

INTERNATIONALISATION AND TRANSFER OF
COOPERATIVE/DUAL STUDY MODELS
IN EUROPE

Scientific expectations, challenges and potentials



Intellectual Output 2

Study on cooperation models between partner universities and associated industrial partners

Funded by



AUTHORS

Prof. Dominique Deneux

CONTRIBUTORS

Prof. Dr. Katja Kuhn, Prof. Dr. Klaus Homann, Prof. Dr. Christian Götz, Lisa Tabea Raab, Dr. Robin Westacott, Prof. Jorma Säteri, Markku T. Leino

EDITORS

The InT#Tech Consortium

LAYOUT

Christopher Schüle, Lisa Tabea Raab

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List of abbreviations

BTS	Brevet de Technicien Supérieur 2-year Vocational Training Certificate prepared in a College
Coop-partner	Cooperative partner (Dualer Partner)
Coop-student	Cooperative student (Dualer Studendierender)
CV	Curriculum Vitae
DAAD	Deutscher Akademischer Austauschdienst German Academic Exchange Service
DHBW	Duale Hochschule Baden-Württemberg Cooperative State University Baden-Württemberg
DUT	Diplôme Universitaire de Technologie 2-year University Degree in Technology
EDUFI	Finnish National Agency for Education
ENSIAME	École nationale supérieure d'ingénieurs en Informatique Automatique, Mécanique énergétique et Electronique
EB	European Baccalaureate Diploma
EQF	European Qualification Framework
GA	Graduate Apprentices
IB	International Baccalaureate Diploma
HWU	Heriot-Watt University
RP	Reifeprüfung Diploma
TOEIC	Test of English for International Communication
TEG	Technical Expert Group

About this Publication

This publication analyses the life cycle of a cooperative student by comparing and evaluating the three different cooperative models of DHBW, ENSIAME, HWU and one non-cooperative study model (Metropolia UAS).

Considering the organizational structures and diverse models, the authors concluded that the systems are substantially different. Based on this awareness, possibilities for cooperation among the partners are identified. The lack of internationalization in some models indicates that the system of cooperative programmes needs to be modified. The principal model of the real integration of practical/on-the-job training while not neglecting the academic rigour of high quality theory education is one of the huge similarities.

This study provides an overview for other universities that would like to establish their own cooperative programmes. Third parties (especially universities) can use this study to compare their models to existing cooperative models in Europe. Additionally, the aim is also to identify potential for international cooperation among cooperative study programmes in Europe.

In all cases, the cooperative student is well educated and has excellent labour market prospects. Although the models differ in their detailed structure, the students and the companies take huge benefit from these models.

1. Introduction

IO2 is organized as follows:

So as to encompass all the aspects of a Coop-Student programme, the student journey in a Life-Cycle approach is used, like engineers usually do when they start designing a new product: each life phase is analysed separately, so as to iteratively collect all the relevant specifications. Here, for each phase of the Coop student journey, each partner was asked to describe the role of its university, the role of the Coop student and the role of the company, in the execution of the training process, from recruitment to becoming a practitioner (and possibly a Mentor).

After collection of data from the four partners, the four models were evaluated in two ways:

- 1) The models were compared two by two to highlight similarities and differences that may impact on the ability of the partners to collaborate, in the scope of internationalization of programmes.
- 2) Based on a list of criteria that universities, students and companies wish to satisfy, the performance of each model was evaluated by the other three partners (and by self, for comparison purposes), so as to foster the emergence of recommendations to universities willing to implement international Coop programmes.

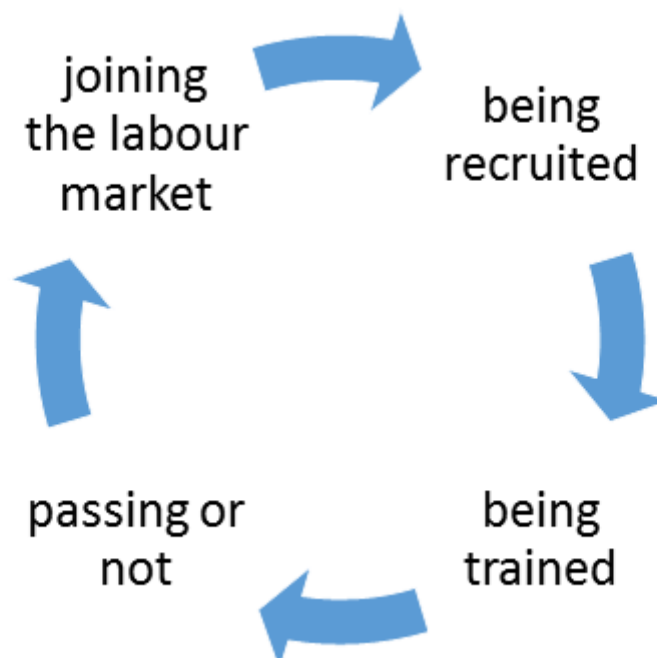
2 Life phases of a Coop-Student

Four phases of the experience of a Coop student were identified:

being recruited,

- application by candidate coop-students and selection process
- being trained
 - learn theory / learn practice / learn internationalization
 - supervision method / communication method among the 3 partners
- progression and graduation
 - assessment of teaching units, ~practice, ~sessions, ~semesters, ~graduation
- joining the labour market
 - exerting the Engineering job (optionally become a teacher or mentor in turn)

Figure 1 – Life phases of a Coop-Student



3 Six criteria that stakeholders wish to increase (based on an internal poll)

- For universities:
 - Increase the number and quality of students,
 - Increase the number of collaborations with companies,

- For companies
 - Increase appeal for new talent,
 - Increase the quality of staff and corporate knowhow

- For Coop-students
 - Increase own qualification and employability (experience),
 - Increase monetary benefit (higher salary, reduced fees)

4 Recruitment phase

4.1 DHBW Stuttgart

Each company partner recruits new employees to be trained (the Coop students) and assigns them to DHBW. The company tells DHBW how many students they will employ each year. In case DHBW has too many placement requests, DHBW can also refuse. The entire recruitment process is done by the company itself. On the DHBW homepage, the number of open placements for each company is published, so possible future students can find a company that offers placements. The companies usually start quite early with their recruitment process, i.e. more than one year in advance. They select their students by their letters of motivation, previous academic record, CV, assessment centres and interviews. Many students come directly from high school ("Abitur"). Some have also done some vocational training after school and may remain with the same employer. With extensive practical experience, it is possible to get access to DHBW without Abitur - these students have to pass an entrance examination. DHBW cannot refuse the proposed Coop-students if they fulfil the academic requirements.

Coop students are recruited through DHBW's Coop partners on an annual cycle for programmes that start in October of each year. Coop students are employed by a company which is a Coop partner of DHBW for the three-year duration of their studies. Coop students cannot apply for a place on a Coop programme directly at DHBW. Instead, they must apply for a study place with one of DHBW's Coop partners offering one or several study places per year in DHBW's programmes.

To become a Coop partner, companies need to prove that they are able to train Coop students during the six training phases throughout the three-year programme according to DHBW's rules and regulations concerning cooperative partnership and students' training.

The university has no or very limited involvement in the recruitment processes of the Coop partners. The university recruits training partners rather than the applicants themselves. There are different types of recruitment into Coop partnership:

- Companies, interested in becoming a Coop partner, apply to the Directors of Studies of the programmes they want to cooperate with. The relevant Director of Studies will then investigate the company's appropriateness and capability concerning the future training of the students on the job. The Director of Studies will then recommend the company to the university's board of councillors to accept it as a new Coop partner.
- Companies, already being a Coop partner of DHBW in a specific faculty and programme which are interested in becoming a Coop partner in additional programmes also have to apply to the relevant Director of Studies.
- Applicants, interested in a specific programme at DHBW can also suggest to a company that they become a Coop partner (bring your own Coop partner). In this case, the company will apply to the relevant department at DHBW to become a Coop partner.
- Directors of Studies actively recruit Coop partners.

There is no legal/contractual binding between the university and the Coop partners.

There is only a contractual binding between the Coop partner and the Coop student.

The contract of studies is a standard contract presented by the university.

After becoming recognised as a Coop partner at DHBW, the company recruits existing employees and new employees as future Coop students. Existing employees are selected by their employers through some internal selection process, which may be different for each employer. Applicants of this type must meet the programme minimum entry requirements either through recognised qualifications or sufficient relevant work experience and a master craftsman's diploma.

The new employee type are recruited by the employer specifically to undertake a Coop study programme, using the company's standard recruitment process. The majority of this type of applicant are school leavers, a minority will enter based on sufficient relevant work experience and master craftsman's diploma.

As long as an accredited Coop partner of the university has been granted one or more study places in a programme and each student meets the minimum entry requirements of the university, DHBW cannot refuse the enrolment of a student.

4.2 ENSIAME Valenciennes

ENSIAME is a French “Grande Ecole” (principally offering Master’s programmes and recruiting based on a competitive admission, with written and oral exams organized in every metropole in France and even in some foreign capitals). For Coop students, the recruitment is performed in three waves: end of March, middle of April and beginning of May. Each year, in Industrial engineering 25 to 50 seats are offered and about 20 to 40 in Electrical Engineering & Industrial IT.

The applicants mainly come from a 2-year program (after GCA) in technology and possess either a DUT (Diplôme Universitaire de Technologie – 2-year University Degree in Technology) or a BTS (Brevet de Technicien Supérieur – 2-year Vocational Training Certificate prepared in a College). Both degrees (DUT and BTS), at Bachelor 2 level, usually lead a student to the labour market, like after a Fachhochschule in Germany, but 20 % of DUT and 5 % of BTS are eligible, if selected, to continue their studies in a Master’s programme. About 10 % of the applicants however come from university programmes normally preparing students for competitive admission to regular Master’s level engineering programmes.

Applicants are selected based on their previous academic records, recommendations from their former institution, a CV and a motivation letter. Two professors, including the responsible person for the requested programme, analyse the applicants’ files. If both agree (accept), the applicant is invited to an interview. If they disagree, a third advisor (the director of the relevant Coop department) analyses the files and decides. Generally about 400 applications are received for each wave.

Interviews are organised using parallel juries composed of at least one professor and a partner industrial delegate (generally a human resource manager). An English Test (written and oral) is also organized. The best applicants are then selected. Once selected the applicants must find a host company. The ENSIAME informs applicants of partner companies willing to recruit Coop students and how they can apply. Another interview may then be organized at the company. If the applicant is accepted by the company, a contract is signed by the company, the Coop student and the ENSIAME. The number of admissions is not strictly fixed. There can be less students than seats, or a few more, depending on the quality of the applicants. The ENSIAME recruited 46 new Coop students in industrial engineering and 30 in Electrical Engineering in 2018-19.

4.3 HWU Edinburgh

Graduate Apprentices (GAs) are recruited on an annual cycle for programmes that start in September of each year. Funding is through Skills Development Scotland and eligibility for this funding is essential to recruitment to the programmes. Primarily, GAs are employees of a company who become students on a Graduate Apprenticeship programme run by the university. As such, the university has very limited involvement in their recruitment – the university recruits employer partners rather than the apprentices themselves. There are two types of recruitment onto the programmes: existing employees and new employees. At the moment there is approximately a 50:50 split between these two types.

Existing employees are recommended to the university by their employers through some internal selection process, which may be different for each employer. Applicants of this type must meet the programme minimum entry requirements either through recognised qualifications or sufficient relevant work experience. The decision on entry is made by the Programme Director of the relevant programme.

The new employee type are recruited by the employer specifically to undertake a Graduate Apprenticeship programme, using the company's standard recruitment process. Many of this type of applicant are school leavers or have recently completed a programme at a Further Education College. They apply for the job at the company, and as part of the recruitment process, short-listed candidates will have their qualifications (and experience) approved by the university. The number of applications per position can range from 10 to 120 depending on the sector and the individual employer. The Programme Director for the relevant programme of study makes all decisions on whether a potential GA meets the minimum entry requirements. Where

the application is based on relevant work experience, this may also involve an interview and the examination of supporting work-based evidence.

4.4 Metropolia UAS

There are no Coop students in Finland, so in this output we are discussing only traditional students.

Mainly recruiting happens by entrance examination twice a year, spring and autumn.

Eligibility to apply for Bachelor's degree programmes in UAS depends on having completed at least one of the following:

- the Finnish general upper secondary school syllabus and/or the matriculation examination;
- an International Baccalaureate (IB) Diploma;
- a European Baccalaureate (EB) Diploma;
- Reifeprüfung (RP) Diploma;
- a Finnish vocational upper secondary qualification with a scope of 120 credit units or 180 credit points, or a comparable previous Finnish vocational qualification with a minimum scope of 80 credit units;
- a Finnish post-secondary or higher vocational level diploma;
- a Finnish vocational upper secondary qualification or a further or specialist vocational qualification as a competence-based qualification, or a comparable previous qualification; or
- a foreign qualification that provides eligibility for higher education studies in the awarding country

Recruitment happens the same way throughout Finland. There is an [Opintopolku.fi](https://opintopolku.fi) website ([Studyinfo.fi](https://studyinfo.fi)). It is the official and up-to-date website with all the information about study programmes leading to a degree in Finland. The Studyinfo portal is maintained by the Finnish National Agency for Education (EDUFI). Finnish educational

institutions and higher education institutions maintain their own study programme information on Studyinfo.

Application to Metropolia's degree programmes takes place online through a system of joint application. The joint application is a national procedure that Finnish higher education institutions use when selecting new degree students. Joint application means that you can apply with one application up to 6 higher education degree programmes by filling the same application form but you can submit only one joint application per application term (spring / autumn).

The joint application is submitted online at Studyinfo.fi which also includes information on different qualifications, about study in educational institutions in Finland and different study options.

After submitting an eligible application an invitation to an entrance examination will be sent via e-mail approximately one week prior to the entrance examination at the latest.

Selection of a student is conditional until the Admission Services has checked the documents influencing the selection. A student selection may be revoked if the applicant does not deliver the required documents within the deadline or if it is found that the applicant has submitted false information.

Eligibility to apply for Master's degree programmes in UAS is having a Bachelor degree in the same subject and a minimum of two years of work experience; in many programmes the actual amount of work experience of a students is greater than 10 years. This is our opportunity to build professional networks across organizations. They are also recruited by entrance examination.

5 Training phase

5.1 DHBW Stuttgart

Our programmes start after high school graduation (“Abitur”) and end at Bachelor level. All programmes have a 3 year duration, where 50 % of the time is spent in the university and 50 % in a partner company. The rhythm of alternation is semester wise, i.e.: 12 consecutive weeks per semester in the university, the rest of the time in the company. In other words, the students spend approximately 6 months (24 weeks) in the university and 28 weeks at the cooperative partner. The students have at least 20 days of holidays which can only be taken during the periods they are at the cooperative partner. The cooperative state university provides only cooperative programmes. Like in regular programmes at “non-cooperative” universities, students learn maths and physics first, then learn how to apply them in concrete situations. In higher semesters, the requirement for mathematical or methodological tools is induced by the problems to be solved, inspired from real work situations (inverse pedagogy, problem-based learning).

5.1.1 Theory

Theory is taught in the university throughout the 3 years of the programme. Theory is divided into three areas:

- (1) core modules (45%), like maths, mechanics, electronics, thermodynamics, design etc., which are compulsory for every DHBW site in one degree programme (e.g. mechanical engineering). The core modules are identical in all 9 DHBW university sites.
- (2) General profile modules (25%), which are DHBW-wide described modules but specific for each major subject (e.g. vehicle engineering). The general profile

modules are also identical in all DHBW university sites, but specific for each major.

(3) local profile or specialty modules (25%) described locally at each DHBW site for each major subject. The local profile modules, however, are individual modules defined locally in order to meet the requirements of the local cooperative partners.

From a content point of view, most modules are scientific-technical. There are subject specific modules (like mechanics or design in mechanical engineering) and also comprehensive modules (like electricity, computer science or maths in mechanical engineering). Some modules are from the humanities field, like quality management, business management, business English, social work, management in Asia. Most modules are compulsory, some can be chosen by the students, some are voluntary. In the 3rd year, students have to do one or two research projects and write a project report for each that counts for 10 credits.

Every teaching module involves a variable amount of time dedicated to new theoretical learning (students learn new theoretical knowledge from a teacher), exercises (students apply theory to typical problems with significant help from a teacher) and labs (students are assessed on their ability to solve real problems on industry-like educational equipment: machines, software). In general, the required time per credit point is 25 hours, where 9 hours are taught and supervised by teachers; the other 16 hours are self-study and are the responsibility of the students. About 40% of all classes are taught by professional internal teachers, 60% of the classes are taught by external

experts (being either professional teachers from other universities or experts from companies).

The role of teachers is to teach, supervise exercises, design (specify, implement) and execute innovative training labs, devise assessment material (written exam, individual project topic), grade assessment by due date (using a mark in the range 1 to 5). The duration of a unit face-to-face hour is 45 minutes; in most cases at least 2 hours are given per face-to-face session for theory and exercises, 3 hours for a lab. Written exams are all written in one examination week (the 12th semester week). The 12-week-period forms a semester. Two semesters form a year. Each module is given only once per year.

5.1.2 Practice

In their first year, the students learn the basic skills every mechanical engineer has to go through like drilling, welding, moulding, etc. In the second year, the students will already work on one or two specific projects (6 months) on which they also have to write a scientific report. In the third year, they will do another 2-month project followed by the bachelor thesis.

These are the guidelines for the execution of practice phases at the DHBW:

1. The practice phases are planned thoroughly. During their studies, the students acquire the necessary professional knowledge by completing a range tasks in various departments.

2. The company departments are informed early about the time and duration of the practice phases, about the knowledge level of the students and the requirements of the DHBW.
3. The company departments provide qualified supervision by a graduate engineer and sufficient time for the guidance of the student.
4. The company departments clearly communicate the tasks and the project goals to the student. Self-reliance of the student is required.
5. The tasks and projects given to the student will help him or her to meet the personal and professional development goals. The tasks and projects performed by the student should be valuable for internal and external customers.
6. By their collaboration, students get insights into business processes. The tasks they work on give opportunities to show their own initiative, approaches and creativity. The complexity and responsibility of the tasks to be solved increases from 1st year to 3rd year. This offers the student chances to gain capacity to act and the ability for employment.
7. The students have a permanent coach for the entire duration of their studies. The students will get feedback from him or her in regular bilateral meetings.
8. If possible, the students spend one of their practice phases abroad. The tasks given to them abroad should ideally complement the contents of their domestic practice

phases. A special emphasis is laid on the acquisition of language and intercultural competencies.

9. The students are integrated into teams and thus experience work socialisation. Beside the acquisition of professional and methodical competencies they learn internal company rules and standards in order to be successful in their jobs and to learn oral expression and communication skills within their companies.
10. The students are also coached by their supervisor in their last year of studies. They will get help in finding a good bachelor thesis. Additionally, the coach will also help to choose the first job within the company after the end of the studies because of their knowledge of the range of business experiences and of the personality and qualifications of the student. This ensures that the first posting of the student will be to the benefit of both the company and the student.

5.1.3 Internationalization

There is very long practical phase in the second year, so that the student can go abroad within the company. This is encouraged by the company and the university, but it is not mandatory.

5.1.4 Supervision

Day to day supervision is the responsibility of the company. The supervisor in the specific department where the practice phase is done is the main character for this role. The coach can also be contacted at any time.

5.1.5 Communication

There are three levels of communication:

Student-Company: On a day-to-day basis, the student is in direct contact with the team supervisor. On the other hand, there are regular meetings between the student and the company coach mentioned above. These meetings are organized by the companies alone.

Student-University: The main contact person in the university is the course administrator. The course administrators are responsible for the organization of the theory phases and are also the contact persons for the students where any problems can be solved.

University-Company: The course administrators are regularly in contact with the company coaches. Once per year, there is a company coach meeting, where all company coaches and all university professors meet. If any problems with the student occur, the course administrator and the company coach work together to solve the problem.

5.2 ENSIAME Valenciennes

Our programmes end at Master 2 level and their duration is 3 years, where 50 % of the time is spent in the university and 50 % in a partner company. The rhythm of alternation is half-week / half-week, i.e.: from Monday to Wednesday noon in one place and from Thursday to Saturday noon in the other place. When the university is closed (usually the Christmas holiday for 2 weeks, summer holiday for 4 weeks, Winter holiday for 1 week), Coop-students are full-time in the company, unless they request leave, like any employee. In regular programmes, students learn maths and physics first, then learn how to apply them in concrete situations. But in Coop programmes, the student's background is more technological than scientific and the requirement for mathematical or scientific methodological tools is induced by the problems to be solved, inspired by real work situations (inverse pedagogy, problem-based learning).

5.2.1 Theory

Theory is taught in the university during the 3 years of the programme. Theory is divided into three areas:

- (1) sciences and technologies (45%), like maths, electronics, thermodynamics, etc.
- (2) Specialty (30%), like storage management or enterprise resource planning in industrial engineering, supervisory control and manufacturing execution in Electrical Engineering & Industrial IT, etc.
- (3) Humanities (25%), like oral expression, foreign languages, general accounting, etc.

Every teaching module involves a variable amount of time dedicated to the theoretical course (students learn new theoretical knowledge from a teacher), exercises (students apply theory to typical problems with significant help from a teacher) and labs (students

are assessed on their ability to solve real problems on industry-like educational equipment: machines, software). The courses in science and technology are taught and supervised by professional teachers from our Institute. Some courses in engineering methods and humanities (except foreign languages) are taught by expert practitioners. The role of teachers is to teach, supervise exercises, design (specify, implement) and execute innovative training labs, create assessment material (written or oral exam, individual project topic), grade the assessments by the due date (by providing a mark out of 20), and attend the semester jury. The duration of a unit face-to-face session is 1.5 hours for theory and exercises and 3 hours for a lab. Several sessions can occur in the same week. Weeks are gathered in periods (most of the unit courses are achieved in one period). Two periods form a semester. Two semesters form a year. Each session is given only once per year.

5.2.2 Practice

Vocational practice is executed under the supervision of a graduate engineer employed by the company. A teacher from ENSIAME is assigned as a mentor to each Coop student, according to his own expertise, in relation to the company's activity. The goal of the student is generally to be able to execute all the tasks that their supervisor is responsible for. Each professor generally mentors 2 Coop students per year of the programme, i.e.: 6 Coop-students at any one time. Practice is 100 % executed within the perimeter of the company, which can sometimes induce prescribed work at the company's customers or suppliers. The normal progression of a Coop student, from the status of technician (just after recruitment) to graduate engineer (just after graduation), follows a standard process. During the first year, the student is expected to discover the work environment: missions, organization, resources, technical tasks performed. As a skilled technician, the student should be able to quickly learn the how-

to-do of a to-do list assigned by the supervisor, and should become a trustworthy technical employee. During the second year, the student should develop the ability to gain an overview of technical tasks, so as to organize (plan, control) the tasks to be performed. The student should also be able to analyse and improve the tasks, explain them to technical staff, and check their sound execution. The students' skills not only deal with "how-to?" but also with the "when?" and "why?" issues. During the last year, the student should develop the ability to manage several projects in parallel, and deal with the financial aspects, so as to improve managerial skills, including management of resources (staff and budget). The role of the Coop student is to execute more and more demanding tasks. The role of the company mentor is to plan and control the tasks, allocate sufficient resources to the student, organize the work so that no important skill is forgotten. The role of the university is to check that the environment is consistent with the student's professional expectations, that the suggested tasks are consistent with each other and that they are adequate in terms of complexity and available resources. If necessary, the university mentor will recommend some readings to extend or anticipate the acquisition of sufficient theory.

5.2.3 Internationalization

It is mandatory for our Coop students to gain experience at work, in their specialty and abroad. A dedicated period of 12 weeks is allocated during the 8th Semester (from May to July). The Coop students keep their salary from their employer during this half semester. In large companies possessing foreign subsidiaries, the internship is just a temporary transfer within the group. In small companies where no foreign subsidiary can support a placement, the Coop student has to find their own placement, or attend a partner in the academic network of the ENSIAME.

5.2.4 Supervision

Day to day supervision is the responsibility of the company. The mentor is the main character of this role, although the role is often shared with a group of skilled practitioners. Sampled supervision is performed by the university supervisor, who has the obligation to visit the apprentice in the company at least twice a year. The first visit should occur not later than three weeks after the recruitment of the Coop student.

5.2.5 Communication

The Coop student is responsible for ensuring a good level of communication with the company and the university. In particular, the Coop student is responsible for organizing regular meetings in the company (finding a relevant and possible date, booking a meeting room, preparing the meeting). Between two meetings in the company, a meeting is organized for all the Coop students and their respective mentors within the ENSIAME. The manager of Coop education takes this opportunity to give up-to-date information about the school and communicate the requirements of the next period, regarding the training program in progress. During every meeting in the university, an oral presentation is also done by the Coop student in front of a jury. During every meeting in the company, all the aspects of the work carried out by the student are checked: theory assimilation, behaviour and performance in the company, academic results, TOEIC score, work performed so far and work to be done before the next meeting, advice from the mentor and from the university supervisor. A standard IT tool called MySup (<https://www.mysup.fr/>), developed by the regional Coop Training Centre (Formasup) for all the participating universities, is used to record the meetings

in the companies as well as all the electronic messages exchanged by the stakeholders.

5.3 HWU Edinburgh

The Graduate Apprenticeship programmes are to SCQF level 10 (BEng(Hons)) and SCQF level 11 (Masters), which are 4 and 5 years, respectively. The Learning Outcomes for each programme are common across Scotland and are devised by a Technical Expert Group (TEG) organised by Skills Development Scotland (SDS). The TEG is comprised of relevant employer experts, relevant academics from a number of universities and the relevant professional body. Once the Outcome Framework for a subject is completed, universities bid for funding to deliver the programme through competitive tender. A successful bid provides funding for a fixed cohort size for the full 4 years of the programme. Heriot-Watt delivers the following programmes (with year of first delivery): Engineering: Design and Manufacture (2017), IT: Software Development (2017), IT Management for Business (2017), Civil Engineering (2018), Construction and the Built Environment (2018), Business Management (2018), Engineering: Instrumentation, Measurement and Control (2019) and Data Science (2019), all of which are to SCQF level 10.

There is no upper age limit on who can become a Graduate Apprentice, the only restrictions are that the apprentice must be older than 16 (18 for some subject where there is a significant safety element to the job role) and living and working in Scotland for the duration of the apprenticeship.

There are three types of Graduate Apprentice, each type brings its own challenge to the organisation of the programme:

- those who have just left high school
 - o are making the transition from one level of education to another as well as, in many cases, starting their first serious employment on their career path; they require more support than an individual who is trying to do only one of these;

- their programme and work can be tailored to ensure the programme works;
- those who have completed a lower level of apprenticeship (Foundation or Modern)
 - have work experience and already have experience of post-high school education, but a Graduate Apprenticeship is very different to a Modern or Foundation Apprenticeship because of the academic rigour required for a degree; the individual and/or their employer is not necessarily prepared for this or the inter-dependency of the theory and practice parts;
 - if their work contract remains similar to their previous apprenticeship contract, both the work and study can be accommodated;
- those who have substantial work experience
 - have been out of education at any level for a long time and are likely to be employed in a role with significant responsibility. They require significant support with regard to study skills, confidence in education, workload management and managing expectations;
 - are unlikely to have any flexibility around the requirements of their job, so matching their learning (theory) with activities in the workplace (practice) is a challenge for them and the university.

5.3.1 Theory

Graduate Apprenticeship programmes at Heriot-Watt are weekly release from the workplace to attend the university; other universities have different delivery models. This means that the GAs attend the university one day per week, for most of the programmes, and the workplace for the remainder of the week. The day of attendance is usually a Friday or a Monday, depending on the programme and year of study.

Attendance at university is formal only during the traditional academic semesters (September to December and January to May), but informal and ad hoc support sessions are provided during the summer period on the same day of the week. The teaching at the university is delivered by traditional academics as part of their teaching allocation or by teaching staff hired specifically to deliver teaching on GA programmes.

Around 25% of each programme is business or workplace skills and behaviours related, while the remainder is directly related to the subject of the degree.

Some of the theory is delivered by distance learning or directed learning, so it is undertaken by the student in the workplace. This gives the student the opportunity to align the learned theory with activities in the workplace, and identify evidence from the workplace that can be used for assessment.

5.3.2 Practice

The vast majority of practice happens in the workplace. The few occasions for which this is not the case arise because some element of the outcome framework requires equipment not available in the workplace of an individual apprentice, and thus this is undertaken at the university in a simulated environment.

Practice means different things in different subject areas. For business management, practice is about completing workplace activities or reflecting on these activities. For engineering, it can also be demonstrating competence in the use of specialised equipment. Practice also means different things depending on the age and experience of the apprentice.

The workplace activities are supported by a Work-Based Mentor who is an established employee of the employing company. The role of the Work-Based Mentor depends on the type of apprentice (school leaver, apprentice continuation, established employee), but their overall role is to ensure that each apprentice has the opportunity, where resource within the employer allows, to demonstrate learning of theory (applying their knowledge of theory) or practice in the workplace. For the school leaver type it is possible to plan workplace activities to align with the theory learned in the classroom; for the other two types, this is more difficult because they are in established job roles. For the latter two cases, the role of the Work-Based Mentor becomes more about supporting their apprentice to reflect on their workplace activities to identify where they are demonstrating their knowledge and new learning. In all cases, any workplace activity that will be used for assessment must be agreed with the programme delivery team at the university as suitable for assessment (validity, level, breadth and depth). Each year of the programme should contain a reflective summary so that each apprentice can demonstrate the how, when, why, where of the application of their learning.

5.3.3 Supervision

Day to day supervision in the workplace is the responsibility of the employer through the Work-Based Mentor. The university tutor must meet formally with the apprentice and their work-based mentor 4 times per year, preferably but not necessarily, in the workplace to update on progress against the agreed outcomes. Informal conversation involving all three people (or any two of the three) can happen at any time by e-mail, phone, Skype etc.

5.3.4 Internationalization

No Graduate Apprentices currently go abroad.

5.3.5 Communication

There is joint responsibility between the apprentice and the university for communication. Communication takes several forms: between the university (the tutor) and the individual apprentice; between the university (the tutor) and the Work-Based Mentor; and between the University (Relationship Manager) and the employer (HR representative or L&D Manager). This triumvirate of partnerships ensures that the needs of all three groups (apprentice, employer and university) are met.

The apprentice, tutor and work-based mentor must meet formally 4 times per year to discuss progress and barriers that may prevent the completion of the agreed outcomes.

5.4 Metropolia UAS

Metropolia's Graduate programmes are to European Qualification Framework, EQF level 7 (BEng) and EQF level 8 (MEng).

Bachelor of Engineering programme duration is 4 years (240 ECTS). About 80 % of the time is spent in the university and 20 % in a company. There are projects, which are devised and supported by companies, but during these, they are not working at companies.

Metropolia UAS Master of Engineering (60 ECTS) program is a 2 -year program that allows an individual to study alongside a full-time job. The average student in the

program is a 30 - 40 years old engineer or team leader, who wants to make a career leap from engineering toward management positions.

5.4.1 Theory

Lecturers can arrange their courses in order to achieve the best result. There are some limitations, but teachers have quite a high level of independence in how they execute their pedagogical view. Metropolia encourages staff to think out of the box, when speaking about new teaching methods. What is important is an approved curriculum, which is followed in studies leading to a degree. The learning outcomes, content and assessment criteria related to learning, as well as the scope of studies, are defined in the study modules and courses.

A credit point is defined in Metropolia as an average of 27 hours of work performed by the student for the completion of a course, including all the work required for the course. This includes 10 to 12 hours (of 45 mins) of contact teaching in classroom or laboratory. Attendance is generally not mandatory. About 80 % of all classes are taught by university staff, 20 % of the classes are taught by external experts from companies.

The study modules of Engineering (BEng) programmes are the following:

- compulsory studies of degree programme 110 ECTS (math, physics, languages, general engineering skills)
- compulsory studies of learner's track 40 ECTS (basic studies of the selected track)
- one optional study module of the track 15 ECTS
- one totally elective study module 15 ECTS
- advanced professional skills 15 ECTS
- two internship periods 30 ECTS (20 weeks of work at a company)

- bachelor thesis 15 ECTS

The studies of the first year, and half of the second year studies are compulsory and common to all the students in the degree programme. The learner's track is selected at the end of the first semester of study. In building services engineering there are three options: HVAC Design, HVAC Contracting and Facility Management (only available in blended studies aimed at adult learners). Half of the studies of the second year are compulsory and common to all the students within the track.

During the last two years of study the students have to complete four compulsory elective study modules of the major and one optional module. In addition, the student has to complete one elective study module. The students also have to complete two internship periods of 10 weeks and finally carry out a bachelor thesis on a topic related to their major.

The students may relatively freely plan the timing of their studies of the spring periods of the third and fourth year, and period 2 in the fourth year based on the timing of the optional and elective modules, work placement and international exchange.

The Master's degree consists of Professional Studies (30 ECTS credits) and the Master's thesis project (30 ECTS credits). Courses consist of lectures, laboratory work, workshops, assignments, and projects as well as independent studying.

Courses are provided on the basis of the objectives and contents of the study modules or courses. Students are entitled and obliged to participate in the different study forms included in the courses so as to achieve the objectives of the courses.

Both the lecturer and the student are obliged to give and receive feedback in a constructive and timely manner. Feedback collected on learning, the learning environment and teaching is used to develop education activities.

5.4.2 Practice

The work placement periods (30 ECTS, 20 working weeks) may be carried out during the study periods of the third or fourth year, or alternatively during the summer periods between the semesters. During the internship the student is generally employed (90 %). The student and company makes a contract together; the university has nothing to do with it. The amount of salary is a matter between the student and the company.

During practical training the student will become familiar with the essential working tasks in the relevant field of study, will develop professional competence and will be able to apply the learned knowledge and skills in working life.

All practical training included in the degree will be implemented as professional training within the student's own degree programme. At the beginning of their studies the students work in practical work tasks in their field of study (Practical training 1), and later as their professional competence increases, they move on to more demanding practical training (Practical training 2). The aim of the practical training is to familiarize the students with the work tasks and working environment within the degree programme, and to guide them to engineering tasks in their field of study.

In the Degree Programme in Building Services Engineering the practical training can include use and maintenance tasks, contracting and monitoring tasks, as well as working as an expert in tasks related to management, research, product development,

design and project management. The practical training period will provide the students with guidance in performing these tasks.

Students have also opportunity to participate in on the job-learning period (15 ECTS). It is an optional study module.

MINNO is Metropolia's Innovation project (10 ECTS). At its best, an innovation project results in a high-quality outcome that is beneficial both to the students working on it and to the professional collaborators as well, the result gaining positive visibility. Innovation project results are also good examples and demonstrations of skills and cooperation between companies and the University.

Students normally undertake their Bachelor thesis (15 ECTS) in the company, where the subject of the thesis may be defined by the company.

Although the Metropolia model is not a co-operative study model, engineering students complete at least 55 of the total of 240 ECTS in company related studies (Innovation Project and Thesis) and work placement. In addition, most of the 3rd and 4th year students are working at part time jobs in companies. The companies are usually the same as those for the work placement period, and the topics of the Innovation and Thesis projects often come from the same companies. From the companies point of view, this is an important part of their recruitment process.

5.4.3 Internationalization

Metropolia encourages all degree students to complete a part of their studies/work placements abroad. Metropolia has 490 active partner institutions in Europe, North and South America, Asia, Africa and Oceania. In practice, around 10 % of the students take part in international student exchange or training.

5.4.4 Supervision

The Placement Coordinator is responsible for the arrangement of work placement periods. However, it is the student's responsibility to search and acquire the work placement. Metropolia has its own Internet Placement application. Through this application the Placement Coordinator manages the placement periods. Students have to apply for the placement periods there. They also have to store their diary, reports, learning task etc. in this application. Day to day supervision is the responsibility of the company.

5.4.5 Communication

The student has the biggest role in communication. They are in charge of their own placement period. The student and company have normal communication methods: phone, email, WhatsApp and so on.

6 Passing teaching units, teaching sessions and semesters, graduating

6.1 DHBW Stuttgart

Theory is assessed by the teacher who delivered the course, exercises and labs by points. In case there are several teachers involved in the module, their assessment points are weighted according to the module description and added up to give an overall percentage. Each module (theory) is evaluated using a grade from 1.0 to 5.0 (1.0 = best, 5.0 = worst). The grade must be 4.0 or better to pass the module. A grade of 4.0 is usually given if 50% of the overall percentage is achieved. There is no second chance to increase the grade if the grade is better than 4.0. If a module is failed (i.e. a grade worse than 4.0) it can be repeated once. If it is failed again, the student has once per academic year a 3rd chance: in this case the test is replaced by an oral exam and can lead to the grades 4.0 (=passed) or 5.0 (=not passed). If a student runs out of opportunities to be assessed in a module, the student is automatically withdrawn from the programme.

Practice is evaluated in the following way: The students have to write a report about each practice phase. The company supervisor suggests a grade for this report. The university examination board (which consists of all professors) has to confirm this grade. After the 2nd academic year there is an oral dissertation that takes place at the university which each student has to undergo. In this oral dissertation, each student has to present one of their projects from the last year, to answer questions, and to answer general questions about practice problems. In the 3rd academic year, the Bachelor's thesis forms a large part of the practice phase. This thesis is evaluated by the company supervisor (50%) and a university supervisor (50%) which can be a

professor or a graduated person from a company (but not the company the student works for and not a competitor). If the grades differ by more than 1.0 (on the scale of 1.0 to 5.0) a third independent person will grade the thesis. There is no thesis defence nor oral exam to the Bachelor thesis. If any of the reports are failed (i.e. a grade worse than 4.0) it can be repeated once. If it is failed again, the student is automatically withdrawn from the programme.

The evaluation of every module is given in grades (1.0 to 5.0, where 1.0 is 100% and 4.0 is 50% of the overall requirements fulfilled). A module is passed if it has a grade of 4.0 or better. If it is failed, it can be repeated once. If it is failed again, the student has once (i.e. in one module) per academic year another chance to repeat it in an oral exam. Each module has to be passed in the end. If all modules are passed, the student automatically proceeds to the next semester. If one module is failed even after the oral exam, the student is automatically withdrawn from the programme.

Graduation is granted if all modules are passed. The overall grade is calculated out of the module grades, weighted by their ECTS points.

6.2 ENSIAME Valenciennes

The evaluation of every teaching unit is based on an average marks (out of 20), taking into account one or more assessments. The teaching units are gathered and averaged in areas (Sciences and technology, Specialty, Humanities). The average mark in every area should be more than 10 out of 20. The results for each teaching period, especially during the first period of the first year, are scrutinized by the programme managers. In case of poor results, a Coop student is summoned to an individual interview in the university so as to determine the causes (lack of engagement, lack of organization, financial or personal difficulties) and sometimes prescribed an appropriate remedy (group & individual coaching by an industrial expert in human resources management). A jury is organized every semester, so as to validate (or not) the performance of each Coop student. The jury is composed of academic members only (all the teachers involved in the programme), but results are also shared with the company mentors. Even semester juries are more important than odd semester juries, because they determine the ability for the Coop student to progress to the next year of the programme, to repeat the current year (in totality or partially), or even to be reoriented. Between the first and second year, it is required to obtain a TOEIC score over 700, whatever the quality of the other academic or industrial results.

Graduation is decided by a jury composed of the director, the academic managers of the Coop programs and industrial delegates (members of the board of ENSIAME). Graduation is granted if all the semesters are validated, if all the credits have been collected, if the minimum amount of 12 weeks has been spent abroad in a situation of work in the prepared training specialty, and if the TOEIC score is higher than 820. There is an additional opportunity to take the TOEIC test, but ENSIAME pays only for the first attempt. The role of the university is to check the academic level of the Coop

student. The role of the industrial partners is to check the practical skills obtained and the employability of the Coop student. If only the TOEIC score is failed, the Coop student may apply for graduation at a later time, after reaching the required level.

Theory is assessed by the teacher who gave the course, exercises and labs. In case there are several teachers involved in the teaching unit, the referent person is generally the teacher responsible for the course. Each teaching unit (theory) is evaluated by a mark out of 20. The mark should be more than 10 out of 20 to pass the course unit. There is no second chance to increase the mark.

Practice is evaluated by the company mentor (day-to-day performance plus periodic report), by the university supervisor (periodic report only) and by a jury composed of several teachers and industrial delegates (1 oral dissertation organized each semester). The company mentor's opinion is weighted 50 % (30 % performance, 20 % report). The university supervisor's opinion is weighted 20 %. The oral dissertation is weighted 30 %. If any opinion is less than 10 out of 20, the practice is not validated. If the weighted sum of all opinions is less than 12 out of 20, the practice is not validated either. Only the report and the oral dissertation can be repeated to achieve the pass mark.

6.3 HWU Edinburgh

Assessment can be on either theory or practice. Assessment of theory can be in any of the traditional forms of assessment (examination, class test, on-line, exercises). Assessment of practice can be by observation or other evidence such as oral presentation or report on work undertaken in the workplace that is relevant to the learning outcomes.

All assessment is approved by the university tutor. The Work-Based Mentor or other representative of the employer can be involved in assessment if:

- they are providing a contribution to the final mark for a piece of assessment that is not the deciding factor over pass or fail in a course
- they have undertaken Approved Assessor status at the university, in which case they can be solely responsible for a piece of assessment, with overall scrutiny from the university.

Each course unit of the programme is assessed based on a total mark of 100. This total can arise based on a contribution from one or more assessments, where the weighting of each assessment is clearly defined to the apprentice. A minimum score of 40 is required in each course. For each course with a final score of less than 40, an apprentice is allowed an additional opportunity as long as this is completed before the end of the academic year (end of August). Each apprentice must complete the prescribed 60 ECTS credits (made up from 7.5 and 15 credit course units) with each course unit scored above 40 in order to progress to the next stage. A formal decision on progression to the next stage is made by a formal Board of Examiners made up of all the teachers involved in the delivery of the programme.

Apprentices who are struggling are identified through poor performance, lack of engagement or attendance and are approached by their tutor. Where the university can support the individual a plan is put in place. Where support from the employer is required this is discussed in the presence of the apprentice, with their permission.

Graduation is decided by a Board of Examiners for each apprentice reaching the end of year 4 of the programme. To graduate an apprentice must obtain 240 ECTS credits and the average score in the courses in years 3 and 4 must be greater than 40 out of 100. A classification is placed on the score in bands of 10 from 40 (Third Class) to 70 (First Class).

6.4 Metropolia UAS

The teacher who gave the course, exercises and labs, assesses theory. Assessment is based on the competence goals and assessment criteria for a course or study module. The assessment criteria for courses, and the way grades are determined, are described in detail in the implementation plans of the courses, and they will be discussed with the students at the start of each course. A course is considered to be passed only after all compulsory parts of the implementation have been passed. Typically, teachers require completion of 40 % of the assessment criteria to pass the course.

Courses are either assessed on a competence scale of excellent (5), very good (4), good (3), very satisfactory (2), satisfactory (1) and fail (0), or for a justified reason with a grade of pass/fail. The assessment criteria for a 'pass' grade are the same as the assessment criteria for a 'satisfactory' (1) grade, which is that the student has achieved the core competence. The grading scale chosen for the course or a 'pass' grade cannot be changed or removed.

Practice is evaluated by the company mentor (day-to-day performance plus periodic report), with the university supervisor. The students also evaluate also themselves.

Lecturers must record the course credits for each academic year in the study credit register by 31 July. The number of credit points from a course cannot be changed after the completed course has been recorded in the register. There are no formal requirements for the student to pass to the next study year. However, some advanced courses have a prerequisite of completion of the relevant basic courses.

There are two opportunities to retake the exam for a failed course and there is one opportunity to raise the grade of a passed course at places and dates specified for the course. The same assessment criteria and principles are followed in retakes and

attempts to raise grades as those observed during the original course assessment. The opportunity to retake an exam or raise a grade does not apply to course components, unless this has been specifically stated in the course implementation plan.

Students graduate from Metropolia when they have completed the mandatory and elective studies of the degree programme, or work placement and thesis, and gained the 240 ECTS required for graduation. There are no oral examinations by a jury, or final tests before graduation. The degree must be completed in 4+1 years, but discretionary extension may be given, for example for health reasons.

Metropolia provides its graduates with a certificate of the degree they have completed and an appendix detailing the courses performed. Degree certificates are granted and signed by the President. The Dean responsible for the degree programme signs the appendices to the degree certificate.

7 Joining the labour market

7.1 DHBW Stuttgart

In 2012, DHBW started a system of alumni surveys to evaluate their cooperative study programmes. There are two common careers after completing the study programme at DHBW:

- Most of the students do not need to apply for a job, because they have already an open-ended and full-time contract at their training company before completing their study programme (71%)
- Some of the students decide to do a Master's programme, only 6% because of the lack of an adequate job offer

Most of the students who leave their Coop partner find a job after two months (median). More than half of all Coop students gain a salary of more than 40.000 Euro. After five years, 96% of all students have an open-ended and full-time contract at a company. The salaries rise quickly. A third of all students decide to continue with an international experience.

Development:

- More students leave their original company as they gain experience.
- A smaller number have to stay at their company for some years after graduation.
- Most of the companies want their student(s) to stay.
- Occasionally, Coop students will in turn become external teachers at DHBW.

What makes cooperative students attractive/ employable?

Advantages for employers:

- Tailor-made students
- Students know the basics of their Coop company
- Chance to recruit very young people who quickly adopt corporate identity
- Practical experience
- Influence of their teaching

Advantages for alumni:

- Salary
- Practical experience
- Network

Disadvantage: - In some cases, limitation of their academic opportunities

7.2 ENSIAME Valenciennes

At the end of the Coop training contract, leaving the partner company is very common. On average, 57% of Coop students leave the company that trained them in higher education. The retention rates are of the order of 40%. The determining factors of this retention rate, are the sector, the size of the company, the economical conjuncture, the existence, sometimes, of a social plan within the company. It is generally observed that the company mentors would gladly work with the Coop student they trained, but the company cannot afford to recruit a new employee, and prefers hiring a new Coop student. Moreover, Coop students who leave their training company, in a long-term view, get higher salary increases than Coop students who stay in their original company.

The 2018 survey showed that recently graduated ENSIAME Coop students had found their job, with a median salary of 34015 €/y before the end of the program (62%), in less than one month (16% -> 78% accumulated), in less than two months (14% -> 92% accumulated). For comparison purposes, the employment rates, with a median salary of 32600 €/y for the students of the same year who attended a regular programme was before the end of the program (54%), in less than one month (13% -> 67% accumulated), in less than two months (8% -> 75% accumulated).

Occasionally, Coop students become external teachers at ENSIAME, but not necessarily in the Coop programmes.

It is more likely that former Coop students, knowing the system, will request that their company hires another Coop student and will personally mentor the new student, or send internship subjects to our school.

7.3 HWU Edinburgh

Graduate Apprenticeships in Scotland are relatively new and no apprentice has yet graduated from one of these programmes. It is our expectation that:

- apprentices who joined the programme as school leavers will be in one of three positions:
 - o they were offered a contract of employment lasting the length of the apprenticeship and therefore will be looking for other jobs or applying to stay with the employer who supported them through the apprenticeship
 - o they were offered an open-ended contract of employment and will continue to work for the employer who supported them through the apprenticeship
 - o they were offered an open-ended contract of employment but look for other opportunities
- apprentices who joined the programme after completing a lower level of apprenticeship
 - o will stay with the current employer
 - o move to another employer if the opportunity is greater
- apprentices with substantial work experience
 - o will use their new qualification to progress in their current employer
 - o will use their new qualification to find a better opportunity with another employer

7.4 Metropolia UAS

Metropolia has no collected data about companies in which students are working after graduation. More than 90 % of the students are employed in their own branch.

8 Comparison

In the following, for each Life Phase of a Coop student training process, a synthesis of the role of each actor (Coop student, Company and University) is provided, and a similarity index is suggested for each pair of partners, synthesizing the fact that the partners have a very similar model (5) or a very different model (0). The values indicated correspond to the average value of a cross evaluation: Estimated similarity = $\frac{1}{2} \times (\text{similarity estimation of A considering B} + \text{similarity estimation of B considering A})$. To provide an overview, a number code was associated to each value, according to the following legend:

0	1	2	3	4	5
completely converse	Single similarities	Few similarities	Some similarities	Many similarities	Identical

8.1 Recruitment

8.1.1 Application process

Figure 2 – Summary Application Process

Partner	Student's role	Company's role	University's role
DHBW	Apply to company	Offer job+training	Must suit to the study conditions
ENSIAME	Apply to university	Participation to Jury	Entrance examination
HWU	Apply to company	Offer job+training	Must suit to the study conditions
Metropolia	Apply to university	Offer job+training	Entrance examination

Figure 3 – Comparison Application Process

Estim. similarity	DHBW	ENSIAME	HWU	Metropolia
DHBW		1	3.5	0.5
ENSIAME	1		1	2
HWU	3.5	1		0
Metropolia	0.5	2	0	

8.1.2 Selection process

Figure 4 – Summary Selection Process

Partner	Student's role	Company's role	University's role
DHBW	Search company (first step)	Selects level 1	Check admissibility
ENSIAME	Search company (second step)	Selects level 2	Selects level 1
HWU	Search company (first step)	Selects level 1	Check admissibility
Metropolia	Search company (second step)	Offer part-time job	Selects

Figure 5 – Comparison Selection Process

Estim. similarity	DHBW	ENSIAME	HWU	Metropolia
DHBW		1	3.5	0.5
ENSIAME	1		1.5	2.5
HWU	3.5	1.5		1
Metropolia	0.5	2.5	1	

Comments: It seems that two selection models are established. Either the students are selected by the company (internally by recruiting new staff) and sent to the university. Or the students are mainly selected by the university, with more or less support from

the companies, and then have to search for a company to realize the practical part of their Coop study. DHBW and HWU have a quite similar model of Coop student recruitment.

8.2 Training

8.2.1 Theory

Figure 6 – Summary Theory

Partner	Student's role	Company's role	University's role
DHBW	Attend class 24 W/Y	Teach 60 % of courses	Teach 40 % of courses
ENSIAME	Attend class ½ W	Teach 20 % of courses	Teach 80 % of courses
HWU	Attend class 1 day/W		Teach 100 %
Metropolia	Attend class 28 W/Y	Teach 20%	Teach 80%

Figure 7 – Comparison Theory

Estim. similarity	DHBW	ENSIAME	HWU	Metropolia
DHBW		4	2	2.5
ENSIAME	4		2	1.5
HWU	2	2		1
Metropolia	2.5	1.5	1	

Comments: Among the partners, the proportion of theory in the Coop study programmes varies from 50 % to 80 %. Professional teachers do not necessarily teach theory, because practitioners contribute to theory in a range varying from 0% to 60%. Globally, pure theory taught by professional teachers represents 10 % (Metropolia), 20% (HWU, DHBW) or 40 % (ENSIAME) of a Coop programme. DHBW and ENSIAME have a very similar model.

8.2.2 Practice

Figure 8 – Summary Practice

Partner	Student's role	Company's role	University's role
DHBW	Carry out projects	Plan, coach, supervise	Some checks by onboarding the company as a coop-partner
ENSIAME	Carry out projects	Plan, coach, supervise	Check progression
HWU	Do or reflect, carry out projects	Plan, facilitate	Agree on programme
Metropolia	Practical training	Employ, coach, supervise	Check report and give credits

Figure 9 – Comparison Practice

Estim. similarity	DHBW	ENSIAME	HWU	Metropolia
DHBW		3.5	3	2
ENSIAME	3.5		3.5	2
HWU	3	3.5		1.5
Metropolia	2	2	1.5	

Comments: Practice is usually executed in the company, with more (ENSIAME, HWU) or less (Metropolia) control of the tasks by the university. In all universities, practice begins with basic technical tasks and ends with a final project with high expectations (planning, organisation, overview, management ability). The difference between HWU/ENSIAME and DHBW is that the control process of the companies content at DHBW is executed before the company is included as a partner at DHBW. At ENSIAME and HWU the cooperation is more focussed during the study programme and not in advance. The situation is very similar at DHBW, ENSIAME and HWU.

8.2.3 Internationalization

Figure 10 – Summary Internationalization

Partner	Student's role	Company's role	University's role
DHBW	Possible during 2nd Y	Find mission abroad	Network available but in some cases difficult
ENSIAME	3 months job abroad	Find placement abroad	Find acad. Placement
HWU	No intl. mobility		
Metropolia	Optional one semester		Encouraged

Figure 11 – Comparison Internationalization

Estim. similarity	DHBW	ENSIAME	HWU	Metropolia
DHBW		2	0	2
ENSIAME	2		0	1.5
HWU	0	0		0
Metropolia	2	1.5	0	

Comments: International mobility is mandatory only at ENSIAME, is recommended but not mandatory at Metropolia (academic or work placement) and DHBW (academic or work placement), not in practice at HWU. This matrix highlights the extreme difficulty that are facing universities to collectively address the topic of internationalization of dual studies, which confirms the interest and challenges of the InT#Tech project.

8.2.4 Supervision

Figure 12 – Summary Supervision

Partner	Student's role	Company's role	University's role
DHBW	Execute tasks	Control tasks (daily)	Help on request
ENSIAME	Execute tasks	Control tasks (daily)	Control tasks (4/Y)
HWU	Execute tasks	Control tasks (daily)	Control tasks (4/Y)
Metropolia	Execute tasks	Control tasks (daily)	Coordinates / Plans

Figure 13 – Comparison Supervision

Estim. similarity	DHBW	ENSIAME	HWU	Metropolia
DHBW		4	4	3
ENSIAME	4		5	3
HWU	4	5		3
Metropolia	3	3	3	

Comments: In every university, practice in the company is organised in a similar way and the roles of the 3 actors are highly comparable. The control of the tasks executed by the Coop students is always performed on a daily basis by the company only. The university's role goes from support on request (DHBW), to overall planning (Metropolia) or periodic checkpoint inducing visits in the company (twice a year at ENSIAME, 4 times a year at HWU).

Periodic visits by the company mentor to the university is only mandatory at ENSIAME (twice a year, for the year planning review and for students' presentations) and DHBW (once a year for a global company-university meeting).

8.2.5 Communication

Figure 14 – Summary Communication

Partner	Student's role	Company's role	University's role
DHBW	In case of problems only	In case of problems only	Yearly meeting
ENSIAME	Organises 2 meetings/Y	Fills online sharepoint	Fills online sharepoint
HWU	Organises 4 meetings/Y	4 meetings/Y; and reports problems	Commit Rel. manager and tutor
Metropolia	Organises placement		

Figure 15 – Comparison Communication

Estim. similarity	DHBW	ENSIAME	HWU	Metropolia
DHBW		2	2	1
ENSIAME	2		2	1
HWU	2	2		0
Metropolia	1	1	0	

Comments: communication is more or less constrained. Physical meetings of all parties is mandatory 4 times a year at ENSIAME and HWU, once a year at DHBW, not

required at Metropolia. ENSIAME is the only university where the use of an IT tool is mandatory for ensuring the traceability of every electronic and physical exchange between parties. This tool is imposed by the regional organisation in charge of supervising Coop programmes.

8.3 Passing

8.3.1 Assessment (of practice)

Figure 16 – Summary Assessment of practice

Partner	Student's role	Company's role	University's role
DHBW	Report & viva	Assess work & report	Confirms + assess viva
ENSIAME	Report & viva	Assess work & report	Assess report & viva
HWU	(opt.) report & viva	Assessment possible	Assessment by tutor
Metropolia	Self-evaluation	Assess work	Associated to assess.

Figure 17 – Comparison Assessment of practice

Estim. similarity	DHBW	ENSIAME	HWU	Metropolia
DHBW		3.5	2.5	2.5
ENSIAME	3.5		2.5	2.5
HWU	2.5	2.5		2
Metropolia	2.5	2.5	2	

Comments: The practical work is generally assessed by the company mentor, except at HWU. A report and an oral presentation is generally required as a support for the evaluation, except at Metropolia (it is optional at HWU). Metropolia introduced an original and interesting idea: self-evaluation by the Coop students. The control of the professional part of studies by universities is similar at DHBW and ENSIAME.

8.3.2 Teaching units, periods and semesters

Figure 18 – Summary teaching units, periods and semesters

Partner	Student's role	Company's role	University's role
DHBW	2 nd chance (3 rd max)	-	Grade
ENSIAME	No 2 nd chance	50% of ECTS credits	Grade + semester jury
HWU	2 nd chance	-	Grade + board of exam.
Metropolia	3 chances to pass	-	Grade based on scale of competences

Figure 19 – Comparison teaching units, periods and semesters

Estim. similarity	DHBW	ENSIAME	HWU	Metropolia
DHBW		2	3	2
ENSIAME	2		2	1
HWU	3	2		2
Metropolia	2	1	2	

Comments: The evaluation is performed by an academic board of examiners. It is generally based on grades, on different scales (out of 5.0 at DHBW, out of 20 at ENSIAME, out of 100 at HWU), but is based on competencies at Metropolia. Passing assumes that a given proportion of the core competencies or learning outcomes have been acquired, generally 50 % (a score of at least 40 % in traditional grading system

is required at HWU). An evolution from grades to competencies is planned at ENSIAME (a national requirement).

There is generally a possibility for Coop students to get a second chance (or even a third chance at Metropolia and DHBW) if a course unit is failed, except at ENSIAME. The graduation is generally automatic, based on collected teaching units (or competencies), except at ENSIAME, where the jury decides if a student who has failed can pass anyway. The situation is quite similar at DHBW and HWU.

8.3.3 Graduation

Figure 20 – Summary Graduation

Partner	Student's role	Company's role	University's role
DHBW	No role	No role	Auto. based on grades
ENSIAME	2 delegates in the jury	50 % of jury members	Grades + jury
HWU	No role	No role	Auto. based on average grades and credits accumulation
Metropolia	No role	No role	Certificate of competences

Figure 21 – Comparison Graduation

Estim. similarity	DHBW	ENSIAME	HWU	Metropolia
DHBW		2.5	4	2

ENSIAME	2.5		3	1.5
HWU	4	3		1
Metropolia	2	1.5	1	

Comments: The Coop students have no role in the graduation process. The companies generally also have no role in the graduation decision, except at ENSIAME, where the graduation jury is composed of 50 % non-academic members (partner companies).

8.4 Joining the labor market

8.4.1 Exerting the job in turn

Figure 22 – Summary Joining the labor market

Partner	Student's role	Company's role	University's role
DHBW	2-3 months a job	71% retention	No role
ENSIAME	2-3 months a job	40 % retention	No role
HWU	N/A	N/A	N/A
Metropolia	N/A	N/A	N/A

Figure 23 – Comparison Joining the labor market

Estim. similarity	DHBW	ENSIAME	HWU	Metropolia
DHBW		4	N/A	N/A
ENSIAME	4		N/A	N/A
HWU	N/A	N/A		N/A
Metropolia	N/A	N/A	N/A	

Comments: The Coop programmes at HWU were implemented recently and there have been no graduates so far. Metropolia is a University of applied sciences. They have no cooperative programmes implemented yet. Mostly the comparison shows the largest differences between one Coop programme and Metropolia, who donot run a Coop programme. There are no statistics regarding the behaviour of former Coop students, because there are no former Coop students. The situation at DHBW and ENSIAME, two universities that implemented Coop-studies for tens of years, is quite similar.

8.5 Synthesis of the comparison

The matrix below gives the average value of the similarity indices, observed on the previous 11 criteria (Only 10 sometimes, if there is no data available.).

Figure 24 – Synthesis of the comparison

Estim. similarity	DHBW	ENSIAME	HWU	Metropolia
DHBW		2.68	2.75	1.8
ENSIAME	2.68		2.25	1.85
HWU	2.75	2.25		1.15
Metropolia	1.8	1.85	1.15	

The interpretation of this is that the four universities have implemented higher education dual study programs in a large variety of situations. It confirms the extreme difficulty that the partners would have if they wanted to cooperate in the scope of a classical exchange of students among them. However, this is a very positive information for the project. The first reason stems from the richness and representability of our small survey, based on only four partner universities. The second reason is that the (expected) success of the international module experimentation will demonstrate that despite our strong differences, international collaboration of Coop student programmes is however possible.

9 Evaluation of each model

The model of each partner was evaluated by the three other partners, according to the 6 criteria agreed on beforehand (2 for the students: **increase employability** and **increase monetary benefit**, 2 for the companies: **increase corporate know-how** and **increase attractiveness for students**, 2 for the universities: **increase attractiveness for students** and **increase attractiveness for companies**). The model of each partner has not been evaluated globally, but item by item, following the life phases of a Coop student, from being recruited as a Coop student to being hired by a company after graduation. The average evaluations of how each model item impacts on the 6 criteria is reported on radar graphs. The score is to be interpreted like this: 5 means that the model has a strong positive impact on the criterion. The number 0 means that the model has no impact at all on the criterion. Theoretically, the larger the area of a radar graph, the more influence of the different criteria towards the special phase of the life cycle phase model is represented. Sometimes, it is not necessary that the company and the university have huge influence in the same phase. The models profit from shared responsibilities. It can be an advantage if the cooperation is really close, so that all stakeholder are integrated in each phase.

Since there are two criteria for each actor, an average value has been computed for each (Student, Company, University). Then a global average value has been computed, to reflect the level of estimated global satisfaction for all the parties. The values can be interpreted according to the following legend:

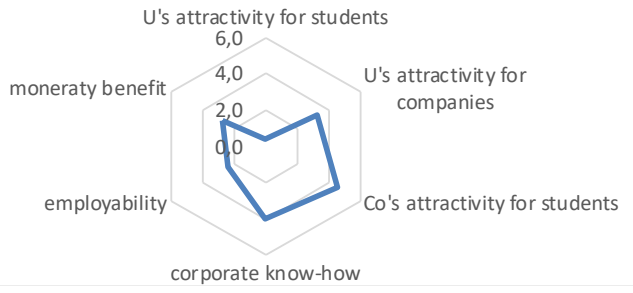
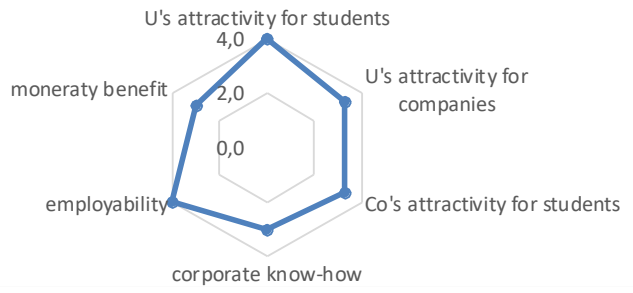
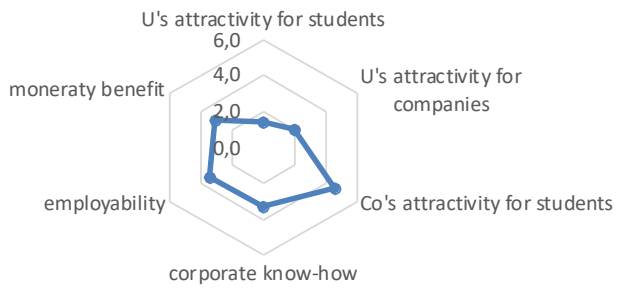
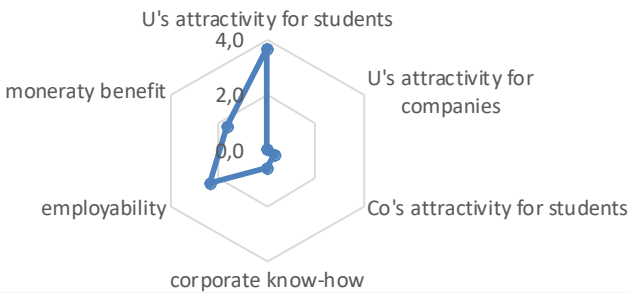
0	1	2	3	4	5
No influence	Single influence	Some influence	Much influence	Very much influence	Significant influence

IMPORTANT: The scores do not at all correspond to a value judgement about the partners. Nor do they intend to suggest any ranking. If university A gets a score near to 5 on a criterion, while university B gets a score near to 0, it does not mean that university A is performing better than university B. The context, the regulation, the constraints existing or not in the region or in the country, the financial model, the experience of coop-education are determining what can and cannot be done by each partner. The criteria that the authors used to compare their programmes can also be extended or changed. Other evaluation models could lead to different results.

The reader should please keep in mind that Metropolia provides no Coop programme. Therefore, the criteria do not completely suit their model. It shows the potential of a UAS to offer Coop programmes in addition to their other programmes.

A very positive score for an item, however, suggests that the model item can be recommended as good practice for establishing a cooperative study programme, because it provides satisfaction to all the concerned actors (student, company, university). It also means that the cooperation is close. In some cases, close cooperation can cause challenges as well. This is exactly what will be emphasized in the comments following every comparison. After regarding the evaluations, the reader should have an impression, which categories influence the student's life cycle in which way.

9.1 Impact of the coop-students application and selection process

DHBW	<table><tr><th>average</th><th>Employ-ability</th><th>Influ-ence Comp.</th><th>Influ-ence univers.</th></tr><tr><td>2,9</td><td>2,5</td><td>4,3</td><td>1,8</td></tr></table>	average	Employ-ability	Influ-ence Comp.	Influ-ence univers.	2,9	2,5	4,3	1,8	 <table><tr><th>U's attractiveness for students</th><td>1,0</td></tr><tr><th>U's attractiveness for companies</th><td>2,0</td></tr><tr><th>Co's attractiveness for students</th><td>3,0</td></tr><tr><th>corporate know-how</th><td>2,0</td></tr><tr><th>employability</th><td>1,0</td></tr><tr><th>moneraty benefit</th><td>1,0</td></tr></table>	U's attractiveness for students	1,0	U's attractiveness for companies	2,0	Co's attractiveness for students	3,0	corporate know-how	2,0	employability	1,0	moneraty benefit	1,0
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ENSIAME	<table><tr><th>average</th><th>Employ-ability</th><th>Influ-ence Comp.</th><th>Influ-ence Univers.</th></tr><tr><td>3,4</td><td>3,5</td><td>3,2</td><td>3,7</td></tr></table>	average	Employ-ability	Influ-ence Comp.	Influ-ence Univers.	3,4	3,5	3,2	3,7	 <table><tr><th>U's attractiveness for students</th><td>4,0</td></tr><tr><th>U's attractiveness for companies</th><td>3,0</td></tr><tr><th>Co's attractiveness for students</th><td>2,0</td></tr><tr><th>corporate know-how</th><td>1,0</td></tr><tr><th>employability</th><td>3,0</td></tr><tr><th>moneraty benefit</th><td>2,0</td></tr></table>	U's attractiveness for students	4,0	U's attractiveness for companies	3,0	Co's attractiveness for students	2,0	corporate know-how	1,0	employability	3,0	moneraty benefit	2,0
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METROPOLIA	<table><tr><th>average</th><th>Employ-ability</th><th>Influ-ence Comp.</th><th>Influ-ence Univers.</th></tr><tr><td>1,4</td><td>2,0</td><td>0,5</td><td>1,8</td></tr></table>	average	Employ-ability	Influ-ence Comp.	Influ-ence Univers.	1,4	2,0	0,5	1,8	 <table><tr><th>U's attractiveness for students</th><td>4,0</td></tr><tr><th>U's attractiveness for companies</th><td>1,0</td></tr><tr><th>Co's attractiveness for students</th><td>1,0</td></tr><tr><th>corporate know-how</th><td>1,0</td></tr><tr><th>employability</th><td>1,0</td></tr><tr><th>moneraty benefit</th><td>1,0</td></tr></table>	U's attractiveness for students	4,0	U's attractiveness for companies	1,0	Co's attractiveness for students	1,0	corporate know-how	1,0	employability	1,0	moneraty benefit	1,0
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Comment: The graphs illustrate the differences concerning the responsibility of the application process. At ENSIAME and Metropolia, the university selects the students. At DHBW the students were selected by the companies and at HWU, the university plays a role in the application process by assessing candidates put forward by the companies. Therefore, a score about 1 means that, for example, at DHBW the university (DHBW) does not have a high influence on the recruitment process. The

future DHBW students apply directly at the company. The attractiveness of the company is important to future DHBW students because they plan to work at this company after their graduation.

Concerning Employability, it is difficult to say that the recruitment process has a high impact on the employability of the students. However, it should be mentioned that, for example at ENSIAME and DHBW, the students represent a pre-selected group who have to fulfil strong application criteria, which can be an indicator for high quality. At HWU, the selection process is also young like the whole programme and they are still establishing their workflows. In some cases, the students are already working and then start the Coop programme, otherwise, the companies select the students. Normally, the companies only provide such programmes to high potential employees. At Metropolia, there is no “end-to-end” connection between the university and the company, therefore the recruitment of students is identical with other UAS’s.

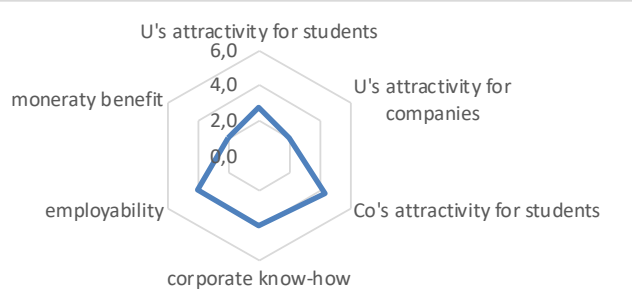
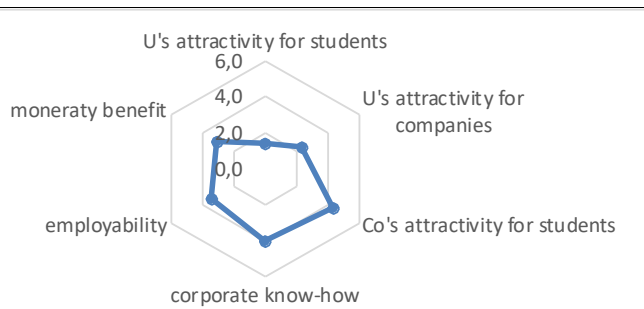
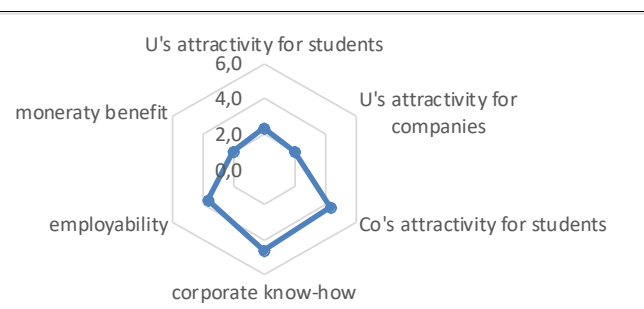
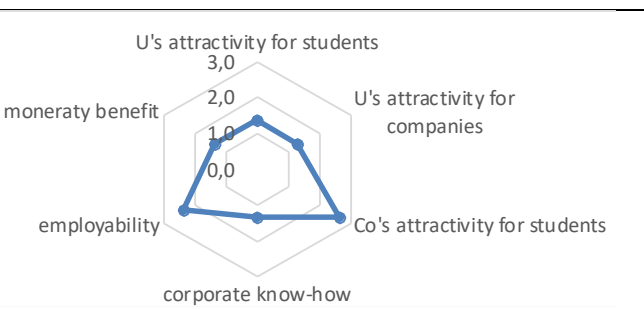
It is also important to mention that originally, the project consortium evaluated 6 different categories but the figures and tables show only 3 values. In most cases, the assumption of condensing the categories into three figures does not harm the result.

9.2 Impact of the theory teaching process

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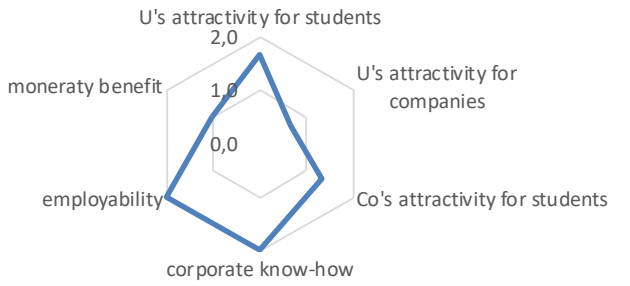
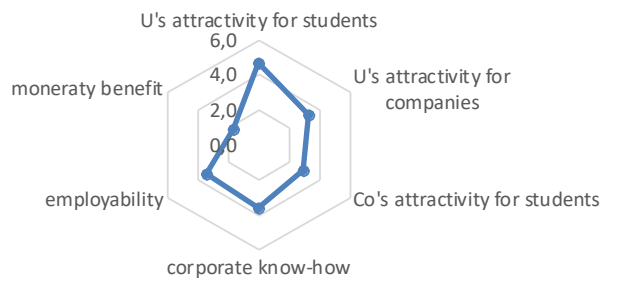
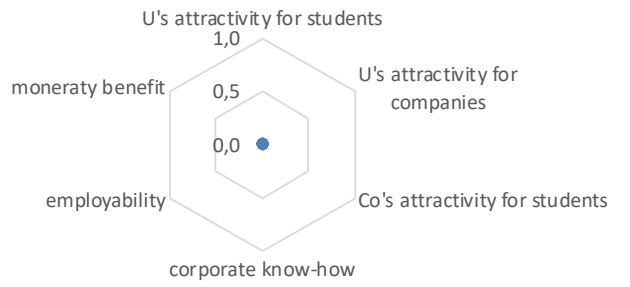
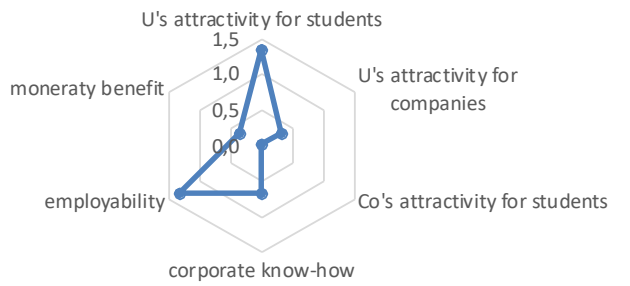
Comment: DHBW and HWU are responsible for the content of the theory phase, being quite independent from the companies. ENSIAME closely cooperate with the companies. Metropolia has a collaboration with companies (UAS) but it has the complete autonomy for their contents.

Impact of the practice teaching process

DHBW	<table><tr><th>average</th><th>Employ-ability</th><th>Influ-ence comp.</th><th>Influ-ence Univers</th></tr><tr><td>3,2</td><td>3,0</td><td>4,2</td><td>2,3</td></tr></table>	average	Employ-ability	Influ-ence comp.	Influ-ence Univers	3,2	3,0	4,2	2,3	 <table><tr><td>U's attractiveness for students</td><td>6,0</td></tr><tr><td>U's attractiveness for companies</td><td>4,0</td></tr><tr><td>Co's attractiveness for students</td><td>2,0</td></tr><tr><td>corporate know-how</td><td>4,0</td></tr><tr><td>employability</td><td>2,0</td></tr><tr><td>moneraty benefit</td><td>2,0</td></tr></table>	U's attractiveness for students	6,0	U's attractiveness for companies	4,0	Co's attractiveness for students	2,0	corporate know-how	4,0	employability	2,0	moneraty benefit	2,0
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ENSIAME	<table><tr><th>average</th><th>Employ-ability</th><th>Influ-ence comp.</th><th>Influ-ence Univers</th></tr><tr><td>3,1</td><td>3,2</td><td>4,2</td><td>1,8</td></tr></table>	average	Employ-ability	Influ-ence comp.	Influ-ence Univers	3,1	3,2	4,2	1,8	 <table><tr><td>U's attractiveness for students</td><td>2,0</td></tr><tr><td>U's attractiveness for companies</td><td>2,0</td></tr><tr><td>Co's attractiveness for students</td><td>2,0</td></tr><tr><td>corporate know-how</td><td>2,0</td></tr><tr><td>employability</td><td>2,0</td></tr><tr><td>moneraty benefit</td><td>2,0</td></tr></table>	U's attractiveness for students	2,0	U's attractiveness for companies	2,0	Co's attractiveness for students	2,0	corporate know-how	2,0	employability	2,0	moneraty benefit	2,0
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HWU	<table><tr><th>average</th><th>Employ-ability</th><th>Influ-ence comp.</th><th>Influ-ence Univers</th></tr><tr><td>3,2</td><td>2,8</td><td>4,5</td><td>2,2</td></tr></table>	average	Employ-ability	Influ-ence comp.	Influ-ence Univers	3,2	2,8	4,5	2,2	 <table><tr><td>U's attractiveness for students</td><td>2,0</td></tr><tr><td>U's attractiveness for companies</td><td>2,0</td></tr><tr><td>Co's attractiveness for students</td><td>2,0</td></tr><tr><td>corporate know-how</td><td>2,0</td></tr><tr><td>employability</td><td>2,0</td></tr><tr><td>moneraty benefit</td><td>2,0</td></tr></table>	U's attractiveness for students	2,0	U's attractiveness for companies	2,0	Co's attractiveness for students	2,0	corporate know-how	2,0	employability	2,0	moneraty benefit	2,0
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employability	2,0																					
moneraty benefit	2,0																					
METROPOLIA	<table><tr><th>average</th><th>Employ-ability</th><th>Influ-ence comp.</th><th>Influ-ence Univers</th></tr><tr><td>1,7</td><td>1,8</td><td>2,0</td><td>1,3</td></tr></table>	average	Employ-ability	Influ-ence comp.	Influ-ence Univers	1,7	1,8	2,0	1,3	 <table><tr><td>U's attractiveness for students</td><td>1,0</td></tr><tr><td>U's attractiveness for companies</td><td>1,0</td></tr><tr><td>Co's attractiveness for students</td><td>1,0</td></tr><tr><td>corporate know-how</td><td>1,0</td></tr><tr><td>employability</td><td>1,0</td></tr><tr><td>moneraty benefit</td><td>1,0</td></tr></table>	U's attractiveness for students	1,0	U's attractiveness for companies	1,0	Co's attractiveness for students	1,0	corporate know-how	1,0	employability	1,0	moneraty benefit	1,0
average	Employ-ability	Influ-ence comp.	Influ-ence Univers																			
1,7	1,8	2,0	1,3																			
U's attractiveness for students	1,0																					
U's attractiveness for companies	1,0																					
Co's attractiveness for students	1,0																					
corporate know-how	1,0																					
employability	1,0																					
moneraty benefit	1,0																					

Comment: The companies mainly contribute the practical expertise. Due to the fact that the students are employed at the company, they gain a lot of corporate know-how. All graphs are focused on the categories companies' attractiveness, employability and corporate expertise.

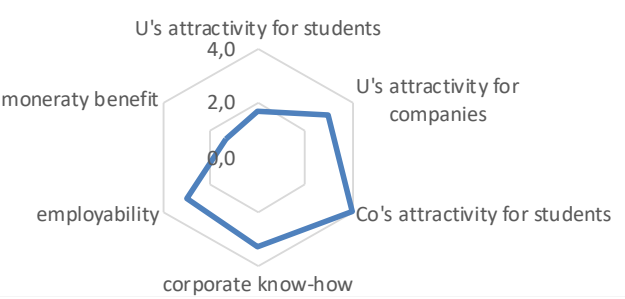
9.3 Impact of the internationalization method

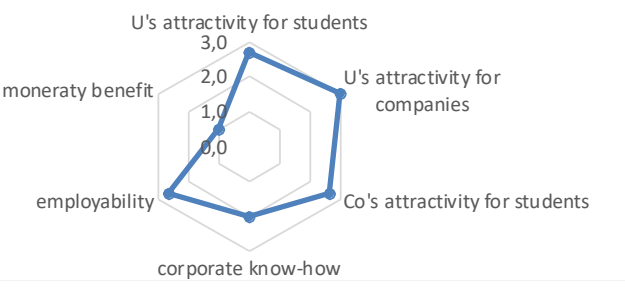
DHBW									
<table><tr><th>average</th><th>Employ-ability</th><th>Influ-ence comp.</th><th>Influ-ence Univers</th></tr><tr><td>1,4</td><td>1,5</td><td>1,7</td><td>1,2</td></tr></table>	average	Employ-ability	Influ-ence comp.	Influ-ence Univers	1,4	1,5	1,7	1,2	
average	Employ-ability	Influ-ence comp.	Influ-ence Univers						
1,4	1,5	1,7	1,2						
ENSIAME									
<table><tr><th>average</th><th>Employ-ability</th><th>Influ-ence comp.</th><th>Influ-ence Univers</th></tr><tr><td>3,3</td><td>2,5</td><td>3,3</td><td>4,0</td></tr></table>	average	Employ-ability	Influ-ence comp.	Influ-ence Univers	3,3	2,5	3,3	4,0	
average	Employ-ability	Influ-ence comp.	Influ-ence Univers						
3,3	2,5	3,3	4,0						
HWU									
<table><tr><th>average</th><th>Employ-ability</th><th>Influ-ence comp.</th><th>Influ-ence Univers</th></tr><tr><td>-</td><td>-</td><td>-</td><td>-</td></tr></table>	average	Employ-ability	Influ-ence comp.	Influ-ence Univers	-	-	-	-	
average	Employ-ability	Influ-ence comp.	Influ-ence Univers						
-	-	-	-						
METROPOLIA									
<table><tr><th>average</th><th>Employ-ability</th><th>Influ-ence comp.</th><th>Influ-ence Univers</th></tr><tr><td>0,7</td><td>0,8</td><td>0,3</td><td>0,8</td></tr></table>	average	Employ-ability	Influ-ence comp.	Influ-ence Univers	0,7	0,8	0,3	0,8	
average	Employ-ability	Influ-ence comp.	Influ-ence Univers						
0,7	0,8	0,3	0,8						

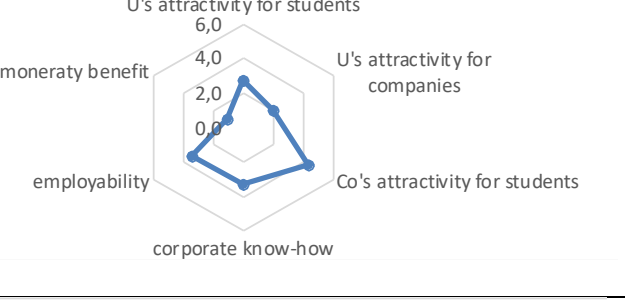
Comment: Internationalisation is completely integrated in the model of ENSIAME but not defined, if the students gain international experience during semester or workplacement. Metropolia has a huge and established network for semester exchanges. At DHBW, some companies enable international work placements, few students participate in semesters abroad. HWU has the biggest international network including two international campuses at Dubai and Malaysia, but there is no possibility for cooperative students to participate in international exchange. The

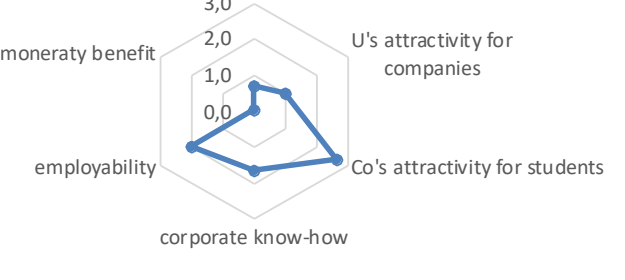
internationalisation depends a lot on the industrial stakeholder and the structure of the programme.

9.4 Impact of the supervision process

DHBW									
average	Employ- -ability	Influ- ence comp.	Influ- ence Univers		U's attractiveness for students	U's attractiveness for companies	Co's attractiveness for students	corporate know-how	moneraty benefit
2,7	2,2	3,7	2,3		4,0	3,0	2,0	1,0	0,0
					employability				

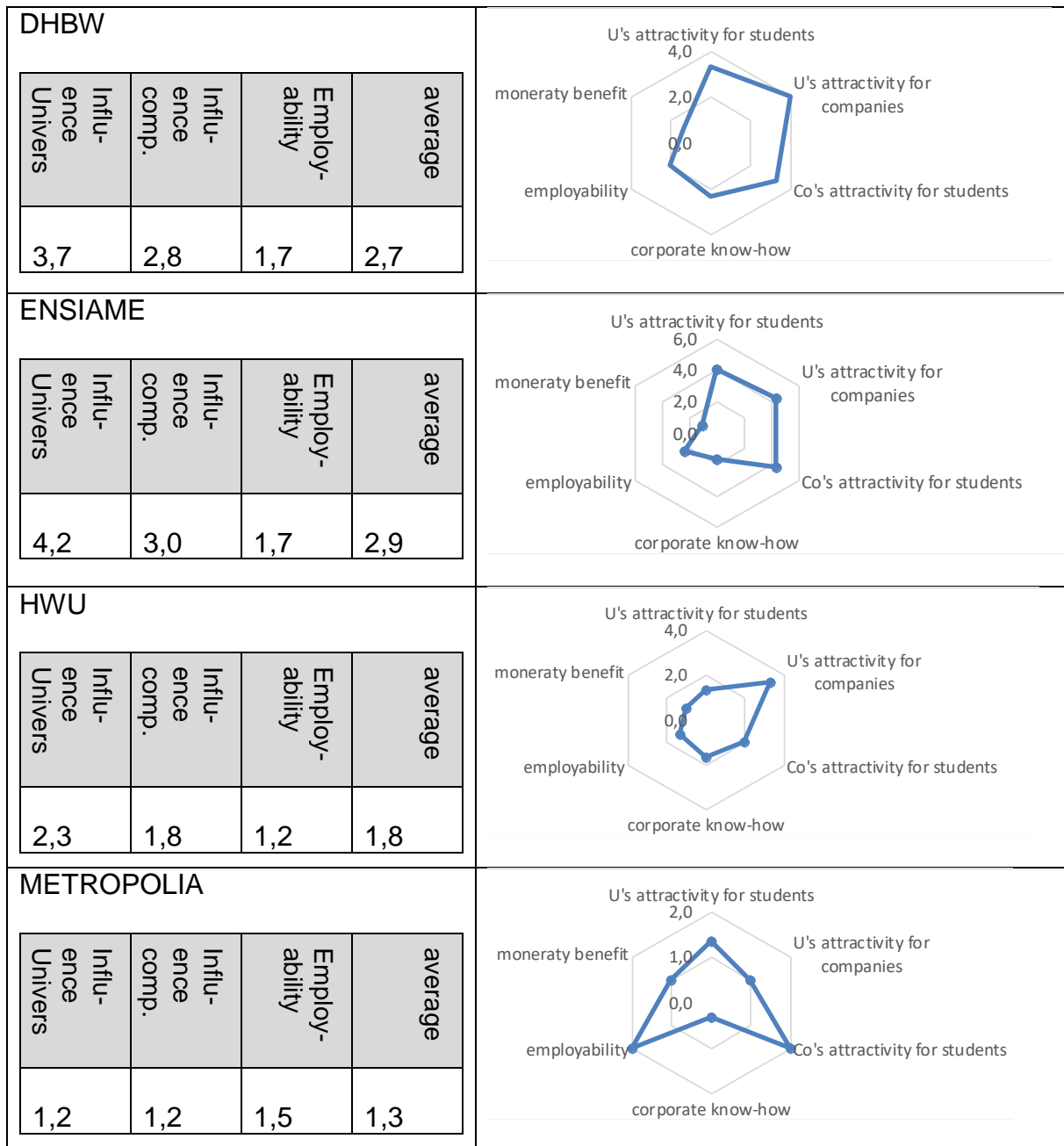
ENSIAME									
average	Employ- -ability	Influ- ence comp.	Influ- ence Univers		U's attractiveness for students	U's attractiveness for companies	Co's attractiveness for students	corporate know-how	moneraty benefit
2,3	1,8	2,3	2,8		3,0	2,0	1,0	0,0	0,0
					employability				

HWU									
average	Employ- -ability	Influ- ence comp.	Influ- ence Univers		U's attractiveness for students	U's attractiveness for companies	Co's attractiveness for students	corporate know-how	moneraty benefit
2,8	2,2	3,8	2,3		6,0	4,0	2,0	1,0	0,0
					employability				

METROPOLIA									
average	Employ- -ability	Influ- ence comp.	Influ- ence Univers		U's attractiveness for students	U's attractiveness for companies	Co's attractiveness for students	corporate know-how	moneraty benefit
1,3	1,0	2,2	0,8		3,0	2,0	1,0	0,0	0,0
					employability				

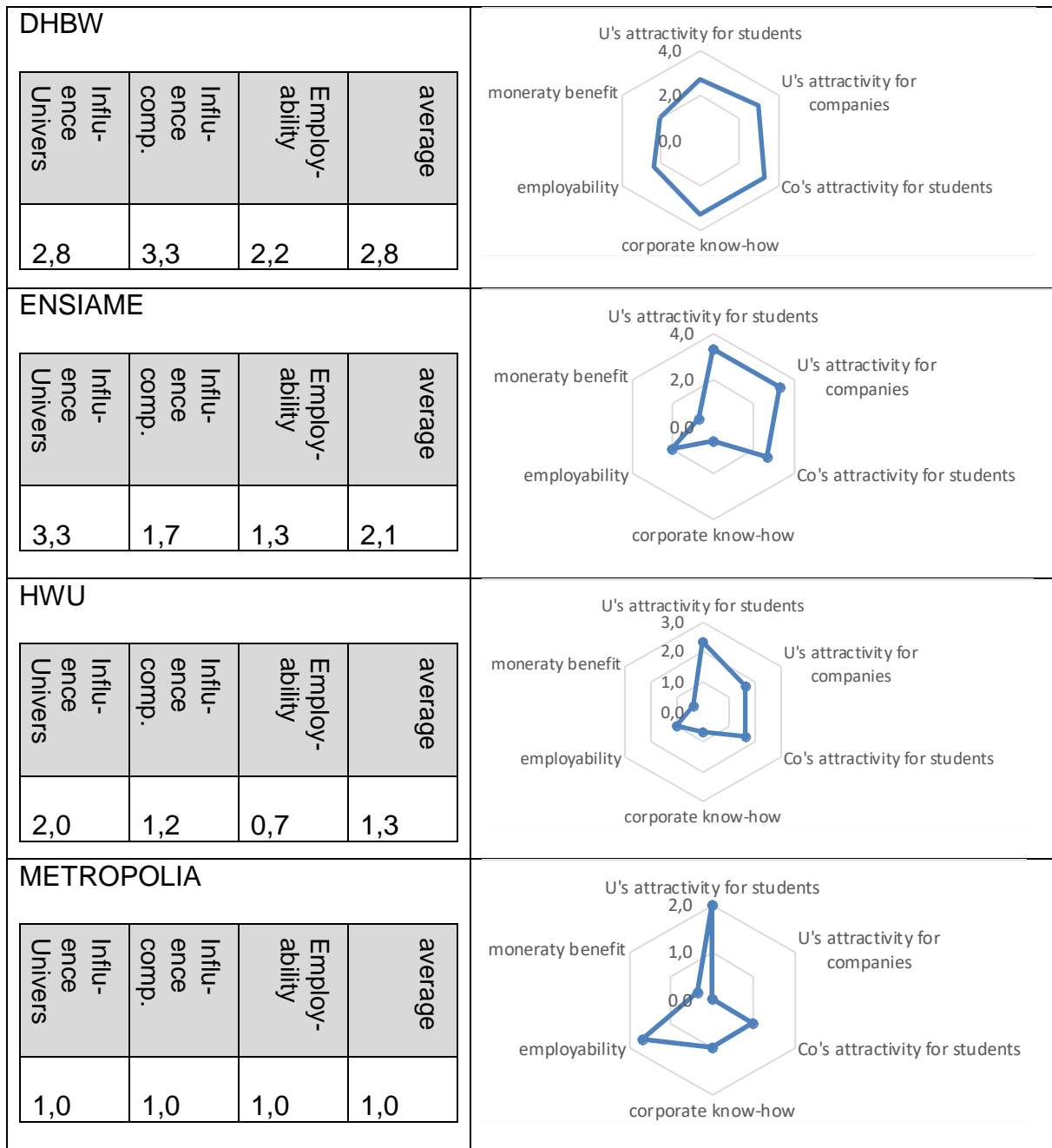
Comment: The supervision process in a cooperative study programme is established by the companies. At Metropolia, as a UAS, the supervision is less than in typical cooperative programmes. A cooperative programme is more attractive to students if the programme is supervised in the context of its structure.

9.5 Impact of the communication process



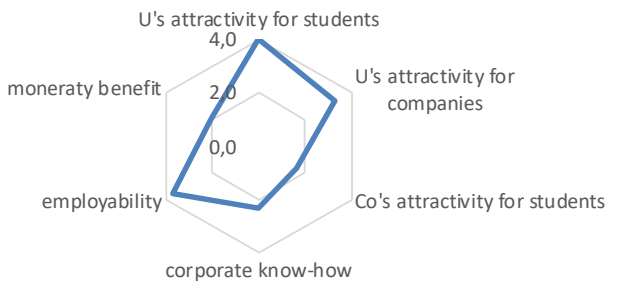
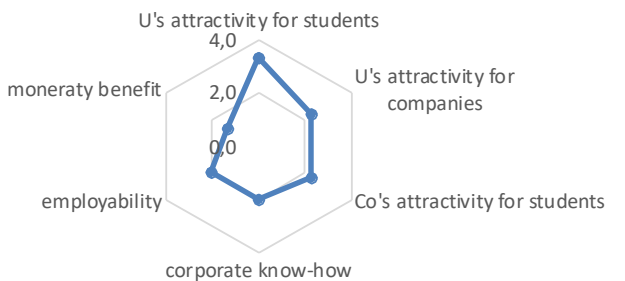
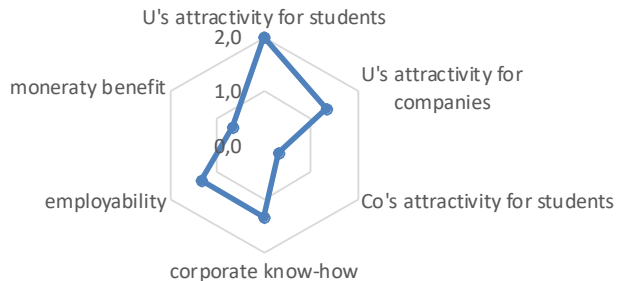
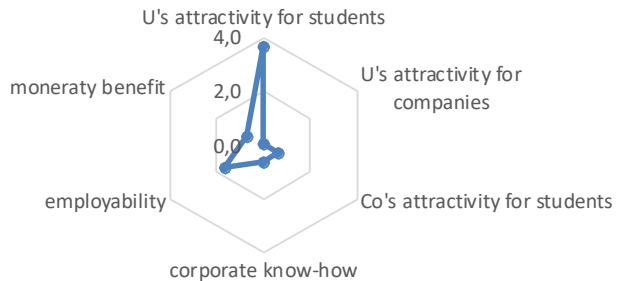
Comment: The graphs show that the communication processes differ a lot. At DHBW, ENSIAME and HWU, the communication of the university is very important.

9.6 Impact of the assessment process



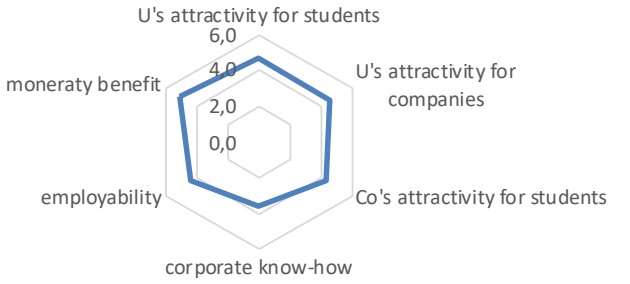
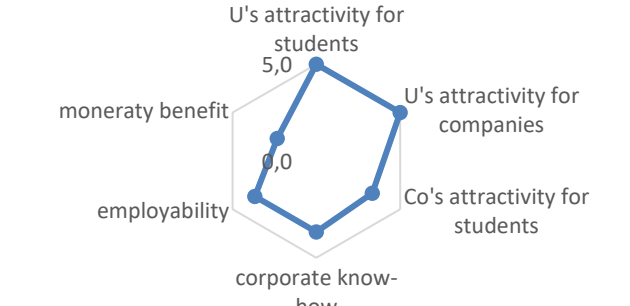
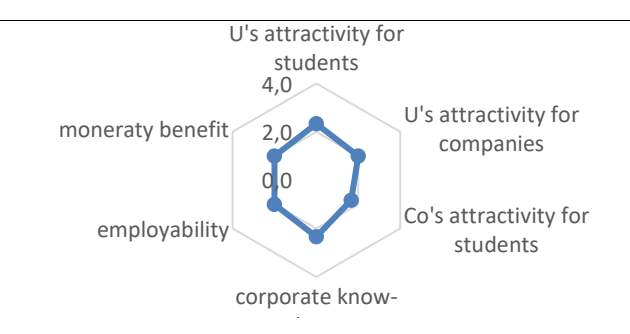
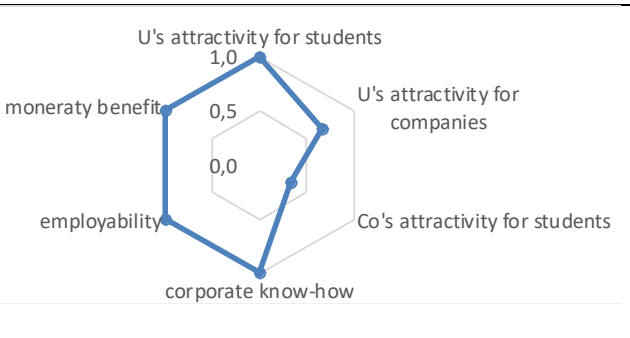
Comment: All universities have the biggest impact on the assessment process. There is also a difference between the cooperative programmes (DHBW, ENSIAME, and HWU) and the UAS (Metropolia), regarding that, the companies do not play an essential role. At DHBW, the assessment process depends on the corporate expertise.

9.7 Impact of the assessment, units~, sessions~, semesters collection, and graduation process

DHBW	<table><tr><th>average</th><th>Employ-ability</th><th>Influ-ence comp.</th><th>Influ-ence Univers</th></tr><tr><td>2,8</td><td>2,8</td><td>2,0</td><td>3,7</td></tr></table>	average	Employ-ability	Influ-ence comp.	Influ-ence Univers	2,8	2,8	2,0	3,7	
average	Employ-ability	Influ-ence comp.	Influ-ence Univers							
2,8	2,8	2,0	3,7							
ENSIAME	<table><tr><th>average</th><th>Employ-ability</th><th>Influ-ence comp.</th><th>Influ-ence Univers</th></tr><tr><td>2,2</td><td>1,7</td><td>2,2</td><td>2,8</td></tr></table>	average	Employ-ability	Influ-ence comp.	Influ-ence Univers	2,2	1,7	2,2	2,8	
average	Employ-ability	Influ-ence comp.	Influ-ence Univers							
2,2	1,7	2,2	2,8							
HWU	<table><tr><th>average</th><th>Employ-ability</th><th>Influ-ence comp.</th><th>Influ-ence Univers</th></tr><tr><td>1,2</td><td>1,0</td><td>0,8</td><td>1,7</td></tr></table>	average	Employ-ability	Influ-ence comp.	Influ-ence Univers	1,2	1,0	0,8	1,7	
average	Employ-ability	Influ-ence comp.	Influ-ence Univers							
1,2	1,0	0,8	1,7							
METROPOLIA	<table><tr><th>average</th><th>Employ-ability</th><th>Influ-ence comp.</th><th>Influ-ence Univers</th></tr><tr><td>1,2</td><td>1,2</td><td>0,7</td><td>1,8</td></tr></table>	average	Employ-ability	Influ-ence comp.	Influ-ence Univers	1,2	1,2	0,7	1,8	
average	Employ-ability	Influ-ence comp.	Influ-ence Univers							
1,2	1,2	0,7	1,8							

Comment: The graphs show that the universities are mostly responsible of the assessment process. Concerning assessment, there are huge differences.

9.8 Impact of the job finding process

DHBW	
ENSIAME	
HWU	
METROPOLIA	

Comments: The impact of the job finding process depend on all categories. It shows as well that the integration of industry partners into the university structures is less focused at UAS than at cooperative programmes.

10 Synthesis of recommendations

This page gathers the recommendations derived from the previous analyses.

The process of recruitment of Coop students can provide equally high satisfaction to all the parties because every actor has influence on it and can make a decision. The university should decide which student it would like to recruit and with which companies it would like to cooperate. The company should decide which student it would like to train and in which university this student should learn theory. The Coop student should decide which university programme to attend and in which company to be trained on-the-job.

The rhythm of alternation, which is very different in each university, does not influence the satisfaction levels of the theory teaching process. This process mainly influences the university satisfaction. The implication of practitioners in the theory teaching, which is generalized in every university, seems to be a good practice.

The practice teaching process mainly influences the company's satisfaction, since practice is executed inside the company. The best practice seems to have students carrying out projects with increasing difficulty in the company, under close control by a company mentor and the approval of the practice learning programme by the partner university.

The determinant for the satisfaction of all the actors regarding internationalization is the fact that a stay abroad is recommended (or even imposed) by the training programme, with a dedicated period. The student gains a cultural (generally also linguistic) experience, the company improves its corporate expertise in terms of international openness, the university gains attractiveness. The ideal situation is when

the placement abroad is consistent with the company's activity and the programme's major topics.

Good practice in supervision is when the university is involved in the control of the student's activity in the company, by means of regular visits, and when the company is also involved in the control of the student's progress in the university and regularly invited to visit the university (information meeting or attendance at student's presentations).

Despite different implementations of the communication between actors and different levels of constraints, in our respective universities, the Coop student is the key element (student progress is the subject of the exchanges; students generally organizes the meetings between the company and the university). The use of a data SharePoint, to ensure the tractability of the exchanges, can be suggested as a good practice.

The maximum satisfaction of all the parties, regarding the practice assessment process is when the practical work is assessed by both the company (assess the work and a written and/or an oral presentation of this work) and the university (based on a report and/or an oral presentation of the work). Self-evaluation by the Coop student may also be recommended, in addition, as a good practice.

Most of the time, the students have no role in the semester validation and graduation process and it is difficult to satisfy their criteria, except by offering them a second chance to pass. The university is the main actor for these processes, which can be generally considered as automatic (when based on grades with a pass/fail threshold). The company can gain satisfaction if it is granted a role in the graduation process (for example, by participating to the jury).

The impact of the job finding process is not observable at HWU and Metropolia due to the very recent implementation of Coop programmes. In the two other universities, the satisfaction is high for all the parties. Proposing Coop programmes probably benefits

the universities in terms of attractiveness. Graduated from Coop programmes is an excellent factor for employability with monetary benefit for students, while companies benefit from experienced new practitioners, when they can retain them.

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The majority of the content consists on expertise of the different authors which they gained in different roles by working for cooperative study models. This study contains internal data collected by internal surveys and interviews.

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