Project Title: Community Service Engineer

Final Report   Public Part

Project information

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Beneficiary organisation:	Thomas More

Project coordinator:	Inge Vervoort
Project coordinator organisation:	Thomas More
Project coordinator telephone number:	+32 (0)14 56 23 10
Project coordinator email address:	inge.vervoort@thomasmore.be

Executive Summary

An UNESCO report[1] affirms **the role of engineering** as the driver of innovation and of social and economic development, but emphasises the need to transform engineering education, curricula and teaching methods to focus on **relevance** and **a problem-solving approach** to various fields of engineering. Community Service Engineering could take up this role. That is why, in October 2013, six European partners united in the CSE consortium **to develop, pilot and offer** a postgraduate course in Community Service Engineering and examine the options **to translate this course into undergraduate engineering curricula.** Engineers have, so far, not been very active in **the social profit sector**. There is a clear need **for technology** within this sector given the significant number of project proposals submitted by social profit organisations at Cera Award (www.cera-award.be). The sector itself is mostly lacking expertise and time to address these projects with own resources. With the course, the consortium responds to the quest of various fields of engineering to **outline the societal role of the profession** in a curriculum where **theoretical background and learning by doing methods** go hand in hand.

The course fits the European Quality Framework for the European Higher Education area **(EQF)**. The course objectives and learning outcomes are built on the results of a needs analysis and a survey among relevant stakeholders, the partner's own experience and the expertise and critical eye of associate partners from the **field of engineering, the social profit and the profit sector**. The consortium members use **CDIO** as the **common framework** for their joint curricula.

The consortium offers an interdisciplinary programme. The bridge is made between engineering and social work. **Project work** is an important part of the training. We start from real needs of people and organisations. Technics remains important but so is the process that students go through. By targeted questions, this process comes to the surface and students learn with and from one another about different contexts, the co-creation of technology, technical criteria, user criteria, viable business models, implications for other fields, etc.

The course is expected to appeal to engineers in various ways. It may **attract young people** who today have a public image of a solely technological engineering profile and **female students** may get interested in engineering jobs. It may appeal to young engineers that are looking for specialisation possibilities at the start of their career as well as on a group of senior engineers who want (or need) to reorient their job life at a certain point in time. They might want to fill the gap of the widely felt shortage on the labour market for **professionals in technical and healthcare/welfare sectors**.

The partnership chose for a dynamic educational model, with different approaches and levels. Actually 4 building blocks for collaboration have been developed:

- A shared database with project ideas brought up by the partners
- A design thinking template (tool, step-by-step approach for students to do assignments)
- Learning outcomes through a short online track based on CDIO, released on Udemy
- Shared learning materials in a shared learning platform (FeedbackFruits)

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[1] (*) document available at: http://unesdoc.unesco.org/images/0018/001897/189753e.pdf

The partners award participants with a **CSE certificate** or a **diploma supplement** in case the course is integrated into the regular engineering curricula. While elaborating the curriculum a lot of questions arose. These questions could be formulated into research questions. Community Service Engineering could evolve on term to a real specialty, **a strong scientific research area**.

Main stakeholders of the project are: the partner institutions and their students, social profit organisations, vulnerable groups (elderly, youth at risk, people with disabilities, ethnic minorities, people in poverty), companies in assistive technologies, companies unconscious of social profit market potential for their products, other institutions interested in offering the course and partners of other European curriculum development projects or other projects in general.

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1.   Project Objectives

The aims and objectives of the 3-year project were **to improve the quality and relevance of higher education** by bringing together engineering students, teachers, the social sector and the profit sector.

This cooperation would develop and build the potential of emerging demands from the social sector for better adapted technical solutions. Technology students would be challenged by curricula and learning-by-doing methods to cooperate with the social sector and other HEI partners. The teachers would support them to develop innovative technical and tailored solutions for the challenges the social sector is facing today.

In short the CSE project aims were:

1. In regard to current & future market labour needs:
-   to bring better and innovative solutions for the social sector
-   to link the social sector and industry
-   to build a curriculum in a collaborative and multidisciplinary environment
-   to promote geographical and labour market mobility as well as lifelong learning in Europe.
-   to make the engineering education and job more attractive to young people in general and female students in particular
-   to support research and innovation in the social sector
-   to offer options for a career shift to senior engineers
-   to create new business opportunities for the social sector
-   to support the creation of a more inclusive society

2. In regard to lifelong learning/network learning:
-   to start a postgraduate joint "Community Service Engineer" degree
-   to make sure the course would be sustainable after the project termination
-   to facilitate network learning via the learning framework

3. In regard to the link between curricular education activities with business & employment needs
-   to offer a good mixture or theoretical background and practice
-   to offer options to translate the course content into the curricula as an option/minor for an undergraduate engineer

4. In regard to include transmission of transversal skills
-   to use ECTS and DS (Diploma Supplement) conform to the European Commission's descriptions
-   to support physical and virtual mobility of students and staff
-   to ensure the quality of the output using Tuning and TRIS-EFQM concepts
-   to promote the improvement of non-specific domain competences in the areas of team learning, leadership skills, presentation, communication skills and project management
-   to promote the acquirement of international-intercultural competences

5. In regard to better exploiting the potential of ICTs
-   to use virtual mobility as an important aspect within the curriculum in case students don't choose to be physically mobile
-   to work towards a multi campus, international, blended learning environment where the ICT platform plays a key role for the delivery of the curriculum

6. In regard to continuous professional development for the HEI staff
- to define the teacher's role in new learning environments and provide support

The programme is collaborative, networked, capitalizing on expertise of different European institutions, with involvement of stakeholders and non-university expert institutes in both the engineering, social and business area.

2. Project Approach

To successfully carry out all the tasks needed to meet the project objectives the workload has been divided in 12 work packages (WP):

WP1 = Project management
WP2 = Learning framework
WP3 = Social sector needs
WP4 = Business 2-Way communication
WP5 = Projects back office
WP6 = International-intercultural competences
WP7 = Curriculum
WP8 = Teacher's role
WP9 = Pilot projects
WP10 = Quality assurance and quality plan
WP11 = Dissemination
WP12 = Exploitation

Six project partners have collaborated to meet the objectives. They are:

P1 = Belgium – Thomas More Kempen vzw (TMK)
P2 = Belgium – KU Leuven (KU Leuven)
P3 = Portugal – Universidade do Porto (UP)
P4 = The Netherlands - De Haagse Hogeschool (HHS)
P5 = Sweden – Högskolan Väst (UW)
P6 = Belgium – Roger Van Overstraeten Society (RVO-Society)

All partners have made the link between engineering, social work and business.

All HEI-partners have well-functioning international offices and are eager to continue setting up international mobility (virtual and/or physical) for students and maximise the international-intercultural learning outcomes.

All partners have involved national stakeholders for detecting needs and as a linking-pin to the market.

Now, at the end of the project all partners have expressed their intentions to continue the work in this new domain for engineers and, based on the developed dynamic educational model, are eager to stay connected with each other in one way or another. The collaboration among partners was established at several levels: on the level of institutions, professors and teachers, and on the level of students.

To optimally make use of their expertise partners had been appointed WP-leader of the work package they had most experience in:

P1 was project coordinator of WP1 and got support from an external evaluator and an expert in intellectual property rights and financial management.
P2 was leader of WP2 and got support from all partners.
P6 was leader of WP3 and got support from all partners.
P4 was leader of WP4 and got support from all partners.
P5 was leader of WP5 and got support from all partners.
P1 was leader of WP6 and got support from all partners.
P1&2 are leaders of WP7 and got support from all partners.
P3 was leader of WP8 and got support from all partners.

P1 was leader of WP9 and got support from all partners.
P1&2 were leaders WP10 and got support from the external evaluator.
P1 was leader of WP11 and got support from all partners.
P1 was leader of WP12 and got support from all partners.
The consortium could also count on several associated partners for support if needed and had advisory groups for feedback per country.

WP1 has been responsible for the coordination, management and support of all work packages. 5 face to face partner meetings were planned at the start (month 1, month 8, month 17 and month 32 and month 36). Partners decided to organise 1 additional partner meeting in month 26. Online meetings were organised approximately every month.

WP10 imposed quality requirements and checked whether these requirements were met. **WP11 and 12** made sure all stakeholders were informed about the project outcomes and that results are exploited and sustained for the future.

In total there have been **8 work packages for implementation** that made sure the profile of the (European) "Community Service Engineer" was defined and can be trained in the future.

Training in the sense of a built curriculum has been achieved gradually:

- **WP2** at first set up basic course contents that could be consulted as open source material. WP2 has defined how different stakeholders/actors can meet via the learning framework. In the second half of the project the basic course contents evolved to the short online track (released on Udemy[2]) that serves as the minimal taught programme to support students in their project based coursework for the social domain.

- **WP3, 4, 5 & 6** have focused on important aspects to be explored and agreed upon for the (international) cooperation between partners/project work. These work packages could be looked at as preparatory work for the realisation of curriculum.

- **WP8** clarified the teacher's role and provided support, since in this international, multi-campus, blended learning environment the traditional role of the teacher will not be sufficient to support the students, to maximise innovation potential and to support the network.

- **WP7 and WP9** have been (in connection with WP2) the work packages in which the curriculum was effectively built. WP9 focused on the project work as an important part of the curriculum. Partners tested their collaboration in projects. The project based course work included Work Integrated Learning (WIL) principles. Further on, an educational model was developed from real life projects with engineering students. WP7 initially focused on setting up a postgraduate curriculum. This helped to gain a lot of insights and allowed to develop (online) learning methods and material. Next, partners chose CDIO as a common framework to redefine the learning outcomes and build a common taught programme to support the project based coursework. 3 modules were developed:
    - user centred design and vulnerable groups
    - organisations in the social domain

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[2] https://www.udemy.com/community_service_engineering/

     ○   technology in the social domain, including norms and international standards.

Partners chose to collaborate via a dynamic model, with different approaches and levels. A lot of autonomy stays with the partner institutions. Minimally, institutions offer the taught programme via the short online track to support students in their real life project work. Many institutions however enrich this content with the resources available on the shared learning platform (Feedback Fruits[3]). Actually, within the dynamic educational model, 4 building blocks for international collaboration have been developed. In WP7 partners also have explored and found possibilities for sustainability of the curriculum on top of the postgraduate curriculum. The dynamic model facilitates:

- ○ That different levels of education can collaborate according to EQF level 6 or 7
- ○ That institutions can place their own emphasis
- ○ That material can be shared
- ○ That international collaboration happens (niche markets)

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[3] https://secure.feedbackfruits.com/

- **Objectives of the WP's and used methodology**

WP1: project management

The main objective of WP1 has been to achieve effective project communication, administration and reporting. First task in this WP was to set up **a project board**. All partners contributed to work packages and project reports and evaluations. First things on the agenda were to arrange the **agreement** with the European Commission and the **partnership agreements**, **IPR agreements** and to draw up a document with **internal administrative rules & guidelines**.

Next was to effectively organise the work in the WP's and to write a **project and activity plan** with key tasks and a schedule for the next 3 project years, a financial management plan and a detailed **project action planning**. A handy tool to execute and monitor this process turned out the be the online project management tool Smartsheet[4].

At the start of the project **internal rules** have been established on decision taking procedures, including voting rules for formal decision taking on important topics.

An experienced **external evaluator and financial expert** was appointed to support this process and to make sure to always have a 'critical friend at the window' for the benefit of its implementation. He observed the project with a lucid eye to make it more effective by highlighting strengths and weaknesses and suggesting recommendations, following the **PDCA-cycle**.

The external evaluator also assisted in reaching a first **agreement on intellectual property rights (IPR)**.

A **virtual workspace** was set up to organise efficient and effective communication between partners. In the course of the project this took shape in a combination of a shared Dropbox folder and monthly online partner meetings using the Cisco Webex meeting center. After every monthly virtual meeting detailed **minutes with to do list and recordings** have been made available to all partners.

All consortium members have engaged **associated partners** in their own countries that are involved in reflection/advice on the concept/objectives of the programme, the curriculum, quality assurance, link between research, innovation and the programme, stakeholder input… on a yearly basis.

Partners have met face-to-face three times up to date with meetings in months 1, 8, and 17. After every meeting detailed **minutes** were made available to all partners.

In April 2015 the midterm report has been submitted as part of WP1. Writing and submitting **this final report** about the project for the EACEA[5] and other stakeholders also is part of WP1.

WP2: Learning framework

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[4] https://www.smartsheet.com/
[5] http://eacea.ec.europa.eu/index_en.php

A) Content definition
What is Community Service Engineering? What is the social sector? How do we frame the role of engineering in this sector?
For the content part, partners started from the insights gained and topics defined in Belgium in the context of setting up the postgraduate course in Community Service Engineering.

Consortium partners checked the relevance, accuracy and completeness of these topics with faculty members of both the engineering and the social sciences discipline. In a partner meeting the list of topics and the survey outcomes have been discussed. This process resulted in **a list of basic topics** and **a revised structure of modules and order** to bring forward these topics. As a next step various experts have been recruited originating from different European countries.

Following the international nomenclature, the term **'Community Service Engineering'** has been coined to encompass **aspects of technology in the broad welfare sector**, i.e. technology for the empowerment and participation of vulnerable groups in society, to improve the quality of living and optimise social profit organisations. The term 'Humanitarian engineering' often is related to engineering in developing countries. 'Biomedical engineering' is used in relation to health care. The term 'Care technology' comes close to what this programme aims at, but the scope of 'Community Service Engineering' is broader also including eg. technology to fight poverty.

During the first months **'misunderstandings'** between the partners arose in regard to the use of the term **'social profit sector'**. That is why the consortium felt the need to define what is understood with 'social profit sector'.
Social profit sector is an umbrella term for organisations which have **the following two characteristics**
1. **The mission of the organisation is explicitly a social/societal mission** either because
   a) Their core business i.e. their outcome (their services or products) is 'social', meaning contributing to health, welfare and inclusion
   b) Their production process is 'social' because the organisation creates employment for people with a large distance to the labour market.
2. **The organisation attaches equal importance to social, environmental and environmental value (cq. is People-Planet-Profit driven).** There is no or limited profit distribution to individual shareholders. Often – but not necessarily - these organisations are –partially- publicly funded.

B) Learning infrastructure & functions
Which functions are needed for a joint curriculum? The partnership discussed about and identified that the following functions were needed:

- *Knowledge space:* In this part all teaching resources and learning materials in regard to **the course contents (subject matters)** for Community Service Engineering are gathered and made available. These can consist of powerpoint presentations, streamed lectures, existing video material, articles, references to literature,…
- *Research space:* This space has 2 parts. **One part** consists of the **projects online database** which contains project ideas, projects picked up by students and templates which describe in brief the outcomes of each project with information on where more details can be found. Via tag functions students and other stakeholders can search through the database.
The other part gathers research questions. While elaborating the curriculum a lot of questions arise. These questions can be formulated into research questions.

Community Service Engineering could evolve on term to a real specialty, a strong scientific research area.

An enumeration of possible research questions:

- How can technology eliminate barriers and improve inclusion?
- What is the potential for inclusion of technology per target group of the social profit sector: the elderly, people in poverty, people with mental and/or physical disabilities, …
- What is the market potential of the developed technology?
- Is there existing technology that would be of added value within the social profit sector?
- How does an engineer design for and interact with vulnerable target groups?
- What methods of the User Centred Design approach are appropriate in interaction with persons with mental disabilities?
- ...

Partners did not delve deeply into these research questions but decided to show the research potential for the domain.

- Learning space: Here students are guided in the process to undertake their projects and defend their final result. This space illustrates the CSE pedagogies and puts the students into action. Items are: the (online) design thinking template with tasks to perform for project work in the CSE context, WIL (Work Integrated Learning) reflection methods and formative feedback, description of methods to support User Centred Design and Participatory Design, worksheets, evaluation criteria for the project work,…

- Free expression space: Partners feel a space where stakeholders can start a forum and discuss with other parties interested in the domain without formal requirements is of added value.

Given the functions needed, which platform will suit best? Consortium members have experiences with learning platforms such as Blackboard and Moodle. These platforms have the disadvantage that it is difficult to add and give access to users (teachers/students) who are not members of the partners' own institution. Feedback Fruits is a young startup at TU Delft. HHS had good experiences with their platform which promises to improve education by providing students and lecturers with the tools that will transform the way they interact and learn. Feedback Fruits has created a separate virtual university for the CSE consortium. The CSE consortium has built a base for the above mentioned functionalities on this platform.

Feedback Fruits is at the same time the shared learning platform and one of the four building blocks for collaboration. The 4 building blocks for collaboration are:

1. The projects online database (www.cse-projects.eu); that is the first part of the research space.
2. The design thinking template - https://sites.google.com/site/designthinking2015/; that is part of the learning space.
3. The short online track; that is part of the knowledge space – based on CDIO https://www.udemy.com/community_service_engineering/learn/v4/content
4. The shared learning materials on Feedback Fruits as other part of the knowledge space to complement the short online track - https://secure.feedbackfruits.com/#groups/66729/contents/146813

Partners could contact KU Leuven for support on demand for topics related to the use of the learning platform.

KU Leuven was also engaged in developing the short online track as an upgrade for the basic online streamed lectures. Partners have created an online course on Udemy with selected topics and quizzes. At the end of the course (after all videos have been watched and quizzes completed) the Udemy platform automatically generates a certificate of completion.

C) Basic webinars
At the start of the project, CSE partners in Belgium organised a series of conferences with both national and international guest speakers. KU Leuven and Thomas More have piloted a joint postgraduate course (in English) in the academic year 2014-2015. Webinars have been recorded at several events. Consortium partners have examined the material and selected **6 streamed lectures** to be presented **on the website** with the list of basic topics in mind:

- Assistive Technology, A leverage for Independant Living & Quality of Life by Peter Lambreghts (Independent Living and ENIL, the European 'Independent Living' movement)
- Open Innovation by Prof. Dr. Bert Mulder (The Hague UAS)
- What role can technology play to go beyond 'disabilities' by Prof Dr. Ing. Christian Bühler (TU Dortmund University and the rehab centre ESV)
- The school of the future by the Flemish Office of the Minister for Training and Education and the international perspective – Mr. Jan De Craemer
- The trends and the international perspective for the social profit sector (Jos Sterckx, Knowledge Centre Social Europe)
- Domestication of digital games in life of older adults by Vero Vanden Abeele (KU Leuven)

It was during the selection process that our Swedish partner pointed out that the webinars that are on the website now cannot be called webinars. She mentioned that they are actually streamed lectures and that a webinar is an 'interactive conference room'; a learning opportunity for the consortium.

The basic webinars were step 1 in the gradual process for building one curriculum with the international consortium. The figure below shows the evolution year after year:
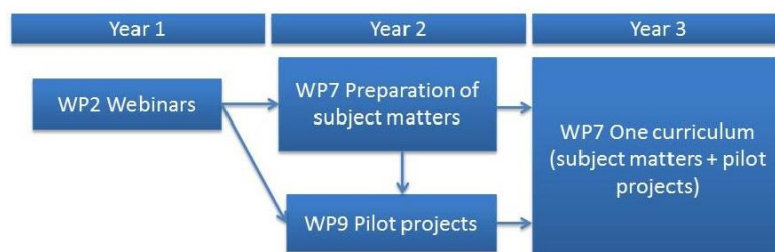
In the second half of the project partners decided to develop a short online track as basis for the taught programme and upgrade for the online streamed lectures. KU Leuven was engaged in developing this short online track. It has been created on Udemy with selected topics and quizzes. At the end of the course (after all videos have been watched and quizzes completed) the Udemy platform automatically generates a certificate of completion. This course is available at: https://www.udemy.com/community_service_engineering/

WP3: Social sector needs – PULL: (unconscious) need for technology

For this work package the way **RVO society** (P6) works for the **CERA award** has served as an exemplar.

Three steps are taken to link needs and students:

- First a questionnaire is distributed to a large number of organisations with the help of one or more umbrella organisations. Social profit organisations are invited to describe the technical problems they want to be solved.
- In a second step, these problems are evaluated and categorised by a group of experts from universities according to the type and level of curriculum they fit best.
- In the third step these topics are presented to the appropriate students who can choose to tackle them as a bachelor or master of engineering.

RVO society has developed **a train the trainer** about the way they interact with and search for needs within the social profit sector in Belgium and translate the needs into project proposals. This train the trainer was presented to all partners during a virtual meeting.

Based on the insights provided by this train the trainer partners from the Netherlands, Portugal and Sweden **have evaluated** how to set up a structure to detect the needs of the social domain within their own country.

RVO Society created a template to write a local country scenario to pull the social profit sector. All HEI partners have subsequently written their own scenario on how to involve the local actors. Later on this scenario was executed to gather the needs from the social domain in each country.

In **a feedback session** all partners commented on the working method of RVO society and gave insights and suggestions for improvement based on their own findings.

One of the adaptations was the integration of the scenarios of WP3 and WP4 into one scenario since partners felt this was a more efficient approach.

Partners also learned from the structure of the Cera database and the project ideas it already contained at the start of the LLP project. This gave a lot of inspiration to find their own project ideas to put into the consortium's database. The Cera award database structure as such has also been a starting point to create the consortium's database (content elements, key terms, tags,…)

Based on 100 project ideas in their database, RVO Society has produced a report on the social sectors' recurring needs for technology.

WP4: Business 2-way communication - PUSH: Existing technology & companies seeking to do   business with social organisations and/or (unconscious) eye for market potential within the social sector of existing technology

This work package started from **Chesbrough's "Open innovation"** and partners experience.

The aim of WP4 is to provide for a **communication plan** to involve businesses and technology partners into the CSE curriculum and to **disseminate the results** of student's projects to these companies.

At the project's starting point HHS organised a survey among partners to examine their experience with 'open innovation' processes and the way they collaborate with businesses

and organisations in their current educational approach.

The way HEI can be a linking pin was clearly presented at the first partner meeting of the CSE consortium in The Hague on May 14th, 2014 when Prof. Dr. Bert Mulder (The Hague UAS) shared his ideas on open innovation.
Furthermore HHS shared **show cases** for the CSE curriculum. The consortium also gained insights from visiting the Betafactory in Delft. The Betafactory is the knowledge and innovation hub of the Expertise Centre Technology, Innovation & Society (TIS) at The Hague UAS. The Betafactory bridges the gap between education, technology and business and promotes cooperation which focuses on innovation and entrepreneurship.

Based on the template for the communication plan HHS provided, each partner wrote its own scenario on how to involve local actors. Also partners drew up a list of businesses with potential to the social profit sector.

The communication plan/scenario has been a starting point to:
- Continuously learn and agree on how to communicate in 2 directions with the market
- Set up a yearly local meeting with associated partners and define future structured communication channels
- Contribute to cross-fertilisation between projects (comparable challenges, comparable target groups that can be learnt from) and between countries.
- write the inspirational document 'Higher Education Institutions as international hubs in Community Service Engineering Innovation Networks' which has been accepted as a full paper for the first 'Engineering4Society' conference, which took place in June 2015.

As already mentioned under WP3, there has been an integration of the scenarios of WP3 and WP4 into one scenario since partners felt this was a more efficient approach.

WP5: Projects back office - Engineering/technology students making the link (step by step) via projects

In the scenario's created in WP3 and WP4 HEI-partners have described how they will set up a structural partnership with partners in the field in order to detect problems/situations with a need for technology in the social profit domain. These will be translated into project proposals and **listed up on a yearly basis**.

During the curriculum engineering students consecutively select a project proposal, interact with and listen to the needs of the social profit organisation (or the vulnerable groups they serve), translate them into technological questions and solutions, advise to implement the technology and evaluate market potential and possible channels to the market.

The **project database**, which is part of the projects' back office, contains project ideas, projects picked up by students and weblinks that lead to the results of each project.

A **well organised back office** has a lot of **added value** for the project work. It allows **students** to search through available project ideas, identify students-colleagues that are working or have worked on comparable challenges or for comparable target groups, get inspired by previous project work,… It allows **partners/teachers** to organise online interaction between students across borders, to exchange challenges between institutions, to stimulate mobility starting from appealing challenges at partner institutions,…

First partners have agreed on **the template** to present project ideas/technological challenges to students. Next **a web application** has been developed by Högskolan Väst (UW) as a prototype. This solution has been presented to the consortium and after some iterations was accepted. By March 2015 with some delay the database could perform the intended tasks, although it was only reachable and executable on the development machines at UW. In order to reach the next stage of development, **external hosting** was required. Thomas More allowed its IT department to host the application in order to make it available externally. In order to transfer the database from the computers at UW and have the database operational on the TMK servers, part of the development was taken over by TMK. Also maintenance and technical support will be done by the TMK IT department.

Once external hosting was a fact CSE partners put their project ideas in the tool and started using the application.

This work package has also defined the role and tasks for the back office and has created procedures. Starting from the experience with the postgraduate course in Belgium. Knowhow has been shared and discussed with the partners. Partners have shared their experiences and approaches for project work. University West has contributed by sharing its expertise on Work Integrated Learning (WIL). Partners have been invited to the conference on ‘Assessing and Assuring Quality in Work-Integrated Learning’ that was held at University West in Trollhättan, Sweden May 18-20. Here we have worked specifically on WIL in the context of CSE.

The **web application (online project's database)** has been integrated in the **research space** of the learning platform (WP2).

The **guidelines for students** while doing project work (design thinking template) have been integrated in the **learning space** of the platform (WP2).

Collaboration between institutions and teachers and the related procedures to follow and documents to use are kept in a **shared Dropbox folder**. (project detection, preparation, execution, follow up and assessment)

WP6: Development of international-intercultural competences

The publication "The Professional Value of ERASMUS Mobility" proves that mobile students acquire **extra competences** thanks to a mobility experience. Diverse studies demonstrate that employers value a mobility experience:
- QS Global Employer Survey Report 2011[6]
- Staat een internationale ervaring goed op je cv?

During the kick off meeting in Leuven and the first partner meeting in The Netherlands, CSE partners have learnt from ICOM, ISBI and IEREST as good practices. Next a document (train the trainer) was produced. This was presented during a virtual meeting and partners have been asked to give feedback and jointly think about how to organise virtual and physical mobility of students and staff within the CSE curriculum. A mindmap served as a starting point for this discussion.

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[6] content.**qs**.com/**qs**/**qs-global-employer-survey-2011**.pdf

During the CSE curriculum we have focused on the acquirement of both domain specific intercultural competences as of generic intercultural competences.

Domain specific intercultural competences – international interdisciplinary learning:
- Being able to practice one's discipline in an international context
- Understand the cultural relatedness of one's discipline
- Knowledge of the profession and stakeholders in other countries
- Knowing international organisations relevant to one's discipline (a.o. standardisation authorities)

Generic intercultural competences:
These competences are also referred to as transversal skills.
- Cultural self-knowledge
- Cultural flexibility
- Cultural resilience
- Cultural receptivity
- Cultural knowledge
- Cultural relational competence
- Cultural communicative competence
- Cultural conflict management
- Multiperspectivity

Guidance, support and counselling are essential to maximise the potential learning outcomes of "an international experience". This opinion is supported by Dr. J De Wit in his publication "De wet van de stimulerende achterstand".

Based on the work of ISBI, ICOM and IEREST the CSE consortium has developed activities to in order to allow students to acquire intercultural competences during the curriculum.

During WP5 partners have agreed on how international cooperation is integrated in the project work:
- There will be synchronous and a-synchronous interaction between students, based on assignments for project work via Feedback Fruits
- Partners have organised a joint webinar on the topic of 'cultural aspects' (2014-2015)
- Partners have organised a series of joint online webinars on the topics of 'Living with a disability', 'Caring for an ageing population' and 'How informal caretakers benefit from technology' (2015-2016)
- Partners have taught in each other's curricula (staff exchange)
- Via the scenarios of WP3 and WP4 students find easy access to relevant stakeholders in the various countries
- Partners have stimulated mobility starting from appealing challenges at partner institutions (in this case Peer Assisted Learning techniques have allowed CSE students to learn from one another and to overcome language barriers)

Thomas More has used the ICOM test to trigger **the enhancement of international-intercultural competences** as a learning outcome of curriculum with the socially ingenious students. A report has been written on the results of these tests that students took before and after the curriculum. A report on the findings has been written consecutively.

WP7: Postgraduate curriculum & options for translation into undergraduate curricula

The setting up of the curriculum itself was **step 3** in the **gradual process** for building **one joint curriculum** with the international consortium. The building of the joint curriculum itself has been **spread over 2 years**. The figure below shows the evolution year after year:
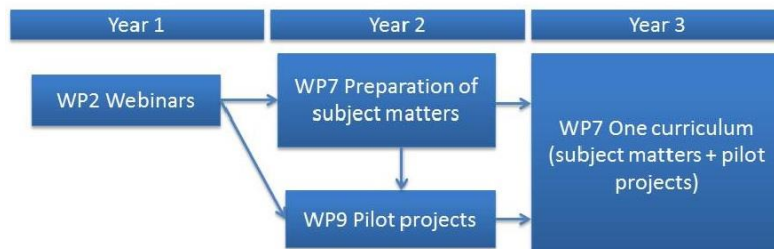
It has been the aim of the consortium partners to establish **a sustainable cooperation**. A postgraduate curriculum was initially considered to be the best option for this sustainable relationship as partners. However, it soon turned out that the economic crisis and austerity had amplified the pressure on higher education and not all partners in the lifelong learning project were given 'carte blanche' to launch a new postgraduate course. Since different educational systems contained limitations the only solution was working around them and create a joint blended curriculum.

To come to a common understanding discussions have been held based on the image below.
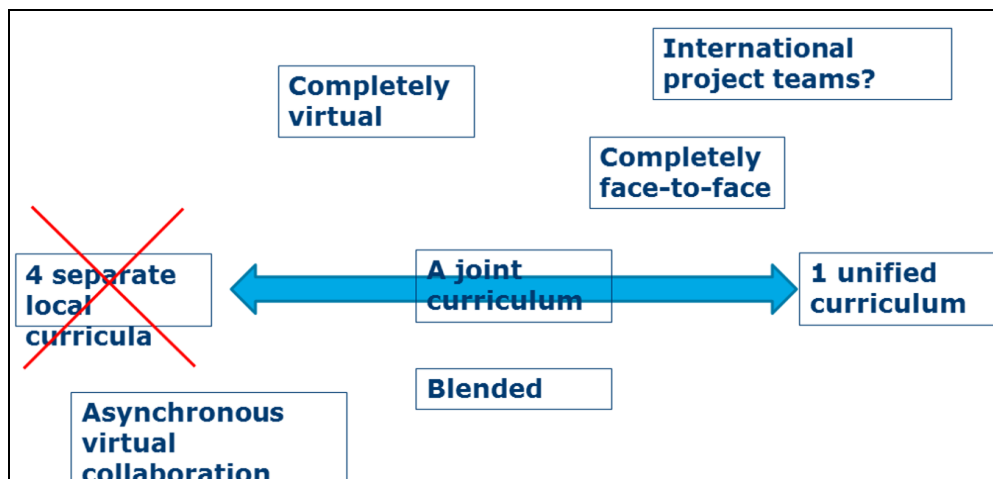
It is clear that four separate curricula would not be in compliance with our initial project proposal. At the same time partners could not collaborate in one unified postgraduate curriculum for the reasons mentioned above. They felt **a blended curriculum** was the way to move forward in this domain. The reason is clear. The blended curriculum can take into account the different structures and ways the engineering education is organised in the different partner countries. Traditional universities like KU Leuven and UP handle curriculum changes somewhat differently than universities of applied sciences like TMK and HHS. For that reason, creating one unified curriculum for all partners was not an option and a more pragmatic approach was followed. This lead to the blended curriculum that offers

four building blocks for collaboration and can tap into the existing educational structures of the partners involved.

The figure below shows how the curriculum has actually been developed in reality:
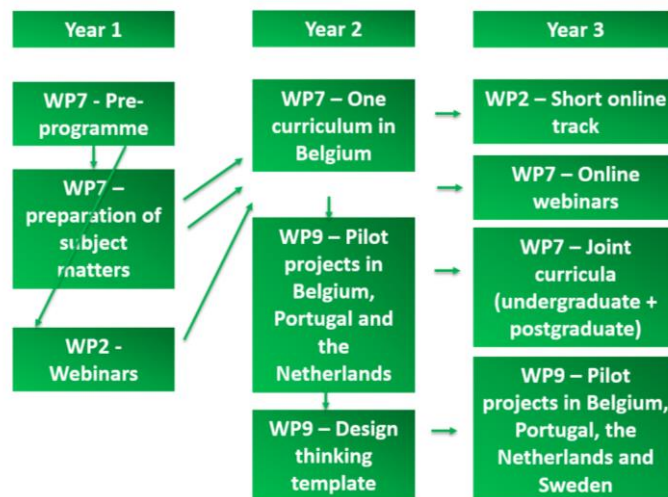
As a first step P1&2 have developed **a web based survey** that could then be used in the different partner countries to probe the interest of the engineering community (young people, female engineers, 50+).

During the **first academic year (2013 – 2014)** partners in Belgium organised a pre-programme.

This pre-programme consisted of **three conferences** on the topics of ageing, living with a disability and poverty. The events were structured in **three parts**. During **the first part** a keynote speaker gave his own view of the potential of technology for the social profit sector. Then, a representative of the social profit sector itself testified about the subsector, the target audience and the potential for technology. Finally, several cases spoke for themselves. In the **second part**, we explored in round table discussions the experiences and visions of the public: What did positively surprise them? What would they remember? What were their remarks? How did they look at 'technology in the social profit sector'? Do engineers have a role to play? What are the conditions for technology to truly mean an added value for the sector? In the **third part**, we raised our glass to technology for social inclusion, empowerment, accessibility of public space, websites, media, support in heavy workload, the efficiency of social profit organisations ... and we expanded our own network.

This pre-programme allowed to register 6 Webinars and have them published on the website (www.cse-education.eu). At the same time research was done on topics for the curriculum, guest lecturers were visited and invited to play a role in the curriculum, assignments were developed, …

During **the second academic year (2014 – 2015)** the curriculum was tested as an independent postgraduate course in Belgium. Project work in the CSE context was done in Belgium, the Netherlands and Portugal. Partners shared their experiences and lessons learnt were taken to year 3. Based upon feedback from the first year students, the design

thinking template was created. This template guides students in the process for the project work and allows students to find one another (internationally) and connect.

During the **third academic year (2015 – 2016)** the short online track (WP2) has been developed. This short online track is the minimal version of the taught programme (joint programme) which is offered to students to underpin the project work. Another important achievement in this third year was the organisation of 3 online webinars, which partners used to bring 'actual and relevant topics in CSE' to students. At the same time partners developed their own pathways to integrate Community Service Engineering into their curricula. At Thomas More (P1) the first pioneer's year of 'socially ingenious' was organised. At KU Leuven (P2) CSE became a track in the existing postgraduate course of innovation and entrepreneurship. UPorto (P3) developed the CSE online course in continuous education which has been launched in September 2016. HHS (P4) has developed its track for the CSE voucher within 4 faculties. UW (P5) has developed 'Welfare technologies and digitalization in social work and social pedagogy, 7.5 HE credits'. The result is that partners have developed a similar context and learning outcomes for their engineering students which triggers international interaction and collaboration.

Starting as a postgraduate course initially turned out to be the ideal track to develop, test and further design this new domain for engineers. For a postgraduate course (continuous/adult education) there are fewer formal requirements, the approval procedures are easier, no account should be taken of how to integrate the CSE profile into existing and already overcharged engineering curricula.

After the pioneers year, partners agreed to implement CDIO[7]. While CDIO is the common educational framework, the implementation of CDIO and Community Service is different for each partner. Community Service Engineering is an element of the Engineering Education at the universities of all partners involved. Resources are shared and collaboration between the institutions, students and staff is organised at different levels. CDIO is the common language but the CSE curricula have been adapted to the local situation, as shown in the figure below.

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[7] http://cdio.org/
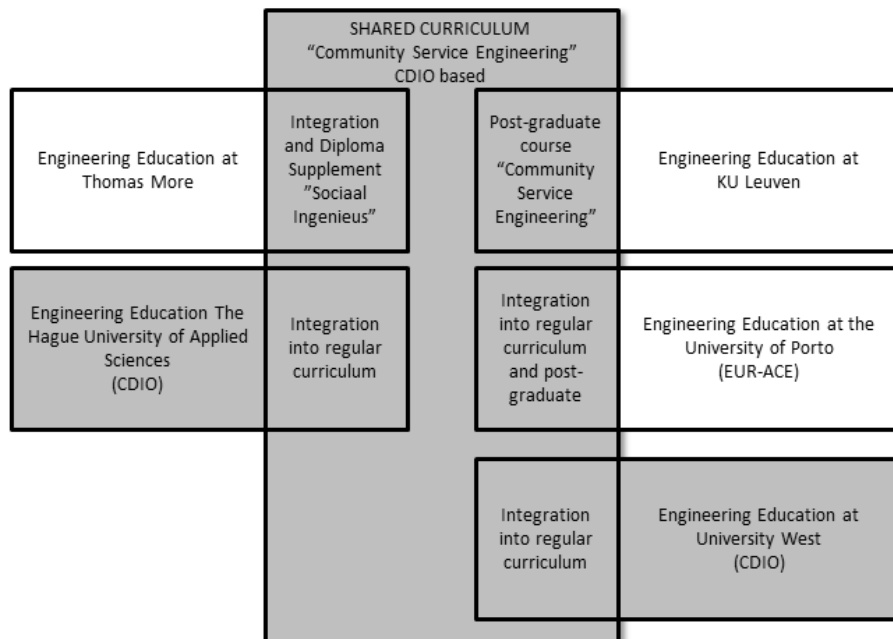
In regard to the shared resources and collaboration partners have agreed to reorganise the curriculum into three main topics:
- User centred design
- Technology and the social profit sector
- Organisations in the social profit sector

The topics as they were present in the pioneer's year of the CSE postgraduate course at KU Leuven have thus slightly been reorganised.

Belgium kept its plans to develop a separate postgraduate course. It was launched and pioneered in the academic year 2014-2015. Next it has been integrated as a track in an already existing postgraduate course named the Postgraduate Programme in Innovation and Entrepreneurship in engineering.

The Netherlands initiated the idea of a diploma supplement for its technological bachelors. This idea was also introduced in Belgium for technological bachelors and named the diploma supplement 'socially ingenious'.

Portugal took up the CSE curriculum as a course in its Centre for Continuing Engineering Education. Furthermore the University of Porto stimulates its master students to undertake a master thesis with a clear social dimension. In implementing the project for the master thesis, Portuguese students are also urged to seek contact with the target audience and interact with other stakeholders. Students gain access to the short online track and the design thinking template that provides support in this undertaking.

University West has developed the course on "Welfare technologies and digitalisation in social work and social pedagogy", next to stimulating its master students in project work courses to undertake real-life projects with a clear social dimension.

As such all CSE partner institutions start from real-life projects and work with technology students (EQF level 6 or 7). All partners underpin this project work with a taught programme

and the mentoring of the students. All students create an online portfolio in which they illustrate both the process and the final result of their project.

(International) interaction is stimulated in the project based coursework in various stages and for various reasons.
- In the initial stage research is done to detect already existing technology and relevant resources in relation to the need/challenge students are developing a solution for.
- In the course of the project students are invited to interact with various stakeholders in order to have a better understanding of the needs and values of the target audience their solution will serve and to gather feedback from peers in order to improve their designs.
- At the final stage of the project students are encouraged to maximise the valorisation potential of their project's end results. There are various options in this final stage:
  o Students might want to start up their own business based upon the insights gained and prototype developed.
  o Students might want to offer their findings and prototype to stakeholders (organisations, businesses, umbrella organisations,…) active in the domain.
  o The project's end result might need further research, development, iteration of prototypes and validation which is best done in the context of the Higher Education Institutions itself (HEIs), which act as open innovation hubs for societal innovation and transformation.

Students are stimulated to interact with various stakeholders both on a local and on an international level. This is important since businesses active in the social domain are often operating in niche markets and need a European or global scope to find enough market potential. Students' projects in particular and the CSE educational model in general could make the bridge to find the needed market.

WP8: Teacher's role:

There will be a **new and challenging role for teachers** in this international learning environment, that will function as a lifelong/network learning environment. Traditional teaching competences might not produce the desired learning outcomes. That's why this work package goes into the role of the teacher and support for the teacher to be ready for this role.

The meeting in Delft, NL (14-16 May 14) was decisive to finalize the WP8 plan and schedule. The plan approved consisted mainly of:

A report on the role and needed support for teachers
- First draft of 'the role of the teacher' in general terms
- Incorporate suggestions from workshop at the first face-to-face partner meeting
- Use Dropbox files
- Revise periodically based on experiences in the CSE curriculum in audio and face to face meetings
- Final version
- Contributions from partners

The first draft on the 'traditional role of the teacher' had the following structure:
- How to organise and manage a joint degree programme

- Pedagogical, technological and organisational issues for teachers in blended learning
- Teachers in a blended learning environment with international dimension

This report has been enriched with several inspiring documents of projects that researched the 'new role of the teacher'.

This structure was approved at the meeting in Delft. It is composed by a main document and by nine annexes. The report guided the teachers involved in the project pilot courses in 2015 and 2016. It was then reworked based on the experiences with the curriculum.

To allow the UPorto (P3) to give support on demand from partners regarding the role of the teacher a Google Doc Excel file was created by the coordinator.

The UPorto intended to consecutively describe and document the process of giving support on demand, which would include the following steps (this would have provided an overview of the interventions):

- registration (date, source, partner,...)
- nature of demand (what was the request)
- classification (what as it about, make categories)
- intervention (what support was provided)
- results (how was it solved)
- follow up (after 2-3 weeks)
- satisfaction about the intervention (ask feedback)
- after several interventions a FAQ could be designed with most frequently asked questions, and made available to the partners

However, there were no recorded contributions in this file. In agreement with the coordinator a questionnaire was sent to partners related with the objectives of WP8. The goal was to have a more direct approach to partners based on their previous experience of teaching courses related with CSE.

In all responses from the partners the UPorto identified different roles of the teachers that begins with initiative/ developing and ends with evaluation and continuing.

- Brainstorm about a (new) program with interested teachers/ researchers.
- Lobbying in the team and management for developing a program (for a pilot)
- In every program we have a main teacher who is the coordinator and overall responsible for the program, the facility's, the exams, the evaluation and the renewing our ending of the program.
- At least two teachers, but at several occasions 3-4 teachers, including the coordinator, develop in co-creation a program based on formulated competencies and learning goals.
- All the teachers search for contacts in the work field, research institutes and universities to bring in principles for the subgroups to (re)design a technical product
- The involved teachers give lectures in the program and they coach workgroups or individuals
- Also they search and guide guest teachers or professionals for guest lectures on special subjects.
- The teachers organise and/or support student in their work-visits to the end users and their community related to the subject.

- They organise in-between presentations and assessments and to the principals and other interested people.
- The teachers make a model for examination and judge the result, in partnership with the principals, on behalf of a judgement-form.
- They organise an evaluation at the end of the program face to face, group wise and/or digital (for example with Socrative - http://www.socrative.com).
- Adjust the outcomes of the evaluation to the program/pilot
- Marketing the program to students and college's inside the faculty and in other faculty.
- Organizing the registration

From these contributions UPorto derived the following conclusion for WP8: None of the proposed strategies or case studies show any substantial difference from the general issues where a teacher is involved. Of course there are aspects that illustrate the importance of stakeholders of the social domain but that is not different for instance of industry for a teacher of engineering or of pharmaceutical companies for a teacher of pharmacy. Of course that there are aspects that may be concomitant like being administrator and process facilitator, teacher and instructor, coach and motivator, consultant and co-learner, commentator and provider of feedback, stimulator of collaborative learning and assessor of the learning outcomes and process. However these aspects are not enough to differentiate the teachers related in CSE from other teachers.

WP9: Pilot projects

The pilot projects are step 2 in the gradual process for building one curriculum with the international consortium. The figure below shows the evolution year after year:
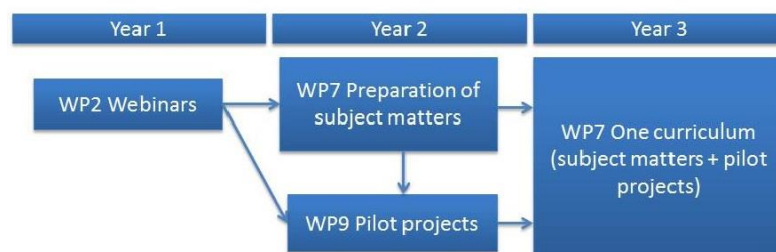
This work package focusses on **students' project work.**

WP9 brings together what has been developed in WP2, 3, 4, 5, 6 & 8.

Pilot projects account for 15 ECTS credits in the postgraduate curriculum. Half of the curriculum is project work.

In the proposal it was planned that Thomas More Kempen (P1) would coordinate the pilot set-up and collect feedback. This has actually been the case.

During the first run of the postgraduate course **in Belgium** (2014-2015**)**, 5 students have been pioneering the curriculum. Each student chose to work individually on a project for the social profit sector.

P1 shared his approach with the consortium. This entails:

- The template to present project proposals
- The contact with project promoters (social profit organisations, businesses and research groups at HEI) pitching their idea during the kick-off for the curriculum. Depending on promoters availability the pitching was done face-to-face, online or via a recorded video message
- The document with an overview of tasks and assignments to guide students during the process for the project
- The structure of the e-portfolio students build on a Weebly website
- The couching of students during the process
- The definition of the role of the promoter and the role of the mentor
- Peer learning among students for their project work
- The final evaluation of students via pass/fail for their work

For the year 2015-2016 the CSE track at KU Leuven (P2) was integrated as a track in an already existing postgraduate course named the Postgraduate Programme in Innovation and Entrepreneurship in engineering. 3 students chose to do this track and started working individually on 3 project ideas for the social domain. At the same time Thomas More (P1) launched its diploma supplement 'socially ingenious' for the technological bachelors. 6 projects for the social domain were undertaken and students worked in groups to achieve their end results.

In **the Netherlands** 5 pilot projects have been carried out in 2014-2015. This lead to the integration of this type of project work in minors that focus on learning how to (re)design products for vulnerable end users in the Social Domain in 2015-2016. These minors are:
- Minor Social Work Online in which students develop an application for a vulnerable group commissioned by a care or business organization from the work field
- Minor Social Community's for peace (SC4P) for technical students. The concrete ambition is to design hands-on suitable applied technologies to provide the basic needs for refugee-camps
- The project "Vision and design for end users in the social domain" for students Human Technology in their third year in which they (re)design an IT product from the perspective of the user
- Project Usable Design in which second year IT students develop an IT application (website, app) for a vulnerable group, in this case "Young Caretakers of ill people in the family"

The project work in **Portugal** is typically done in the second semester. In the implementation of the CSE project, the UPorto investigated how master students could be triggered to do a master thesis in the CSE domain, to use the CSE materials and to collaborate. The UPorto attracted various partners in the field to partner up with the students. One notable partner is the movement "Uma Vida com a Arte". This movement is created by a group of persons that are living in a homeless situation in Porto. In the context of this movement different CSE projects flourished. The common denominator of these projects is that they demonstrate how design can make a difference in the life of people living in extremely poor conditions, and at the same time, reduce waste by using recycle materials. The projects allowed UPorto engineering students to understand the necessities and capacity of work of these people in poverty.

The **Swedish partner** in engineering partnered up with colleagues in the social work department and the pedagogical department in order to promote the uptake of technological challenges from the social sector. It is part of the pedagogical approach in Sweden that students define their own project within the project based coursework

programmes. Pilot projects were therefor not undertaken in 2014-2015. Arrangements were made with teachers of courses in project work to facilitate the promotion of the CSE profile and related challenges. To trigger students some examples of project ideas have been formulated.

Partners promote that project ideas can be taken up by students from the various institutions. Students are not limited to ideas brought up by their own institution. In order to allow staff and student mobility on the basis of project work, partners have worked out or updated inter-institutional agreements amongst one another.

In the second year of the pilot projects the document with an overview of tasks and assignments to guide students through the process for the project work and the structure of the e-portfolio students was built on a Weebly website and have been integrated into the design thinking template (building block 2 for the curriculum).

WP10: Quality assurance and quality plan

The aims of this work package are to ensure that the project runs at high quality standards and that all tasks and deliverables are completed as promised, to make evaluation tools and decide on strategies for both national and transnational evaluation, to evaluate the project both internally and externally. All this allows the consortium to review how the project is doing against its objectives, whether the project has impact and is efficient towards all partners and other stakeholders.

The consortium has recruited an **external expert** to take forward the **external evaluation** in subcontracting. **Internal evaluation** is coordinated by P2 with the partners and will be mainly concentrated on product evaluation. **Both product and process evaluation** will be tackled by the external evaluator. Product evaluation has to focus on effectiveness, i.e. the curriculum, quality of the course and learning methods, application of the EQF and the credit award system. Process evaluation addresses the project's efficiency, its success and challenges in meeting its intended deadlines and outcomes.

Rather than undertaking a summative evaluation, which is felt to give a more limited and static picture of the project, the partnership decided to opt for a formative approach, and to **involve the evaluator early in the project** to enable him to develop appropriate evaluation measures and to collect the required information as the project goes along. In addition, the partnership is looking for the external evaluation to focus also on the financial management and intellectual property right issues. This external evaluation should help assess the project's effectiveness, efficiency, impact and sustainability.
The **key deliverables** of the external evaluation are:
- a definition of a project evaluation framework and tools
- implementation of the evaluation
- mid-term report to the project partners with initial finding and recommendations
- final evaluation report including key conclusions and recommendations

P2 with the contribution of all WP leaders and the external evaluator wrote, executed and monitored a **quality management plan**. All partners got instructed on the Plan-Do-Check-Act quality cycle at the kick off meeting.

To follow-up the work packages the consortium has **monthly online meetings**. Also the associate partners and other stakeholders are involved in the evaluation.

In regard to product and process evaluation the following suveys and reports are available:

- Evaluation of the pre-programme/conferences
- Students of the postgraduate course pioneers' year have been asked to evaluate each face-to-face contact moment and all guest speakers
- Students of the postgraduate course pioneers' year have been invited to evaluate the overall curriculum with a questionnaire based on the EFQUEL guidelines.
- During the course when problems appeared they were logged in the Quality Management Plan and tracked to closure
- Evaluation of the webinars the consortium has jointly organised in the academic year 2015-2016 (year 3)
- Evaluations of the face-to-face partner meetings
- Evaluation of the short online track on Udemy – rating by a broad audience

Internal Quality Control evaluation was performed on three levels. The most frequent control was executed by the responsible project partner(s) per WP. In addition, the other project partners assisted in further checking the quality of these deliverables. A final quality control was performed by the chosen expert advisory panel (which includes only stakeholders within the CSE project).

During the course of the project some problems have been logged. The partners discussed these problems and the measures taken in solving the problems have been described in somewhat detail in a document that could be consulted via a Google Doc.

Final project evaluation revealed that:
- A continuous improving of the CSE project quality system took place
- The project followed approved business processes and standard operating procedures
- The international regulatory requirements were met
- A periodically reviewing performance was performed
- The role of technology for challenges in society was enhanced by on boosting engineers activity in the social profit sector
- The project brought awareness on the innovation in education according to new needs in society

The partnership has used the following tools for quality management implementation:
- **Webex**, **Mindmeister**, **Weebly** and **Google Docs** in improving activities and processes throughout the project
- **Webex**, **Dropbox** and **Mindmeister** in communication and sharing information
- **Qualtrics** to get feedback as well from students as from partners and other stakeholders

WP11: Dissemination

There are 6 different levels concerning the dissemination objectives of this project:
1. **Gaining attention** of target groups: public opinion, academic institutions, engineering higher education institutes in the European area, policy makers and other stakeholders, social profit organisations, businesses, engineering organisations, etc.
2. **Information**: showing to the general public the high relevance of social profit organisations and the job possibilities for "Community Service Engineers".
3. **Awareness creation**: making best practices and project compendia available to Engineering schools and universities, as well as to their umbrella organisations (cf. list below)

4. **Action**: we want to stimulate uptake of similar initiatives all over Europe
5. **Support**: interested groups will be provided with the practical experiences gained within this project
6. **Engagement:** we want to ensure consultation and involvement of end users in the project life, meaning engineering students, vulnerable groups, social profit organisations, businesses, teachers,…

To plan and monitor the process this work package started with inviting partners to think about and plan their local dissemination actions, to invite local stakeholders to be (partly) present at the partner meetings, to communicate about their actions via the CSE social media channels and to regularly report on the dissemination activities via an online form.

At the start the consortium jointly decided on the URL for the website. Amongst various options www.cse-education.eu has been withheld. Partners can provide their local information via derivatives such as e.g. www.cse-education.be. A logo for CSE has been designed.

CSE partners in Belgium have organised a series of conferences with both national and international guest speakers. Streamed lectures have been recorded on this occasion.

For further dissemination actions partners feel it is important to focus on both internal and external stakeholders. Communicating to internal stakeholders is needed to create support for the domain in one's own institution, to attract students, … Communicating to external stakeholders is important to find interesting project ideas, to valorise project results, to find potential employers for the CSE profile,….

On many occasions members of the consortium have written and submitted (joint) scientific papers to publish on the curriculum.

During the course of the LLP project we have learnt from initiatives in the same domain in Europe and we have been in touch with the staff responsible for the development of these programmes to learn about their approach and to explore collaboration potential.

- Finland – TAMK – Master's degree programme in Wellbeing Technology
- The Netherlands – EU Master in Care & Technology
- Belgium - VIVES – Bachelor in de zorgtechnologie
- France - Université de Limoges - Master Auton'Hom-e

Other important actions in this Work Package are:
- Set up a contact database of target groups, stakeholders, individual contacts, organisations, networks,…
- Write and distribute press releases with every event or newsworthy development,
- Write and design project poster and flyer to use as presentation material for possible applicants for the course and for introduction of the project to stakeholders,
- Distribute a poster and flyer to partners and stakeholders,
- Organise a final project conference.

Partners' staff members are involved in several networks related to either e-learning, distance education, continuing education, engineering education (CDIO network), work integrated learning etc. and can rely on these networks to promote and disseminate project results.

Dissemination activities include: info sessions, meetings, presentations, published articles, e-mail campaigns, distribution of information, twitter account, LinkedIn group, Facebook group, participation in conferences, contact database, the Engineering4Society conference in June 2015 and the final conference in September 2016.

Highlights of dissemination in the first project half

Important dissemination activities have been:
- The organisation of a series of conferences in Belgium (April – September 2014)
- A seminar day in The Hague with key note speaker on health & technology development in collaboration with HEIs, presentations from social profit sector, education (national & international), technology/business. Poster presentations. Workshop Design Thinking on 'how to reach open innovation with HEIs collaborating with the social profit sector and industry. (May 14th, 2014)
- Article in Weliswaar - publication for the social profit sector
- Article in Ilya – Publication of the engineering association (IENET)
- Article in De Gezinsbond (277.229 CIM)
- Cera-Award and CSE; winners of the sustainable partnerships award 2014
- Festive start of the CSE curriculum at the Cera-Award Ceremony – September 27th, 2014

Highlights of dissemination in the second project half

Important dissemination activities have been:

- UPorto has presented an abstract at AECEF 2015
- UPorto has presented a proposal for a paper at ASEE
- UW has invited LLP partners to the WACE conferences
- Conference "Radical innovations for health; our challenge!" – Delft (HHS – NL)
- Stakeholder meetings in the various countries
- Publication in Campuskrant KU Leuven of an undertaking of CSE programme director Bart Vanrumste that perfectly fits the CSE context.
- Publication in the magazine of Bank Nagelmackers; title: Innovate with a heart
- Press article based upon a project of Socially Ingenious
- An European Network meeting: CLUSTER 25th Anniversary Symposium 'Challenges & Frontiers in Engineering Education' Presentation by Jan Engelen under Subtopic 4: Involvement of Society - with title: Community Service Engineering – a report on a new type of engineering postgraduate course, stressing the role of engineering for the economic development. - Prof. Jan Engelen, KU Leuven
- Viamigo, one of the projects we worked on during this first edition of the Community Service Engineering - post graduate course @KULeuven(http://www.cse-education.be/results-2014---2015.html) was presented at The International Conference on Information, Intelligence, Systems and Applications (IISA)
- Presentations and papers of different partners at the Engineering4Society conference in Leuven, June 18 & 19th, 2015, published in IEEE proceedings
- Presentation at CDIO 2016 by Suzanne Hallenga (HHS) on the topic CDIO as a blueprint for Community Service Education
- The release of the short online track on Udemy
- Presentations and papers of different partners at the second Engineering4Society conference in Leuven, September 15 & 16, 2016

- Dissemination event at UPorto, September 28, 2016 where the online course in continuous education has been launched; Engenharia ao Serviço da Comunidade.
- Presentation of 'The development and implementation of an educational model for Community Service Engineering: project based learning and international interaction' at the EAPRIL conference in Porto in November 2016.
- Organisation of a symposium within AAATE 2017 together with the EU Master in Care and Technology[8].

WP12: Exploitation

The main aims of this work package are to ensure that the results are sustained beyond the life of the project and used beyond the project itself, to ensure transfer of results to relevant local, regional, national and European decision-makers, to make sure target groups understand how the results meet their needs and to convince end users to adopt them.

Partners have been asked to answer a survey concerning further exploitation of the course and their plans to create impact through targeted actions. Also questions were asked about the future plans and actions at the local level.

An important issue related to the further exploitation of the course initiatives is to convince students about the value of the study domain in general and the courses in particular. Many stakeholders have expressed their belief in the future of this domain for engineers. Some quotes as response to the question: 'How do you look at technology in 'the social domain'? Do engineers have a role to play?

- 'From my point of view there are a lot of opportunities for engineers. It is important that engineers look at a potential problem from the point of view of the 'client' instead of focusing on the technology aspect.'
- 'Technology is not incorporated enough in the social sector. Engineers have a role to play but it will be necessary to attract them by presenting care in a new way. Technology will not emerge fast enough in traditional care (institutes).'
- 'Yes, key role as translator, linking person and gateway to modern technology. definitely useful input for business case viability.'
- 'Engineers have a role in the translation of state of the art technology that is disposible to the specific domain of the social sector. Important to listen to the users to catch their needs, and then translating them into technical requirements.'
- 'Absolutely. In close collaboration with users and caregivers.'

On the other hand, the recruitment for the pioneer's year of the postgraduate course in Belgium did not go smoothly. The number students attracted was only five.

Jamie Gorson, a young engineering student at Olin College (USA) and placement student in Belgium (2014-2015) has investigated which engineers could potentially be attracted to the curriculum and how it should be advertised.

Broadly speaking these were her findings: This curriculum will attract two different kinds of students. One who is becoming an engineer because they see a problem in the social world and want to fix it and another who is an engineer but feels the desire to be well-rounded and have an advantage over their fellow graduates.

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[8] http://www.master-ct.eu/

Innovation of higher education is today submitted to the laws of economics: innovation, not accompanied by a good business plan, is not likely to happen.

For most partners, this resulted in a solution that integrated CSE in the existing curriculum as much as possible, with additional costs restricted to the minimum.

Thomas More (P1) attracts engineering students (EQF level 6) to the diploma supplement of 'socially ingenious'. KU Leuven (P2) has integrated the Community Service Engineering track in the existing postgraduate course of innovation entrepreneurship as an engineer. At the same time KU Leuven seeks to appoint a CSE coordinator to work in between engineering faculties, to trigger master students (EQF level 7) to do a master thesis in the CSE domain and internally disseminate and future develop CSE materials and collaborate internationally. UPorto (P3) has started the online course in continuous CSE education that is free and open to the public. UPorto will keep attracting its master students (EQF level 7) to CSE related project work for their thesis. At HHS (P4) the result of participating in this project is that students (EQF level 6) of 4 faculties now can get the Socially Ingenious Certificate. By labelling different courses that were already there, students can collect their own credits and they are also invited to join in on courses from Thomas More. The certificate will make teachers at HHS aware to add courses to the "socially ingenious" initiative. UW (P5) has created the course 'Welfare technologies and digitalization in social work and social pedagogy'. The course entails 7,5 ECTS credits and will be taught in English in order to attract foreign students. In their project based coursework they will keep triggering students (EQF level 7) to do work for the social domain. RVO-Society (P6) gathered some new ideas during the course of the project. Its sponsor (CERA) has committed to fund the CERA Award for another 5 years and to improve the existing intentions on how to develop the future Cera Award 2.0, searching for the right partners and technology transfer (co-creation, not only demand).

To summarise we can state that the choice most partners made to integrate CSE in existing curricula allows to attract more students to the domain and allows to sustain the curriculum with minimal additional costs.

Working in the shared context of Community Service Engineering provided the incentive for the CSE partners to enter into Erasmus inter-institutional agreements. These agreements allowed for staff mobility for teaching under the Erasmus programme.

The institutions also agreed that virtual mobility should be in place to add recent and relevant topics in a dynamic way to the short online track which forms the basis for the taught programme. During the project's lifetime this virtual mobility has been set up in the form of online conferences/webinars with participation of students and staff of the various institutions.

Here we also want to stress the importance of maintaining a network with partners in the field in the various countries.

In their exploitation plan partners have stated the intention to maintain what has been started within each institution and keep up the international collaboration.

Partners call upon their networks and invite other engineering institutions to join the consortium as ally partners.
- CSE partners
- E+ partners
- E4S network

- EU master care and technology
- …

In order to maintain the international collaboration coordination is needed. In the exploitation plan the role of the coordinator of the international CSE network has been defined, a budget has been calculated and suggestions have been made for pathways to grow into a bigger network and/or to connect with existing initiatives. Furthermore, ideas of the aims and activities of this network have been described.

3.   Project Outcomes & Results

What follows is a list of deliverables connected to the different work packages. As stated above the deliverables of work packages 3 and 4 have been integrated.

WP1.	Coordination – Management - Support	
	Lead by TMK	*delivery month*
1.1	Administrative rules and guidelines	2
1.2	Partner agreements	3
1.3	Progress report	18
1.4	Final report/internal	36
1.5	Final report/external	36

WP2.	Learning Framework	
	Lead by KUL	*delivery month*
2.1	Learning platform with 5 webinars	12
2.2	Support on demand	12-36

WP3.	Social Sector Needs (PULL)	
	Lead by RVO	*delivery month*
3.1	Train the trainer for polling and engaging the social profit sector	2
3.2	Local scenarios	8
3.3	Database	8
3.4	Report on social sectors' recurring needs for technology	12

WP4.	Business 2-way Communication (PUSH)	
	Lead by HHS	*delivery month*
4.1	Scenarios of the different country meetings	6
4.2	List of businesses with market potential to the social profit sector	12

WP5.	Projects Back Office	
	Lead by UW	*delivery month*
5.1	Well-structured database	12
5.2	Procedures for project detection, preparation, execution, follow up	12
5.3	Integration with the learning framework	12

WP6.	Development of Intercultural Competences	
	Lead by TMK	*delivery month*
6.1	Procedures for mobility and support of students	12
6.2	Report on learning outcomes in regard to intercult. competences	24

WP7.	Postgraduate Curriculum	
	Lead by TMK	*delivery month*
7.1	Description of the postgraduate curriculum	20
7.2	Report on options to translate into undergraduate curricula	23
7.3	Feedback report on the first test year	36

WP8.	Teacher's Role	
	Lead by UP	*delivery month*
8.1	Report on outcomes workshop role description & needed support	9
8.2	Support on demand	12-36
8.3	Final report: role description & needed support for teachers	36

WP9.	Pilot Projects	
	Lead by TMK	*delivery month*
9.1	Pilot set-up description	13
9.2	Compendium of project results from pilots	22
9.3	Pilot evaluation and feedback	24

WP10.	Quality Assurance	
	Lead by KUL	*delivery month*
10.1	Quality management plan	3
10.2	Quality management report	36

WP11. Dissemination
Lead by TMK   *delivery month*
11.1   Project website   4
11.2   Dissemination report   36

WP12. Exploitation
Lead by TMK   *delivery month*
12.1   Business and exploitation strategy report   36

* All deliverables to produce in English only.

4.   Partnerships

The project partners
The CSE consortium is a very strong partnership. It is built on the expertise of each of the institutions and the people working in it.

P1 = Belgium – Thomas More Kempen vzw (TMK)

P1, Thomas More university college, plays an important strategic and international role in Flanders, the northern part of Belgium. More than 13.000 students study at seven campuses. It offers more than 30 professionally orientated study programmes.

Role in the project:

WP1	Coordination – Management - Support	P1 (TMK) has built up knowledge and experience in project guidance, day to day operational management, partner communication and reporting.
WP2	Learning framework	TMK has brought in experience with VirCampus
WP6	Development of international-intercultural competences	TMK has lead this WP. Basic input have been the results of the ISBI-project and the ICOM test for measuring international-intercultural competences. TMK was also associate partner in the IEREST project.
WP7	Postgraduate curriculum and options for translation into undergraduate curricula	TMK has lead this WP together with KU Leuven.
WP9	Pilot projects	TMK has lead this WP
WP11	Dissemination	TMK has lead this WP
WP12	Exploitation	TMK has lead this WP
WP5	Projects back office	In the final stage of development TMK has taken over the development of the projects database from UW. The database is now operational on the TMK servers. Also maintenance and technical support will be done by the TMK IT department.

P2 = Belgium – KU Leuven (KU Leuven)

The Katholieke Universiteit Leuven (KU Leuven) is the Flemish offshoot of the oldest university in the Lower Countries which was originally founded in 1425. In the academic year 2016-2017 52.173 students are attending classes at the 16 faculties of the KU Leuven, about 7.769 of whom are foreign students. Many courses are offered in English. Most courses, however, are taught in Dutch. The KU Leuven is a member of the Coimbra Group (a network of leading European universities) as well as of the LERU Group (League of European Research Universities) and the CLUSTER group (Network of co-operating universities of technology in Europe).

Role in the project:

WP2	Learning framework	KU Leuven has taken the lead in setting up the learning space (multi-campus, blended learning, short online track…)
WP7	Postgraduate curriculum and options for translation into undergraduate curricula	KU Leuven has lead this WP together with TMK. Together they have pioneered the postgraduate course in CSE (2014-2015) and the track of CSE in the postgraduate course of innovation entrepreneurship in engineering.

		KU Leuven has shared its expertise in setting up and organising students' projects in engineering education, in interdisciplinary research, development, exploitation and communication on the bridge between engineering and social sciences.
WP10	Quality assurance & quality plan	KU Leuven has lead WP10 (implementation & quality control), and has assisted in assuring the quality assurance of research methods, communication within and between WPs, documentation - particularly clarity and accessibility of public documents, appropriate use of resources and internal monitoring and evaluation of each WP.

P3 = Portugal – Universidade do Porto (UP)

The University of Porto (UP) with its 14 faculties and a management school is the second largest university in Portugal. With more than 30.000 students, a teaching staff of approximately 2.000 and over 1.200 of other staff, UP is a popular HE Institution in Portugal. The 'Tecnologias em Educação' office has for mission to give support for all users in the use ICT in the teaching/learning process, acting for faculty support and promotion of good practices related to e-learning, distance learning and continuing education.

Role in the project:

WP2	Learning framework	UP has a vast experience in learning spaces (multi-campus, blended learning…) and has brought it in this WP
WP8	Teachers' role	UP has taken the lead in this WP. Thanks to its experience with learning platforms, UP had a clear view on roles for teachers to take.

P4 = The Netherlands - De Haagse Hogeschool (HHS)

The Hague University of Applied Sciences is situated in the 'Randstad region' of the Netherlands, and focuses its education and research activities on **urban and metropolitan themes**. This focus is reflected in the **diversity of its student population**.

The HHS **profile** contains the following elements:
- Fulltime Bachelor Programmes of high quality
- Partner for innovation in professional practice
- A strong international orientation.

HHS has chosen to intensify its **research priorities on three themes**:
1. Technology and Health: Vital communities and quality of life
2. Entrepreneurship and innovation against the background of globalisation
3. Good governance for a safer world (as city of Peace and Justice)

Role in the project:

WP4	Business 2-way communication	HHS had a vast experience in open innovation and making the link to the market and has brought it in in this WP. HHS has taken the lead in this WP. HHS collaborated with RVO-Society since it was decided to integrate the deliverables of WP's 3 and 4.

WP7	Postgraduate curriculum & options for translation into undergraduate curricula	HHS has had an important role in how to translate the curriculum into undergraduate curricula, meaning a combination of (adapted) courses for undergraduates and projects and/or offering (part of) the postgraduate course as an elective to undergraduate students.

P5 = Sweden – Högskolan Väst (UW)

University West (UW) in Trollhättan (Sweden) consists of four different departments, departments of Economics and IT, Social and Behavioural Studies, Engineering Science and the department of Nursing, Health and Culture. The identity of the university is founded on a clear focus on education, work integrated learning and research of high international quality close to the working field and applicable.

Role in the project:

WP5	Projects back office	UW has a vast experience in Work Integrated Learning and has brought it in in this WP. University West has taken the lead in this WP and has collaborated with TMK in the final phase of development.
WP4	Business 2-way communication	UW and PTW (Research Team Production Technology West) in particular create methods and procedures that make research results quickly reach the industries where they are of benefit. Insights of PTW has been brought in for linking projects' results and the market.
WP8	Teachers' role	Thanks to their experience with Work Integrated Learning, UW had a clear view on the teachers' role for project work. They have brought in these insights in WP8.
WP9	Pilot projects	University West has collaborated with TMK in this Work package to make sure that what was set up in the back office was brought correctly into practice. Based upon experience in the pilot projects (WP9), the projects back office has been updated.

P6 = Belgium – Roger Van Overstraeten Society (RVO-Society)

Society Roger Van Overstraeten (RVO-Society) strives for a more compelling science communication and a more appealing science education, for young people in particular and the unlearned public in general. That way science literacy will increase and everyone will be able to relish the full potential of scientific progress and use technology for a better world.

Society Roger Van Overstraeten saw the light in the year 2000 and was named after the founder of Imec, Roger Van Overstraeten. Imec is a world-leading research centre in nano-electronics and, as is RVO-Society, headquartered in Leuven, Belgium. RVO-Society is a non for profit organisation employing 9 FTE's and has partnerships with IMEC, the Flemish government and several companies.

Role in the project:

WP3	Social sector needs	RVO-Society has designed the model to link practical work, defined by the social sector, in a qualitative and sustainable model to CSE, building on the experience in the CERA Award project. RVO-Society collaborated with HHS in the WP since it was decided to integrate the deliverables of WP's 3 and 4.

WP11-12	Dissemination and exploitation	Important task in setting up and supporting dissemination and exploitation in Belgium

Associated partners

All consortium members have involved **associated partners** (umbrella organisations, enterprises, chambers of commerce, local regional bodies, …) as a **link to the market**. These associated partners have opened up their communication channels. Via these channels students could look for existing technology and translate it for use within the social profit sector (answer to the formulated needs). Compendia of project results have been presented in the final project stage through the communications channels of the associated partners. Newly developed technology (via the projects) has been offered in this way to the market. Partners are flexible to allow other stakeholders to become involved. The initial network has already enlarged compared to the proposal stage.

Nr	Name of organisation	Type of institution	City	Country
1	De Vereniging voor Social Profit Ondernemingen - Verso vzw (Association for social profit enterprises)	Inter-sectoral employers' organisation for the social profit sector in Flanders	Brussels	Belgium
2	SEFI –European Society for Engineering Educations	non-profit organisation	Brussels	Belgium
3	CAW Federatie	non-profit umbrella organisation for the social sector	Berchem	Belgium
4	CERA	Co-operative group	Leuven	Belgium
5	SPK vzw	Regional development organisation	Turnhout	Belgium
6	VOKA Kempen	Chamber of commerce	Geel	Belgium
7	VOKA Leuven	Chamber of commerce	Leuven	Belgium
8	VOKA Health Community	Platform for innovation in the broad healthcare sector	Brussels	Belgium
9	VAPH	Flemish Agency for Disabled Persons	Brussels	Belgium
10	IENET	Community of all engineers in Belgium	Antwerp	Belgium
11	Leuven.Inc	Organisation building a bridge between knowledge centers, high-tech entrepreneurs, enterprises and their socio-economic partners	Leuven	Belgium
12	Sociale Innovatiefabriek	a networking organisation that promotes, guides and supports social and societal innovative concepts	Brussels	Belgium
13	Ordem dos Engenheiros – Northern Chapter of the Association	Engineering Professional Body	Porto	Portugal
14	APPACDM	Private Social profit organisation	Porto	Portugal
15	EPDAH	Social profit organisation	Braga	Portugal
16	GAS – Grupo de acção social	Social profit organisation	Porto	Portugal
17	Fundação Manuel António da Mota	Social profit organisation	Porto	Portugal
18	UPTEC	Science and Technology Park of University of Porto	Porto	Portugal
19	Catholic University in Porto - Centre of	Higher Education Institution	Porto	Portugal

	studies in Human Development	– Partner in Education		
20	Portuguese Society of Engineering Education	Society for Engineering Education	Coimbra	Portugal
21	GGD Zuid-Holland West	Social profit organisation	Zoetermeer	Netherlands
22	Municipalities of the Hague and Delft	Local government	Delft & The Hague	Netherlands
23	Florence	Social profit organisation	Rijswijk	Netherlands
24	Pieter van Foreest	Social profit organisation	Delft	Netherlands
25	Teknikföretagen	Employers' organisation, and a force for innovation	Stockholm	Sweden
26	NU-sjukvården	Social profit organisation	Trollhättan	Sweden

Larger worldwide network

In the course of the project strong bonds have been established with the following organisations:

The Fetzer organisation in the US, whose FAC (Advisory Council) on Engineering has a clear focus on Engineering for Society issues.

Olin College of Engineering, an engineering college near Boston in the US that **acknowledges the increasingly human-centred nature** of the engineering practice and presents itself as a new kind of engineering college that believes that engineering is a creative enterprise that begins and ends with people and their desire for a better world.

European Master Course Care and Technology (Consortium of 6 UAS in Europe), with whom the CSE consortium has taken up the engagement to organise a symposium as part of the AAATE2017. Student will be given the opportunity to share the results they obtained in their project work for the social domain.

Esclatec in Spain, a referral Special Employment Centre for the inclusion in the labour market of seriously disabled people.

CanAssist at the University of Victoria, Canada, an organisation that is working to increase independence and inclusion among people of all abilities.

CSE partners have partnered up with the E4S network on 2 occasions to organise a conference together. This link shows the participants in the conferences.

5. Plans for the Future

All participating HEI in the LLP project acknowledge there is a role for engineers in the social domain. During the course of the project they have connected with partners in the workfield (organisations, companies, research groups,…) and have established structural collaborations for the project based coursework.

All partners agree that the project based coursework should be underpinned with a taught programme, minimally the short online track. This track allows students to develop human/user centred design skills, gain empathy for vulnerable groups and learn about organisations in the social domain in order to develop apt technological end results that can sustain in the market. This was a gap in the educational structure for engineers before.

All partners organise the CSE track in English and embed it in a European and global network.

The first plan for the future is to maintain what has been started within each institution and keep up the international collaboration.

At the Engineering4Society conference and at the last partner meeting (in September 2016) each partner has expressed its intentions to keep attracting its engineering students to the CSE domain, be it as students in an online course of continuous education or as students for the diploma supplement of 'Socially Ingenious' or for the CSE track within the postgraduate course innovation entrepreneurship or as students that take a course unit that is especially designed to explore the potential of technology for the social domain.

As well each partner will keep offering its students real-life project work ideas, where students need to partner up with organisations in the field and/or vulnerable groups in order to achieve good end results. To guide students in this project work the CSE partners will minimally offer the short online track. Many institutions however enrich this content by CSE courses that use the shared resources on Feedback Fruits.

KU Leuven has offered students the opportunity to sign up for a credit contract at Thomas More. This allows KU Leuven engineering students (masters) to take the course "Socially Ingenious" at Thomas More and obtain credits.

Working in the shared context of Community Service Engineering provided the incentive to enter into Erasmus inter-institutional agreements as HEI's. These agreements allowed for staff mobility for teaching under the Erasmus programme. Partners will keep up and expand these exchanges in the future.

For the future partners have furthermore agreed to keep up the virtual mobility to add recent and relevant topics in a dynamic way to the short online. During the project's lifetime this virtual mobility has been set up in the form of online conferences/webinars with participation of students and staff of the various institutions.

Only then CSE can build capacity to find innovative solutions that can be applied in a wider range of social organisations and can detect market potential for businesses across Europe and beyond (niche markets). Companies offering technology for the social domain are often operating in niche markets and need a European and/or global scope to find enough market potential. Student's projects in particular and CSE in general make a bridge to find the needed market, thereby acting as open innovation hub for societal innovation and transformation.

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The short online track is presented on Udemy and the continuing education course of UPorto (P3). There is open access to the course for engineers worldwide. As such the short online track is offered to a wide public. Valuable feedback and insights will be gained from this broad audience.

Partners have already called upon their international networks and have invited other HEI to join the consortium as ally partners. Ally partners are higher education institutions which find interest in the four building blocks of the CSE curriculum and find ways to integrate it in their project based coursework or other parts of their engineering curricula in a similar way the LLP partners did. As such the consortium can be expanded. This idea has been taken from the IEREST project [9]that also worked with ally partners and expanded the partnership after the project's lifespan in a successful way.

Volgograd State Technical University (VSTU) is one those partners who has already actively collaborated. Also the first steps have been made for collaboration with UVic (Canada).

Contacts have been made with the management of the European Project Semester (EPS). This is a programme offered by 16 European universities in 12 countries throughout Europe to students who have completed at least two years of study. The CSE consortium sees a lot potential synergy with EPS since it also has project work in the core, is designed with engineering students in mind but open to other disciplines.

In the exploitation plan partners have also formulated the wish to create a sustainable network with dedicated universities (beyond the current CSE consortium), that are willing to propose the programme(s) to their students and to further support the implementation in the upcoming years. A budget has been estimated to install a central secretariat and agreements have been made on the tasks of this administration, complemented with a local contact person at each university.

Co-funding of the EU-commission was important to provide time and resources to work on the development of the CSE curriculum. Now that the presence of the project in the field is a fact, the project should take advantage of this position to increase its impact. Therefore, the outcomes and products of the project have to be stressed. It is important that they are shown as a joint product of the whole partnership and are able to reach and influence all stakeholders, both within the academic and industrial world, but also in the social sector.

As such we will be able to achieve the long term target as it has been formulated in the project proposal:

1. Building networks to foster CSE and innovation in the social profit sector through student projects
Through the development of new links, and strengthening of existing collaborative links, between academic, social profit and business partners within the consortium the project deliverables have resulted in the integration of similar curricula for engineers in EU academic institutions. Therefore, rather than an end in itself, CSE has provided a platform for future collaboration into the needs and challenges associated with developing innovation skills in third level education and beyond (integration into existing curricula)

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[9] http://www.ierest-project.eu/

which, in an efficient manner, have been enhanced by the relative complementary strengths of the collaborating partners.

2. Disseminating CSE outputs
The CSE website will be maintained for minimally 2 years following the end of the project. This will assist in raising awareness of the CSE project and this project in particular amongst those that search the internet for keywords such as innovation, EU, social profit sector, vulnerable groups and activities of daily living, as well as providing a record of the project details for other educational institutions and bodies involved in third level education who aim to establish similar educational modules. The same can be said about the short online track on Udemy.

3. Contribution to emerging "innovation union" across Europe
Successful development of undergraduate modules for CSE and the course in continuous education at UPorto concerned with innovation will allow partners in the CSE network to develop a critical mass with respect to expertise in innovation and research, boost our competitiveness, enable European companies to lead in the development of new technologies, to grow and assume global leadership in new growth markets, improve the quality and efficiency of public services and so contribute to creating large numbers of new quality jobs.

4. Contribution to the "attractiveness" of the engineering profession
CSE supports a positive image to the technological and engineering profession. Labour markets in European countries are in need for engineers. It has been proven that by emphasizing the social added value of technology the younger generation and female students in particular are attracted towards the profession. The educational models that have been developed have built on the experience of the example of Olin College in the US that attracted 40% of female students for engineering studies.

5. Exploitation of CSE IP
Where potential IP arises from CSE projects, this project has been in a good position to expedite the use of its results commercially. All findings have been disseminated as literature and presented at conferences and workshops by all participants. In line with this goal, one of the aims of WP5 has been to define how to build in the future upon projects end results and how previous projects and documentation can be used to enhance efficiency and effectiveness (comparable challenges, comparable target groups that can be learnt from) for the development of technology also for regular businesses.

6. CSE: Informing national and EU policy
The results of the project fed into each of the collaborating institutions' local evidence base and contribution to the development of local, national, and extra-national policy with respect to teaching of innovation, both generally and specifically in relation to technology development for social profit organisations and target groups. Part of the dissemination has been to reach an audience from local policy makers, regional authorities and representatives from national government.

6.   Contribution to EU policies

The project and the CSE consortium have contributed to the following key EU policies, objectives and priorities.

Objectives of the Lifelong Learning Programme

LLP-Obj-a: to contribute to the development of quality lifelong learning and to promote high performance, innovation and a European dimension in systems and practices in the field.

This project has constructed bridges between worlds that often stayed apart. Both engineers and society at large have benefited from joining the innovative potential of engineers to a better understanding of the social profit sector. CSE has been an eye-opener showing the potential of lifelong learning opportunities in those highly interdisciplinary areas. It has also constituted a best practice example for multi-campus blended learning based on the European Qualifications Framework for Lifelong Learning.

LLP-Obj-h: To support the development of innovative ICT-based content, services, pedagogies and practice for lifelong learning

CSE has developed an international (postgraduate) curriculum. A blended and multi-campus approach has made optimal use of state of the art ICT tools to support both on-line and off-line activities/courses and interaction with the community. E-learning platforms have been used allowing for a flexible delivery (in time and space) of learning resources and (virtual) support for face-to-face teaching, guidance for the practice part adapted to the needs of the learners in the different countries.

Specific Objectives of the Erasmus Action

ERA-SpObj-a: To support the achievement of a European Area of Higher Education

As CSE has aimed at creating a joined curriculum, it is compliant to the EAHE goals for greater compatibility and comparability of higher education systems. Real and virtual mobility for teachers and trainers has been promoted. The project has described the various components in a way that is reproducible, hence facilitating the transfer of this education initiative across Europe. CSE by being based on EFQM and the European Qualifications Framework, adheres to high quality standards.

ERA-SpObj-b: To reinforce the contribution of higher education and advanced vocational education to the process of innovation

We have designed and delivered a novel educational model which offers practical, interdisciplinary and effective learning opportunities to engineering students and students with a social and economic background across Europe. Via the practice part students have interacted with social profit organisations (starting from their needs) and have made the link with industry. This interaction explicitly meant to contribute to innovation in accordance to market needs.

Operational Objectives of the Action

ERA-OpObj-2: To improve the quality and to increase the volume of multilateral co-operation between higher education institutions in Europe

High quality results have resulted from the use of EFQM as the framework for quality management when developing the joined curriculum between 5 European universities. The multilateral dimension is clear as CSE joins expertise, best practices and opportunities for real and virtual mobility of students and teachers. The project is both multi-lateral and multi-

disciplinary and has enforced these dimensions at a European level with a high dissemination potential to other EU-countries. The consortium members use **CDIO** as the **common framework** for their joint curricula. CDIO offered a very good platform to find common grounds for the blended CSE curriculum.

ERA-OpObj-4: To improve the quality and to increase the volume of co-operation between higher education institutions and enterprises

Associated partners (enterprises, chambers of commerce and local regional bodies, …) have been involved as a link to the market per participating country. These partners have opened up their communication channels. Via these channels students could look for existing technology and translate it for use within the social profit sector (answer to the formulated needs). Via compendia of project results newly developed technology has been communicated and offered to the market.

Priorities

Priority 1: Improving the quality and relevance of higher education, including through cooperation between HEIs and the labour market

Via projects students have discovered new labour market opportunities in highly interdisciplinary areas with social innovation potential. CSE has shown a positive image of the engineering profession, stimulated inclusive engineered solutions for the social profit sector and attracted more female students. Knowledge of the social profit sector, combined with field practice and insights in the state of the art technology, has motivated engineers to tailor solutions that answer real market needs.

LLP Horizontal policies

SpecNeed: Making provision for learners with special needs, and in particular by helping to promote their integration into mainstream education and training

The project has addressed this priority in two ways. The curriculum has a course on the integration of learners with special needs into mainstream education. Good, creative, and inclusive engineering can provide tools that are needed for their optimal integration. During the course, engineers have learned about the problems and good practices in this area. Also, when choosing/developing tools for distance education particular attention has been paid to students with special needs.

Discr: Promoting equality between men and women and contributing to combating all forms of discrimination based on sex, racial or ethnic origin, religion or belief, disability, age or sexual orientation

It has been proven that by emphasizing the social added value of technology the younger generation and female students in particular are attracted towards the engineering profession. For mobility activities (physical and virtual) there has been special attention for the acquirement of international-intercultural competences based on the outcomes of the ISBI-project (Integral Student Support in Internationalisation) thus combatting discrimination.

Complementarity with other policies

ET2020: Education and Training 2020 Work Programme

CSE has answered to the strategic framework for European cooperation in education and training (ET 2020) by 1) implementing the EQF, 2) making engineers more sensitive for social cohesion and inclusion and 3) promoting creativity and innovation through the creation of a joined (postgraduate) curriculum of high quality and efficiency. It has contributed to the modernisation of the education by implementing state of the art pedagogical methods, multi-campus blended learning; virtual/real mobility.

RTD-FP: Research and development, Research Framework Programme

There is a lot of potential for "community service engineers" within the areas of research and development such as 1) Socio-economic sciences and Humanities 2) Elderly 3) e-Inclusion 4) Assistive Technology & Independent Living etc. Engineers with the right background can contribute to these research areas with a better understanding and holistic view on the problems and research areas.