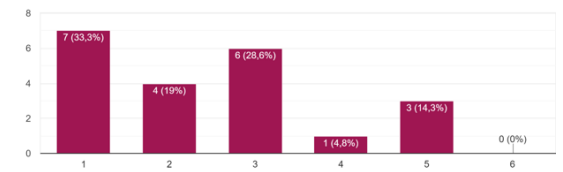
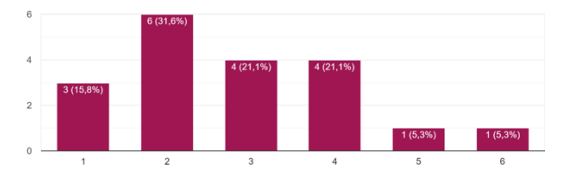
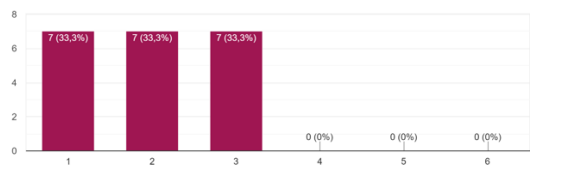


I continiously adapt my approach to the requirements that arise.
19 respostas

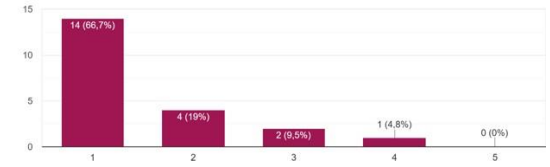


I continiously adapt my approach to the requirements that arise.
21 respostas



Data of Satisfaction & Workload

How satisfied were you with the I Living Lab overall?
21 respostas



My workload for the I Living Lab corresponded to the credits I was awarded for it (6 ECTS = 150-180h)?
21 respostas