HEIBus Project

WORK PACKAGE 3: Multidisciplinary Real Life Problem solving (RLPS)

Deliverable 3.8

RLPS Implementation Guide

May 2019

Task 3.8	RLPS Implementation Guide
D3.8	RLPS Implementation Guide
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Short Description	After the second round of RLPS the partner HEIs write a step-by-step guide of the RLPS model. The model consists of three different levels of RLPS: original implementation (used in RePCI project), partly virtual implementation and totally virtual implementation.
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1. Introduction

The underlying idea of the Real Life Problem Solving Projects is the contact between students and the industry. Under the HEIBus umbrella, this simple cooperation idea is larded with extras and innovative teaching/ learning techniques.

This implementation guide gives an overview of different ICP (International Cooperation Project) methods the current HEIBus consortium (five universities from five different European countries) has tested throughout the past years, including a step-by-step guide of the HEIBus RLPS model.

2. Description of the different RLPS models

2.1 RePCI

RepCI stands for *Reshaped Partnerships for Competitiveness and Innovation Potentials in Mechanical Engineering*. The RePCI research project is the predecessor of HEIBus and hosted four RLPS projects. The goal of RePCI was to radically improve the cooperation between the mechanical engineering industry and related Higher Education Institutions (HEIs) by expanding partnerships to new companies, by spreading the novel partnership model to other European HEIs, and by committing small and middle sized enterprises (SMEs), associations and decision makers to support the novel partnership model. The project was aimed to change the scatted university-enterprise cooperation to a goal oriented and strategically managed hand-in -hand walking. One of these goal oriented cooperation models was the RLPS projects.

The RLPS concept under the RePCI umbrella is shown below.

Cooperation Partners
- Two universities
- One company

Task of Project
- Assignment comes from company
  - Suitable task: all kind of predevelopment tasks

Proceeding
- 1st intensive week (in the country where the company is located)
- Students work at home (in their home universities)
- 2nd intensive week (in the country of partner university)
- Final presentation
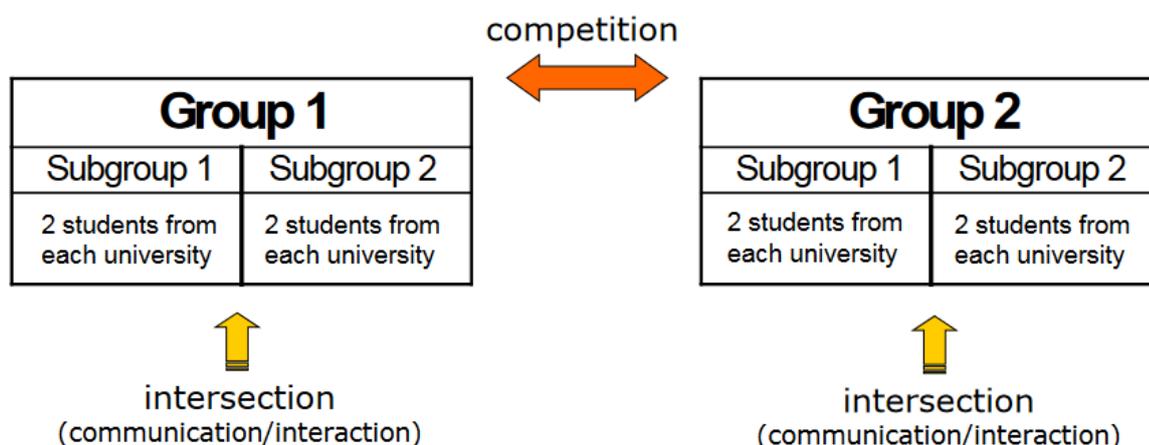- Total project duration approximately 13 weeks

Cooperation Partners
- 2 teachers from each university
- Contact person from company

Organization
- 8 students from each university
- 2 parallel groups – 2 subgroups

competition

Group 1	
Subgroup 1	Subgroup 2
2 students from each university	2 students from each university

Group 2	
Subgroup 1	Subgroup 2
2 students from each university	2 students from each university

intersection
(communication/interaction)

intersection
(communication/interaction)

Intensive Weeks
- Meetings in company
- Lectures
- Project work
- Supervision
- Cultural and social events

Goal ➡ increasing International Competences
- Learn cultural, social and language skills
- Work in intercultural and interdisciplinary environment
- Contact to foreign companies
- Work in a real industrial project
- Learn the way of working in companies

The above described concept is executed in the following steps:

- Definition of leader university (where the project will start)
- Selection of company (comes from the country where the project starts)
- Definition of project task (university and company together)
- Selection of students

- Organization of intensive weeks
- Supervision of students during the whole project
- Evaluation of project results
- Selection of the winning solution

2.2 HEIBus

The HEIBus project focuses on strengthening the collaboration between Higher Education Institutions (HEIs) and companies by creating new innovative cooperation models. These models will facilitate the involvement of students and staffs from HEIs in international Research & Development & Innovation (R&D&I) projects proposed by companies. During the three year implementation three cooperation models have been developed and tested, one of these models being the RePCI RLPS Projects, yet HEIBus put a spin on the solid foundation tested in RePCI- major differences are the focus on multidisciplinary and virtual working.

HEIBus includes implementations of six RLPS processes. The processes are implemented in two rounds (phases). After the first round, the process is evaluated and improvements are made to the RLPS method. The second round of the process tests the improvements and suggests further modifications if needed. So during the HEIBus project life cycle six RLPS projects were conducted. Three during Fall 2017 and three during Fall 2018. A total of 108 students took part in these international cooperation projects (each project involves 18 students, 6 staff member from 3 different HEIs (3 different countries), and company representatives).

Each implementation involves the lead HEI, two other partner HEIs and one company. The real life problem is an international product or service development project in which the topic is given by the company.

Students form three international teams, A, B and C, where there are representatives from each HEI. In team A there are 2 students from each three HEIs and in the same way in team B and team C. The teams compete against each other in solving the given problem. The process includes partly and totally virtual implementations. Partly virtual implementation, implemented by teams A and B, consists of one intensive week at the hosting HEI, virtual learning and distance learning. In the totally virtual implementation (team C) there is no intensive week at the hosting HEI, but the week is carried out virtually. The intensive week and virtual learning contains tailored lectures given by company representatives and/or HEI experts based on the needs and the topic of the project. In the end of the project the results are presented by the teams and the company representatives choose the winner. The company has the rights to the solutions and it may utilize the results of the project in its future products or services. The teachers/professors/lecturers also grade the teams based on requirements of each HEI.

Cooperation Partners
- Three universities
- One company

Task of Project

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HEIBus

- Assignment comes from company
    - o Suitable task: all kind of predevelopment tasks

Proceeding
- 1st intensive week (in the country where the company is located)
- Students work at home (virtual working phase)
- Final presentation
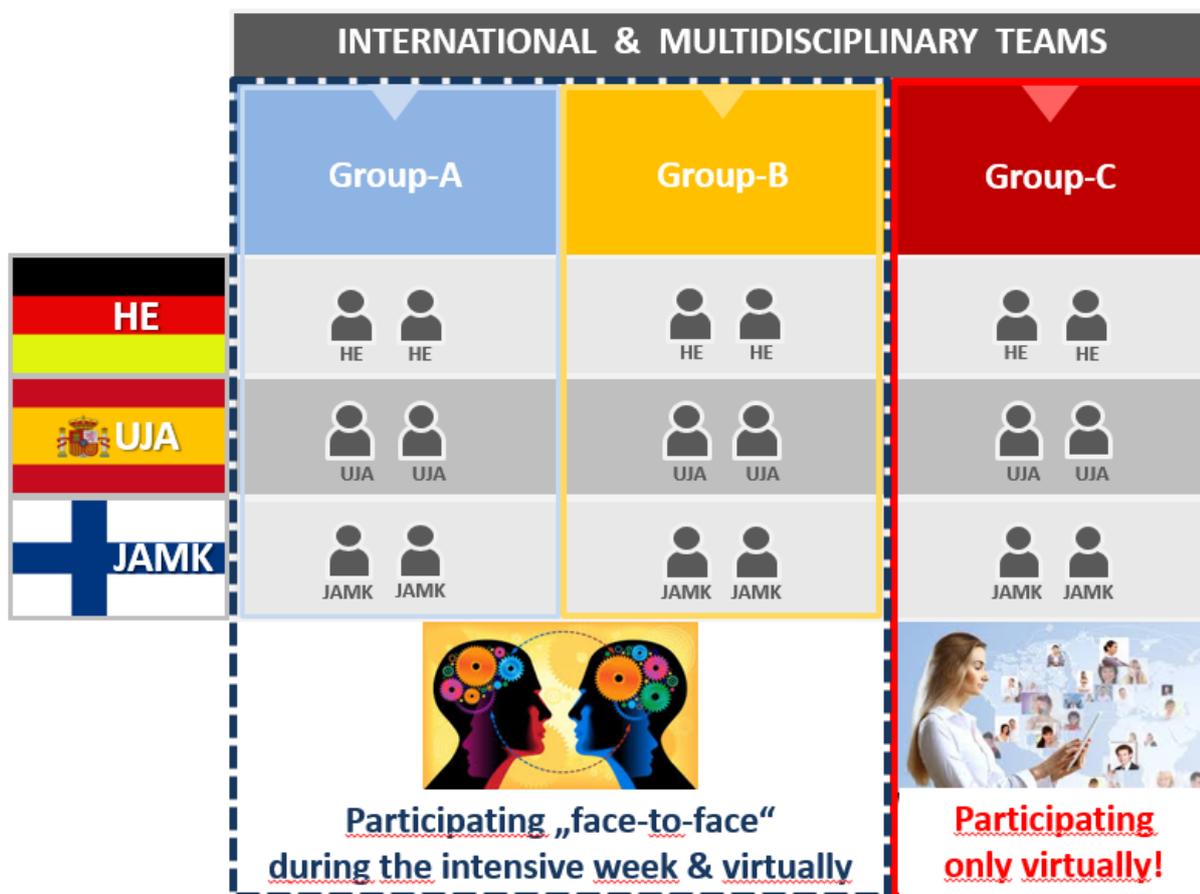- Total project duration approximately 13 weeks

Cooperation Partners
- 1-2 teachers from each university
- Contact person from company

Organization
- 6 students from each university
- 3 parallel groups
    - o Two groups are on-site (the so called Groups A and B)
    - o One completely virtual group (Group C)

Example of the organizational structure:

Intensive Week

- Welcome presentation at hosting university
- Meetings in company
- Company tours
- Tailored Lectures
- Project work sessions
- Meeting with supervisions
- Cultural and social events

Goal ➡ increasing International Competences

- Learn cultural, social and language skills
- Work in intercultural and interdisciplinary environment
- Learn about other study disciplines and respect their project goals/ objectives
- Contact to foreign companies
- Work in a real industrial project
- Learn the way of working in companies
- Learn to deal with working virtually
- Presentation skills

The above described concept is executed in the following steps:

- Definition of hosting university (where the project will start)
- Selection of company (comes from the country of the hosting university)
- Definition of project task (university and company together)
- Creating tailored lectures
- Selection of students
- Organization of intensive weeks
- Supervision of students during the whole project
- Evaluation of project results
- Selection of the winning team

3. Comparison RePCI – HEIBus

Although the underlying idea is the same, between RePCI and HEIBus are some settled differences. The aim of HEIBus WP3 RLPS Projects is to bring students and companies to work together by implementing and further developing the Real Life Problem Solving (RLPS) method. The basis for this work package is the RLPS method created in the RePCI project. In the RLPS of RePCI project, Mechanical Engineering students from two different HEIs form mixed groups. Both groups were given a same real-life problem

by a company. Student groups found solutions for the problem and in the end the company selected a winning solution. The work on problem solving included two intensive weeks and distance working in between. During the HEIBus project, the RLPS method is taken into a new, multidisciplinary cooperation level by widening it from Mechanical Engineering to other study areas, e.g. Logistics, Technical Management, Industrial Business and Business. HEIBus RLPS also develops a virtual implementation (an intensive week replaced by a virtual intensive week) for the RLPS to make the method independent from place and more accessible for example to students unable to travel.

The overall set-up of these two different RLPS projects is seen in the two graphs below.

RePCI RLPS process:
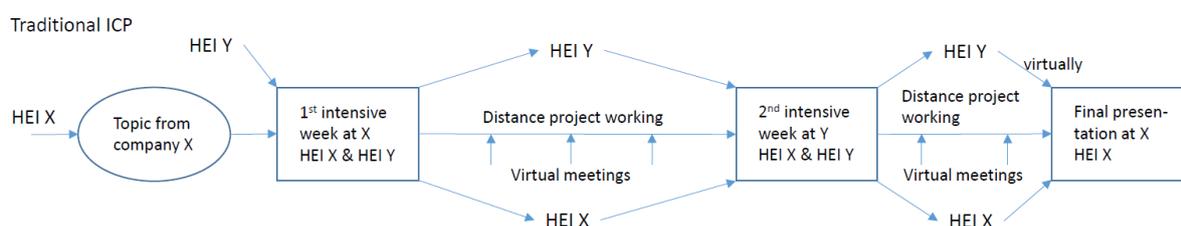
Team A: 4 students from HEI X + 4 students from HEI Y
Team B: 4 students from HEI X + 4 students from HEI Y

HEIBus RLPS process:
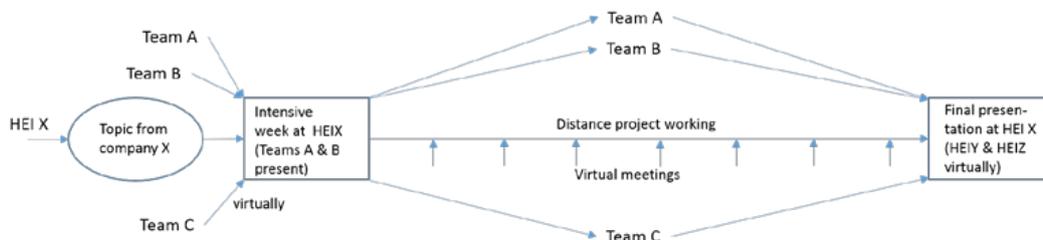
Team A: 2 students from HEIX + 2 from HEIY and 2 from HEIZ
Team B: 2 students from HEIX + 2 from HEIY and 2 from HEIZ
Team C: 2 students from HEIX + 2 from HEIY and 2 from HEIZ

4. Step-by-step guide

Based on the experiences gathered within the past years, it is strongly suggested to start planning an international cooperation project about one year before the project should get kicked-off. Having time to thoroughly plan a project of high standard ensures an added value for the students, company partner and the university staff.

Steps	Description of the tasks	
1. Partner universities	A total of three universities form the core-team. One university takes the lead as the so called Hosting HEI. The Hosting HEI is the project manager, responsible for most of the tasks.	
2. Set a rough time schedule	Hosting HEI plans a rough time schedule in agreement with the other two universities. Rough time schedule means that the intensive week in the country of the Host will be set and approximately when the final presentations will be conducted.	**Phase 1** Two semesters before planned kick-off.
3. Find a suitable company	Hosting HEI find a suitable company partner – preferred is a company that is close to the university.	
4. Definition of task	Hosting HEI and company partner find a suitable project task. Grading criteria and project aims must be set and agreed on. Focal points and what exactly is wanted from the student teams must be clearly documented and later conveyed to the students. The rough time schedule must also be agreed on with the company representative due to the company's intense involvement in the intensive week.	
5. Plan needed tailored lectures	It is important that all involved students have the needed knowledge in order to successfully manage the project tasks. Specifically created tailored lectures will ensure that tis know-how is properly conveyed to all involved students. Usually one to three tailored lectures are sufficient- depending on the complexity of the task and the background of the students.	
6. Recruiting process of students • Definition of how many students are needed from which specialization • Each university conducts own recruitment process • Create info material, hold information sessions	How students can be best recruited for this project is up to each university. Important is that university partners and company partners have a clear understanding what specializations are needed and which university tries to deliver students from which faculty.	**Phase 2** One semester before planned kick-off.
7. Update the rough time schedule by adding more details, plan events and appropriate activities	Hosting HEI is responsible (see examples of intensive week schedules in Appendix A). Cultural events, team-building activities, dinner should also be planned and scheduled. Plan company visits, laboratory tours if project relevant.	
8. Reserve lecture rooms for the entire five days of the intensive week	Each student team must have their own room. The supervisor's room can be the same as the	

• Work rooms for the student teams and the supervisors • A video conference	larger conference room needed for the video conference. This video conference room must be equipped with all the necessary functionalities to conduct the virtual intensive week.	
9. Hotel accommodation and guest arrivals	Hosting HEI must discuss with HEI partners how accommodation can be planned. Hosting HEI helps with all arriving questions/ problems in regards to travels and stays of the guests.	**Phase 2** One semester before planned kick-off.
10. Set up virtual meeting rooms	Hosting HEI should check within the university what video conference systems are available and then set up four virtual meeting rooms. One 'open' one in which all the official meetings are transferred. Each student team must have their own private meeting room which they can use during the virtual working phase.	
11. IT services	Hosting HEI must check with university to get guest access for all guests in order to use university's Wi-Fi system for example	
12. Marketing/ PR	Hosting HEI should consult the PR department to publicize the upcoming international cooperation project. Also data protection topic need to be discussed. Appropriate actions must be taken so marketing related pictures can be taken for example.	
13. Give-aways	If desired, obtain meaningful presents for the guests.	
14. Presentations • Welcome Session • Tailored lectures • Company information	Presentations needed for the intensive weeks need to be composed and collected.	**Phase 3** About one month before planned kick-off.
15. Final preparations for the intensive week	Purchase drinks, snacks, etc. to create a warm and welcoming atmosphere during the kick-off of the project. If needed obtain tickets for public transportation systems.	
16. Virtual working period	Hosting HEI must ensure that contact between team members is working out. Tams need to be in touch with the supervisors on a regular basis. Checking each teams progress is crucial- so good communication is very important during this phase. Students must be reminded of the final presentation and the final written report.	**Phase 4** Lasts approximately 12 weeks
17. Final presentation	It is ideal if the final presentations ca be conducted at the partner company. Hosting HEI representatives as well as the student on sight	**Phase 5** Ending of the project

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	will be at company while the HEI partners are participating virtually.
18. Evaluation/ Grading	Company chooses the winning team. Why a certain solution/ idea/ work is the best, is solely decided by the company representatives. University supervisors give grades based on an evaluation table/ grading table created during step 4. Decisions and reasons must be well document and conveyed. The winning team chosen by the company must not have the best grade given by the company supervisors. These two evaluations are completely independent of one another.

Phase 5

Ending of the project

5. Checklist

Checklist: Organization of HEIBUS RLPS Intensive Week (for the Hosting University)

Number	What to do	Who is involved	Status	comments
1	Hosting University finds suitable company partner and agrees on rough schedule for the intensive week	Mainly the hosting University. Partner HEIs can be consulted in case of uncertainties.		
2	Agree on a fitting and realistic task for the student project	Hosting HEI and selected company partner		
3	Agree on needed tailored lectures (who can hold these tailored lectures?). Only project relevant lectures should be composed.	Hosting HEI with the help of company partner and partner HEIs		
4	Market the project to students from the fitting study area. Short info session during a lecture for example.	HEIs		
5	Choose appropriate students	Each HEI conducts their own selection process		
6	Reserve workroom for lecturers from the guest HEI	Hosting HEI		
7	Three workrooms for the three groups	Hosting HEI		
8	Reserve a video conference room for all the virtual meetings during the intensive week	Hosting HEI		

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9	Plan for and prepare all the needed equipment in order to ensure that the intensive week can be conducted virtually without any issues	Hosting HEI		
10	Obtain the names of all guests in order to register each person with the needed departments at hosting university, for example to get Wi-Fi access, etc.	Hosting HEI, information needed from participating HEIs		
11	Set up virtual meeting rooms. Four in total (one for all members where the official meetings are conducted and one for each team)	Hosting HEI		
12	Look for suitable accommodation for guest lecturers and students	Hosting HEI		
13	Organize a social event as well as a dinner (ice-breaker and team-building efforts)	Hosting HEI		
14	If beneficial for the project task, plan faculty/ laboratory tours at hosing university	Hosting HEI		
15	If beneficial for the project plan appropriate company tours close to the hosting university	Hosting HEI		
16	Finalize the detailed plan for the intensive week	Hosting HEI, input from company partner		
17	Name tags	Hosting HEI		
18	If desired coordinate appropriate actions to offer lunch at the university's Mensa for all project participants	Hosting HEI		
19	Be in touch with all project team members to ensure that information is shared and everyone feels well informed	Hosting HEI		
20	Be in touch with the public relations department to ensure that event will be sufficiently covered for marketing purposes	Hosting HEI, partner HEIs can also use this project as a marketing tool		
21	Have all project partners sign an agreement that pictures can be taken during the intensive week and these pictures might be used for marketing purposes (print media, social channels, homepage, etc.)	Everyone		
22	If needed, public transportation tickets can be purchased beforehand	Hosting HEI		
23	Organize small snacks and drinks for the duration of the intensive week	Hosting HEI		

24	Organize appropriate giveaways. Keep in mind environmental aspects, presents should be useful and meaningful	Hosting HEI		
25	Prepare an informative welcome-presentation.	Hosting HEI		

HEIBus

6. Master Plan Intensive Week

Intensive Week Schedule

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
8:30 AM		**Opening Session** (Introduction, welcoming, basic/ organizational matters, project requirements overview)	Project Work	Project Work	If fitting: Faculty / Laboratory Tour (if the information is relevant for the project topic)	Travel to partner company
9:30 AM						**Individual Status Meetings for each Group with HEI and BUS Supervisors**
10:30 AM		*Coffee Break plus official group pictures*		**Individual Status Meetings for each Group with HEI and BUS Supervisors:** Release of Project Plan + List of Requirements	Project Work	
11:00 AM		**Tailored Lecture #1**				
11:30 AM						
12:00 PM						
12:30-13:00		*Lunch*	*Lunch*	*Lunch*	*Lunch*	*Lunch*
1:00 PM		Travel to partner company	Travel to to company tour	Project Work	Project Work	Travel back to University
2:00 PM		**Company presentation, Project presentation, Company Tour, Lecture #2**	**Company/ factory tour** of a company near by that deals with the project topic.			**Closing Session**
3:00 PM						
4:00 PM						
5:00 PM					Cultural Activity, followed by a dinner	
6:00 PM		Travel back to University	Travel back to University	Faculty / Laboratory Tour		
7:00 PM		Project Work	Project Work	**Project Work**		
8:00 PM						

Reserved Rooms	
	Group A
	Group B
	Group C
	Supervisors / Meeting Room

Color Code
Activity at Hosting HEI
Activity at Partner Company
Project Work Sessions
Extras (organized by the HOSTING HEI) such as cultural activities or special tours