Smart HEI-Business Collaboration for Skills and Competitiveness

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ABSTRACT

Smart HEI-Business Collaboration for Skills and Competitiveness (HEIBus, www.heibus.eu) is an Erasmus + Knowledge Alliances 2 (KA2) project. Its duration is 36 months (1 January 2017 – 31 December 2019) and it aims to develop smart and innovative new methods for Higher Education Institution (HEI) - company cooperation. With a budget of about one million euros, the project brings together five universities and seven companies from five European countries with strong expertise and experience in different fields. JAMK University of Applied Sciences is the main partner of the project. Seventeen associated partners from six European countries follow the progress of the project, utilise the results and take part in some project activities.

In the HEIBus project, there are eight work packages, which are 1) Management, 2) Best practices of HEI-company cooperation, 3) Multidisciplinary student-level real-life problem solving, 4) Expert-level real-life problem solving, 5) Flexible student mentoring by companies, 6) Quality assurance, 7) Evaluation and 8) Dissemination & exploitation.

The HEIBus project focuses on strengthening the collaboration between HEIs and companies by creating new innovative cooperation models. These models facilitate the involvement of students and staff from HEIs in international Research & Development & Innovation (R&D&I) projects proposed by companies.

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INTRODUCTION

Europe is trailing behind the USA, Japan and Canada with regard to building a smarter economy. Competitiveness and rising levels of productivity are a crucial force behind sustained levels of economic progress and the wellbeing of citizens. In short, Europe needs improvements. To tackle the problems Europe has launched the Europe 2020 strategy, with objectives on employment, innovation, education, social inclusion and climate/energy. The Europe 2020 strategy identifies actions to boost growth and jobs.

The schooling systems in Europe are on a very good level, but we still need to improve the velocity of innovation, productisation and commercialisation. At HEIs, both the students and university personnel are frequently handling innovations that could be the basis of improved business in small- and medium-sized companies (SMEs) or create new business possibilities for larger enterprises.

Economic success demands that the company is innovative, which in turn requires different kinds of multidisciplinary know-how. The purpose of the HEIBus project is to increase, improve, widen and deepen HEI-company cooperation at the student and expert levels, promoting entrepreneurial thinking and innovations. The earlier RePCI project (www.repci.eu, funded by the EU Lifelong Learning Programme and carried out in 2013-2015) led to a fruitful cooperation between HEIs and companies. The feedback of HEIs and companies showed a clear need for even deeper and wider cooperation, however, such as multidisciplinary study area cooperation and HEI-company expert-level cooperation.

HEIs have many challenges, such as meeting future needs and challenges set by working life and developing teaching methods which motivate students to learn and carry out their studies in time. The labour market is constantly evolving, with the necessary skills, competences and qualifications changing over time. Traditional education does not always answer the needs of the field, and new teaching and learning methods for new skills are needed. It is important that the needs of working life (companies) be matched with the education provided. This is an ongoing process and can only be reached with HEI-company cooperation.

One key factor for the success of the companies is competent and motivated personnel. One way to achieve this is through deeper integration of the company with the student groups throughout the studies, which provides the company with a good recruiting tool.

1 BACKGROUND AND BASIC INFORMATION OF THE HEIBUS PROJECT

1.1 Partners

The HEIBus project consists of five university and seven company partners from five different European countries (Finland, Germany, Hungary, Romania and Spain) taking part in the project as full partners:

- JAMK University of Applied Sciences (main partner, www.jamk.fi/en/) and ITAB Pikval Oy (www.pikval.fi/en/) from Finland

- Technical University of Cluj-Napoca (www.utcluj.ro/en/), SC PRO Tehnic (www.pro-tehnic.ro) and Automates ACM SRL (www.automatesacm.ro) from Romania
- University of Miskolc (www.uni-miskolc.hu/en/), Electrolux (www.electrolux.com) and Robert Bosch Power Tool (www.bosch-garden.com/gb/en) from Hungary
- University of Applied Sciences Esslingen (www.hs-esslingen.de/en/) and Stoebich (www.stoebich.com) from Germany
- University of Jaen (www.ujaen.es/serv/vicint/home/index) and Valeo Lighting Systems (www.valeo.com/en) from Spain.

The group of company partners consists of SMEs as well as some large companies. Three HEI partners are academic universities while two are universities of applied sciences. The partnership comprises a perfect variety of different types of organisations and professionals. This provides very interesting and fruitful cooperation with different perspectives on each aspect of the project. There are also 17 associated partners (companies and organisations) from six European countries who follow the progress, utilise the results and take part in at least some of the project activities.

The project focuses on strengthening the collaboration between HEIs and companies by creating new innovative cooperation models. These models facilitate the involvement of students and staff from HEIs in international Research & Development & Innovation (R&D&I) projects proposed by companies.

1.2 HEI-company cooperation

Currently, HEIs and companies around the world are experiencing a renewed interest in strengthening their forms of cooperation. It has been proved that bridging the gap between HEIs and companies benefits both parties. Cooperation between HEIs and companies is not a new concept. There are cooperation programmes, which date back to the first decade of the 20th century [1] or are well-known internationally that have served as a reference model [2]. However, the idea of integrating working life with the learning process has its detractors. They place strong emphasis on exploitative internships and non-enriching jobs in which students are just observing instead of being engaged in productive work. To tackle this problem, there are associations such as the Canadian Association for Co-operative Education (CAFCE) [3], the Cooperative Education & Internship Association (CEIA) [4] and the German Central Evaluation and Accreditation Agency (ZEvA) [5] that guarantee the quality of cooperation agreements.

The mechanisms offered by HEIs to provide students with the opportunity to gain work experience, in their career fields, are included in the generic concept of Work Integrated Learning (WIL) [6]. According to the definition adopted by the Higher Education Quality Council of Ontario [7], work-integrated learning is the process through which students come to learn from experiences in educational and practice settings. It includes the kinds of curriculum and pedagogic practices that can assist, provide, and effectively integrate learning experiences in both settings. Depending on the context, the term WIL is often used interchangeably with other, similar terms such as “work-based learning,” “practice-based learning,” “work-related learning,” “vocational learning,” “experiential learning,” “co-operative education,” “clinical education,” “internship,” “practicum,” and “field education” [8]. However, many of these terms are also used to describe specific types of work-integrated learning. The most widespread types of WIL are:

- Cooperative education
- Internship

- Apprenticeship
- Field experience
- Mandatory professional practice
- Applied research learning
- Service learning

1.3 Work packages

The HEIBus project consists of eight work packages which are Management (WP1), Best practices of HEI-company cooperation (WP2), Multidisciplinary student level real life problem solving (WP3), Expert level real life problem solving (WP4), Flexible student mentoring by companies (WP5), Quality assurance (WP6), Evaluation (WP7) and Dissemination & exploitation (WP8). Four of them (WP2, WP3, WP4 and WP5) are implementation work packages which will be explained deeper in the following chapters.

The project addresses the flagship initiatives of innovation union, youth on the move and an agenda for new skills and jobs. The HEIBus project carries out several tasks where students, HEI experts and company experts are involved in solving real-life problems of companies. This boosts the new innovative ideas that can be quickly taken into use in companies.

2 BEST PRACTICES OF HEI-COMPANY COOPERATION

The aim of the Best practices of HEI-company cooperation work package (WP2) is to analyse the existing cooperation models providing real-life experiences between HEIs and companies in the following way:

- to analyse the state-of-the-art HEI student-company cooperation models
- to analyse the state-of-the-art HEI expert-company cooperation models
- to analyse different platforms and forums used in HEI-company communication
- to analyse the best practices on company involvement in HEI education

Descriptions of existing cooperation models and the main tasks are in *Table 1*.

Table 1. Existing cooperation models and the main tasks of work package 2

Student-company cooperation models	**HEI expert-company cooperation models**	**Internet based platforms for HEI-company communication**	**Company involvement in HEI education models**	**Coaching for virtual activities**
To search different existing methods or models	To search existing models	To find and analyse 15 internet based platforms	To search different existing methods or models	To ensure effective participation of all partners in virtual activities
To find at least 10 good and beneficial models	To find at least 10 good and beneficial models	To search best practices for communication	To search different levels of involvement	To organizes coaching of virtual methods
To select 5 models for deeper analysis	To select 5 models for deeper analysis	To build a new platform or to join in best available platform	To analyse different levels of involvement	To use social media for different project activities
To form background for the Multidisciplinary student level real life problem solving (WP3)	To form background for the Expert level real life problem solving (WP4)	To help continuation of the HEIBus activities after the project	To form background for the Flexible student mentoring by companies (WP5)	To invite associated partners to take part in virtual coaching

So far, all work package leaders have searched existing methods and models for HEI-company cooperation, which the leader of WP2 has collected. During April - May 2017 the best models for deeper analysis were selected. Regarding the outcomes of this work package, the best and most comprehensive ideas and models for HEI-company cooperation are expected to be found. These models will form a good background for the other implementation work packages, WP3-WP5.

3 MULTIDISCIPLINARY STUDENT LEVEL REAL LIFE PROBLEM SOLVING

The aim of the Multidisciplinary student-level real-life problem solving (RLPS, WP3) work package is to create a new model on how to spread the real-life problem solving method to a new multidisciplinary cooperation level. The aim of the work package is also to build a virtual implementation of the RLPS method. This frees the RLPS method from the confines of space and make it more accessible to students unable to travel, among others. It also makes the method easy to use anywhere in the Europe. RLPS focuses on bringing students, HEI staff and companies together. The idea is that students from different study programs and nationalities form mixed groups in order to solve a real-life problem that has been given to them by a company, as shown in *Fig. 1.*

In every pilot projects, three multidisciplinary and international student groups work upon and solve the proposed topic during one academic semester and compete with each other.

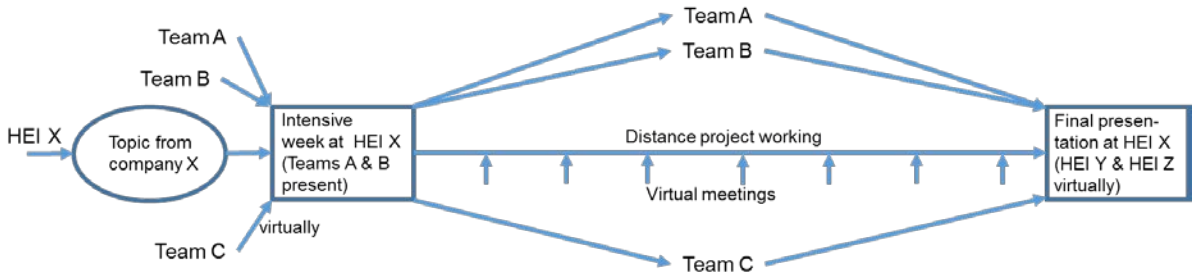

Fig. 1. Pilot Projects of WP3

At the end of the semester, the company tutors select a winning solution and HEI supervisors give grades.

Three first-round projects will be carried out in autumn 2017. In spring 2017 partner HEIs have had meetings with partner companies, discovered applicable and good topics and required tailored lectures for these implementations, created their own information material and have possibly held information sessions for suitable student groups, as well as announced an application period for students. The companies who will offer the topics for the first-round projects are ITAB Pikval Oy from Finland, Andaltec (www.andaltec.org/en/) from Spain and Automates ACM SRL from Romania. In May 2017, supervisors of HEIs chose the students for these three pilot projects. Finnish, German and Spanish students and supervisors will take part in ITAB Pikval project, Finnish, Hungarian and Spanish in Andaltec project and German, Hungarian and Romanian in Automates project. In the beginning of the implementations, two student groups will have one intensive week in the home country of the company giving

the topic and the third student group will take part virtually in this intensive week. After the intensive week, all students will work at their own HEIs and members of a certain student group will cooperate virtually until the end of the implementation. After the first-round pilot projects, feedback from students, HEI supervisor and company tutors will be collected and possible improvement will be conducted before the second-round pilot projects. Three second-round pilot projects will be carried out in autumn 2018. This work package is expected to produce motivated students with good teamwork, project management, cultural and language skills.

4 EXPERT LEVEL REAL LIFE PROBLEM SOLVING

The Expert-level real-life problem solving (EXPERT, WP4) work package aims to develop and pilot a new cooperation model between HEIs and companies. This enables companies to bring more complex problems to be solved by international and multidisciplinary experts. This promotes innovation and knowledge transfer between HEIs and companies as well as increases the skills of HEI experts and the working life relevance of education.

In the beginning, a step-by-step process model is built and pilot projects for testing the model are planned, as shown in *Fig. 2.* In order to search for companies and their topics for pilot projects, an information sheet about expert-level real-life problem solving is created. Each HEI involved in WP4 makes a list of companies in their own country to be contacted (including partner companies and possibly other companies), sends them the information sheet and asks potential project topics. The topics are listed and each involved HEI selects two topics for the pilot projects from a list of the topics. The selection criteria are practical: when does the project need to have results, are suitable experts available for the project, etc.

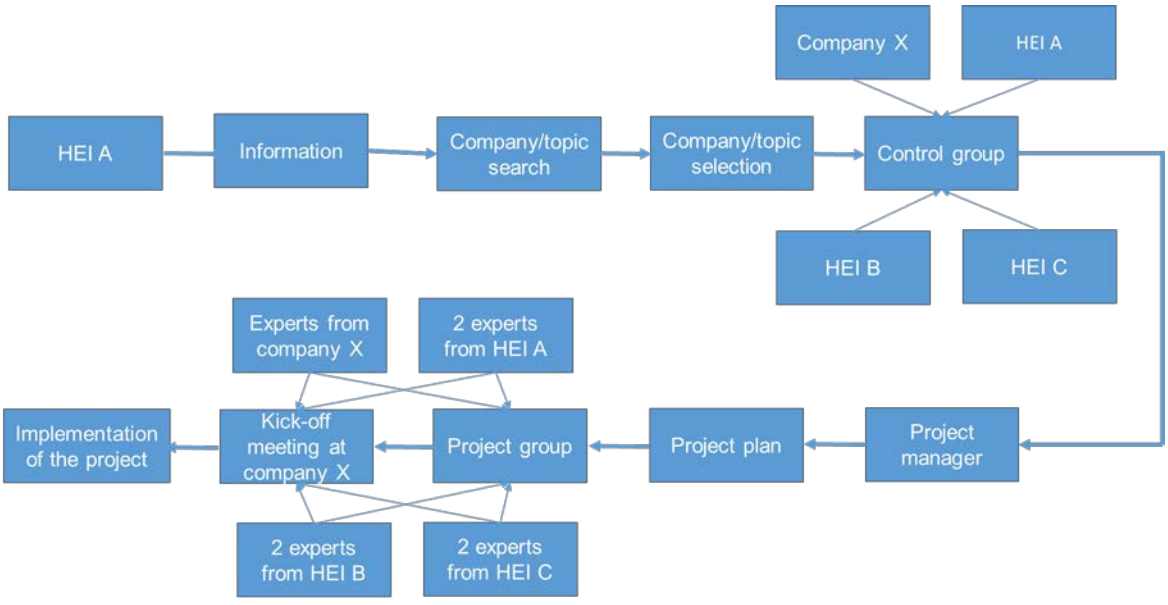

Fig. 2. Pilot Projects of WP4

There will be a total of six pilot projects where companies introduce a real-life problem to be solved by a team of experts from HEIs and companies. In order to make improvements and test the method, the six pilot projects will run in two phases. A control group consisting of representatives from each involved HEI and the company of the topic will be formed for each pilot project. The control group selects a project

manager who is responsible for following the implementation, reporting the progress to the control group and running the practical issues of the implementation.

The project manager also makes the project plan, which is then accepted by the control group. The schedule of each pilot project depends on the needs of the company and the problem to be solved. The project manager supported by the control group finds and selects best experts for the problem to be solved and these experts form the project team. One team includes a total of six experts from three different HEIs (three different countries) and two experts from the company whose problem the team is solving.

The project is led by the project manager and implemented by the project team according to the project plan. In the beginning of each project, a kick-off meeting in the company is arranged where the whole project team is present. Other project meetings and the final meeting at the end of the project are arranged by video conferences (virtually). The project team agrees on the best ways of working together including virtual meetings, individual work, forming smaller teams inside the project team etc. The project team works on solving the real-life problem of the company and proposes a solution. With the help of the project team, the project manager reports the results of the project to the company.

After the pilot projects are implemented, feedback is gathered and analysed. In addition, an action plan for widening the international expert cooperation model outside the partner group is made.

The Expert-level real-life problem solving work package includes also building a virtual Expert Support Service with easy and quick access for all companies looking for expert services by HEIs. The Expert Support Service offers direct expert contacts for starting an expert-level RLPS, and a possibility to ask quick support for smaller problems.

5 FLEXIBLE STUDENT MENTORING BY COMPANIES

The Flexible student mentoring by companies (Flex Mentoring, WP5) cooperation model aims to find and test flexible ways to involve companies in the education process of students. Flexibility comes from different levels of involvement. Virtual reality, which is not dependent on time or place, is present in many activities, such as expert lectures and info sessions for a wider audience that makes it possible for students from international HEI partners, among others, to join by video conference, etc. The cooperation model also seeks to find out if Flex Mentoring could be a feasible solution for improving students' employment rate after graduation and helping students lacking behind in their studies or at risk of dropping out completely.

During implementation, one or more companies walk hand-in-hand with one study group from the beginning until the end of the studies. Each HEI partner selects two suitable student groups: one group consisting of students at the beginning of their studies and another group in which the students are at a more advanced level. Each HEI and company chooses the involvement level and methods best suited to them, in a flexible way. HEI teachers inform the student groups about the Flex Mentoring programme.

This work package contains the following tasks:

- to make plans on how the Flex Mentoring programme is implemented

- to select the most suitable involvement methods and to make detailed plans for the execution for each study year
- to review the plans after every study year and to modify if needed
- to create info materials of Flex Mentoring
- to introduce the materials to selected companies and student groups in every partner country

The main outcomes of this work package will be:

- increase motivation and study success for students
- easy recruitment way and a good labour force for companies
- good knowledge transfer between HEIs and companies

6 SUMMARY

The HEIBus project started in the beginning of 2017. So far, the biggest challenge has been getting all the needed documents from some company partners in time. Most of the activities have focused on WP2 because it forms the basis for other implementation work packages. Also in WP3 the planning of the first-round pilot projects is progressing well. In WP4 the process model has been created, and planning for the first-round pilot projects has started. In WP5 the plans on how the Flex Mentoring programme is implemented have done, the most suitable involvement methods have selected and the detailed plans for the execution for each study year have made.

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