

# REDEEM2 PROJECT

**SHAPING THE NEXT GENERATION OF JOINT  
PROGRAMMES IN SCIENCE AND TECHNOLOGY**



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## **EXECUTIVE SUMMARY**

### **BACKGROUND AND OBJECTIVES**

What is the impact of Joint Programmes studies on the graduates' life and career and what lessons can universities of science and technology learn from the stakeholders' feedback to develop more efficient international programmes leading to enhanced employability? Many surveys on double/joint/multiple degrees have been carried out over the years, but little if no attention has been devoted to the impact these programmes have on the students' career paths and the development of their competences. Past surveys focused on credit mobility in general, comprehensive universities, or specific regions and often did not lead to any concrete tools to support the creation of better programmes. The members of the CLUSTER network ([www.cluster.org](http://www.cluster.org)) have been cooperating since the early 1990s in the development and management of joint educational programmes and agreed that the time has come to collect feedback from all the stakeholders involved (current students, alumni, programme developers, and employers) in the existing programmes and identify the potential for improvement. In September 2015, seven members of the consortium embarked on a two-year project supported by the Erasmus+ Strategic Partnerships programme to provide the network and the partner universities with answers and innovative tools in this respect. The main objectives of the project were to: 1. Provide tools to technical universities to reform the existing joint programmes and create new ones based on a better understanding of what works and what does not in terms of structure, content, employability, student and employer expectations and perceptions, national and scientific field-specific differences, etc. 2. Improve the attractiveness of the reformed/newly created programmes from both the students' and the employers' perspective by enhancing the employability and satisfaction rates of the STEM graduates participating in these programmes. 3. Boosting the internationalization and recruitment strategies at the higher education institutions that will implement the final recommendations and make use of the quantitative and qualitative analysis results.

This project provided interesting results that needed to be followed up and further elaborated. For this reason, the consortium decided to apply for a second project to be carried out by a slightly different set of partners in order to:

- investigate how universities worldwide deal with JPs (institutional survey) and in particular to analyze the involvement of employers in the process;
- qualitatively and quantitatively analyze the feedback of the recent graduates on a global scale (the first project focused only on graduates from the partner universities);
- produce a new set of guidelines to facilitate the inclusion of employers in JPs;
- develop an online filtering tool for any user to customize the results of the surveys to their own needs;
- Test the results obtained for the development of new JPs with a more active participation of companies or revise existing programmes in this respect.

### **METHODOLOGY**

The project consists of the following main phases:

- Desk research and analysis of the state of the art.
- Quantitative analysis through a survey collecting feedback from the graduates.
- Qualitative analysis through a survey for focus groups and interviews involving the four target groups.
- Development of a set of tools for the reforming and development of more relevant and efficient joint programmes.
- Creation of a network of JPs with direct involvement of employers.

## **STATE OF THE ART**

Activity 1: desk research on the existing JPs with active participation of employers.

Activity 2: comparative study of the existing JPs at 140 universities worldwide.

Activity 3: interviews with partner universities successfully running JPs with these characteristics.

## **QUANTITATIVE ANALYSIS**

Activity 1: structuring of the questionnaires and defining what indicators to include in the survey, how to formulate the questions and how to reach the target groups.

Activity 2: collection of quantitative data by distributing the online questionnaires to the JP graduates and a control group (students with a single degree) from universities worldwide.

Activity 3: evaluation of the data and statistical analysis.

## **QUALITATIVE ANALYSIS**

Activity 1: definition of the format for the focus groups and interviews for each target group

Activity 2: focus groups and interviews are performed at each partner university to collect in-depth feedback from JP students, current students, employers, and staff involved in the development and design of the programmes.

Activity 3: feedback analysis and descriptive report of the findings.

## **REFORMING THE JOINT PROGRAMMES**

Activity 1: a workshop involving all the different stakeholders has been organized to discuss how the involvement of employers might be boosted

Activity 2: development of a set of guidelines based on the collected material and feedback received from the stakeholders.

Activity 3: training event for professionals involved in the development and implementation of joint programmes at the partner universities and beyond.

Activity 4: actual reforming of JPs or creation of new ones based on the project findings. Fourteen (14) JPs have been/are being created.

Activity 5: Development of an on-line filtering tool that enables any user to analyze the results of the surveys according to their own needs and interest.

#### **EXPLOITATION OF RESULTS**

The results obtained are being used as follows:

1. The institutional analysis and the online filtering tool is being used to provide both data on the development of new JPs to universities and crucial information to the prospective students on the benefits and impact of JPs on their lives and careers.
2. The quantitative analysis is being used to provide a general picture of what a JP graduate is, and this will be used for marketing and recruitment purposes to enable the students to make an informed decision. In fact, the goal should be not necessarily to recruit more students for JPs, but the right ones. As a side effect, students would be prevented from applying for a joint programme for the wrong reasons. This new set of data and evidence will also help all the actors to eliminate existing misperceptions.
3. Improve the communication to employers; address their misperceptions about the profiles and skills of JP graduates.
4. Support the programme developers in creating educational products that better satisfy the expectations of the students and the needs of the companies through the evidence collected and by making a systematic use of the JP guidelines.

# 1: INSTITUTIONAL ANALYSIS

## 1.1 FRAMEWORK

One of the main objectives of the REDEEM 2 project, which was not addressed by REDEEM, consists in providing a comparative analysis of the different approaches and current trends in joint programmes from the HEIs' perspective. In line with that objective, the findings presented in this section of the report focus on the motivations, perceptions, and support services from a set of universities with extensive experience in developing and managing joint programmes in all their possible forms.

Since the early 1990s, universities have been implementing programmes that explore ways of establishing new academic collaborations and partnerships in this field. According to the 2015 Bologna Process Implementation Report, however, the number of students who benefit from this experience has been very low. The REDEEM project, hence, is in line with the European strategy to enhance and expand the breadth of joint programmes.

The work focuses on five key aspects reflected by the structure of the questionnaire distributed to all major universities of science and technology and schools of science and engineering at comprehensive universities worldwide:

**PART 1 | GENERAL INFORMATION:** number of existing JPs, structure of the JPs, certification awarded, average number of students enrolled, most popular countries, top fields, typical language of instruction.

**PART 2 | STUDENT ENROLMENT AND SUPPORT:** JP alumni /association, enrolment procedures, evaluation system, tutoring.

**PART 3 | FUNDING AND SUSTAINABILITY:** sustainability, main sources of funding.

**PART 4 | BENEFITS AND CONSTRAINTS:** motivations to develop JPs, main perceived benefits, main challenges, legal requirements/constraints that complicate the setting up of JPs.

**PART 5 | COMPANY INVOLVEMENT:** how, nature of the collaboration, main benefits, and obstacles.

## CHARACTERISATION

140 HEIs worldwide responded to the survey in spring/summer 2021. The geographical distribution reflects the popularity of joint programmes in the different parts of the world:

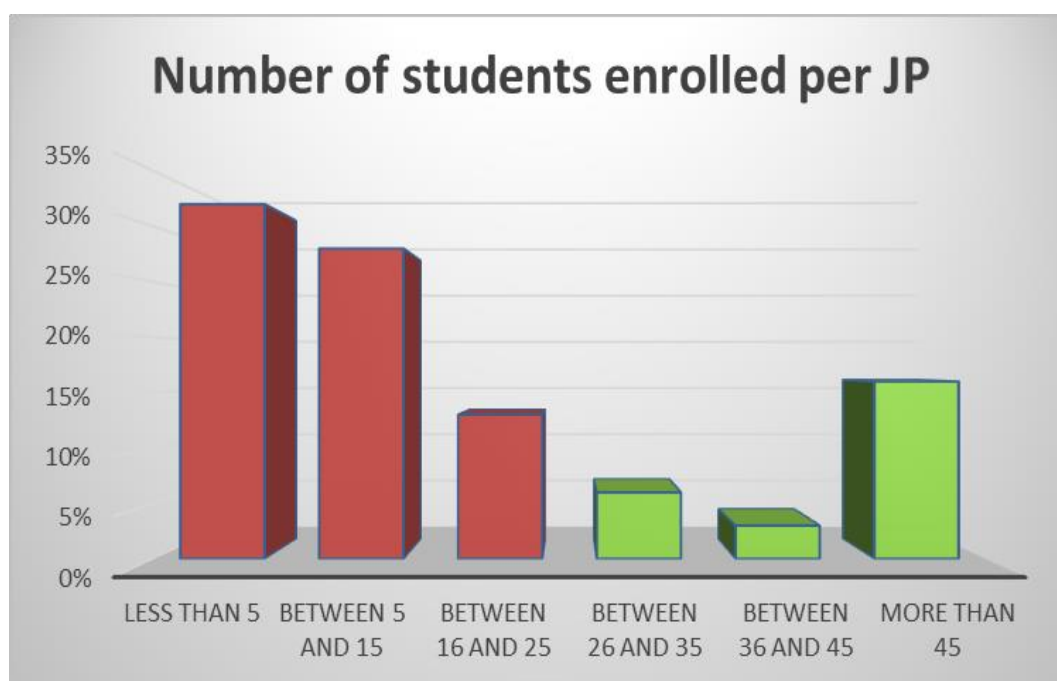
- Europe 65%,
- Asia 15%,
- Latin America 12%,
- Oceania 5%,
- Others 3%



A good distribution was achieved in terms of HEIs' size as well as the number of JPs currently active at each HEI, with an average of 18 and a maximum of 180 active JPs at one of the respondents. A first finding is that the ratio between traditional dual degrees (national master's programmes exchanging a limited number of students yearly) and truly joint programmes (one single integrated academic programme with joint recruitment, management, selection, and admission processes) is 3.6 to 1, which shows that the transition from the traditional approach to the more integrated approach is still ongoing, at a slower pace than expected.

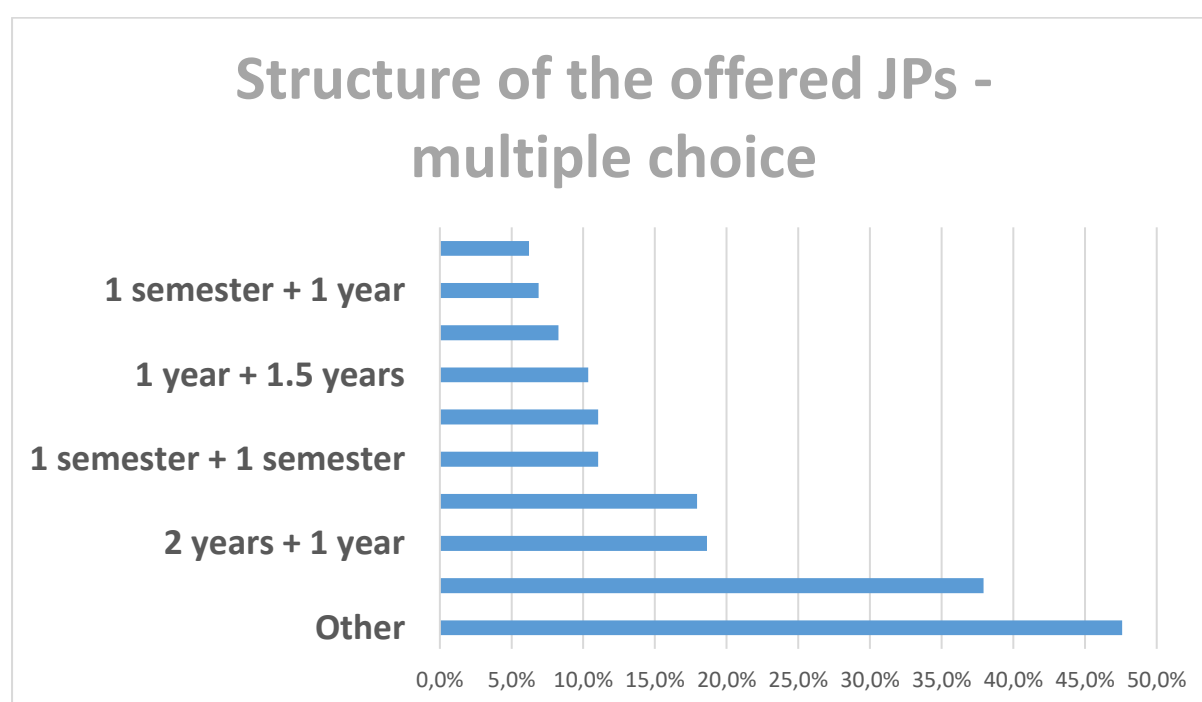
## 1.2 GENERAL INFORMATION

The first indication received from the survey is that existing joint /dual-degree programmes are still underpopulated in terms of student enrolment. Recent studies have shown that programmes with less than 25 students per intake (edition) are more likely to be discontinued and their cost/benefit ratio is too low to justify the effort required to develop and manage such programmes. One third of the respondents stated that the average number of students enrolled in their joint programmes is 5 or lower and 75% of the respondents stated that this figure is lower than 25 students. This proves that the developers are often not aware of the importance of securing a substantial and consistent number of eligible applicants for each intake to guarantee the sustainability of the programme. Another reason for this type of shortcoming is the lack of a needs analysis involving prospective students and employers. It has been noted that most universities are still developing this type of programmes for their own sake, which should only be one of the criteria leading to this decision.



When it comes to the structures of the JPs adopted by the respondents (total duration of the programme and duration of stays at each partner university), the responses show that the situation is still very fragmented, but with a trend towards the 1+1 year model chosen by 38% of the respondents, probably due to the popularity of the Erasmus Mundus programme. Nine

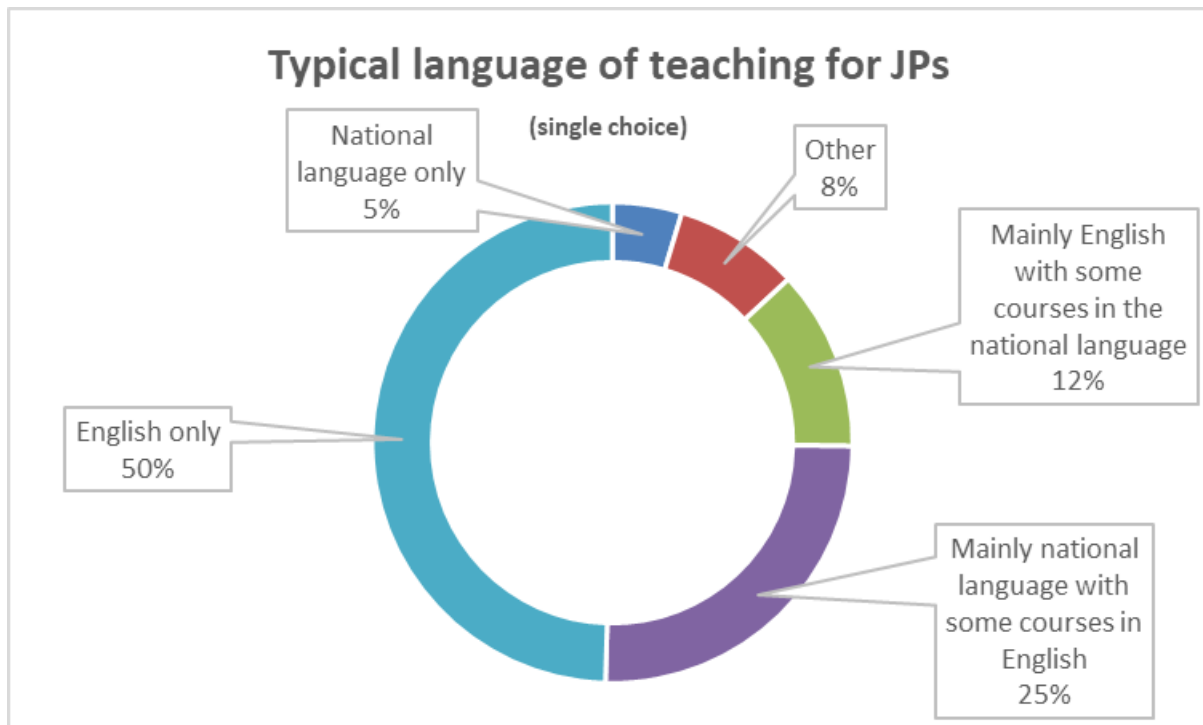
different models were offered by the questionnaire as multiple choice options, but 48% of the respondents chose the “other” option, which confirms that the number of models adopted worldwide is very high. One of the reasons for this choice might be the fact that only full years or semesters are envisaged by the options offered, while more and more universities adopt the term (trimester) system. Another reason might be that the offered choices refer to programmes with mobility paths between two partners only, while there are consortia that structure their JPs with mobility tracks that involve 3 universities.



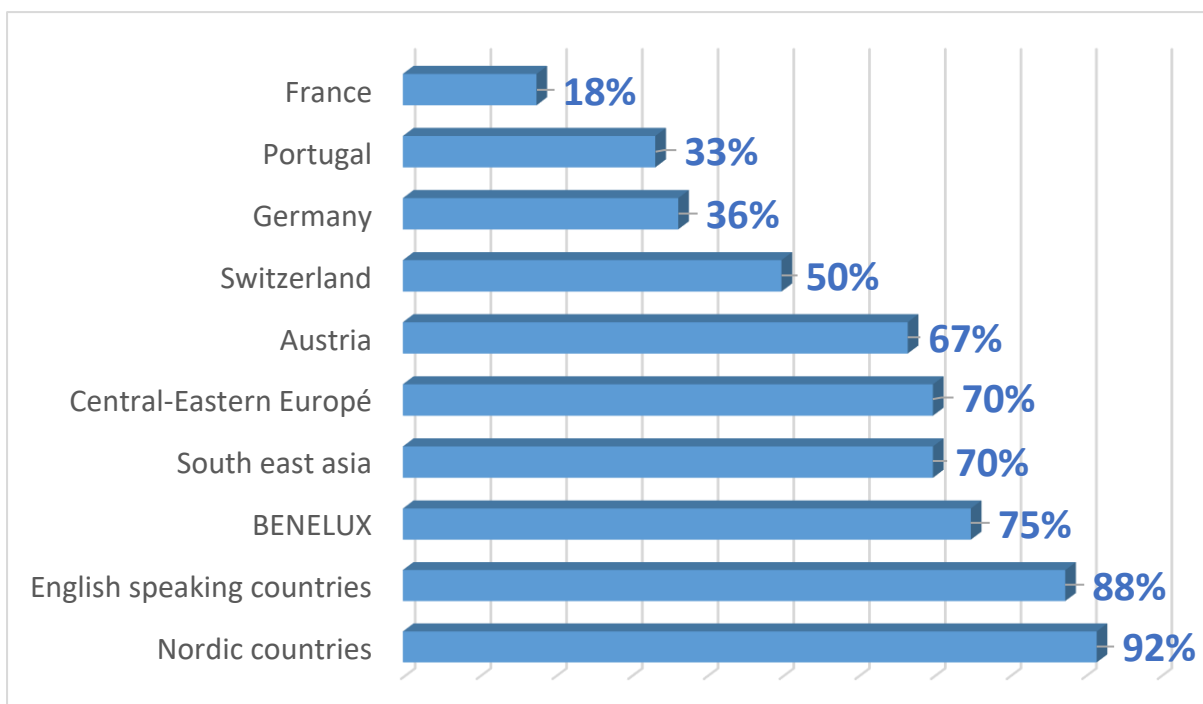
When it comes to the type of certificate issued at the end of the programme, 61.5% of the respondents stated that two (or more) separate certificates are the rule while 24.8% answered that a diploma supplement is also issued, including information on the nature and structure of the joint programme. Only 17.2% of the respondents reported that a joint certificate is issued as a rule, and these most likely are the truly joint programmes. While the possibility to issue joint diplomas is still prevented (or complicated) by the national legislation in some countries, the fact that less than 25% of the HEIs issue a diploma supplement cannot be justified in any way and this should be encouraged so as to provide the graduates and their prospective employers with full information on the contents of the joint programme.

TYPE OF CERTIFICATE AWARDED FOR THE JOINT PROGRAMMES	%
<b>Each involved university issues a separate diploma</b>	<b>61,4%</b>
Each involved university issues a separate diploma with the addition of a joint certificate/diploma supplement	24,8%
Only one joint diploma is awarded to the students on behalf of both/all involved universities	17,2%
Other	6,2%

English as a teaching language is slowly becoming predominant in joint programmes, with 50% of the respondents stating that their joint programmes are taught entirely in English, while only 5% of the respondents are offering joint programmes in the national language only. This picture is the exact opposite of the one that was observed at the beginning of the 1990s when the first double degrees were developed. Nevertheless, 25% of the respondents are still offering JPs in the national language with a number of courses taught in English and 12% offer courses mainly in English with a number of courses in the national language. The reason for offering more courses in English undoubtedly is the need to be attractive in the recruitment process, but the importance given by the EU to multilingualism might slow down this trend in the coming years.

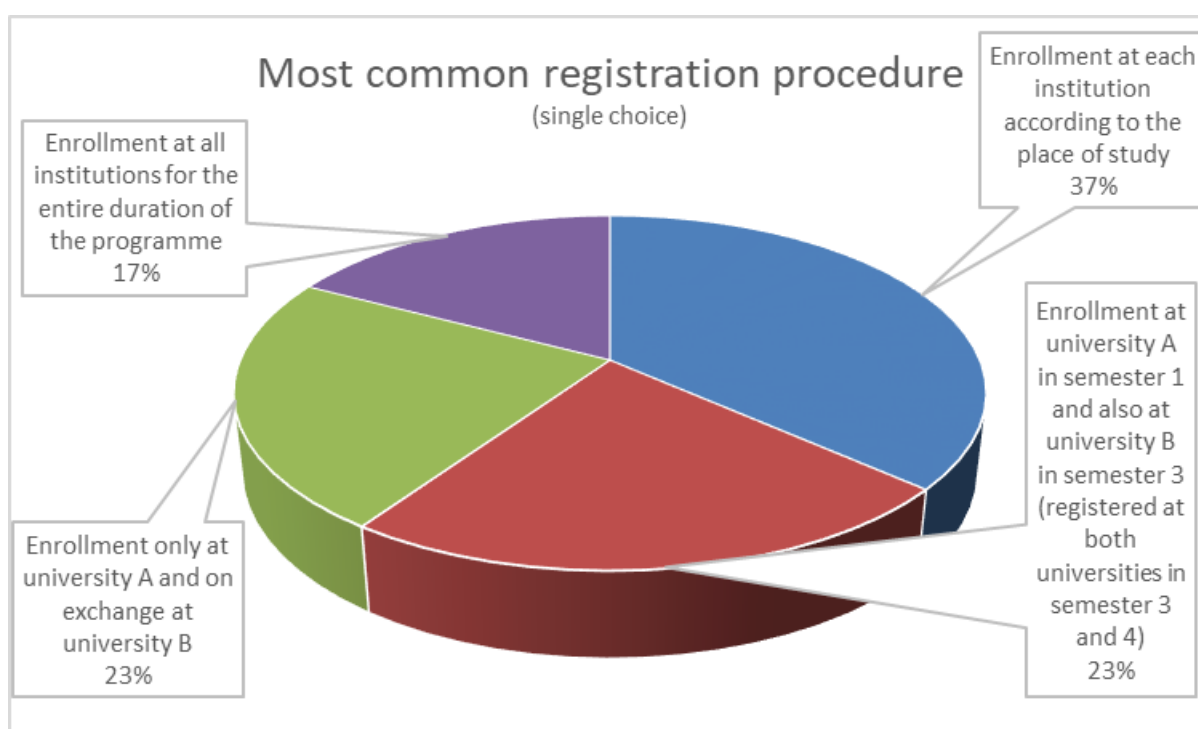


When we look at these results from a comparative perspective, we notice though that the national differences are striking. Looking at those HEIs that offer JPs in English only, the percentages per country vary a lot from 18% in France up to 92% in the Nordic Countries. Only roughly, one third of the HEIs in Portugal and Germany offer JPs in English only.



### 1.3 STUDENT ENROLMENT AND SUPPORT

When asked for the typical registration procedure, the respondents provided very fragmented answers with no clear indication of a dominant model. 37% chose the model of enrolling the students at the university they are currently attending in each semester/year, but this model can be problematic for those HEIs that need a student to be officially enrolled for the whole duration of the programme to issue two separate diplomas. The same is true for the 23% of respondents who chose the model of having the students registered at university A in the first year (or as long as they study at university A) and at both university A and B in the second year (or whenever the mobility takes place). Another 23% of the respondents chose the model to enroll students at university A only and on an exchange at university B. This model overcomes some bureaucratic barriers in those countries where being enrolled at two different universities simultaneously is forbidden, but leads to problems when it comes to charging tuition fees, since students are often exempted from paying this type of fees when on an exchange. Finally, only 17% of the respondents chose the fourth model, in which students are registered at each partner university for the whole duration of the programme. Again, these are most likely the 17% of the truly joint programmes that also issue joint diplomas, since the percentage is exactly the same.



One of the main concerns expressed by the alumni is the lack of attention given to JP students by the HEIs and the fact that they are seldom addressed as a separate group. This concern is reflected by the absence of specific alumni chapters/associations for specific JPs, since almost 63% of the respondents answered that they do not offer this option and they are not planning to do so. Only 7.4% of the respondents answered positively. The same is true for student associations attached to specific JPs: 62% of the respondents do not offer this option and are not planning to do so, while only 7.8% answered in a positive way. Since alumni have proven to be a very valuable resource for the sustainability of the JPs and a powerful resource when

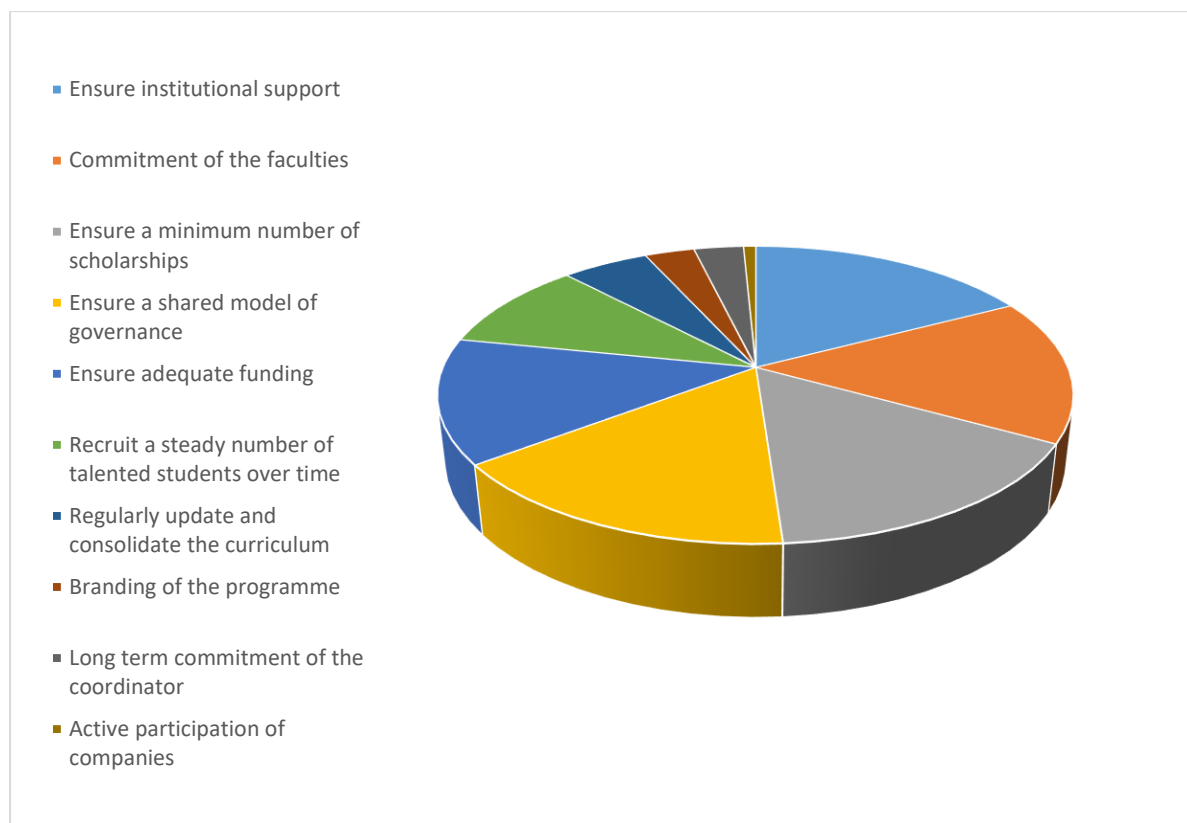
it comes to recruitment capacity, HEIs should definitely put more effort in providing these students with better and dedicated support.

DO YOU HAVE A SPECIFIC ALUMNI CHAPTER/ASSOCIATION FOR JOINT PROGRAMME GRADUATES?	%
<b>No, and it is not planned</b>	<b>62,8%</b>
Yes, but only for graduates from a specific joint programme	16,0%
No, but it is being created	13,8%
Yes, for all the graduates from any joint programme	7,4%

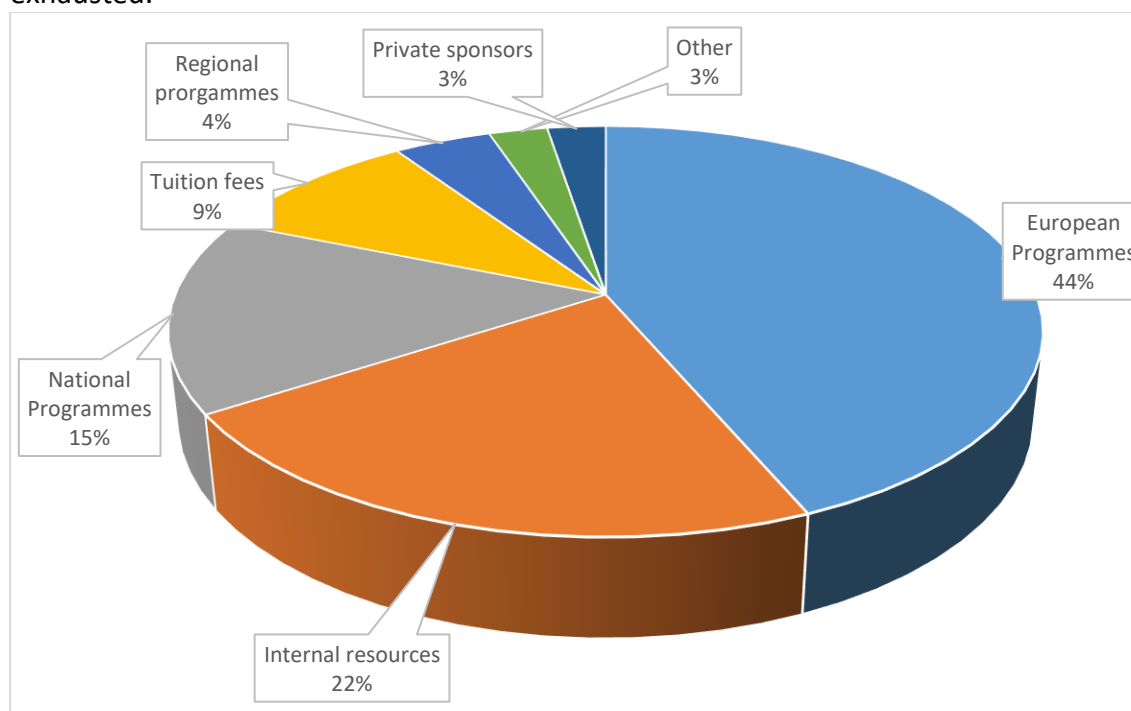
DO YOU HAVE A SPECIFIC ASSOCIATION FOR THE CURRENT JOINT PROGRAMME STUDENTS?	%
<b>No, and it is not planned</b>	<b>62,2%</b>
Yes, open to all students	23,3%
Yes, but only for students from specific programmes	7,8%
No, but it is being created	5,6%
Only the diploma of the home university is awarded with mention of the joint educational initiative in the diploma supplement	1,1%

## 1.4 FUNDING AND SUSTAINABILITY

When asked for the most crucial elements needed to ensure sustainability of the JPs (single choice), the majority of the respondents (17.3%) mentioned ensuring institutional support, which confirms previous findings: too many JPs are discontinued or do not reach their full potential due to the lack of support or interest from the central level, which makes a thorough needs analysis even more relevant. This concern was closely followed by the following three very diverse elements with 15.7% each: Commitment of the faculties, ensure a minimum number of scholarships, ensure a shared model of governance. Surprisingly enough, the branding of the programme was not perceived as a element crucial to sustainability, although it has been proven that the most successful programmes are those that perform better in terms of marketing and branding. More communication is therefore needed. Again, the active participation of companies was the lowest scoring element, mentioned only by 5.7 of the respondents as the most crucial component for the sustainability of a JP. In addition, in this case, better communication of the potential that a company might bring into the JP is needed.



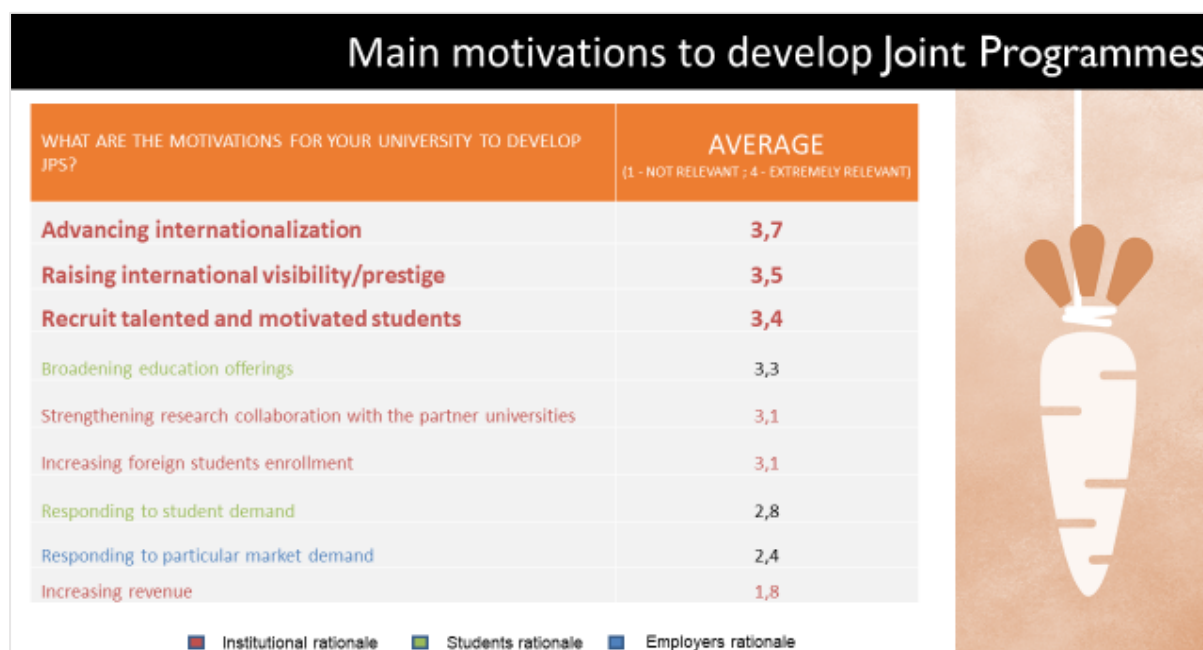
Concerning the main source of funding used to set up and run JPs (single choice), 43.6 of the respondents selected “European Programmes” which turned out to be by far the most popular option, most likely because of the popularity of the Erasmus Mundus programme. The second most popular option was the use of internal funding (22.2%), followed by national programmes (14.4%). Only 2.6% of the respondents had private sponsors (companies and employers) as the main source of funding. This again shows that the potential is far from being exhausted.



## 1.5 BENEFITS AND CONSTRAINTS

The main motivations for developing joint programmes vary a lot from country to country and from institution to institution, but the general finding is that HEIs do this mainly for their own sake, prestige, and visibility. In fact, on a scale from 1 to 4 (where 1 is not relevant and 4 is very relevant), the respondents rated advancing internationalization with 3.7 on the average, enhancing international visibility and prestige with 3.5, and recruiting talented and motivated students with 3.4. Responding to a student demand was rated much lower (2.8/4) and responding to a market demand even lower (2.4/4). This confirms that a thorough needs analysis is often lacking and that JPs are still used as a tool for the benefit of the HEIs that develop them. Increasing revenue had the lowest average score (1.8/4), which shows that HEIs have understood that these programmes are very costly and resource-intensive.

When it comes to the perceived benefits of offering JPs, the answers are similar to the expectations, but it is clear that the implementation of JPs has a very low impact on enhancing the collaboration of the involved professionals and does not seem to set examples that facilitate the creation of more similar programmes within the institution. Both aspects should probably be addressed more explicitly to exploit the full potential of JPs at the institutional level. In particular, an active engagement of academics and administrators in the JP activities seems to be rather low in many cases with no real opportunities offered to them other than managing the programmes and providing teaching and supervision “at home”. Efforts along this line would definitely enhance the bonds of the concerned JPs and facilitate the creation of a specific community and sense of belonging.





## Main challenges to set up Joint Programmes

WHAT ARE THE MAIN CHALLENGES ASSOCIATED WITH SETTING UP NEW JP?	AVERAGE (1 - NOT CHALLENGING ; 4 - EXTREMELY CHALLENGING)
<b>Funding</b>	<b>3,2</b>
<b>Sustainability</b>	<b>3,1</b>
<b>Curriculum design</b>	<b>3,0</b>
Legal issues	2,9
Accreditation	2,8
Fees structure	2,6
Academic calendar	2,5
Institutional support	2,5
<b>Degree duration</b>	<b>2,4</b>

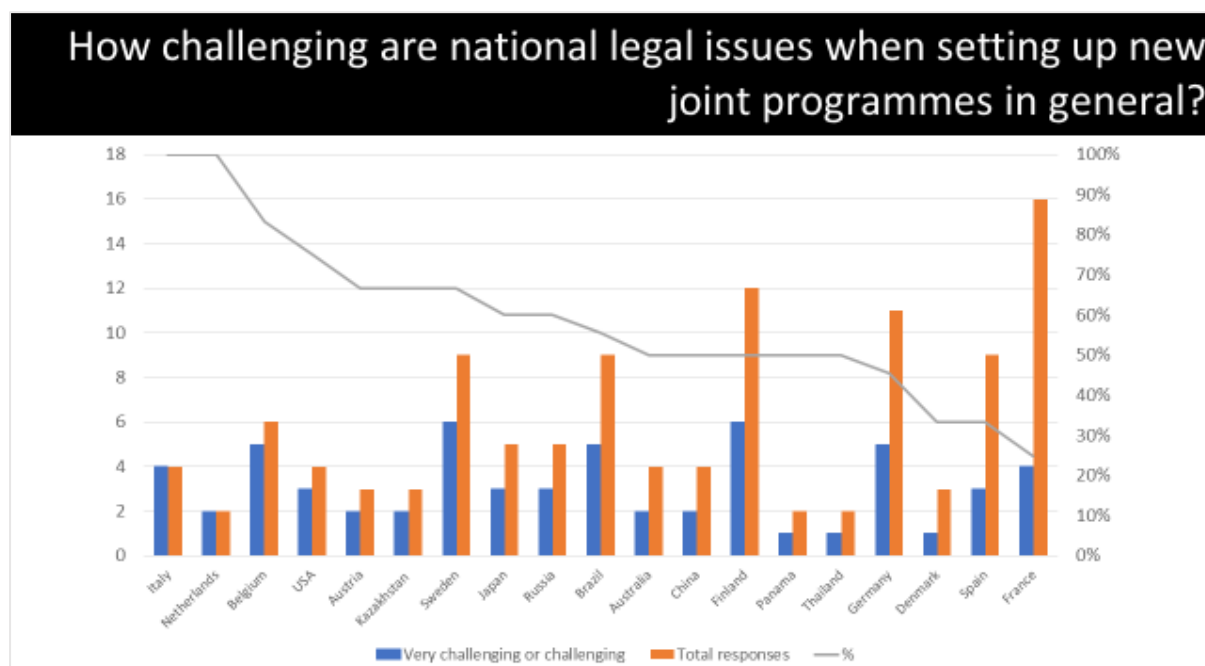


When it comes to the challenges associated with joint programmes, funding issues (3.4/4) and sustainability (3.1/4) are the aspects ranked highest on the average. Mismatches in the academic calendar (2.5/4), institutional support (2.5/4), and programme duration (2.4/4) are considered the least problematic aspects by the respondents. This might be due to the fact that after three decades of experience, most HEIs around the world have developed mechanisms that facilitate the development and management of JPs, even if many of them have realised that funding and sustainability are two problematic aspects that need to be investigated and secured from case to case, since there is no one size fit of all solutions available on the market.

WHAT ARE THE MAIN CHALLENGES ASSOCIATED WITH SETTING UP NEW JP?	AVERAGE (1 - NOT CHALLENGING ; 4 - EXTREMELY CHALLENGING)
<b>Funding</b>	<b>3,2</b>
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Accreditation	2,8

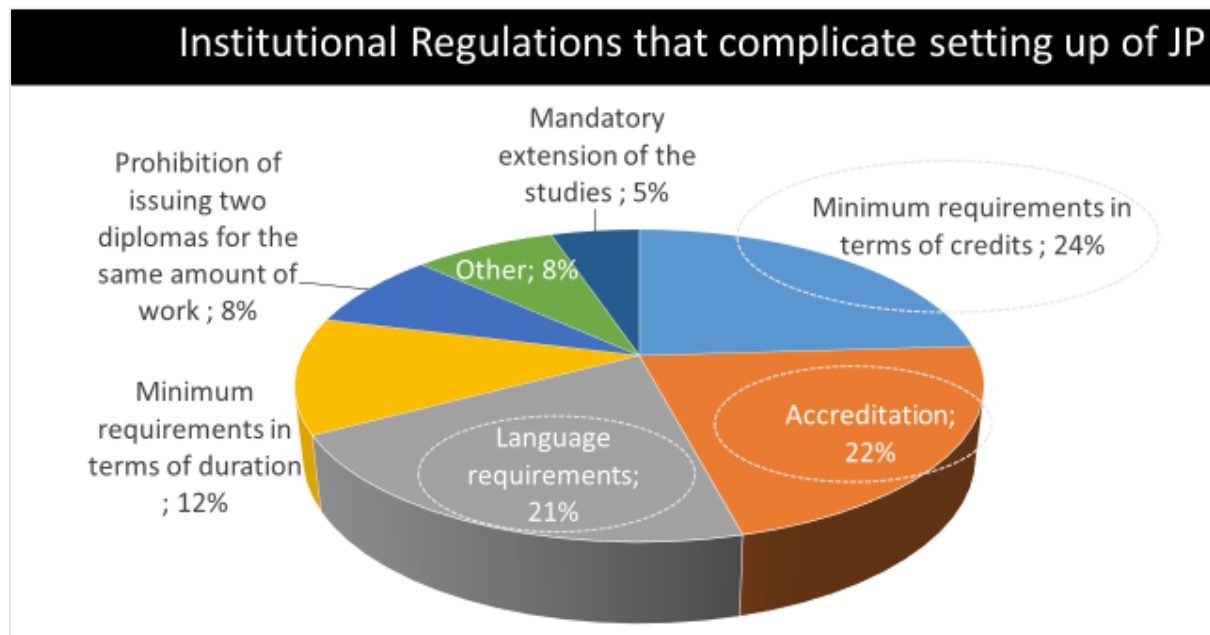
Fees structure	2,6
Academic calendar	2,5
Institutional support	2,5
<b>Degree duration</b>	<b>2,4</b>

The perception of how challenging national legal issues are for the development of new JPs obviously varies a lot from country to country, with 100% of the Italian and Dutch respondents claiming that these aspects are challenging or very challenging, down to 30% of the Spanish and 20% of the French respondents.



When asked about the institutional challenges that complicate the setting up of new joint programmes, 24% of the respondents answered that the most challenging aspect is minimum requirements in terms of allocation of credits. This shows that curricula are still rather rigid in many countries, which makes it difficult to satisfy the minimum requirements of two or more local (or national) regulations without ending up with an extension of the nominal duration of the programme. Accreditation was chosen as the most challenging aspect by 22% of the respondents, since even when the new JP builds on an existing and accredited national programme, it needs to be reaccruited when part of the curriculum is offered by a second university. Language requirements were chosen by 21% of the respondents, since in some countries students have to meet national language requirements for being issued a national diploma although the programme is taught in English. Minimum requirements in terms of duration was chosen by 12% of the respondents, since some institutions require long periods

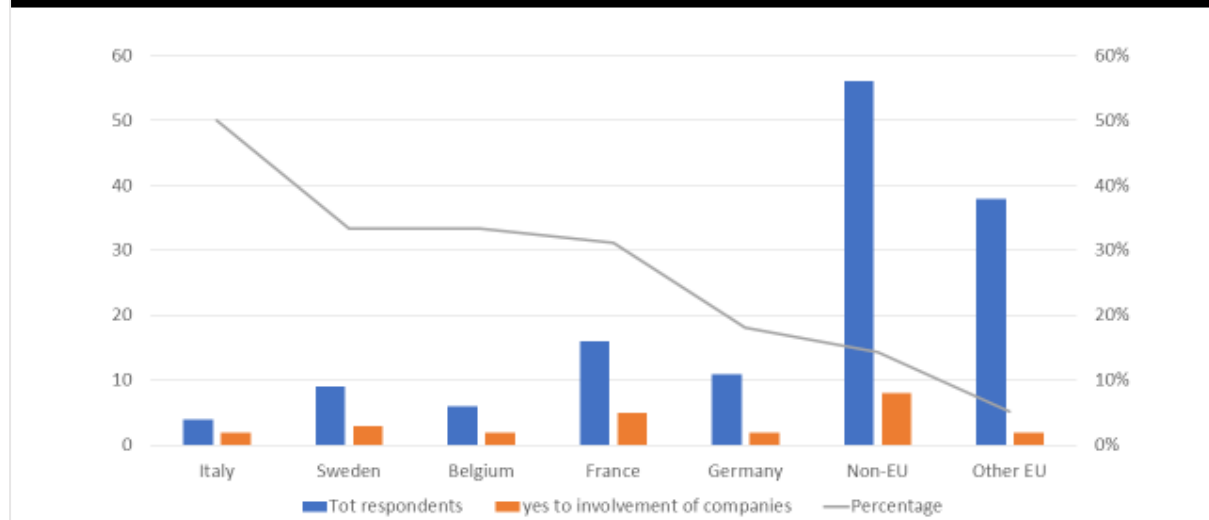
of residence for a student to be entitled to obtain the local degree and if two institutions with similar requirements partner up, this might result in an extension of the nominal duration of the programme. The formal prohibition to issue two diplomas for the same amount of work was chosen by only 8% of the respondents, showing that this type of concern that was very common at the beginning of the process has now been overcome by most universities. This also holds for the mandatory extension of the studies, which was chosen by only 5% of the respondents as the major concern.



### COMPANY INVOLVEMENT

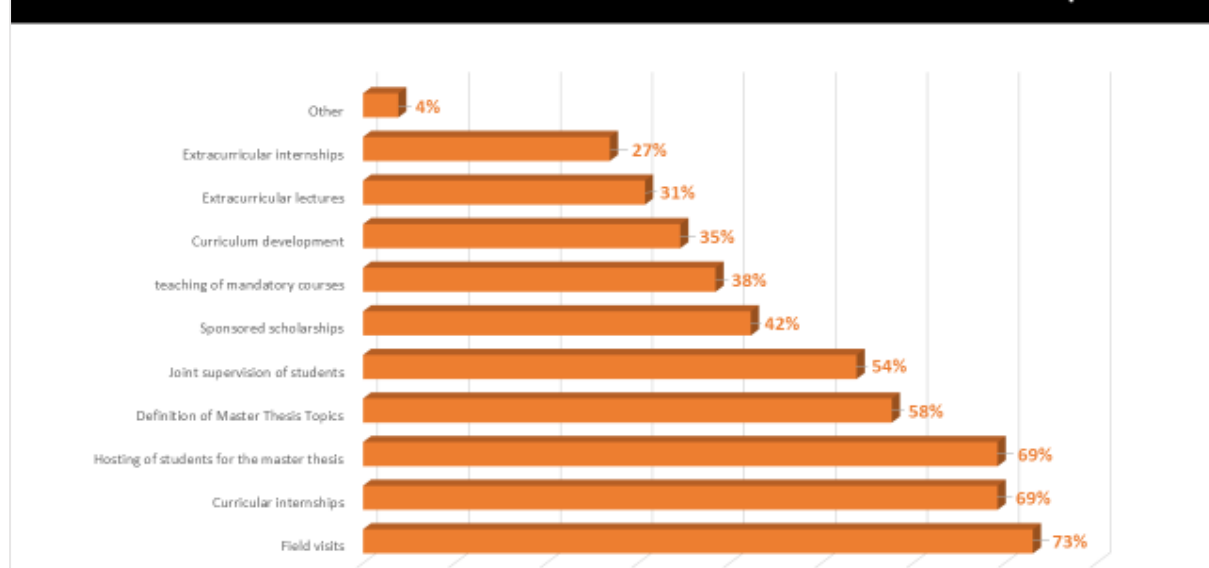
The number of HEIs stating that they offer JPs with the direct participation of companies is only 17% , which shows that the main scope of the project is still very relevant and that action needs to be taken to encourage the creation of more JPs with these characteristics advocated by the JP alumni in the course of the REDEEM project (2015-17). Although the figures are quite low in all investigated countries, the situation varies a lot from country to country, with a 50% of the Italian HEIs claiming to offer JPs with the direct participation of some company down to 18% in Germany and 15% in non-EU countries. Most of the EU countries (other than Italy, Sweden, Belgium, France, Germany) showed an average percentage of a mere 5% of JPs with the participation of employers.

## Does your institution offer joint programmes with the direct involvement of companies?

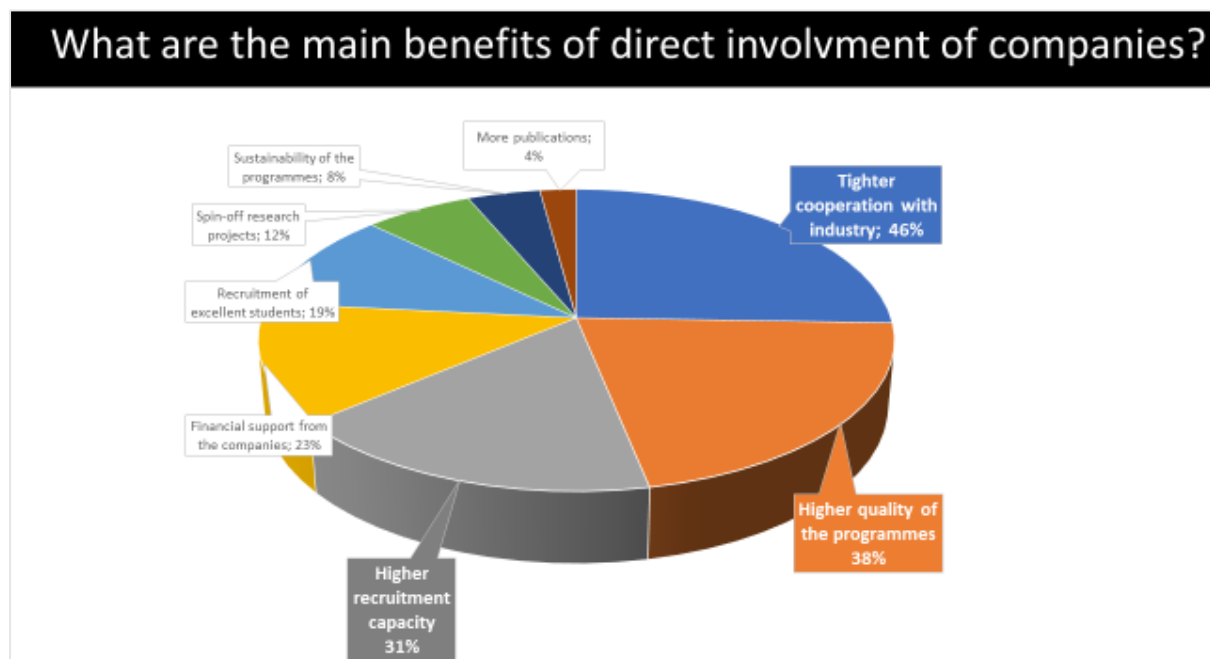


The 17% of the respondents with ongoing programmes with the participation of employers were asked for the nature of this involvement and their answers showed that in many cases this involvement is very superficial and has a very limited impact on the programme. The most common activity (mentioned by 73% of the respondents) is field visits to the employers, followed by curricular internships (69%), and hosting students for the master's thesis (69%). The least popular activities are extracurricular internships (27%) and extracurricular lectures (31%). Only one third of the respondents mentioned joint curriculum development as one of the activities carried out together with the employers, although this would be needed most according to both companies and students covered by the REDEEM qualitative analysis.

## What is the nature of involvement of the companies?

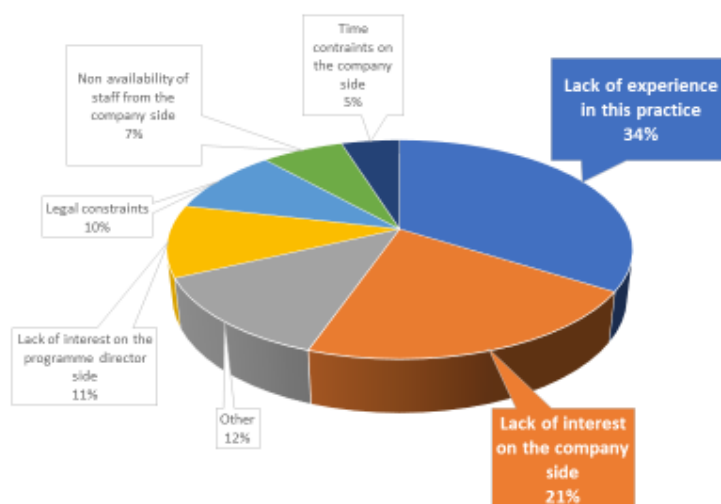


The respondents with experience in this type of JPs were also asked for the perceived benefit from the involvement of companies. Again, as for the development of JPs in general, the share is highest for the mere interest of the HEI, with 46% of the respondents mentioning a tighter collaboration with the involved companies as the most notable benefit and 31% considering a higher recruitment capacity (attractiveness of the JP) to be the main result. 38% of the respondents mentioned a higher quality of the JP achieved through the involvement of the employers. Only 23% of the respondents experienced a financial contribution by the employers involved and only 8% stated that this involvement resulted in a higher sustainability of the JP.



When asked for the reasons that prevented the involvement of companies, the majority of the respondents mentioned the lack of experience as the main obstacle, which again shows the need for clear guidelines that are among the main outputs of this project. 21% of the respondents chose the lack of interest from the employer's side as the main obstacle, but when the employers were asked the same question they agreed that the interest in getting them actively involved is lacking on the side of the academia. This shows that better communication is needed, since the interest seems to exist on both sides, but a set of misconceptions prevents collaboration. Only 10% of the respondents consider legal issues to be an obstacle and even fewer mentioned lack of staffing or lack of time on the company side as major concerns.

## What were the main reasons that prevent the involvement of companies?



### CONCLUSIONS

Traditional double-/dual-degree programmes still are the rule, while truly joint programmes are the exception. JP models are highly fragmented and diverse, with a trend towards using the 1+1-year model. Joint degrees (diplomas) are still prevented by legislation or institutional regulations in many countries. Therefore, multiple degrees are the rule in most cases. English is becoming the predominant teaching language. It already is the only teaching language for half of the analyzed JPs. Registration procedures and tuition fee policies also are highly fragmented and constitute one of the most problematic aspects to deal with when setting up a new JP. JPs are still seen mainly as a tool to boost the HEIs' internationalization, visibility, and ranking, while the needs of students and employers are in the background or completely neglected. Funding and sustainability are the main challenges for HEIs when it comes to developing and managing new JPs. Employers are generally not involved in the development and implementation of JPs and when involved, they play a minor role in the programme. For better information, communication must be improved.

## 2: COMPANY INVOLVEMENT

The survey of higher education institutions done within REDEEM2 shows that still a minor part of them run master's programmes in close co-operation with companies. Out of 145 institutions that answered our survey, 26 institutions (18 percent) claimed that they had examples of heavy involvement of companies in some master's programmes.

Results on company involvement
18% (26 institutions) claim to offer JPs with substantial involvement of companies
6% (9 of them) have companies involved in the development of the curriculum
15% (10 of them) have companies involved in the teaching in mandatory courses
6% (8 of them) have companies involved in extracurricular lectures
10% (15 of them) have companies involved in defining master's projects
13% (19 of them) have companies involved in field visits

12% (18 of them) have companies involved in curricular internships
5% (7 of them) have companies involved in extracurricular internships
12% (18 of them) have companies hosting students for the master's thesis
10% (14 of them) have companies involved in the joint supervision of students
8% (11 of them) have companies sponsoring scholarships
5% (7 of them) got informal input from companies when thinking about the creation of the joint programme

1 of them had companies taking part in the working group that created the joint programme

2% (3 of them), including the one above, have formal participation of companies in the group that created the joint programme and one company representative for periodical follow-up of the programme

The involvement obvious to students typically consists in inviting representatives from companies to give guest lectures, in having ties with certain companies that continuously offer internship opportunities, in having project assignments as part of courses that are provided by companies as “real world cases”, and in organizing career supporting events. The typically short time perspective that companies live with is making it very difficult for professors to make companies enter substantial long-term commitments – companies want fast solutions and do not want to commit to detailed collaborations several years ahead. Professors are very well aware of the potential value in being able to market their joint programmes with paid internships as part of the package, but it is still a rare occasion. We did not find any such examples in our contacts with programme directors. Also we have not come across examples of JPs that have managed to obtain significant funding from companies. Two of the joint programmes included in interviews set up advisory boards with representatives of companies and other employers. These JPs are the International Master of Science in Fire Safety Engineering and the Master of Space Science and Technology. The idea is to have a continuous dialogue about the programmes with stakeholders.

It should also be considered that companies are very different. The start-up company, for example, has unstable or no revenues and is based on a single innovation - conditions that largely differ from those of big engineering companies. The biotech start-up founder we interviewed targeted very specific master’s programmes to get access to students for thesis work with the right interest and knowledge and to be close to that research; “since this area is developing very fast, this is important”. The main involvement in master’s programmes was to suggest topics for thesis projects and continuously have a few master’s thesis projects running. They offered no pay to students doing thesis work and could not offer an environment where the students were integrated in a working group. What they offer is involvement in developing frontier technology and contact with a very small number of persons. The focus for this company is on becoming established and even on just surviving the first years and hopefully on broadening the involvement with academia with time, “In the future we could also give more feedback to the programmes, especially for programmes aimed towards entrepreneurship.” This kind of company is not necessarily tied to a certain region; “We could work with programmes located elsewhere. We are, for example, looking for students studying machine learning in Australia. I worked for five years in Motorola Lab in Australia so I have good contacts there. “This company founder saw joint programme students as a category of students who have developed the independence and self-reliance that is important for employees.

Big companies seem to typically want to channel students through established procedures. For example, they often have a standardized way of administrating master’s projects for engineering students and do not want to put energy into developing individual arrangements. For a master’s programme director to be able to involve a major company in a special co-



operation, there typically needs to be a personal relationship. When that person in the company moves within the company or elsewhere, that co-operation is easily lost.

An important aspect is the desired extent to which employers influence a master's programme from the academic managers' points of view. As an example, one professor mentioned that a company wanted the curriculum to include learning a certain software, since they needed to hire staff who knew that software. In the programme director's view, that is much too shortsighted and specific; "by the time our students enter the workforce, that software may even very well be replaced with a new one". The challenge is to have companies contributing to help the programme being relevant and to get different kinds of support for activities, while keeping enough distance to have the independence to decide on the content and pedagogy. This issue was mentioned often by academics.

Furthermore, it can be noted that seemingly attractive internships and similar activities in prestigious companies are not automatically very rewarding experiences for the students. Some students we interviewed saw their company placements as very motivating and said that they added new dimensions they would not have grasped by only taking courses on campus and that they were very formative for their careers. Others complained about having been left very much on their own with not much sense of the meaning and functioning of the company unit they were put in and not always getting very interesting and well-thought-out tasks. One student expressed it as follows: "The involvement of companies varies from course to course. Sometimes they just hand you many reports. You do not always understand the working of the businesses. You do not feel you are really doing anything. I had a project in Aalto University last year that was great. We developed a go-to-market plan for a new product and the person there was really nice and we got to work closely with them. We learned loads."

There was also some criticism towards companies when sending Human Resources staff to events about industry, since some companies mainly want to market themselves as employers, whereas the students expect to get to know about the company's technology and business model. One student added, "About the network events, we understand that in the real world no one will hold your hand, but I think they [the staff running the master's programme] could do much more for matchmaking activities". When talking to non-European students in particular, the impression was strong that they often feel alien about how to move in the labor market culture. Many of them have entered a joint programme with the ambition to get a foothold in a foreign country. Seemingly small things, such as getting a business card from a company representative and perhaps an invitation to come and visit his or her unit towards the end of studies, can then be very motivating and is seen as a big help. It is our impression that coordinators of joint programmes do not always realize this need and that some support of this kind can be a good thing to organize. At some universities, this is a regular central activity to cover up the differences in different programmes and departments. Summing up students' views, there seemed to be a general understanding that the students' experiences of engaging with companies vary. Our conclusion is mainly that the quality of companies' involvement cannot be taken for granted and that some form of follow-up of company involvement is recommended. This is also something that is discussed a lot among the students themselves. A programme that guarantees quality internships and involvement in courses or is connected in a strong ecosystem of companies and other organizations providing access to internships is not seen as a problem, it is easily a dealmaker or deal breaker for prospective students. It is our hypothesis that communication of a great record of accomplishment and positive reviews from former students will be crucial to the

programmes' sustainability in the long run. This is especially true for more industry- or business-oriented programmes. For more theoretical and, thus, research-oriented programmes, this is a somewhat less urgent factor, even if the student groups are seldom very homogeneous.

Programme directors are well aware of this. The fact that we do not find very structured and sophisticated interaction with companies in joint programmes, beyond what has been in place for a long time, shows how big the challenges are to bridge the gap between universities and the working life.

Lastly, there are fundamental cultural differences in the relationship between universities and employers. This conclusion can be drawn from discussions with program directors who typically encounter challenges in harmonizing opportunities for the students to gain access to employers through the programme. An example is the automotive engineering joint programme mentioned earlier. The involvement of company representatives in courses is much higher at the French and Czech partners' than at the German partner university. Cultural differences in the academia-industry relationship could easily be the subject of a whole project. Here, we just mention that these differences play a bigger role in joint programmes because of their intercultural nature.

- Many joint programmes are oriented very much towards the labor market. However, innovative content and structure and significant funding have not been found when it comes to company involvement in joint programmes.
- Involving companies is complex, time-consuming, dependent on persons, and thus very difficult to scale.
- Cultural differences affect the university-company relationship, but are difficult to pin down. This makes joint programmes more complicated.
- Joint programmes support the integration in the job market. This is a crucial aspect especially when JPs attract many international students who see the programme as their way to enter a foreign labor market.

### **3: INTERVIEWS WITH COORDINATORS FOR JOINT MASTER'S PROGRAMMES IN MARCH AND JUNE 2019**

#### **3.1 MASTER OF AUTOMOTIVE ENGINEERING - EMAE**

*The Master of Automotive Engineering, EMAE, started already in 2005 as an Erasmus Mundus programme and was initiated by Professor Gabriela Achetnová at CTU in Prague.*

##### **WHAT IS THE NATURE OF THE PROGRAMME?**

We wanted to develop a programme providing broad competence in automotive engineering combined with intercultural and language competencies. We saw a great demand for that combination of skills. During the first year, the students should all learn the basics they are supposed to be familiar with as an engineer in the area, and then continue with a specialization in the area of their interest. The partners contribute specializations in which they are particularly strong and that complement each other. This way, we can offer a wider option of specializations than if we all ran our own programmes individually.

We wanted studies in countries with different languages, and the students should be able to take intensive language courses in the first year (at CTU) to prepare for studies in the language used at the host institution for their specialization. French is used in Brittany, German in Chemnitz, Indonesian or English at IIT Bandung, and English is used in Prague and Nijmegen. Initially, all students begun the studies at CTU Prague, but that has now changed and there are a larger number of study tracks.

We also aimed at choosing partners in regions having a strong automotive engineering industry.

We mainly had the automotive industry in mind as the working market. Finally, the fact that the students would get two master's degrees in two countries would help them in their career.

We get students from everywhere, both from partner universities and other universities in Europe as well as from outside of Europe. About half of the number of admitted students are from within Europe and half from outside.

Applicants need to have a bachelor's degree in engineering, preferably in mechanical, transport, or electrical engineering.

##### **WHAT IS THE GENERAL LAYOUT OF THE PROGRAMME?**

The first three semesters consist of courses, followed by the fourth semester devoted to the final thesis. A summer internship is also obligatory.

The students start at one of four member institutions and then continue at the institution of choice in the second year. The students choose one out of eight specializations. All students should study in two different countries.

The institution of the second year is responsible for the thesis. The defense is done at that university, even if the internship is done somewhere else in the world.

#### **LIST OF SPECIALISATIONS:**

- Advanced Powertrains - CTU, Prague
- Design of Vehicles and Modelling and Computation – ENSTA, Brittany
- Vehicle Dynamics and Control - HAN Nijmegen
- Fuel Cell Drives and Hybrid Motors - TU Chemnitz
- Internal Combustion Engines, Powertrains, and Engines and Fuels - IFP School, Paris
- What is the working market like
- Most of our alumni at least started their careers in the automotive industry, mostly in development or production, but of course, they also spread to other areas.
- The students can pursue a PhD, but mostly they want to work in industry.
- The employability for the students is seen as very strong.

#### **HOW ARE COMPANIES INVOLVED?**

Involvement of companies in the programme is seen as positive, even if the cultural traditions largely survive. This means, for example, that the French partners have a strong involvement of people from industry in teaching, but less so in Germany. Currently, mainly an industrial partner teaches one topic in CTU, automation in production. In addition, field visits are generally incorporated in many courses.

Most final theses are done in collaboration with companies and most often in research and development units.

Prof. Achtenová explains, “It is seen as a learning experience to search for internships and thesis projects. We sometimes offer suggestions, but in most cases, the student is expected find it on his/her own. The internship should best be linked to the final thesis.”

#### **WHAT ARE THE MAIN CHALLENGES FINANCIALLY AND ADMINISTRATIVELY?**

We do not have any funding as Erasmus Mundus and so cannot offer scholarships, which is a challenge. We can offer scholarships for a few cum-laude students. That is the only funding. We request scholarships only for students coming from outside. Several members have some subsidies from governmental sources.

The tuition fee currently is EUR12, 000, divided into 7,000 for first year and 5,000 for second year for non-European students. The EU students pay EUR 2,000 per year. The German partners cannot charge fees, but the others have those fees. The German partner is very attractive because of this, but since they teach in German, only that is a threshold. Level B2 is required for the German language.

The students get diplomas from the two universities where they studied, meaning it is a double-degree programme. They also get two transcripts. The diplomas mention that the studies were carried out as a collaboration between “university X and university Y”.

“We have been running the programme for 15 years now, so we have a lot of experience to make it work. We have one meeting of all involved universities per year. The majority of students in first year are in Prague. The meeting is often in Prague in autumn, so that the partners can meet to inform the students. In Czech Republic, all students do not only need all compulsory credits and the thesis for receiving their diploma, but they also need to have

passed an oral exam that proves the students' understanding of the engineering area, logic reasoning, and maturity. Therefore, we at CUT need to visit the partner universities to attend the defences and also perform this state exam." Prof. Achtenová adds.

#### **FINAL ADVICE**

"It is nice to have great names in the consortium", says Prof. Achtenová, "that is universities that are very well known internationally, but more important in order to have something running well in the long run is to have motivated people involved in the programme. The responsibility of the people is what is most important for a good functioning programme. From this point of view, we have been lucky to have good partners around Europe in this programme. Most of them have been involved for a long time, and otherwise they have been replaced with interested people."

#### **EMAE CONSORTIUM ([HTTP://WWW.EMAE.EU/](http://www.ema.eu/))**

CZECH TECHNICAL UNIVERSITY, PRAGUE

ENSTA, BRETAGNE

HOGESCHOOL VAN ARNHEM EN NIJMEGEN

IFP SCHOOL, PARIS

INSTITUT TEKNOLOGI, BANDUNG

TECHNICAL UNIVERSITY OF CHEMNITZ

**WEBSITE:** <http://www.ema.eu/>

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*The interview with Professor Gabriela Achtenová took place on June 10<sup>th</sup>, 2019. Achtenová is full professor at CTU in Prague and affiliated with the Vehicle Centre of Sustainable Mobility and is currently also CTU vice-president for education.*

### **3.2 INTERNATIONAL MASTER OF SCIENCE IN FIRE SAFETY ENGINEERING - IMFSE**

*The two-year international master's programme IMFSE started in 2010. It was initiated and is still coordinated by Professor Bart Merci at Ghent University in Belgium. MFSE is now in its third term as a Erasmus Mundus programme.*

#### **WHAT IS THE NATURE OF THE PROGRAMME?**

It is expected that the need for engineers with a thorough understanding of fire safety is growing, as more and more high-rise buildings are being built around the world and since new building materials are being implemented. The working market for IMFSE is quite clear and established, but the vast majority of persons working in this area today still have no specific training. At best, they often have a civil engineering education. There is only a handful of similar master's programmes offered today with a clear focus on fire safety.

First, the students are put on assignments to meet different requirements. The first year focuses on theoretical contents to know the necessary basics of structures, thermodynamics, etc. Classic engineering and also risk analysis and human behavior theory are taught. In the second year, the focus is moved to how to design certain systems, the design implications, and how to meet the expectations and specific regulations in place. In northern Europe, for example, the authorities generally enforce performance-based designs. This means that the maximum time for evacuating a certain type of building is specified. In southern Europe, the authorities generally control through descriptions. For example, they specify that a building should have a minimum number of exits. We must train the students to understand the goal behind the legislation and to be able to move beyond current legislation and building techniques."

The clear majority of the students have an engineering or architecture background.

#### **WHAT IS THE GENERAL LAYOUT OF THE PROGRAMME?**

The two-year master's programme has a compulsory mobility element and the students begin their studies in either Edinburgh or Ghent. During the second semester, all students study in Lund. This means that the students are then brought together for a full semester, which very much strengthens the cohesion of the student group. In semester three, students study at one of the three full partners' depending on their interest. In semester four, for the thesis work, students study at one of the three partner institutions or in one of the associate partner institutions. When the thesis is written at an associated partner institution, then the student also has a supervisor at one of the three full partners'. Most students study at three institutions during the programme.

The choice of partners for the consortium was obvious, since Ghent, Edinburgh University, and Lund University already had specializations in fire safety and were the arguably most established departments in this area in Europe.

Double- and Joint-degree programmes by all three full partners started in October 2010.

Ghent University is responsible for the admission. Applicants complete a form online with information, including recommendation letters, any publications, etc. Merci sets up the first short list for interviews. Lund University and Edinburgh University should agree to this list. After the interviews, a ranking is made. Lund University is responsible for a second screening.

The best outcome for an applicant is to get admission and scholarship. Most students are offered admission, but without a scholarship.

Prof. Bart Merci about the interview: “We start asking general questions about their view on living abroad. We think it is important to get an understanding of how motivated they are. An international programme is challenging. But we ask also technical questions to test technical skills.”

There is no real limit to the number of places in the programme. The number of scholarships varies, but is around 15. This year, close to 25 students started. The students sit together with national students in the classroom.

#### **SPECIALISATIONS:**

- Classes in Ghent have a general fire safety engineering focus
- Classes in Edinburgh focus on fire dynamics, fire safety engineering, and structural design for fire
- Classes in Lund emphasize enclosure fire dynamics, risk analysis, and human behavior.

#### **WHAT IS THE LABOUR MARKET LIKE?**

There is a very high demand for this competence in the working market. Most students have secured an employment already before they graduate. The international component is very much appreciated by employers. Approximately 75 percent are employed in the commercial sector, mainly construction companies and real estate companies. A special advanced sector is construction consultancy companies that need advanced experts. This is a small area with only about a thousand persons worldwide.

The other main sector is within the public sector, mainly fire departments and legislative agencies. A limited number of the students continue within academia.

Prof. Merci does not see the very few similar master’s programmes - for example at Worcester Polytechnic Institute, University of Maryland in the USA, and soon ETH in Zürich - as competitors, but would instead welcome more programmes in the area: “We try to keep track of the alumni through social media like LinkedIn. The network is pretty strong, since the alumni have very much the same interest and a focused job market.” IMFSE alumni are now found in some 60 countries, broadly speaking in all continents except for Africa.

The alumni can easily work in different countries during their career, if they prefer to. In some countries, there are special exams in order to be allowed to work, but those exams are not a big obstacle with the competence obtained after this programme.

The recruitment is very wide with students from all over the world. The coordinators noticed an increase of self-sponsored Chinese students in the last couple of years. There have been

no students from Africa yet, but supposedly, this will change with increased urbanization and regulation and with more people being able to afford the studies.

#### **HOW ARE COMPANIES INVOLVED?**

There is an industry advisory board where trends in the market are discussed to see whether new or developed courses are needed. A meeting is organized every year in connection with the Graduation Day to discuss the curriculum and development of the programme. Each year, the coordinators also organize a “Fire safety day” during the winter, involving companies and other stakeholders. It is a meet-and-greet day with panel discussions and the sponsors present. The event takes place in one of the three partners’ campus. The students get support to finance their travel.

Companies also support internships during the summer break. They do guest lectures during the second year, often as a single lecture, but it can also be for a full course. The environment changes so fast that it is good to bring in external lecturers.

What are the main challenges financially and administratively?

Administration of international programmes is always challenging and the regular funding is not sufficient. There are also more questions asked by prospective students for this kind of programme compared to a regular programme as well as during the studies.

Prof. Bart Merci: “I am fortunate that at Ghent university there is now a long tradition to run Erasmus Mundus programmes. I have good support centrally. But I am also funding an assistant in my department from the fees to handle the student matters.” There is also administration needed at the two other partners. As an estimation, two full-time administrative staff members are needed for this rather small consortium. Without fees, it is very difficult or impossible.

Another challenge for the sustainability of the programme is the high living costs in Europe. A consortium of organizations supporting the IMFSE offers a number of additional stipends in addition to the European scholarships: “The EU funding covers more than the fee. Our own stipend covers only fees. Very few exceptionally talented students can get an extra scholarship.” Since last year, we also have some self-financed students.

The programme is now in its 3rd term. The budget was cut for the second term with only three grants per year. Now, it is twelve grants per year. The fee is EUR 10000 per year for non-EU students and EUR 7000 for EU students.

We need more funding for this programme than the regular payment.

Finally, Brexit is a special and unexpected challenge that affects this consortium, since Edinburgh University is in it.

#### **FINAL ADVICE**

As final words by Bart Merci: “Choose your partners wisely. Within this kind of co-operation, you will have to take your partner’s word unconditionally. You want good partners on board, that means people you can trust and people entering the co-operation with a very high level of motivation. I think size of the consortium should be as big as it needs to be, but not bigger.



In our case, we thought we were the three best partners. There is competition on the European level, but it is not good if you have only a few students at each partner university. As coordinator and responsible for the admissions, Ghent is the first point of entry and as coordinator, I am generally the go-to-person. This means you will deal with a huge amount of issues and challenges. You must be prepared to accept this challenge.

#### **IMFSE CONSORTIUM ([HTTPS://IMFSE.BE/](https://imfse.be/))**

##### **FULL PARTNERS:**

UNIVERSITEIT GENT, BELGIUM – COORDINATOR

EDINBURGH UNIVERSITY, UK

LUND UNIVERSITY, SWEDEN

##### **ASSOCIATED PARTNERS:**

ETH, SWITZERLAND

UNIVERSITY OF MARYLAND, AUSTRALIA

##### **INDUSTRIAL PARTNERS:**

ARUP - IFIC FORENSICS – NFPA - GAE ENGINEERING – KINGSPAN – WSP – PROMATFPC - BRE -

FIRE ENGINEERED SOLUTIONS GHENT - OFR CONSULTANTS - BASLER & HOFMANN - JENSEN HUGHES -

ROCKWOOL - DBI

#### **INDUSTRIAL PARTNERS**

Arup - IFIC Forensics – NFPA - GAE Engineering – Kingspan – WSP – PromatFPC - BRE  
- Fire Engineered Solutions Ghent - OFR Consultants - Basler & Hofmann - Jensen  
Hughes – Rockwool - DBI

**WEBSITE:** <https://imfse.be/>

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*The interview with Professor Bart Merci took place on March 13<sup>th</sup>, 2020.  
Merci is full professor in the Department of Structural engineering and Building Materials.*

### 3.3 MASTER OF SPACE SCIENCE AND TECHNOLOGY

*The Master of Space Science was initiated by Dr. Victoria Barabash at Luleå Technical University in Sweden.*

#### WHAT IS THE NATURE OF THE PROGRAMME?

The idea is to gather students with different backgrounds in engineering and science and an interest in space. We do not think in terms of research-oriented or industry-oriented, but instead aim to educate individuals for their futures. This means that they not only supposed to learn certain topics, but to be further strengthened in how to develop a lifelong learning process. They can choose to do research, or work in industry, or become entrepreneurs. Entrepreneurship is now a mandatory subject.

The space and atmosphere is a wide research subject that contains many different niches in itself.

Often students from outside the EU have studied physics and mechanics, while most EU students have studied space engineering.

#### WHAT IS THE GENERAL LAYOUT OF THE PROGRAMME?

The programme started in 2005. This is now the fourth version of the programme.

In the first year of the programme, all students study to get a common knowledge base. The studies take place at the Space Campus in Kiruna in northern Sweden, where a lot of space research is conducted and many organizations working in this area can be found. The students choose courses to cover "blind spots" after their bachelor's studies. In the second year, the students spread out among the four partner universities.

LIST OF SPECIALISATIONS:

- Dynamics and Control of Systems and Structures - Cranfield University
- Space Automation and Control - Czech Technical University in Prague
- Space Technique and Instrumentation; or Astrophysics, Space Science and Planetology - Université Toulouse III - Paul Sabatier
- Atmospheric and Space Science; or Space Technology and Instrumentation - Luleå University of Technology

Lund Technical University is responsible for the admissions process using the Swedish national web-based system and administrates the tuition fees and transfers to the members.

English language is used at all institutions except for some courses taught in French at Université Paul Sabatier.

#### WHAT IS THE LABOUR MARKET LIKE?

Today, many of the new graduates are employed by small and medium-sized companies. Some are start-ups with only a few persons employed. Until a few years ago, the major actors in the area were very dominant. In Sweden, there are a few agencies that are important employers: the Swedish Institute for Space Physics in Kiruna, the Swedish Space Corporation, and EISCAT Scientific Association.

## **HOW ARE COMPANIES INVOLVED?**

We have wanted to involve stakeholders since the outset. We have external advisors on the board representing agencies that are also big employers. Their feedback regarding development affects the content of the programme. We encourage lecturers from industry. In our area, most research subjects are closely linked to the big employers. Among these Associated Partners are aerospace companies like Airbus and Thales, the European Space Agency, the German Aerospace Center DLR, and the French space agency CNES.

We also run projects together with local actors, such as The Swedish Agency for Economic and Regional Growth, an example being Space for innovation and growth (RIT).

85 % of the students do their final thesis projects outside of the universities. Our surveys show that 73 percent of the students do a summer internship after the first year of studies. For internships in the industry, they typically will get a pay besides the experience and personal contacts.

## **WHAT ARE THE MAIN CHALLENGES FINANCIALLY AND ADMINISTRATIVELY?**

Obviously, funding is always a constraint for research groups. They cannot compete with industry in funding thesis work or with salaries.

Furthermore, issues relating to intellectual property rights are common. Often, the parties agree on five years of non-disclosure. "We need a lot of support from the legal staff at LTU", Victoria Barabash reflects, "especially when foreign companies are involved". Some companies work on defence-related projects. These are difficult for students of some nationalities to enter.

LTU (Sweden), Cranfield (UK), and Aalto (Finland) now all have high tuition fees. This is a big challenge for the recruitment. Fortunately, we still appear to be attractive. Out of 40 students, 12-15 are self-funded. We have now only very few scholarships.

The main competitors are in France and Germany, countries where they also have a strong industry and organizations in the field. "I hope in Swedish perspective that the Swedish Institute starts to market Sweden as a country for education much more systematically. Especially since we do not have the same tradition in our economy to retain the foreign students. "

## **FINAL ADVICE**

International programmes mean more work than regular ones and often lead to problems that are difficult to foresee. You must be prepared to think outside the box to solve administrative and other issues. At the same time, this is also very developing and exciting. "I see working with an international programme as more about developing people and their lives. It is not really about developing companies or industries. In addition, we are connecting people around the world. It is strongly recommended to have a long-term commitment since it takes time to develop the necessary relationships", says Victoria Barabash.

**SPACE ENGINEERING CONSORTIUM ([HTTPS://SPACEMASTER.EU/](https://spacemaster.eu/))**

CRANFIELD UNIVERSITY, UK

CZECH TECHNICAL UNIVERSITY, PRAGUE

AALTO UNIVERSITY, HELSINKI

UNIVERSITÉ PAUL SABATIER TOULOUSE III

**WEBSITE:** [www.spacemaster.eu](http://www.spacemaster.eu)

*The interview with Dr. Victoria Barabash took place on June 12th, 2019. Barabash has been Senior Lecturer at LTH in the Division of Space Technology and Head since 2004.*

## **4: ALUMNI SURVEY AND INTERVIEW ANALYSIS**

### **4.1 QUESTIONNAIRE – JP ALUMNI AND SINGLE DEGREE SURVEYS DESCRIPTION**

In order to fully cover the impact of joint programmes on institutions and graduates, two questionnaires were used, one targeting the Joint Programme (JP) Alumni, the main focus of REDEEM2 research, and another targeting the regular degree (RD) alumni as a control group to better perceive the real impact of the JPs. The control group was composed of single master's degree alumni with a mobility experience abroad.

Following the work developed in the REDEEM Project and in order to ensure a reliable comparison of strategic analytical factors, the Joint Programme Alumni survey aimed at answering two key questions: how do matters stand at present in view of the labour market for the Joint Programme Alumni and what are their perceptions of the impact the Joint Programme had on their career along with the major motivational factors that made them embark on a Joint Programme. For this reason, the personal background, Joint Programmes motivations, skills gained with Joint Programmes, and Joint Programmes satisfaction dimensions were kept as they were in the first REDEEM Project.

To meet REDEEM 2 goals, however, a set of new dimensions was included in the survey, namely, family background, break-out per Programme, region and scientific domain of graduation, motivations to enroll versus statements versus improvements, break-out levels of satisfaction of institution 1 or 2/3 and evaluation, entrepreneurship and employability, and most popular academic fields in Joint Programmes.

As always, the reader must bear in mind the diversity of realities of Joint Programmes graduates. We cannot speak of a Joint Programme without considering academic mobility, not only in terms of partner universities, but also of students who took part in JPs in the framework of a national programme and originated from third countries. The fact that graduates concluding their programmes between 2015 and 2020 spread over around 75 countries results in a huge difference of realities. Global results should be read carefully, because they end up being more indicative than conclusive with respect to the characterization of the employment status, in which factors like seniority and geographical location seem to be very important.

#### **4.1.2 Methodology and analytical dimensions**

The group surveyed includes all alumni of each partner institution, who participated in and graduated from a Joint Programme between 2015/16 and 2019/20. When comparative data between REDEEM and REDEEM 2 Projects is presented, the period is 2004/05 to 2019/20.

The survey aimed at obtaining the most recent graduates' perceptions and opinions and, at the same time, at providing a long-term analysis of core aspects, which covers a period of 16 years to understand the realities of graduates who experienced joint programmes in different periods. Using the LimeSurvey platform, data was collected through an on-line questionnaire made available at two different moments. The first was published in 2019 where information was collected from alumni who graduated between 2014/15 and 2017/18 and the second

was issued in 2021 to collect information from alumni who graduated in 2018/19 and 2019/20.

The REDEEM2 Consortium as well as alumni from the T.I.M.E. Association network were involved in data collection, resulting in an overall response rate of 14.3% (with the rate increasing to 19.6% in the Consortium only). All data presented results from the aggregation of both data collection rounds.

As for the regular degree survey, the sample of the JP Alumni Survey was composed of consortium alumni only, with the survey covering the same cohorts and the same periods, thus resulting in an overall response rate of 15.0%.

Partner	Joint Programmes (JP)			Regular Degrees (RD)		
	N	n	%	N	n	%
Aalto	529	130	24.6%	1153	164	14.2%
CVTU	93	45	48.4%	190	37	19.5%
IST	518	112	21.6%	160	13	8.1%
KIT	<i>250*</i>	77	30.8%	n.a.	n.a.	n.a.
KTH	1586	250	15.8%	852	162	19.0%
T.I.M.E. (External)	<i>2500*</i>	<i>128*</i>	5.1%	n.a.	n.a.	n.a.
TTU	56	16	28.6%	666	161	24.2%
TUD	193	68	35.2%	694	144	20.7%
UPC	1092	148	13.6%	<i>4800</i>	598	12.5%
<b>Total</b>	6817	974	14.3%	8515	1279	15.0%
<b>Total (without External)</b>	4317	846	19.6%	8515	1279	15.0%
<i>*Italic numbers are estimations.</i> <i>n.a. = not available</i>						

As already outlined above, the JP Alumni survey focuses on two key dimensions. The first dimension consists of several indicators that characterize the current graduate employment status, whereas the second dimension encompasses the motives that made them start a JP and their perceptions of the skills gained and competitive advantages, if any, for the labor market. An objective and a small number of indicators were chosen, such as:

- Current employment status
- Employment
- Company location
- Place of residence
- Salary
- Duties performed (whether in the area of study or not)
- Employer's field of activity
- Parents' professional occupations

Following the first REDEEM Project Survey and several comments by EU experts, it was decided to include new dimensions in the REDEEM 2 alumni questionnaire:

- Family background
- Break-out per programme, region and scientific domain of graduation
- Motivations to enrol vs perceptions vs improvements
- Break-out levels of satisfaction by institution 1 or 2/3 & evaluation
- Entrepreneurship and employability dimensions
- Most demanded academic areas in JPs

The second dimension referred to the partners' experience gained from REDEEM, which is divided into 4 large groups:

- Motivational factors for attending a joint programme
- Perception of the role of joint programmes with respect to learning/gaining certain skills
- Joint Programme's challenging aspects
- Competitive advantages a double degree may offer for the labour market

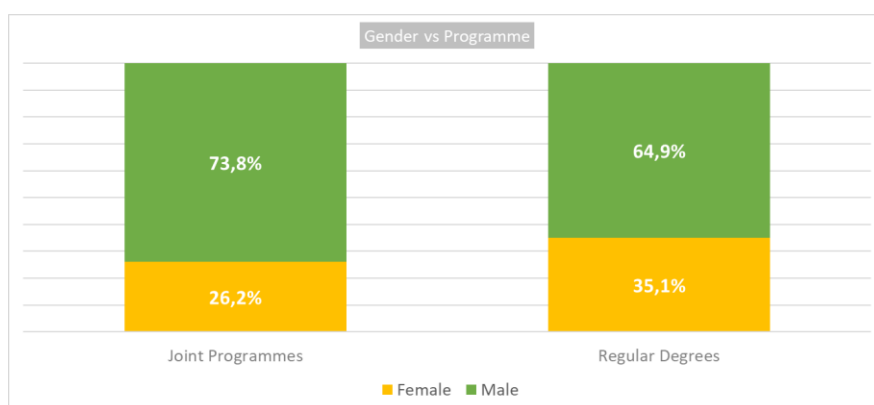
When collecting information, graduates were given the opportunity to submit suggestions for improvement and general comments on the global experience to give the information collection process a more exploratory nature.

#### 4.1.3 Characterisation of surveyed graduates

To characterize the surveyed graduates, the academic, demographic and social, and the employability dimensions are distinguished.

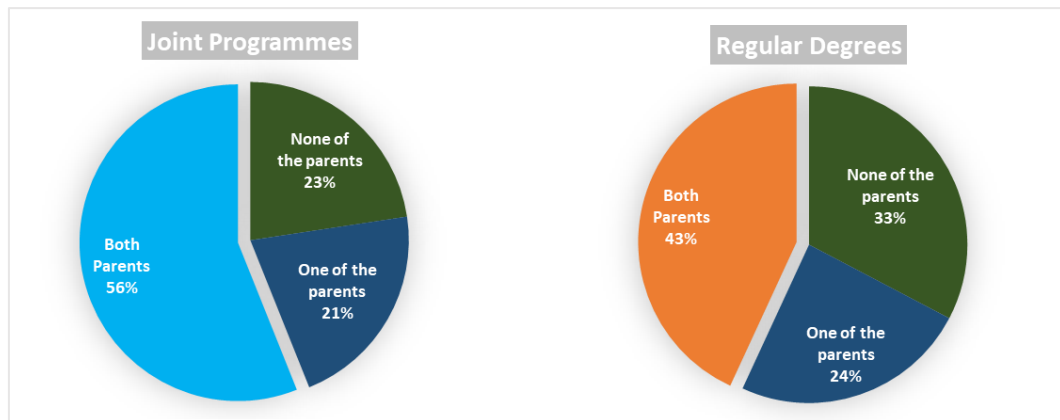
##### Demographic and social characteristics:

- 73.8% of surveyed JP graduates are male. The same tendency was observed for RD alumni, with 64.9% male respondents.

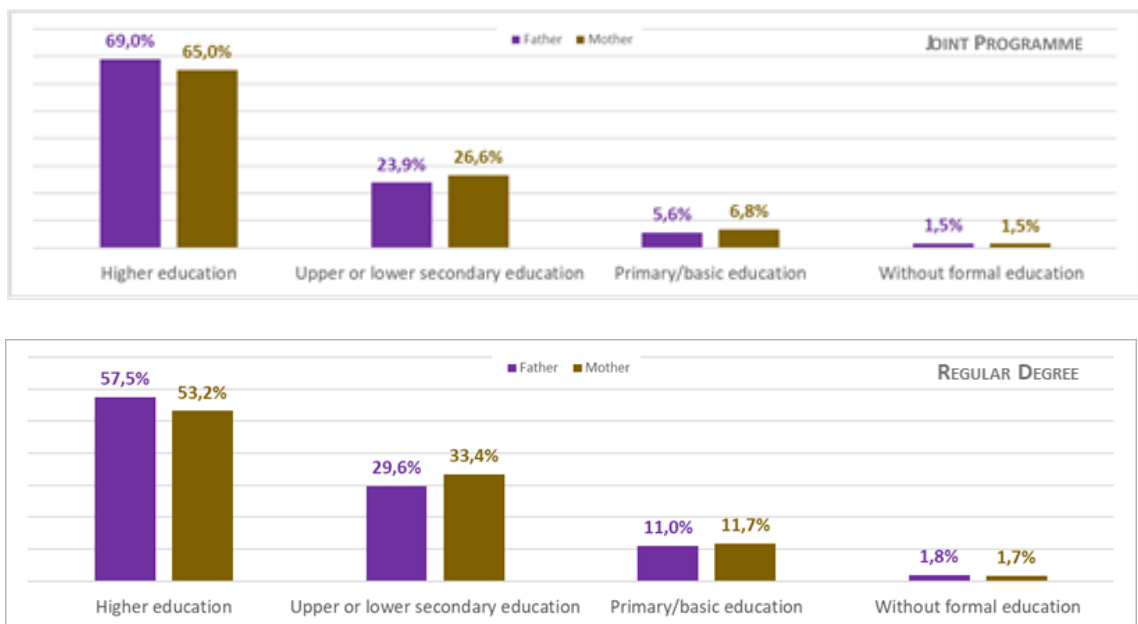


- The average age of JP alumni is 26.9 years, while that of the RD alumni is 26.8 years.

- Regarding the alumni parents' background, 56.1% of both parents of JP alumni have a higher education degree, while only 43.1% of the parents of RD alumni had such a degree.



- If only one of the parents has a higher education degree, this is the father in 69.0% of the cases for the JP alumni. The male higher education dominance is transversal and even deeper for the RD Alumni, where 57.5% of the fathers were the ones holding the degree.



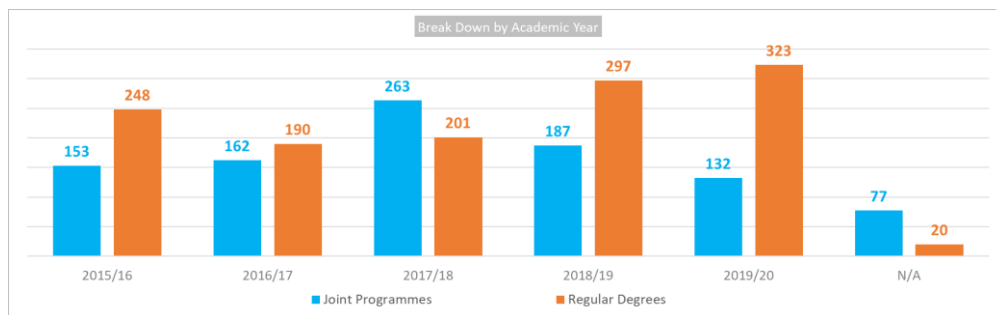
- As for the parents' professional occupations, figures appear to be quite similar for both alumni groups. The majority of the fathers work either as managers (JP = 29.2%; RD = 25.6%) or as technicians and associate professionals (JP = 21.7%; RD = 22.0%). The majority of the JP's alumni mothers work as specialists for intellectual and scientific activities (27.4%), service, and sales (17.0%), the RD's alumni mothers work in the service and sales sector (21.8%) and in the field of elementary occupations (16.9%).



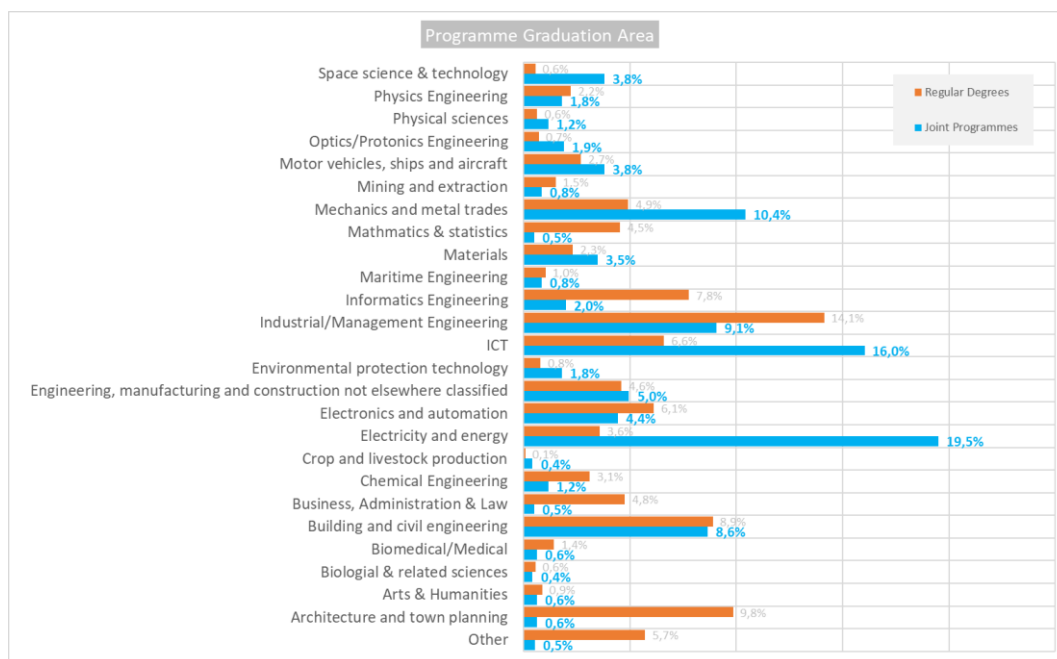
Parents' Professional Occupations	Joint Programmes (JP)		Regular Degrees (RD)	
	Father	Mother	Father	Mother
Armed forces occupations	3.2%	2.1%	1.8%	0.8%
Clerical (clerk/secretary) support workers	1.6%	9.7%	1.1%	9.1%
Craft and related trades workers	3.5%	2.5%	5.0%	3.2%
Elementary occupations	3.5%	13.0%	6.8%	16.9%
Managers	29.2%	12.6%	25.6%	13.9%
Plants and machine operators and assemblers	3.6%	0.7%	3.4%	0.6%
Service and sales workers	10.4%	17.0%	13.2%	21.8%
Skilled agricultural, forestry, and fishery workers	2.4%	0.7%	2.9%	1.1%
Specialists for intellectual and scientific activities	20.8%	27.4%	18.2%	20.6%
Technicians and associate professionals	21.7%	14.5%	22.0%	12.0%

#### 4.1.4 Academic characteristics

- JP graduates from 2016/17 and 2018/19 are represented best, the share being 50.2%. RD graduates from 2018/19 and 2019/20 are the best represented group (48.4%).

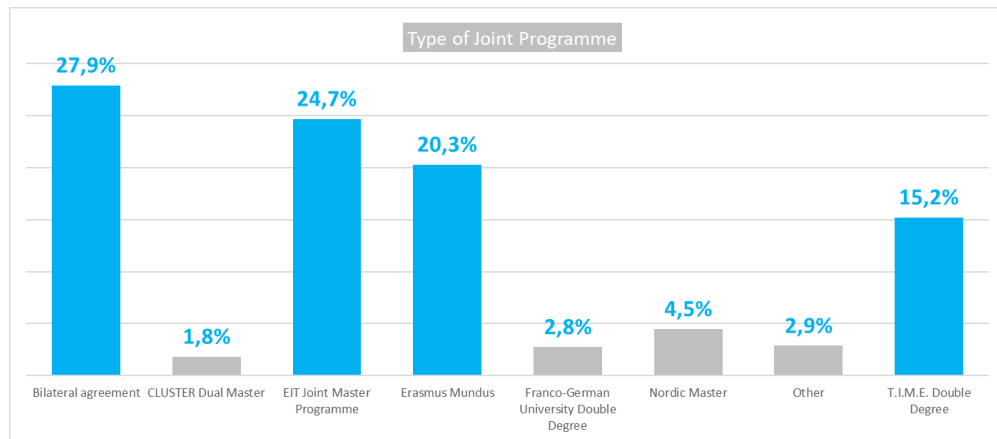


- Electrical Engineering and Energy (19.5%) and ICT (16.0%) are the main programme areas of JP graduates, while RD graduates focus on Industrial/management engineering (14.1%).

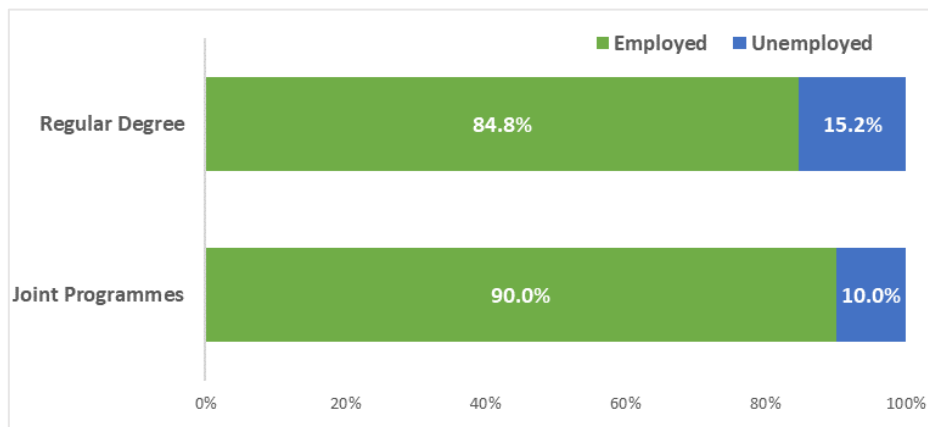


Programme Area	n
Architecture and town planning	8
Arts & humanities	6
Biological & related sciences	4
Biomedical/medical sciences	8
Building and civil engineering	96
Business, administration, & law	3
Chemical engineering	14
Crop and livestock production	4
Electrical Engineering and energy	259
Electronics and automation	58
Engineering, manufacturing, and construction not classified elsewhere	81
Environmental protection technology	24
ICT	233
Industrial/management engineering	119
Informatics	33
Maritime engineering	9
Materials	53
Mathematics & statistics	3
Mechanics and metal trades	103
Mining and extraction	13
Motor vehicles, ships, and aircraft	43
Optics/photonics engineering	19
Others	10
Physical sciences	14
Physics engineering	26
Space science & technology	40
<b>Total</b>	<b>1291</b>

- The majority of JP Alumni graduated from bilateral JPs (27.9%), EIT Master's Programmes (24.7%), and Erasmus Mundus Programmes (20.3%).



#### 4.1.5 Employability characteristics



- 90.0% of the JP alumni and 84.8% of the Regular Degrees alumni were employed at the moment when the survey was answered.
- 67.8% of the JP graduates and 28.2% of the RD graduates were working outside of their home country.
- 69.1% of the JP alumni and 59.7% of the RD graduates were working at large companies (> 250 workers).
- 59.7% of the JP graduates and 72.7% of the RD alumni were working in the private sector.
- 30.6% of the JP graduates and 20.9% of the RD alumni were working in professional, scientific, and technical areas.

## **4.2 EMPLOYABILITY VARIABLES | METHODOLOGY (CVUT)**

### **4.2.1 Introduction to the dimension**

There is no doubt that the concept of "employability" is of vital importance within the realm of higher education. Yet, after it has been in the focus of many discussions, research papers, and projects for more than 20 years now, universities are still looking for a proper way to make this concept an integral part of the set of principles along which their teaching plans are developed.

Attempts to formulate a universally accepted definition of "employability" have shown that we have to consider the context, since it can be approached from different points of view: that of higher education institutions, their students, employers, government, or society in general. As observed in [REDEEM 2018: 15], the learning process and the graduate's achievement and potential to acquire a job are emphasised in the European Higher Education Area. Employability is not only about the acquisition of a job, it rather is "[...] the ability to gain initial employment, to maintain employment and to be able to move around within the labour market," as stated by the Bologna Follow-up group.

In a highly cited paper [Yorke 2006: 5], the author stresses that employability is not the same as employment. He argues that it involves a complex and continuous process of learning that aims at reaching [Yorke 2006: 8] "a set of achievements – skills, understandings and personal attributes – that make graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy". In conclusion [Yorke 2006: 13] states that "employability goes well beyond the simplistic notion of key skills and is evidenced in the application of a mix of personal qualities and beliefs, understandings, skilful practices and the ability to reflect productively on experience".

According to [Cheng 2021: 9], employers view employability from quite a different perspective, since they assume an employable person is ready to work, i.e. has a knowledge, business understanding, skills and attitudes that enable him/her to contribute to organizational objectives soon after commencing employment. Apart from possessing a set of generic professional skills, graduates need to be able to learn such skills as "teamwork, problem-solving, planning, communication skills and taking responsibility. Interpersonal skills are valued far more than any other skills, and personal ethics, the qualities of honesty, integrity and trust are also expected at appointment".

To get students' views on employability, [Cheng 2021: 6] analyses some student unions' documents and concludes that there is a wide range of students' understandings of employability that could even vary with their year of study. The report [NUS 2011: 12] of the National Union of Students (UK) describes employability as "a set of attributes, skills and knowledge that all labour market participants should possess to ensure they have the capability of being effective in the workplace – to the benefit of themselves, their employer and the wider economy". According to this description, the main motivation for students to achieve a university degree is to improve their job prospects and could well coincide with the employers' view of making universities fully responsible for students' employability while ignoring both individual personal as well as external factors. In a broader sense, [NUS 2011:

1] sees the role of university and higher education in general - as far as employability is concerned - in giving students “the opportunity to study an absorbing subject, make new friends, try new experiences – and for students to put themselves in pole position for starting work after graduation”.

In the European Higher Education Area, attention to employability has been steadily growing since the Council of the European Union agreed on a number of serious conclusions during its meeting in Brussels in May 2012 (see [CEU 2012]). These conclusions were considered to be used in the implementation of the Europe 2020 Strategy in the field of education and training in order to achieve the principal goals of the initiative “An agenda for new skills and jobs: an European contribution towards full employment”.

The document introduced a rather exhaustive and acceptable definition that summarises most aspects mentioned so far [CEU 2012: 4] “Employability - that is the combination of factors which enable individuals to progress towards or enter employment, to stay in employment and to progress during their career - is a complex concept, involving not only each individual's characteristics, skills, attitudes and motivation, but also other external factors which lie beyond the scope of education and training policy, such as labour market regulations, demography, the structure of the economy and the overall economic situation.”

On the other hand, the conclusions also presented a unique common means of monitoring the situation with respect to employability in the Member States in a form of a European “Benchmark on the Share of Employed Graduates from Education and Training” [CEU 2012: 14]: “By 2020, the share of employed graduates (20-34 years old) having left education and training no more than three years before the reference year should be at least 82% (as compared to 76.5% in 2010)”.

#### **4.2.2 Comparative literature on employability**

Since the REDEEM 2 project is exploring employability from the university graduates' perspective, the benchmark specification can be used as an inspiration when looking for indicators that would help us to evaluate a university with respect to its graduates' quality and employability. In order to rank a university in its national or even global context with respect to its success in the employability domain, we can calculate the percentage of its employed graduates from (say) 3 years before the year of reference. Since the first global university rankings published in 2004, universities have been paying quickly increasing attention to their ranks. As a result of growing popularity of rankings, different methodologies have been developed and some rankings (as e.g. QS or THE) have become de-facto global standards.

History of rankings on employability is rather shorter - the first QS Graduate Employability Rankings were published in 2015 – and the methodologies used are still under development. In a recent paper [Holmes 2021] the author argues that we still miss rigorous and reliable methods of evaluating teaching and learning or graduate quality and employability as compared to measures of university research output and quality. Among four compared employability rankings (Moscow Three University Missions Ranking, the Emerging/Tendency

Global University Employability Ranking published in THE, the Center for World University Rankings, and the QS Graduate Employability Rankings), the QS methodology seems to be the most successful in offering a reliable assessment of graduate employability.

The QS Graduate Employability Rankings 2022 [QS 2021] methodology uses four indicators with different weights:

Employer Reputation (30%) is based on over 75,000 responses to the QS Employer Survey and asks employers to identify those institutions from which they source the most competent, innovative, effective graduates.

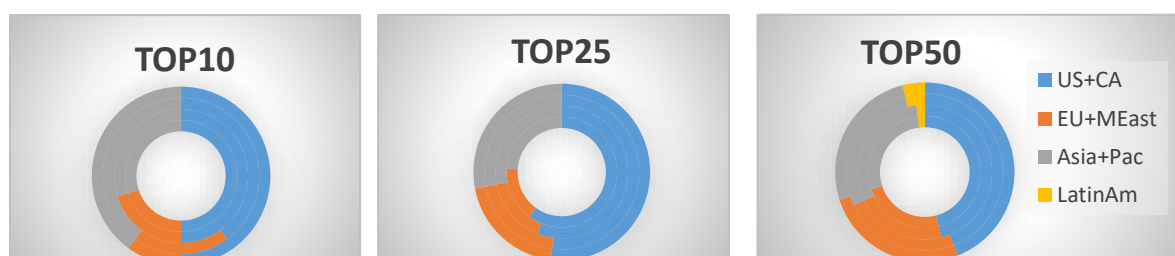
Alumni Outcomes (25%) - more than 40,000 of the world's most innovative, creative, wealthy, entrepreneurial, and/or philanthropic individuals have been analysed to establish which universities are producing world-changing graduates.

Partnerships with Employers per Faculty (25%) - it uses Elsevier's Scopus database to establish which universities are collaborating successfully with global companies to produce citable, transformative research. Then, it considers work placement-related partnerships that are reported by institutions and validated by the QS research team. Both figures are adjusted to account for the number of faculty at each university, and then combined into a composite index.

Employer - Student Connections (10%) – it involves summing the number of distinct employers who are actively present on a university's campus, providing motivated students with an opportunity to network and acquire information in a recent 12-month period adjusted by the number of students. This 'active presence' may take the form of participating in careers fairs, organizing company presentations, or any other self-promoting activities.

Graduate Employment Rate (10%) - it involves measuring the proportion of graduates (excluding those opting to pursue further study or unavailable to work) in full or part-time employment within 12 months of graduation. To normalise the scores, the difference between each institution's rate and the average in each location is considered.

As we could expect, in the recent QS 2022 ranking published in September 2021, the world-famous universities appear on top of both QS World and QS Employability rankings. Actually, the top 10 in both rankings include MIT, Stanford, Harvard, and Oxford, whereas excellent European universities, such as Cambridge, Imperial College (ICL), and ETH, appear in the Top 10 QS World ranking only.



A brief analysis of the top 10, top 25, and top 50 universities in the QS Employability rankings from 2018 to 2022 (2021 rankings have not been published) shows a relative stability of approx. 50% US to 50% non-US universities in the overall rankings, with a slight growth tendency of the non-US share. Among the non-US universities in top 10, Europe is constantly represented by Oxford and Cambridge (with an exception in 2022, when Cambridge's rank was 11), the remainder being Asia and Pacific region universities. In the top 25 rankings, two more places always go to ETH and ICL.



When we concentrate on the top 10 dynamics in time considering rankings according to individual indicators, we can observe some interesting phenomena regarding the shares of different world regions. In the rankings according to the Alumni Outcomes indicator, we obtain a perfectly stable split of 8 US vs. 2 non-US universities, showing the overwhelming dominance of US universities with the only two non-US positions occupied by Oxford and Cambridge. On the other hand, the rankings according to the Employer - Student Connections indicator show an even stronger dominance of Asian and Pacific universities and a total absence of Europe. The rankings according to the Graduate Employment Rate indicator are worth mentioning as well, since US universities reach no more than one position each year, while European universities reach almost 5 positions on average.

We should be aware of the fact that the observations presented in the previous paragraph have been derived from the top 10 data only, so they should not be interpreted as applicable to the whole ranking dataset. Nevertheless, they could be used to check the appropriateness and validity of some indicators or their weights in the QS methodology. As an example, there are universities that made it into the top 10 on Graduate Employment Rate in 2020 and 2022 (thus gaining their "15 minutes of fame"), while ranked 301-500 in the overall evaluation. Obviously, this could provoke questions as to whether validity of the respective data was properly verified. In case the data passed a reliable verification, such results could serve as a confirmation of independence of indicators.

Employability of graduates is considered an integral part of universities' missions and it is frequently expressed in a specification of graduate attributes that ideally include both learning outcomes and discipline-specific as well as transversal skills acquired during the student's higher education trajectory. While learning outcomes and most discipline-specific skills are achieved via a learning process "in the classroom" that consists in accomplishing individual items of the curriculum, most transversal skills are best developed in practical trainings, real work placements or internships, i.e. "outside of the classroom".

A detailed analysis of skills and competencies that are needed in the changing society demands of the 21st century is presented in an extensive report [NRC 2012] that also

concentrates on new methods (“deeper learning”) to be used for acquiring them. According to [NRC2012: 32-34], the competencies are split into the following clusters:

<b>COGNITIVE COMPETENCIES</b>	
<b>Cognitive Processes and Strategies</b>	Critical thinking, problem solving, analysis, reasoning/argumentation, interpretation, decision making, adaptive learning, executive function
<b>Knowledge</b>	Information literacy (research using evidence and recognizing bias in sources); information and communications technology literacy; oral and written communication; active listening
<b>Creativity</b>	Creativity, innovation
<b>INTRA-PERSONAL COMPETENCIES</b>	
<b>Intellectual Openness</b>	Flexibility, adaptability, artistic and cultural appreciation, personal and social responsibility (including cultural awareness and competence), appreciation for diversity, adaptability, continuous learning, intellectual interest and curiosity
<b>Work Ethic/ Conscientiousness</b>	Initiative, self-direction, responsibility, perseverance, productivity, guts, type 1 self-regulation (metacognitive skills, including forethought, performance, and self-reflection), professionalism/ ethics, integrity, citizenship, career orientation
<b>Positive Core Self-evaluation</b>	Type 2 self-regulation (self-monitoring, self-evaluation, self-reinforcement), physical and psychological health
<b>INTER-PERSONAL COMPETENCIES</b>	
<b>Teamwork and Collaboration</b>	Communication, collaboration, teamwork, co-operation, coordination, inter-personal skills, empathy/perspective taking, trust, service orientation, conflict resolution, negotiation
<b>Leadership</b>	Leadership, responsibility, assertive communication, self-presentation, social influence with others

Even though the list above offers a rather extensive set of needed competencies, an open question still is how universities should design their curricula and possible extra-curricular activities in order to make sure that the graduates will embrace these competencies or at least those most desirable by potential employers. In an IIE report [Farrugia 2017], the authors present the results of a survey conducted as a part of the Generation Study Abroad initiative, which was particularly interested in the role of studies abroad in developing a wide range of useful skills. The survey covers a broad sample of more than 4500 alumni of US



universities who studied abroad between 1999 and 2016 and data on 15 skills denoted as 21st Century Workforce Skills that are listed in the following table (boldfaced skills do not explicitly appear in the [NRC2012] list of competencies).

Communication skills	The ability to convey ideas to others through verbal and written means, using clear and effective language that accounts for the audience.
<b>Confidence</b>	The ability to make decisions based on one's own convictions and to trust in one's own competence.
<b>Course/major-related knowledge</b>	Proficiency in one's chosen academic major or course content.
Curiosity	The openness to new experiences and desire to learn.
Flexibility/adaptability	The ability to adjust one's own behavior to changing circumstances and to work in ambiguous environments. This skill includes the ability to learn and be teachable.
<b>Intercultural skills</b>	The ability to understand and respect different cultural contexts and viewpoints. Includes an openness to new ideas and ways of thinking.
Inter-personal skills	Having a positive attitude to get along with others that includes social awareness, the ability to listen, and display good etiquette.
<b>Language skills</b>	The ability to communicate in spoken and written form in a language other than English.
Leadership	The ability to leverage the strengths of others to achieve common goals and use inter-personal skills to coach and develop others. The ability to assess and manage one's own emotions and those of others; use empathetic skills to guide and motivate; and organize, prioritize, and delegate work.
<b>Problem-solving skills</b>	The ability to identify work-related problems; analyze problems in a systematic but timely manner; draw correct and realistic conclusions based on data and information; and accurately assess root cause before moving to solutions.
Self-awareness	The ability to self-reflect and understand one's own strengths and weaknesses.
Teamwork	The ability to collaborate with a diverse team, work within a team structure, and negotiate and manage conflict.
<b>Technical/computer software skills</b>	The ability to select and use appropriate technology to accomplish a given task, or apply computing skills to solve problems.
<b>Tolerance for ambiguity</b>	The ability to be comfortable with uncertainty, unpredictability, conflicting directions, and multiple demands. In essence, tolerance for

	ambiguity is manifest in a person's ability to operate effectively in an uncertain environment.
Work ethic	Demonstrate personal accountability and effective work habits, e.g., punctuality, working productively with others, and time workload managements. The individual demonstrates integrity and ethical behavior, acts responsibly with the interests of the larger community in mind, and is able to learn from his/her mistakes.

Key findings of the survey include (adopted from [Farrugia2017: 5, 6, 12]):

- The skills gained through studies abroad have a long-term impact on career progression and promotion.
- Longer periods of study abroad have a high impact on subsequent job offers and the development of most skills. Short-term programmes are most effective in developing teamwork skills.
- STEM majors highly value the gains made in skills outside of them during studies abroad.
- Choosing a less familiar destination is positively associated with skill development and sense of career impact.
- Student intentionality and highly structured programmes contribute to skill development.
- Significant skill development or improvement is reported by more than 70% of respondents in Intercultural skills, flexibility/adaptability, self-awareness, curiosity, and confidence, but by a maximum of 30% of respondents only in teamwork, leadership, work ethic, and technical/computer skills.

In another survey conducted by IIE and reported in [Sanger 2019], more than 4000 (of 14 092) grantees who received support in different types of international education programmes between 2005 and 2015 responded. Key findings of this survey are:

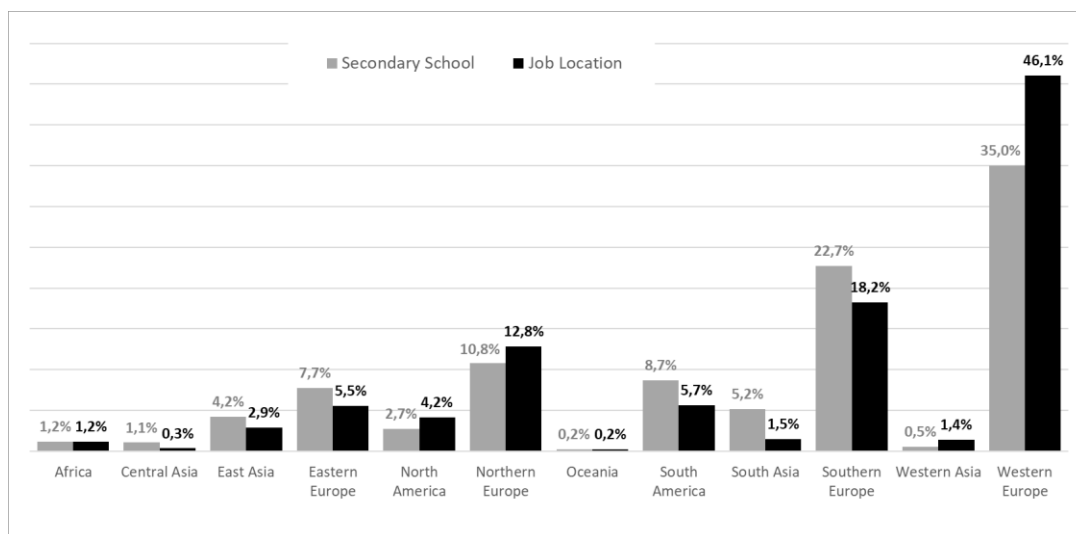
- Alumni find that their programme experiences had important impacts on their career paths and professional achievements.
- Alumni leverage their programme experiences and newly gained skills in developing their careers.
- Alumni report positive impacts on their organizations and their communities.
- Significant skill development or improvement is reported by more than 60% of respondents in Intercultural skills, teamwork, field-specific knowledge, curiosity, and flexibility, but by less than 40% of respondents in leadership and technical skills.
- Education about the benefits of study abroad should start earlier – in recruiting students and in first-year orientation programmes.
- Communication between university and industry should better articulate the job performance-enhancing skills that students gain while abroad.
- Study abroad programming needs to be more intentional to match with employment as well as academic outcomes.

- HEI should encourage and support students of *all backgrounds* to study abroad.
- HEI and study abroad providers should track student employment outcomes *for a longer duration after graduation* to better measure the influence of studies abroad on career outcomes over time.

Graduate employability still is a topic of active research, but there is unanimous consent regarding the key role that study abroad is playing in developing those skills of graduates that are most appreciated by employers. New initiatives and concepts, such as virtual classrooms, blended mobility, internationalization at home, and the like confirm that in COVID-19 pandemic times that dramatically restrict travels, there is an urgent need for offers that can at least partly substitute the student's study abroad experience and its effect on skills development.

#### 4.2.3 Main analysis/graphs

In our alumni survey, we were concerned with collecting data describing the willingness of JP graduates to work (and live) in a country other than that of their origin, which we specified as the country of their secondary school. The column graph below presents the data for different world regions, so that we can also see the distribution of respondents across individual regions.



If we consider the regions that are reasonably represented in the survey (i.e. they have at least 4% in either the Secondary School or Job Location), such regions form the following two clearly distinguishable groups depending on which of the two calculated values is higher:

- Western Europe, Northern Europe, North America
- Southern Europe, South America, Eastern Europe, South Asia, East Asia

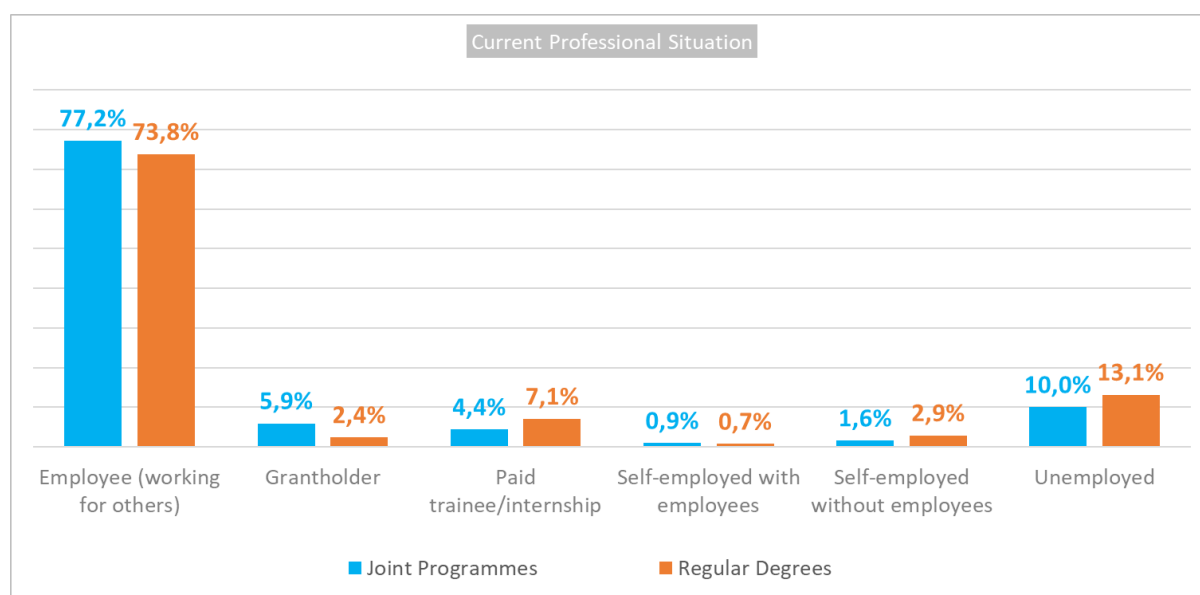
Obviously, about 15% of JP graduates moved from their country of origin (secondary school location) in group B to some country of group A in which they work. The prevailing direction of their mobility is from South and East towards North and West, which coincides with the trend presented in [REDEEM 2018: 21]. An explanation of this trend can be found in the

relevant table under section 1.3, which reveals the motivations for selecting a JD programme for study. The options *Access to more job opportunities* and *Increasing the opportunities for a career in a country other than that of my origin* are highly popular for graduates of both joint programmes and regular programmes.

On the other hand, it was not only the initial motivation of the graduates, but rather the development of desirable competencies within JPs that helped the graduates get jobs in highly developed countries of group A. This argument is supported by the main findings regarding the effects of Erasmus+ mobilities on graduates' employability as outlined in [EU2019: 89]:

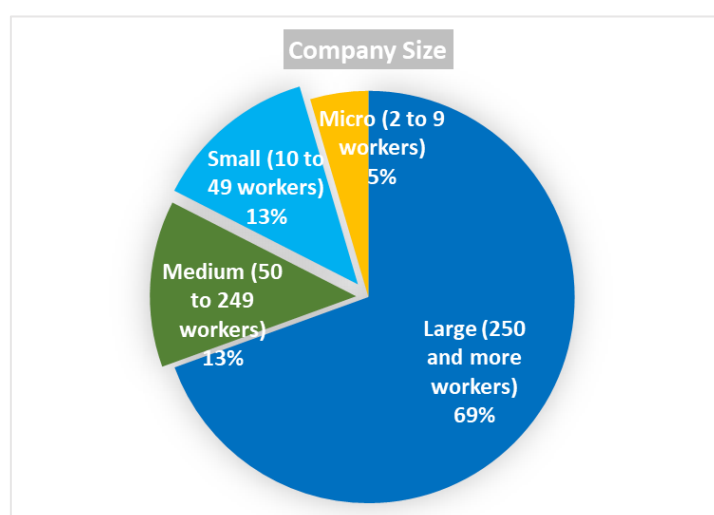
- Erasmus+ participants are very open to international careers - 87% agree or rather agree that they definitely want to work abroad for at least some time. The careers of Erasmus+ graduates are more international than those of non-mobile students: 23% started their first job abroad.
- Erasmus+ graduates from Northern and Western European Programme countries tend to stay in the same geographical region for their first job –even when they go abroad to work- (46% did in both regions), to a higher extent than those from Eastern (24%) and Southern (28%) European Programme countries, who tend to change the region more often when they go abroad to work.
- Compared to non-mobile graduates, the jobs of Erasmus+ graduates have significantly more international aspects. Only 20% of Erasmus+ graduates state that their current job has no international characteristics.

In our alumni survey, we collected basic employment data of the respondents, namely, their employment situation (see graph Current Professional Situation) and for the employed respondents the size of the company they work for (see graph Company Size) and the activity of the company (see graph Activity/Area Sector). As we see, there is no remarkable difference between the JP and regular graduates' employment rates – just 3.4% - while almost the same difference with a negative sign results for unemployment rates. A detailed analysis of the employment rate with respect to different JP types reveals more remarkable differences.

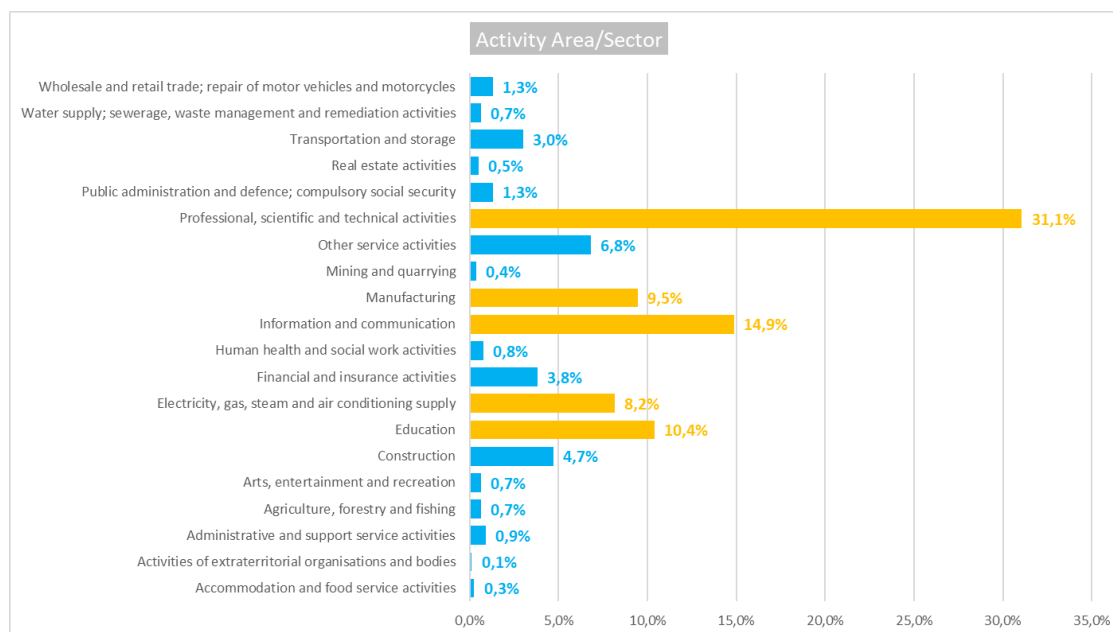


The distribution of employed JP graduates with respect to the size of the company they work for shown in the Company Size graph demonstrates that almost 70% of the respondents work for large companies. This could be explained in part by common graduate preferences as confirmed e.g. by a finding in [Turczynski 2021] stating, **“81% of 2017 grads believe they can advance their careers in large companies, vs. 63% in small companies.”** Another line of explanation is similar to what we already mentioned above: graduates’ competencies achieved by attending JPs helped them get well-paid jobs at large companies.

It is interesting to compare our statistics with world employment statistics extracted from [OECD 2016b]). The JP graduates’ shares of 69 : 13 : 13 : 5 (percentages for large, medium, small, and micro-sized companies) are very similar to the shares of 57 : 15 : 16 : 12 valid for US employees, but very different from the total world shares of 42 : 17 : 19 : 22 and surprisingly highly different from those of the European countries of 31 : 17 : 19 : 33, although approx. 83% of the survey respondents work in Europe. It is worth mentioning that the shares of 67 : 25 : 7 : 1 for the Russian Federation alone are very similar, but obviously due to very different (mostly historical/political) reasons.

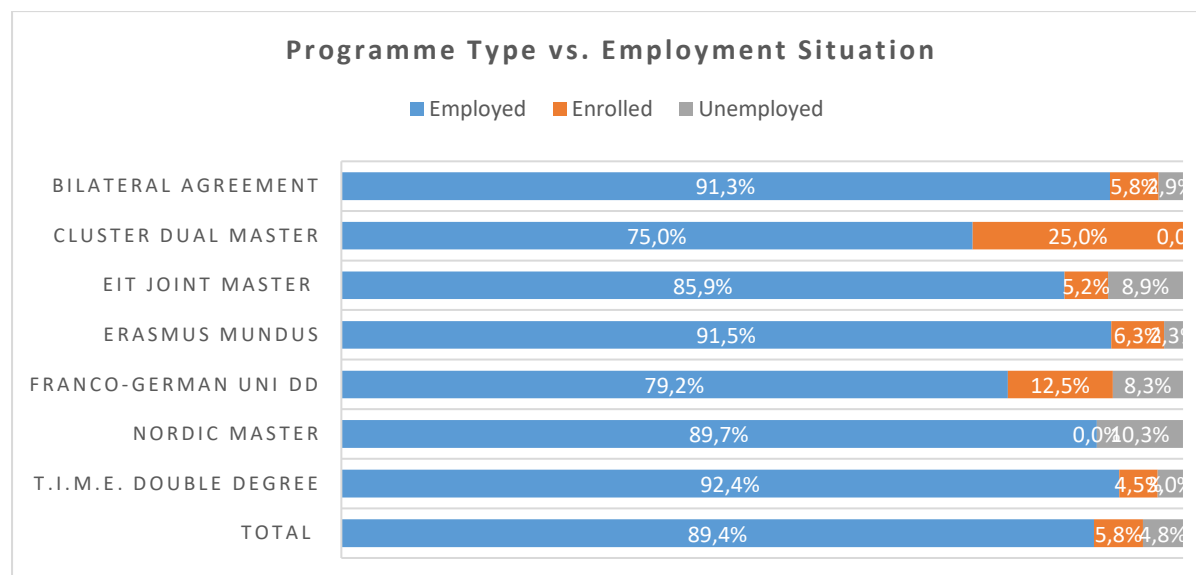


The data obtained regarding the activity areas of JP graduates shows that almost 75% of the respondents are employed in four principal technical areas (professional, scientific, and technical activities; ICT; manufacturing; electricity, gas, steam, and air conditioning supply) or in education. This roughly corresponds to the data in the Programme Graduation Area table, although the two lists of areas are not the same.



#### 4.2.4 Crossed analysis (break out by descriptive variables: JP type | location | salary | academic year | region)

As we have seen above in the Current Professional Situation graph, the average unemployment rates for surveyed JP and regular graduates are basically the same. However, the situation is different when distinguishing certain types of joint programmes and considering those respondents unemployed, who are neither employed nor enrolled in some higher education study programme.

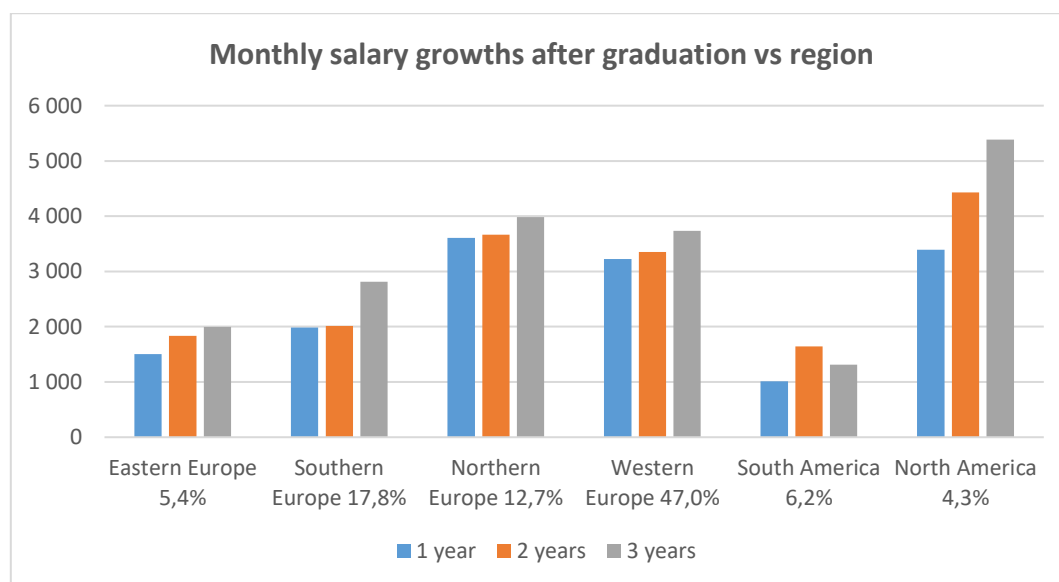


There is more than 10% difference between the most “successful” CLUSTER DUAL MASTER programme with zero unemployed graduates and the highest unemployment rate of 10.3% of the NORDIC MASTER programme graduates. Since the numbers of graduates of these two programmes represent very low fractions of all JP alumni survey respondents (1.9% and 2.9%,

respectively), we cannot draw any serious conclusion from such a comparison. Nevertheless, the difference between unemployment rates of BILATERAL AGREEMENT and ERASMUS MUNDUS groups of graduates is quite significant – it is twice as large as the difference between JP and regular graduates' unemployment rates.

Job Related with Studies vs Region (Company)	Joint Programmes	Regular Degrees
Africa	4,0	
Central Asia	4,3	3,0
East Asia	3,5	4,7
Eastern Europe	4,2	3,8
North America	4,2	3,9
Northern Europe	4,4	4,3
Oceania	3,0	4,5
South America	3,5	3,3
South Asia	3,9	4,1
Southern Europe	4,1	4,1
Western Asia	3,4	3,5
Western Europe	4,2	4,1
<b>Total Global</b>	<b>4,1</b>	<b>4,1</b>

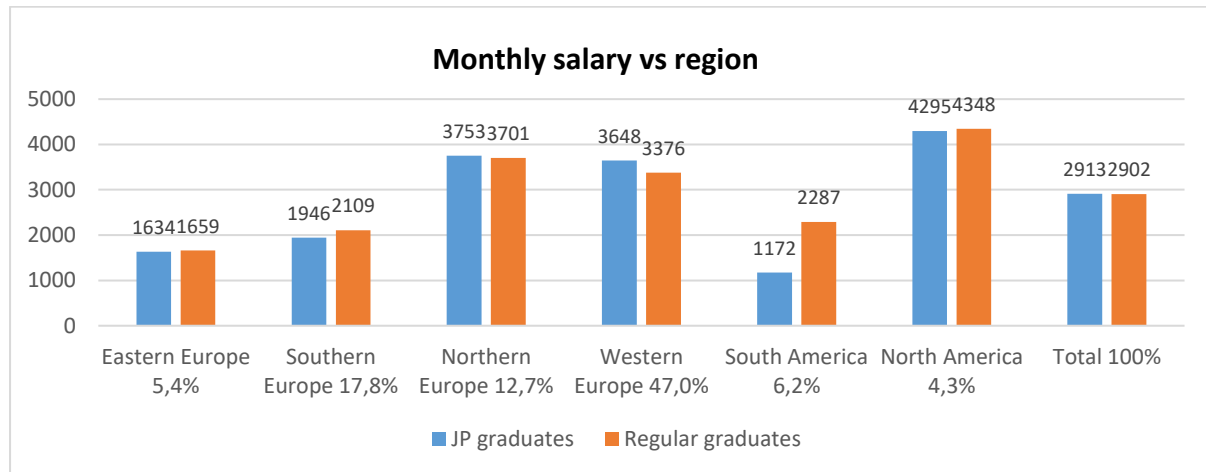
When comparing how related the graduates' jobs are to their fields of study, with 1 being not related and 5 totally related, and breaking that down by the region of the company, the correlation is highest for JP alumni who worked in Central Asia, Eastern Europe, and North America. As for the RD alumni, the correlation is highly positive for graduates who worked in East Asia and Oceania.



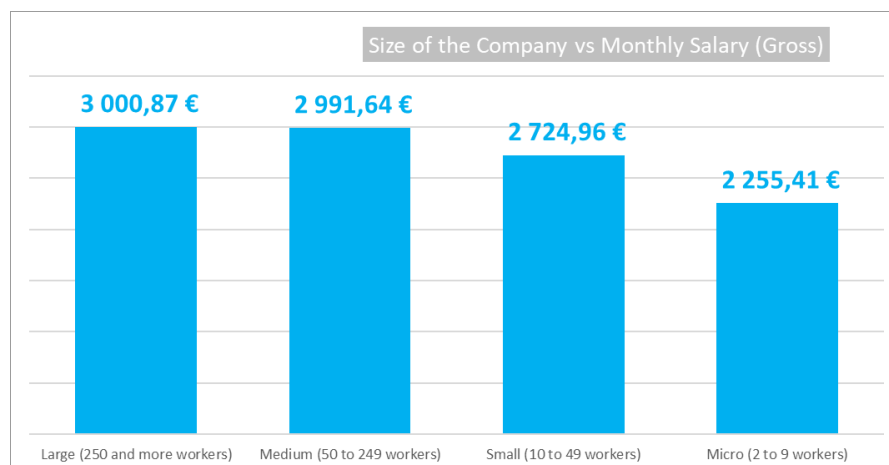
In our survey, we collected alumni data in two rounds: in 2018, for the cohorts of graduates from 2015/16, 2016/17, and 2017/18, and in 2020, for the cohorts of graduates from 2018/19 and 2019/20. In other words, the 2015/16 cohort was in its 3<sup>rd</sup> year after graduation, the 2016/17 and 2018/19 cohorts were in their 2<sup>nd</sup> year after graduation, and the remaining 2017/18 and 2019/20 cohorts were in their first year of employment. This makes it possible to observe the dynamics of graduates' salaries in the first three years after graduation as well as to compare the salaries of JP graduates in different world regions. The graph below shows

only those world regions that are represented by at least 3% of the whole respondents' population. Values are presented in average and in euros (€).

Respondents from North America have both the highest average salary and the steepest salary increase from the first to the third year after graduation – almost 59%. In the European regions, respondents from Northern Europe have the highest average salary, but, at the same time, the lowest average salary increase of 10.4% in two years, while the highest average increase of almost 42% is reported for graduates from Southern Europe.



The overall average salaries of JP and RD graduates are almost the same and the absolute differences of pairs of regional averages are all less than 9%, the only exception being South America, for which the average salary of RD graduates is almost twice the average salary of JP graduates. The regions in which RD graduates are paid higher than JP graduates include Eastern and Southern Europe as well as South America, i.e. the regions belonging to group B specified above in section 1.1.3, which exhibit a remarkable movement of JP graduates “from South-East to North-West”. A rather speculative explanation with respect to the average salaries in these regions could be that most successful and ambitious JP graduates from Southern Europe seek remarkably better-paid jobs in Northern and Western Europe, while ambitious RD graduates work in their region of origin and get (relatively) well-paid jobs.





When analyzing the average monthly salary in relation to the size of the company, significant, but expected differences can be observed. The average monthly salary decreases as the company size decreases, ranging from a 3000.87 € monthly salary at large companies to an average 2255.41 € monthly salary at micro-size companies.

When analyzing the average monthly salary, the reader must bear in mind that salary is an open question to which respondents might not answer honestly. Furthermore, the monthly salary is affected by a series of different factors either individually or combined, namely, the number of responses collected in each category, size of the company, years of experience, micro and macro-economic factors, and social factors.

Job Related to Studies vs Region	%	Joint Programme	Regular Degrees	Delta
Central Asia	0,7%	4,3	3,0	1,3
Eastern Europe	6,9%	4,2	3,8	0,4
North America	2,9%	4,2	3,9	0,3
South America	4,1%	3,5	3,3	0,2
Northern Europe	17,0%	4,4	4,3	0,1
Western Europe	31,0%	4,2	4,1	0,1
Southern Europe	31,3%	4,1	4,1	0,0
Western Asia	0,4%	3,4	3,5	-0,1
South Asia	2,8%	3,9	4,1	-0,2
East Asia	2,1%	3,5	4,7	-1,2
Oceania	0,3%	3,0	4,5	-1,5
Africa	0,5%	4,0		
<b>Total Global</b>	<b>100,0%</b>	<b>4,1</b>	<b>4,0</b>	<b>0,1</b>

In the last table, we present the data that express the level of correspondence of the graduates' jobs to their respective domains of study. The scale is from 1 (no) to 5 (perfect) correspondence. JP graduates from the first seven regions in the list (which include all European and both American regions) representing almost 94% of all respondents reported a higher or equal correspondence of actual jobs with domains of study compared to their regional regular degree counterparts. The opposite relation was found for regions whose representation in our survey was too low to believe they reflect the actual situation.

#### 4.2.5 Conclusions

Analysis of the data collected in our survey as well as of the data from a wide range of references devoted to graduate employability lead to the following findings:

- Students expect/acknowledge that study abroad prepares them for work in the international context (see e.g. [Farrugia 2017], [Sanger 2019], [Stipek2018], or the table Gained Skills in Joint Programmes.
- Alumni surveys coincide in confirming that study abroad helps students significantly improve the skills that have a long-term impact on their careers since they are highly appreciated by employers (see e.g. [Farrugia 2017], [Sanger 2019], and JP graduates' "South to North and West" movement effect.

- Study abroad programmes should be designed to match with employments as well as with academic outcomes, i.e. preferably in co-operation with employer participation (see e.g. [Stipek2018] and the table Improvements in Joint Programmes.
- Joint programmes developed in co-operation with employers represent an ideal option for talented and dedicated students who plan to seek employment at large international companies (see e.g. [EU 2019] and the graph Company Size.

## 4.3 MOTIVATIONS | GAINED SKILLS | IMPROVEMENTS (UPC)

### 4.3.1 Introduction to the dimension

This dimension encompasses three main aspects of the Joint Programme Alumni route: the motivations to enroll in a Joint Programme, the skills gained during their graduation and the improvements that should be made. The goal is to know the reason that made the alumni enroll in a JP and which competences were developed and gained during their academic experience, but also to understand the alignment between what driven the alumni and what they received.

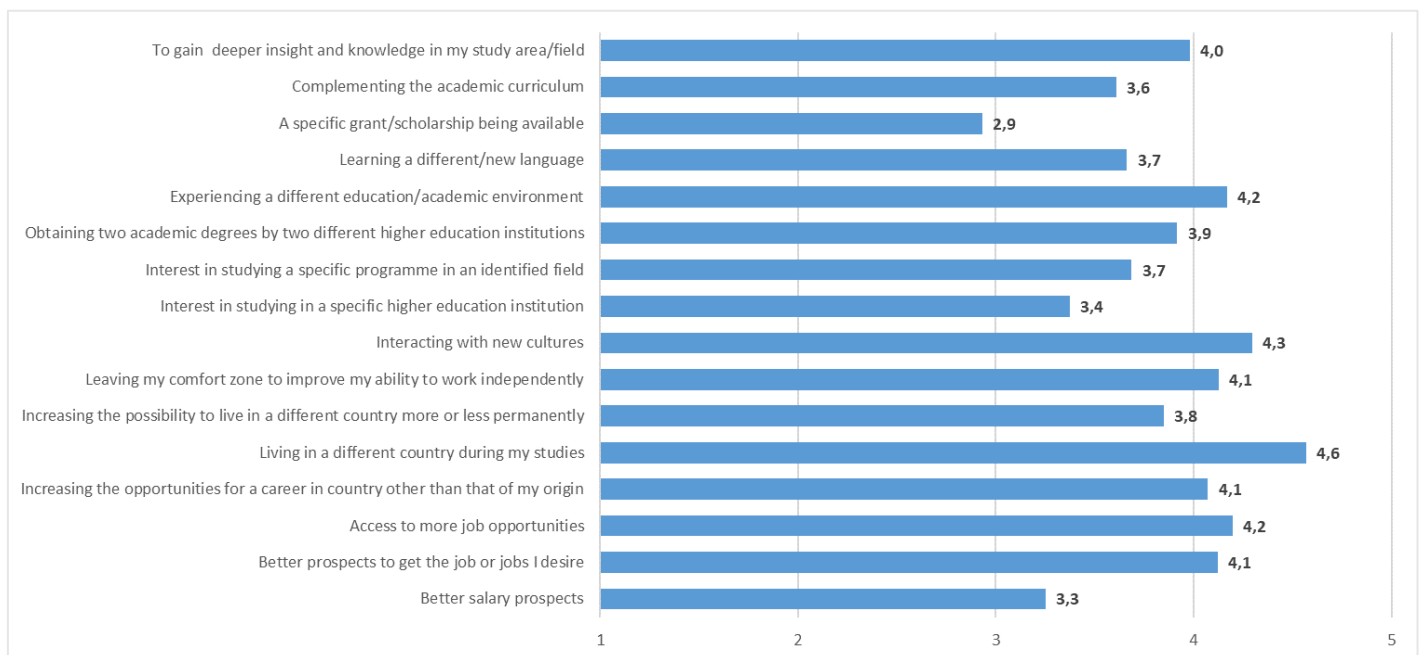
Regarding the motivations to enroll, a set of 16 variables were analyzed under the scope of wage driven motivations, self-knowledge and self-development motivation, social and cultural motivations and academic development motivations.

Concerning the skills gained, a set of 13 variables were analyzed covering the personal growth and development, socio-cultural engagement and professional and academic impact.

### 4.3.2 Main analysis/graphs

Living in a different country during the studies (4.6), interacting with new cultures (4.3), experiencing a different education/academic environment and access to more job opportunities (4.2) were the main reasons to enroll in a JP. It is possible to see that among the major motivations were personal/social reasons, followed by academic and professional reasons.

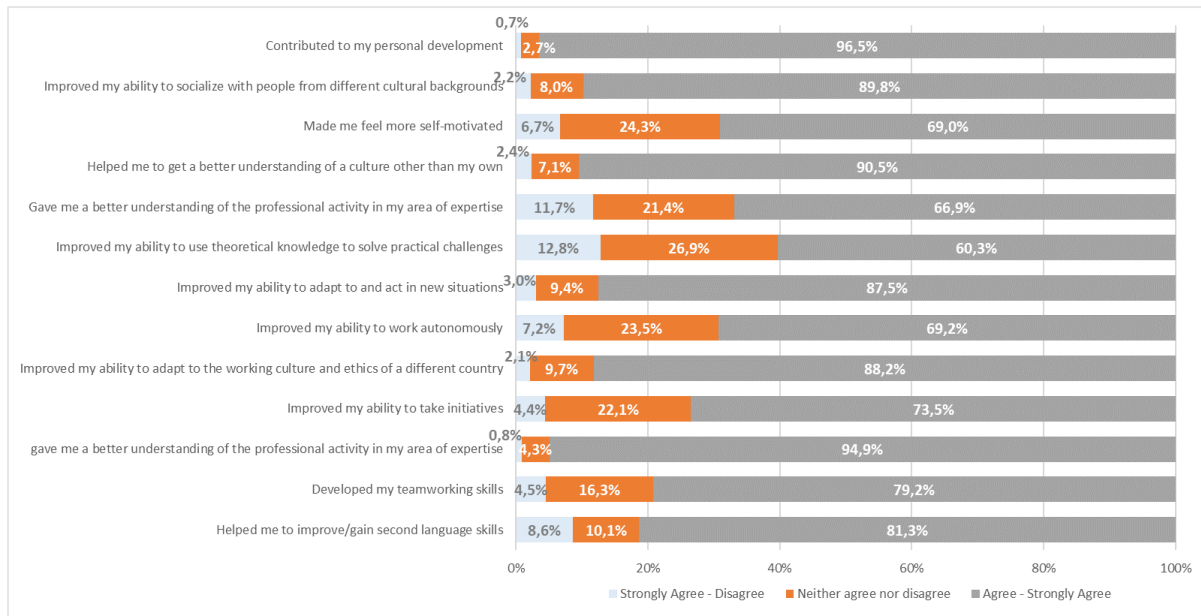
Among the less motivating reasons to apply for a JP, the availability of a specific grant/scholarship (2.9), better salary prospects (3.3) and interest in studying in a specific higher education institution (3.4) were mentioned.



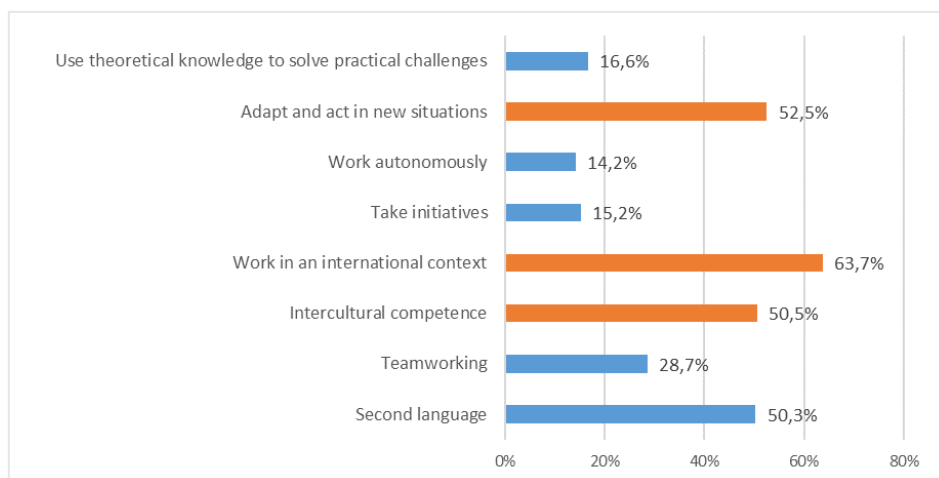
Comparing the same reasons among the JP alumni and the regular degree alumni, who took a mobility period during their master degree, it is possible to observe some differences. For the regular degree alumni, leaving their comfort zone to improve their ability to work independently, experiencing a different education/academic environment, learning a different language and complementing the academic curriculum were also identified as relevant and impactful factors for their mobility.

	Joint Programmes	Regular Degrees
<b>LIVING IN A DIFFERENT COUNTRY DURING MY STUDIES</b>	4,6	4,7
<b>INTERACTING WITH NEW CULTURES</b>	4,3	4,5
<b>ACCESS TO MORE JOB OPPORTUNITIES</b>	4,2	3,6
Experiencing a different education/academic environment	4,2	4,2
Leaving my comfort zone to improve my ability to work independently	4,1	4,4
Better prospects to get the job or jobs I desire	4,1	3,4
Increasing the opportunities for a career in country other than that of my origin	4,1	3,6
To gain deeper insight and knowledge in my study area/field	4,0	3,5
Obtaining two academic degrees by two different higher education institutions	3,9	n.a.
Increasing the possibility to live in a different country more or less permanently	3,8	3,8
Interest in studying a specific programme in an identified field	3,7	2,9
Learning a different/new language	3,7	3,9
Complementing the academic curriculum	3,6	3,9
Interest in studying in a specific higher education institution	3,4	3,0
<b>BETTER SALARY PROSPECTS</b>	3,3	2,6
<b>A SPECIFIC GRANT/SCHOLARSHIP BEING AVAILABLE</b>	2,9	n.a.

Regarding the gained skills, it is relevant to observe that all the variables under analysis were considered obtained at a higher level, namely the Contribution to the personal development (96.5%), A better understanding of the professional activity in their area of expertise (94.9%) and a Better understanding of a culture other than their own (90.5%). Further developed skills mentioned were improving the ability to use theoretical knowledge to solve practical challenges (60.3%), Feeling of self-motivation (69.0%) and the Improvement of autonomously work (69.2%).



When looking at the skills that were improved, the main three were the ability to Work in an international context (63.7%), the capacity to adapt and act in new situations (52.5%) and the Intercultural competence (50.5%).



#### 4.3.3 Crossed analysis (break out by descriptive variables: JP type | location | salary | academic year | region)

Regardless the type of Joint Programme, the main motivations to enrol were the same: Interacting with new cultures and living in a different country during my studies. The same tendency was observed on the other top of the scale, and regardless the type of Joint Programme the less motivating factors were the availability of a specific grant, better salary prospects and interest in studying in a specific higher education institution.

	BILATERAL AGREEMENT	CLUSTER	EIT JOINT MASTER PROGRAMME	ERASMUS MUNDUS	FRANCO- GERMAN UNIVERSITY	NORDIC MASTER	T.I.M.E.
SPECIFIC GRANT/SCHOLARSHIP	2.6	3.1	3.4	3.4	2.3	2.2	2.5
BETTER SALARY PROSPECTS	3.4	3.3	3.3	3.2	2.4	3.0	3.2
INTEREST IN STUDYING IN A SPECIFIC HEI	3.5	3.1	3.4	3.4	3.4	3.2	3.5
OBTAINING 2 ACADEMIC DEGREES BY 2 HEIS	4.1	3.9	3.8	3.7	3.6	3.6	4.3
COMPLEMENTING THE ACADEMIC CURRICULUM	3.7	3.6	3.5	3.7	3.8	3.2	3.8
INTEREST IN STUDYING A SPECIFIC PROGRAMME	3.6	3.4	3.7	4.1	3.7	4.3	3.5
INCREASING THE POSSIBILITY TO LIVE IN A DIFFERENT COUNTRY	3.9	4.0	3.9	3.8	3.9	4.1	3.8
LEARNING A DIFFERENT/NEW LANGUAGE	3.8	3.3	3.3	3.5	4.1	3.3	3.8
INCREASING CAREER OPPORTUNITIES OTHER COUNTRY	4.2	4.2	4.1	4.0	4.1	4.1	4.0
GAIN DEEPER INSIGHT/KNOWLEDGE IN MY STUDY AREA	3.9	3.9	4.1	4.3	4.1	4.2	3.9
BETTER PROSPECTS TO GET THE JOB I DESIRE	4.2	4.2	4.1	4.2	3.5	4.0	4.2
ACCESS TO MORE JOB OPPORTUNITIES	4.3	4.3	4.2	4.1	3.5	4.0	4.2
EXPERIENCING A DIFFERENT ACADEMIC ENVIRONMENT	4.2	4.3	4.1	4.2	4.3	4.2	4.3
LEAVING MY COMFORT ZONE IMPROVE ABILITY WORK INDEPENDENTLY	4.1	4.1	4.1	4.2	4.3	3.8	4.2
LIVING IN A DIFFERENT COUNTRY DURING MY STUDIES	4.6	4.5	4.6	4.5	4.6	4.7	4.5
INTERACTING WITH NEW CULTURES	4.3	4.5	4.2	4.3	4.5	4.3	4.4

When breaking down the motivations by academic year, it is possible to observe that among the less motivating factors, there are no relevant differences either among academic years, nor among the Joint Programme type analyzed in the previous table.

However, it is possible to observe some changes along the years in regards to the motivations to enrol: while interacting with new cultures and living in a different country during my studies are the main triggers to apply for a JP in the 5 cohorts under analysis, it is possible to see that the alumni from 2018/19 and 2019/20 started to slightly shift their motivations with the appearance of leaving my comfort zone and improve ability work independently as one of the major motivations.

	2015/16	2016/17	2017/18	2018/19	2019/20
SPECIFIC GRANT/SCHOLARSHIP	3.1	2.8	2.8	3.1	3.1
BETTER SALARY PROSPECTS	3.1	3.1	3.3	3.4	3.3
LEARNING A DIFFERENT/NEW LANGUAGE	3.9	3.7	3.8	3.4	3.4
INTEREST IN STUDYING IN A SPECIFIC HEI	3.4	3.3	3.4	3.5	3.4
COMPLEMENTING THE ACADEMIC CURRICULUM	3.7	3.6	3.6	3.6	3.6
INTEREST IN STUDYING A SPECIFIC PROGRAMME	3.6	3.8	3.7	3.7	3.7
OBTAINING 2 ACADEMIC DEGREES BY 2 HEIS	3.9	4.0	4.0	3.8	3.8
INCREASING THE POSSIBILITY TO LIVE IN A DIFFERENT COUNTRY	3.7	3.8	3.9	3.9	3.8
INCREASING CAREER OPPORTUNITIES OTHER COUNTRY	4.1	4.0	4.2	4.1	4.0
GAIN DEEPER INSIGHT/KNOWLEDGE IN MY STUDY AREA	4.0	3.8	4.0	4.0	4.1
ACCESS TO MORE JOB OPPORTUNITIES	4.2	4.2	4.3	4.1	4.1
EXPERIENCING A DIFFERENT ACADEMIC ENVIRONMENT	4.2	4.2	4.2	4.1	4.1
BETTER PROSPECTS TO GET THE JOB I DESIRE	4.1	4.1	4.2	4.1	4.1
LEAVING MY COMFORT ZONE IMPROVE ABILITY WORK INDEPENDENTLY	4.1	4.0	4.1	4.3	4.2
INTERACTING WITH NEW CULTURES	4.4	4.3	4.3	4.3	4.2
LIVING IN A DIFFERENT COUNTRY DURING MY STUDIES	4.6	4.6	4.6	4.5	4.6

#### **4.3.4 Conclusions**

These grate group that encompasses all the motivations and acquired competences during the JP experience, clearly shows that JP alumni are not driven by better employability or salary prospects, but rather valuing the personal and social experiences associated with living abroad, along with their academic experience.

The premises to enrol were latter ratified through the gained skills, where it is possible to observe a great impact of the JP experience in the development of personal and cultural dimensions, alongside with the gained knowledge of understanding their professional activity probably due to the available internships.

The experience and JP impact is highlighted by the skills developed, again most visible at the personal and inter-relational aspects, but also in the contact with the profession.

In conclusion, it is possible to assume that the motivations to apply for a JP are more related to the personal development and socio-cultural engagement, and although these are in fact the competences and skills that the alumni mostly developed during their academic experience, the contact with the professional activity is also relevant.



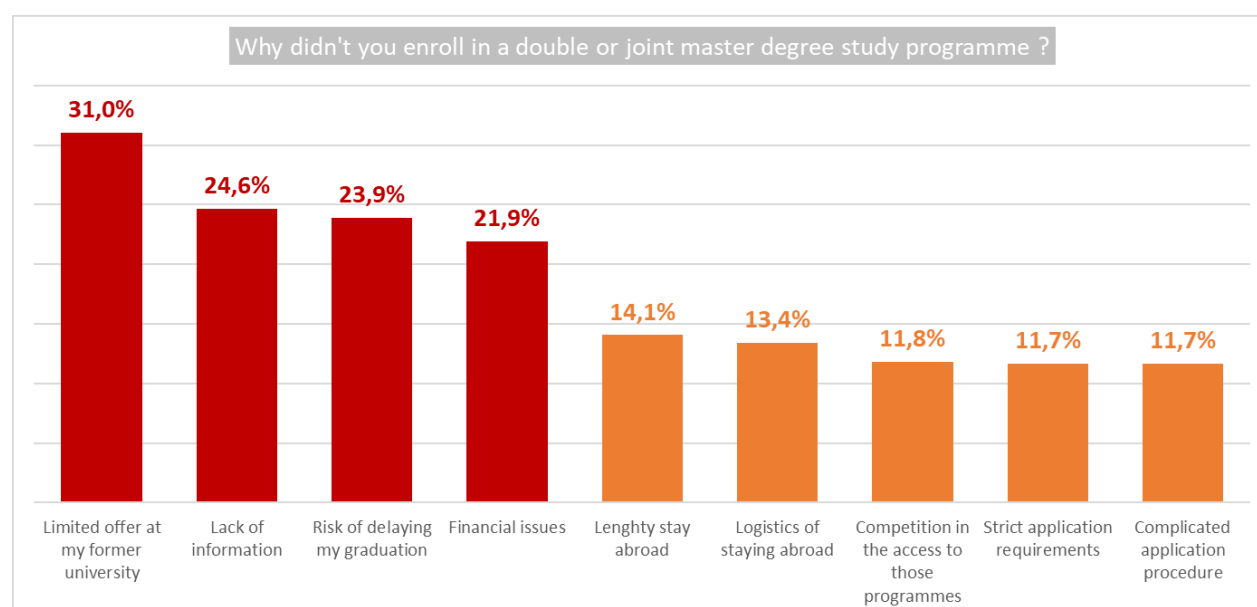
## 4.4 IMPROVEMENTS | JP OPTION CHOICE | SATISFACTION | RECOMMENDATIONS | OPTIONS (UPC)

### 4.4.1 Introduction to the dimension

In this dimension different opinion levels were analyzed, firstly the Alumni were inquired about their JP option choice – so that is possible to access if it's easy for a student to apply and enter in their first option of choice and how that influences his/her assessment of the JP experience. Secondly, a great group regarding the JPs attractiveness to students and the global satisfaction with the JP was observed. Finally, the Alumni overall recommendation, improvement recommendations and academic options could be included in future programmes.

### 4.4.2 Main analysis/graphs

For the majority of the Alumni (95%) there was not a ranked choice regarding their master degree, and they either applied to the only possible choice of JP in their area of expertise, or they only applied to JP one programme. Among the other, who in fact had a choice, 3,9% did not enrol in their first choice, the reasons for that are mainly due to not being accepted or to administrative and lack or poor communication between the Higher Education Institutions. Analysing the results from the Control Group Survey, when asked about the reasons for not enrolling in JP, the limited offer of JP programmes was the main reason indicated (31.0%), followed by the lack of information (24.6%) and the potential risk of graduation delay (23.9%). Although not being in the top three reasons, the financial issues (21.9%) were also a relevant reason that kept those students away from a JP programme.



As for the JP Alumni, 59.3% of them considered that the offer of Joint Programmes in their Institution is either diverse or extremely diverse and 97,6% recommended a JP to current higher education students.



About what can be enhanced in a JP, 44% of the alumni indicated the embedded internships, followed by a wider choice of optional courses (38%) and administrative processes at the institution 1 (35%) and institution 2 (31%), along with more employer involvement (32%). However, the duration of the stay abroad (11%) and the support services at institution 2 (10%) were the factors that from the alumni perspective needs to be improved less.

IMPROVEMENTS IN JOINT PROGRAMMES	
Embedded internships	44%
Wider choice of optional courses	38%
Administrative/bureaucratic processes at institution 1	35%
Employer involvement	32%
Administrative/bureaucratic processes at institution 2	31%
Communication between the programme universities	29%
Language skills of teachers at institution 1	28%
Overall academic quality of the programme	27%
Overall communication with institution 1	23%
Overall communication with institution 2	19%
Double/joint degree students association	18%
Programme workload	16%
Language skills of teachers at institution 2	13%
Lenght of the stay abroad	11%
Support services at institution 2	10%

Regarding the skills gained, 97% of the alumni admitted that the experience contributed to their personal development. A high impact on the social and relational aspects was highlighted (understanding of different cultures and possibility to socialize with people with different backgrounds), along with the opportunities created to contact with international professional experiences (work in an international context and adapt to a new working culture).

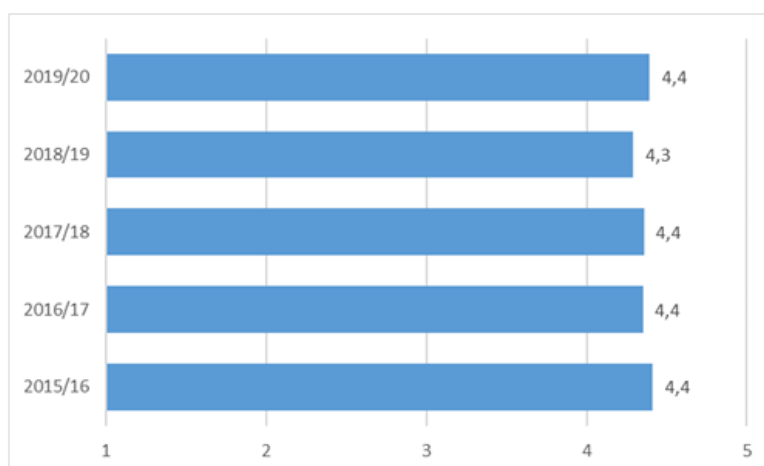
GAINED SKILLS IN JOINT PROGRAMMES	
Contributed to my personal development	97%
Gave me the ability to work in an international context	95%
Helped me to get a better understanding of a culture other than my own	90%
Improved my ability to socialize with people from different cultural backgrounds	90%
Improved my ability to adapt to the working culture/ethics of a different country	88%
Improved my ability to adapt to and act in new situations	88%
Helped me to improve/gain second language skills	81%
Developed my teamworking skills	79%
Improved my ability to take initiatives	73%
Improved my ability to work autonomously	69%
Made me feel more self-motivated	69%
Gave me a better understanding of the professional activity in my area	67%
Improved my ability to use theoretical knowledge to solve practical challenges	60%

#### 4.4.3 Crossed analysis (break out by descriptive variables: JP type | location | salary | academic year | region

When analysing the JP recommendation by the average salary, it is possible to observe a significant difference among the average salaries of the alumni who recommend a JP (2905€) and those who do not recommend it (2583€).



The overall satisfaction with the JP was assessed in a 5-point scale, being five the highest value (extremely satisfied). The five cohorts analyzed are very satisfied with their JP, presenting values between 4.3 (2018/19) and 4.4 (all the other remaining cohorts).



#### 4.4.5 Conclusions

For the majority of the alumni, choosing a JP was a single choice decision, since only 3.9% did not study in their JP of preference. This said it is important to underline that this single choice option was not due to a lack of diversity of available JPs, since the majority confirmed the existence of a high diversity of JP available.

On the other hand, and looking at the students who did not apply for a JP, the main reason indicated was the limited offer along with lack of information.

Almost all of the JP alumni recommended their JP to other students and are highly satisfied with their JP experience. Regardless this extraordinary assessment, there are factors that need to be considered and subject to enhancement: the internships and employers' involvement, the array of optional courses and the administrative processes.

## REDEEM AND REDEEM 2 COMPARATIVE INDICATORS

As mentioned above, most indicators were applied in the REDEEM 2 project surveys again for potential comparisons when justified.

	REDEEM (2016)		REDEEM 2 (2019/2020)	
	JP	RD	JP	RD
Graduates with paid activity	91%	93%	90%	87%
Unemployed currently studying	55%	63%	58%	65%

When analysing the employed alumni, a decrease of employability between both periods and for both groups can be observed. However, the decrease of employability among the regular degree alumni (93% in 2016 to 87% in 2019/20) is stronger than among the JP alumni (from 91% to 90% between both periods). This is a clear indicator of a more stable employability situation of JP alumni.

For the unemployed, it is possible to observe in 2019/20 the same tendency than in 2016. Usually, the unemployed RD graduates tend to proceed with their studies (63% in 2016 and 65% in 2019/20) when compared to the JP graduates (55% in 2016 and 58% in 2019/20). Between both periods, overall analysis shows an increase of graduates who opted to pursue studies when unemployed.

	REDEEM (2016)		REDEEM 2 (2019/2020)	
	JP	RD	JP	RD
Working outside of their country of origin	52%	28%	68%	28%

When analysing graduates working outside of their country of origin, a significant difference can be observed. The majority of the JP alumni (52% in 2016) worked outside of their country of origin, with the figure increasing to 68% in 2019-20. Less than one third of the RD alumni worked outside of their country of origin, the value remaining constant for both periods (28% in 2016 and in 2019-20).

	REDEEM (2016)		REDEEM 2 (2019/2020)	
	JP	RD	JP	RD
Working in the area of their graduation	89%	81%	92%	88%

Another relevant indicator is the agreement between the field of study and the later job area of the graduates. In both groups, JP and RD alumni, a high match can be observed, with the agreement increasing from 2016 to 2019/20. However, the overlap is higher for the JP alumni and reaches 89% (2016) and 92% (2019-20), confirming that graduates work in the area of their graduation.

## 5 INTERVIEWS

As part of the data collection process, interviews were made with four different types of Joint Programmes key players: companies, administrators/academics, JP alumni, and JP students. The interview methods varied for the different groups: individual interviews for companies, individual interviews or interviews of focus groups for JP alumni, round tables for current students and administrators/academics. Some questions to obtain profiling information were the same for all groups:

- Name(s) of the interviewer(s)
- Name of the university

After this, the following information was collected for each group and each participant:

- GDPR: authorization to use this data in the dissemination activities of the project? Y/n
- Size and main activity of the company (name, optional) –for the interviews of companies only
- Position and/or field of study
- Country of origin
- Country of study
- Type of programme
- 

**The script used for the interviews of companies was as follows:**

1. Describe your current involvement in international JP. (How was it initiated; how did you make it work; components more appreciated; teaching involvement).
2. How would you like to contribute to the international JP, beyond your current involvement? (What is the company's benefit from participation in JPs? research interests; recruitment interests, etc.).
3. Have you employed any graduate from an international JP? Does the impact of the profile of the international JP graduates on your company differ from that of other graduates?
4. Obstacles to may prevent the company's long-term commitment to international JPs.
5. How can the sustainability of international JPs (financial, organization, collaboration, company policy to offer scholarships for these international JPs) be enhanced?

6. Suggestions to improve/upgrade the JPs.

**The following script was used for JP alumni:**

1. Describe your experience gained from the international JP (components more appreciated; involvement of companies; etc.).
2. How can the international JPs be improved regarding the involvement of companies and why? (What you get out of the participation?)
3. What's your experience of company collaboration in the JP during your studies? How did it influence your career?
4. Obstacles you see for the involvement of companies in international JPs.
5. Would you or your company be interested in participating in international JPs (mentoring, seminars, teaching, lecturers, recruitment, sponsoring, etc.)?
6. Suggestions to improve/upgrade the JPs

**The script used for interviews of current students was as follows:**

1. What's your perception of company collaboration in the JPs during your studies? (Components more appreciated; involvement of companies; etc.)?
2. How do you evaluate the involvement of companies in international JPs? (Thesis, mentoring, seminars, teaching, lecturers, recruitment, sponsoring, etc.)?
3. How can the international JPs be improved regarding the involvement of companies and why?
4. What do you expect to get out of the involvement of companies in international JPs?
5. Suggestions to improve/upgrade the JPs.

**To interview the administrators/academics, the following script was applied:**

1. Describe the involvement of companies in international JPs? (How was it initiated; how did they make it work; components more appreciated; teaching involvement).
2. How would you expect the companies to contribute to the international JPs beyond their current involvement? (What does the company get out of the participation in JPs? research interests; recruitment interests, etc.).

3. Do you know whether the students of international JPs are more employable than others? Does the impact of the profile of international JP graduates on companies differ from that of other graduates?
4. Obstacles preventing/challenges you see for a long-term commitment of companies to international JPs.
5. How can the sustainability of international JPs (financial, organisation, collaboration, company policy to offer scholarships for these international JPs) be enhanced?
6. Suggestions to improve/upgrade the JPs

Interviews took place between October 2020 and June 2021. The data collection period was longer than expected since the making of appointments for interviews was severely affected by the pandemic. Except for the JP alumni, all remaining groups reached answer rates below the initially expected values, since interviewees were not always available and was hard to schedule interviews that fit their agenda.

NUMBER OF INTERVIEWS	Companies		Administrators/ academics		JP alumni		JP atudents		TOTAL	
	N*	n**	N*	n**	N*	n**	N*	n**	N*	n**
AALTO	1	0	10	11	1	4	8	5	20	20
CVUT	1	0	10	0	1	0	8	0	20	0
IST	1	0	10	9	1	1	8	8	20	18
KIT	1	1	10	6	1	0	8	5	20	12
KTH	1	1	10	3	1	1	8	5	20	10
TUD	1	0	10	2	1	2	8	3	20	7
TTU	1	0	10	0	1	0	8	0	20	0
UPC	1	3	10	11	1	1	8	4	20	19
<b>TOTAL</b>	<b>8</b>	<b>5</b>	<b>80</b>	<b>42</b>	<b>8</b>	<b>9</b>	<b>64</b>	<b>30</b>	<b>160</b>	<b>86</b>

\* N= minimum number of interviews that were requested from the partners.








\*\*n= number of interviews that the partners were able to contribute.



## 5.1 COMPANIES

### 5.1.1 Introduction

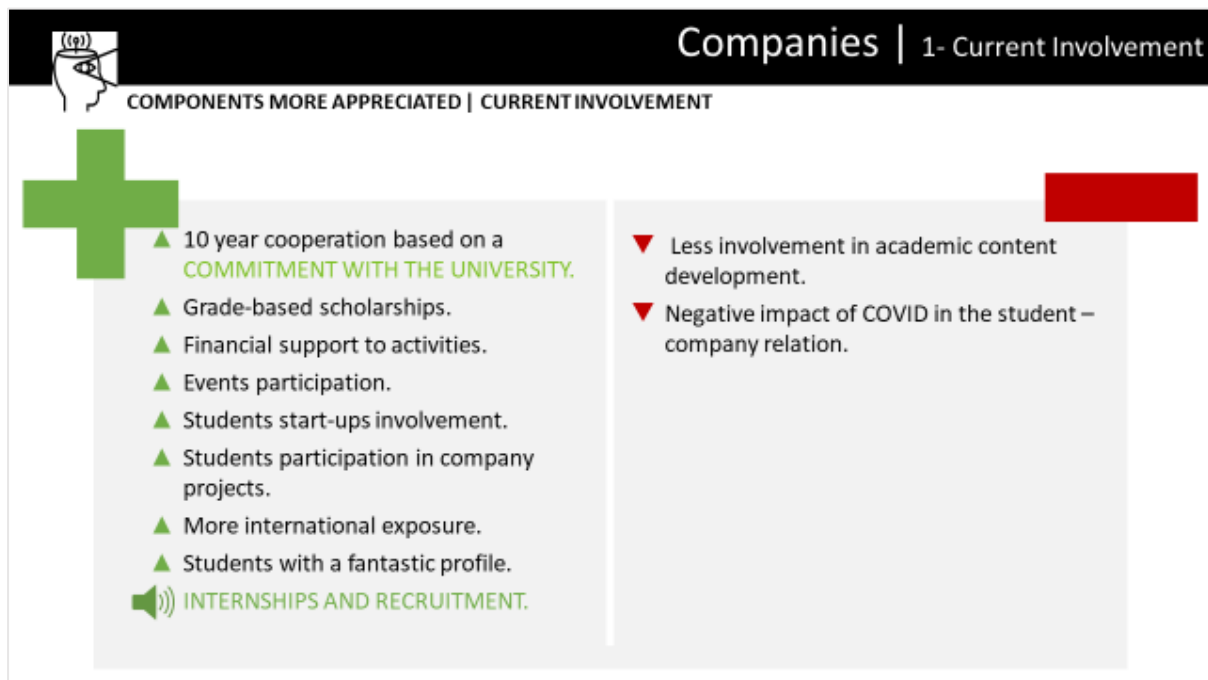
The feedback of the companies involved in joint programmes will be presented below. Based on several dimensions, such as their current involvement, future contribution, employability aspects, as well as barriers and bridges to commitment in –JPs, we will analyse the companies' direct involvement in different phases of joint programmes as well as their ideas regarding the development of co-operation with HEI within these programmes.

Companies   Analyzed Dimensions			
	CURRENT CONTRIBUTION		1- DESCRIBE YOUR <b>CURRENT INVOLVEMENT</b> IN INTERNATIONAL JP?  How was initiated How they made it Components more appreciated Teaching involvement What has the company get out of the participation in JP?
	FUTURE CONTRIBUTION		2- HOW WOULD YOU <b>LIKE TO CONTRIBUTE</b> TO THE INTERNATIONAL JP, BEYOND OF THE CURRENT INVOLVEMENT?  Research interests Recruitment interests Others
	EMPLOYABILITY		3- HAVE YOU <b>EMPLOYED ANY GRADUATE</b> WITH AN INTERNATIONAL JP?  4- THE <b>PROFILE</b> OF THE INTERNATIONAL JP GRADUATES HAD A <b>DIFFERENT IMPACT</b> IN YOUR COMPANY COMPARING WITH OTHER GRADUATES?
	BARRIERS		5- <b>OBSTACLES</b> YOU WOULD SEE FOR A <b>LONG TERM COMMITMENT</b> WITH INTERNATIONAL JP?
	ENABLERS		6- HOW TO <b>PROMOTE</b> THE <b>SUSTAINABILITY</b> OF INTERNATIONAL JP?
	UPDATE		7- Suggestions to improve/upgrade the JP

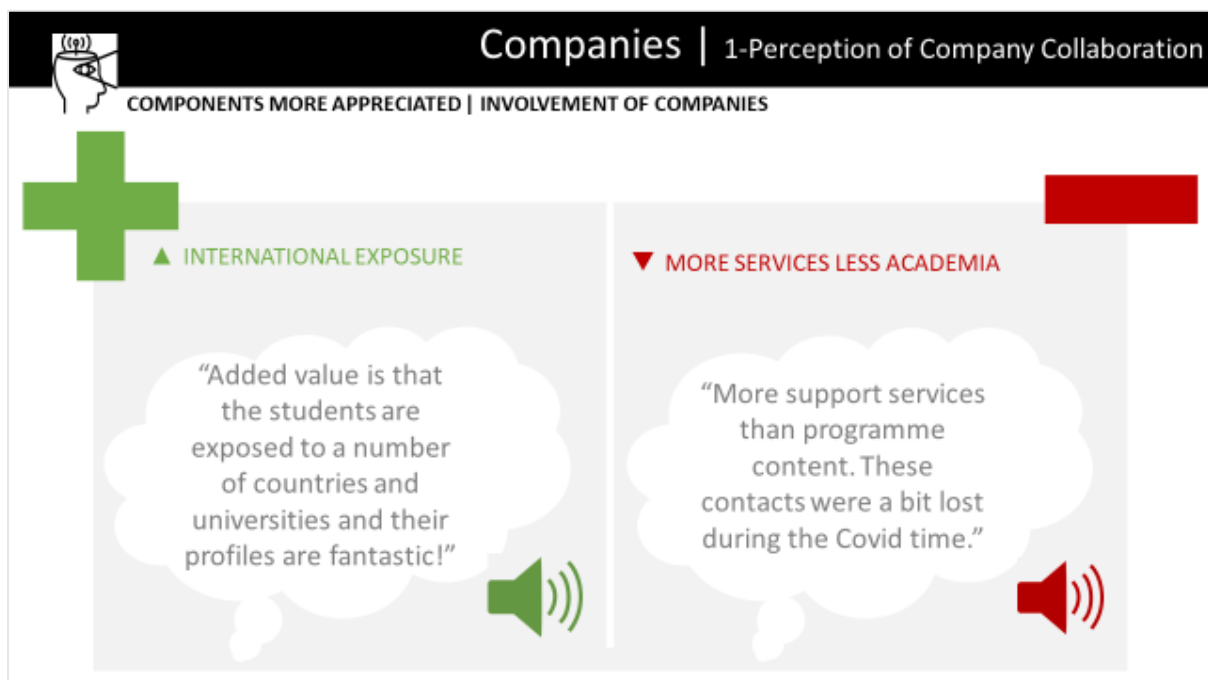
### 5.1.2 Literature

In the past, different studies revealed the need for a closer collaboration of academia and industry to enhance the employability of the graduates, but this has not been achieved so far. From the research done within REDEEM, we know that there is a need to investigate whether and how employers can be involved in the different phases of JPs, as this still seems to be a blind spot in research. REDEEM 2 therefore tries to give some answers in this respect.

### 5.1.3 Main analysis/tables



The interviewed companies answered that contacts to JPs and HEI in general are based on persons and that their current involvement is not always based on a contract, as this seems to be more complicated for HEI. For this reason, the form of involvement of companies varies. It ranges from financial support to events to excursions, scholarships, master's theses to involvement in student start-ups and the participation of students in company projects, among others.



Companies report that they are highly interested in the profile of JP graduates, as the latter represent what is widely called “high potentials”.

Although companies adapted their offers, such as company visits/talks, to the pandemic situation, the virtual encounters have not the same quality than the real face-to-face meetings/excursions.

Companies | 2- Future Contribution

COMPONENTS MORE APPRECIATED | FUTURE CONTRIBUTION

- ▲ Extend cooperation with other faculties/fields of study.
- ▲ Larger pool of students working on thesis/internships .
- ▲ More recruitment opportunities.

“Students are offered positions after graduation”

“Employer Branding is very important for Kärcher”

Though companies are happy to get into direct contact with promising talents, they could imagine being more involved in curriculum development or extend the co-operation to other JPs in other field of studies to enlarge their pool of students, enhance their employer branding, and create more recruitment opportunities.

Companies | 3- Employability

COMPONENTS MORE APPRECIATED | JP GRADUATES EMPLOYABILITY

COMPANIES HAVE JP GRADUATES EMPLOYED

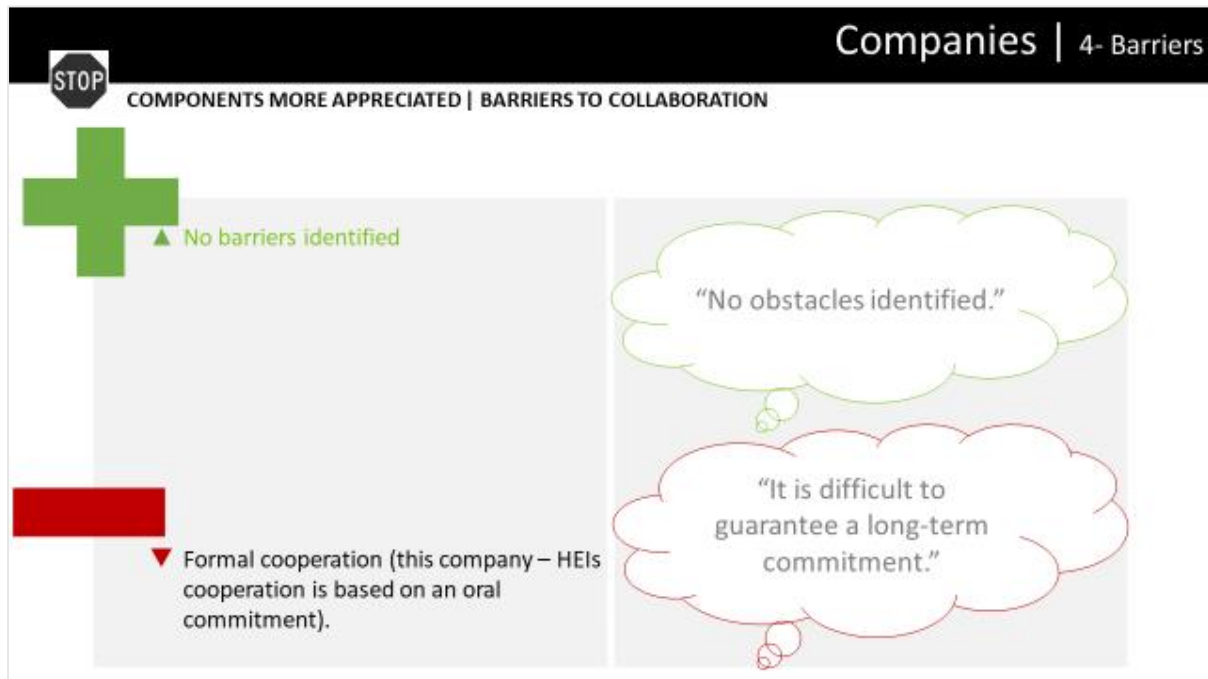
- ▲ (JP Employees) Big difference in terms of maturity
- ▲ Good opportunity to recruit in some strategic geographical areas

- ▼ No difference academically (between JP and regular degree).

“Began directly after their studies and scholarships we offered them”

“The exact amount of graduates with an international JP is not measurable.”

Companies appreciate the profiles of JP graduates and employ them (if performance allows) directly after internships. Although the employment of JP graduates who attended their programme in cooperation with a HEI in a country important to the company is an excellent opportunity, companies cannot evaluate the direct impact of the JP graduates. It can be said that the difference is less tangible in terms of academic knowledge than in terms of mind-set and interculturality. The added value of JP graduates is their mind-set due to their experience of a number of countries, universities, study and working mentalities during their studies.



When it comes to barriers to the involvement of companies in JPs, companies mention that a settled framework for the co-operation would be appreciated in order to formalise the interaction and enhance visibility of both partners.

Moreover, the effect of the pandemic should not be underestimated. Although virtual events have the potential to offer opportunities to a greater public, direct contact and exchange is one of the aspects that is most important to both sides.



## Companies | 5- JP PROGRAMMES SUSTAINABILITY

COMPONENTS MORE APPRECIATED | JP SUSTAINABILITY




- ▲ Good programmes have their company collaboration assured.
- ▲ Company funding for Master thesis.

"If the programme is good this is a given."


"would like to finance master thesis within our company for DD students."

Companies underline the strategic aspects of international JPs in the strategy of HEIs. For this reason and in order to deepen cooperation, they would like to support JPs by financing master's theses at companies.



## Companies | 6- IMPROVEMENT SUGGESTIONS


COMPONENTS MORE APPRECIATED | JP IMPROVEMENT SUGGESTIONS



- ▲ Integration of a practical project with the company within the JP
- ▲ On-site events in the University
- ▲ Entrepreneurship courses integrated in the programmes
- ▲ More soft skills alike courses/notions: self management, communication skills, problem solving, analytical thinking.

"Practical relevance is most important for Kärcher when it comes to employ graduates."

"Teach students to become owners of their destiny."





- ▼ Participation in curriculum development not very interesting.

Companies state that participation in curriculum development is not necessarily important to them. However, they would like to have a practical project integrated in the JP in co-operation with a company, as practical relevance is very important to them in terms of employability. Moreover, they would appreciate more direct contact to the international JP students through more on-site events at the university. Another suggestion is to integrate

entrepreneurship courses/elements in the JPs. Training of self-management, communication skills, problem solving, entrepreneurship, and analytical thinking would enable students/graduates to become “owners of their destiny”.

#### 5.1.4 Main remarks



Companies | 1-Perception of Company Collaboration




▲ INTERNATIONAL EXPOSURE


▼ MORE SERVICES LESS ACADEMIA


“Added value is that the students are exposed to a number of countries and universities and their profiles are fantastic!”



“More support services than programme content. These contacts were a bit lost during the Covid time.”




Companies | 2- Future Contribution



▲ Extend cooperation with other faculties/fields of study.

▲ Larger pool of students working on thesis/internships .

▲ More recruitment opportunities.

“Students are offered positions after graduation”

“Employer Branding is very important for Kärcher”



### COMPONENTS MORE APPRECIATED | JP GRADUATES EMPLOYABILITY



COMPANIES HAVE JP GRADUATES EMPLOYED

- ▲ (JP Employees) Big difference in terms of maturity
- ▲ Good opportunity to recruit in some strategic geographical areas



- ▼ No difference academically (between JP and regular degree).

"Began directly after their studies and scholarships we offered them"

"The exact amount of graduates with an international JP is not measurable."



### COMPONENTS MORE APPRECIATED | BARRIERS TO COLLABORATION




- ▲ No barriers identified



- ▼ Formal cooperation (this company – HEIs cooperation is based on an oral commitment).


"No obstacles identified."

"It is difficult to guarantee a long-term commitment."



## Companies | 5- JP PROGRAMMES SUSTAINABILITY


COMPONENTS MORE APPRECIATED | JP SUSTAINABILITY



- ▲ Good programmes have their company collaboration assured.
- ▲ Company funding for Master thesis.


"If the programme is good this is a given."

"would like to finance master thesis within our company for DD students."



## Companies | 6- IMPROVEMENT SUGGESTIONS


COMPONENTS MORE APPRECIATED | JP IMPROVEMENT SUGGESTIONS



- ▲ Integration of a practical project with the company within the JP
- ▲ On-site events in the University
- ▲ Entrepreneurship courses integrated in the programmes
- ▲ More soft skills alike courses/notions: self management, communication skills, problem solving, analytical thinking.

"Practical relevance is most important for Kärcher when it comes to employ graduates."

"Teach students to become owners of their destiny."



- ▼ Participation in curriculum development not very interesting.

### 5.1.5 Conclusions

It can be concluded that company participation is quite diverse. Different companies have different interests, of course. Companies seem to trust HEIs when it comes to theoretical knowledge and teaching in general. Still, they suggest integration of soft skills and practical experiences in co-operation with them.

We have to underline the fact that the pandemic situation is a challenge to all of us and did not at all facilitate this part of the study. It is a unique situation and feedback of only five










companies is not representative. Therefore, further research on and contact to companies in JPs is needed.

## 5.2 ALUMNI

### 5.2.1 Introduction

This chapter analyses the experiences gained by alumni from JPs with company involvement. As the number of JPs with strong company integration is very low, the analysis is based on responses given by four alumni.

JP Alumni   Analyzed Dimensions				
	PERCEPTION		1- DESCRIBE YOUR EXPERIENCE IN THE INTERNATIONAL JP.	Components more appreciated
	IMPROVEMENT		2- HOW TO IMPROVE THE INTERNATIONAL JPS REGARDING THE INVOLVEMENT OF COMPANIES AND WHY?	Involvement of companies
	EVALUATION		3- WHAT'S YOUR EXPERIENCE OF COMPANY COLLABORATION IN THE JP DURING YOUR STUDIES? HOW DID IT IMPACT YOUR CAREER?	Others
	BARRIERS		4- OBSTACLES YOU WOULD SEE FOR THE INVOLVEMENT OF COMPANIES IN INTERNATIONAL JPS?	How to improve
	COOPERATION		5- WOULD YOURSELF OR YOUR COMPANY BEING INTERESTED IN PARTICIPATE IN INTERNATIONAL JP GRADUATES	Why
	UPDATE		6- SUGGESTIONS TO IMPROVE/UPGRADE THE JP	What you get out of the participation

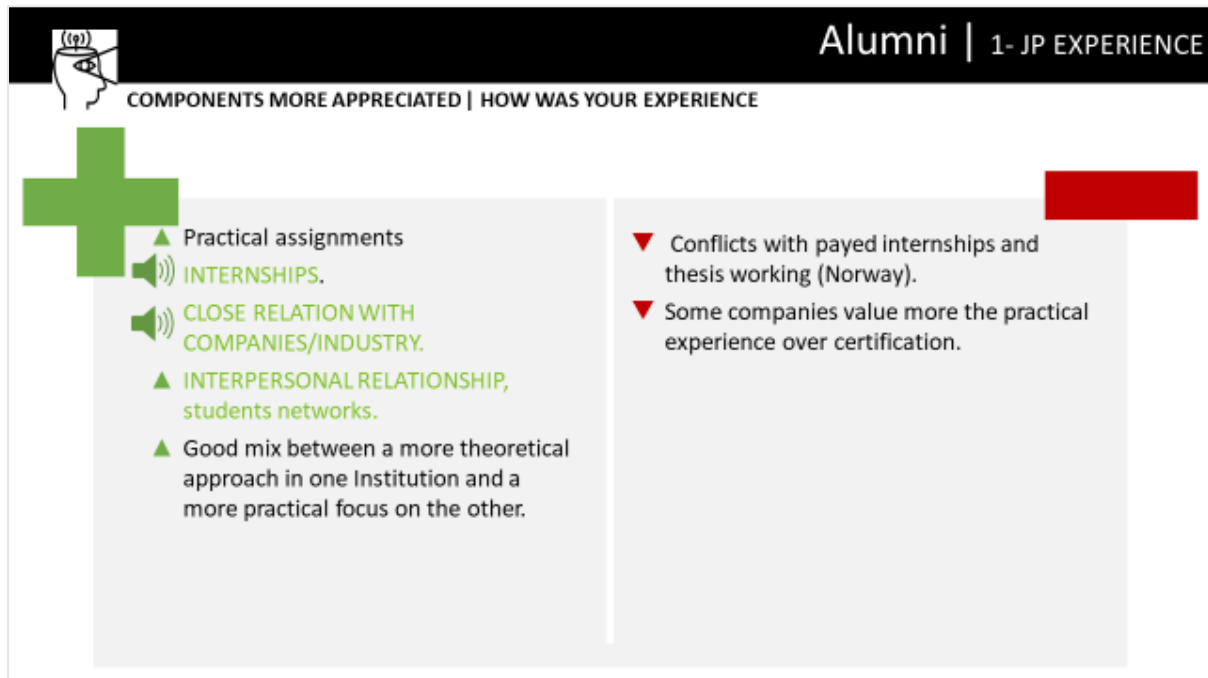
### 5.2.2 Literature

A finding obtained from the first REDEEM project was that JPs are mostly set up by academics without taking too much into account the needs and wishes of students or alumni. Some JPs are given feedback by their alumni via the general university statistics tool or because they are part of a network that offers feedback opportunities to alumni (e.g. regular surveys). For most JPs, however, feedback analysis is too laborious. In REDEEM 2, alumni from JPs with company involvement were specifically asked in personal interviews for their experiences and their suggestions as to how to improve the programmes.

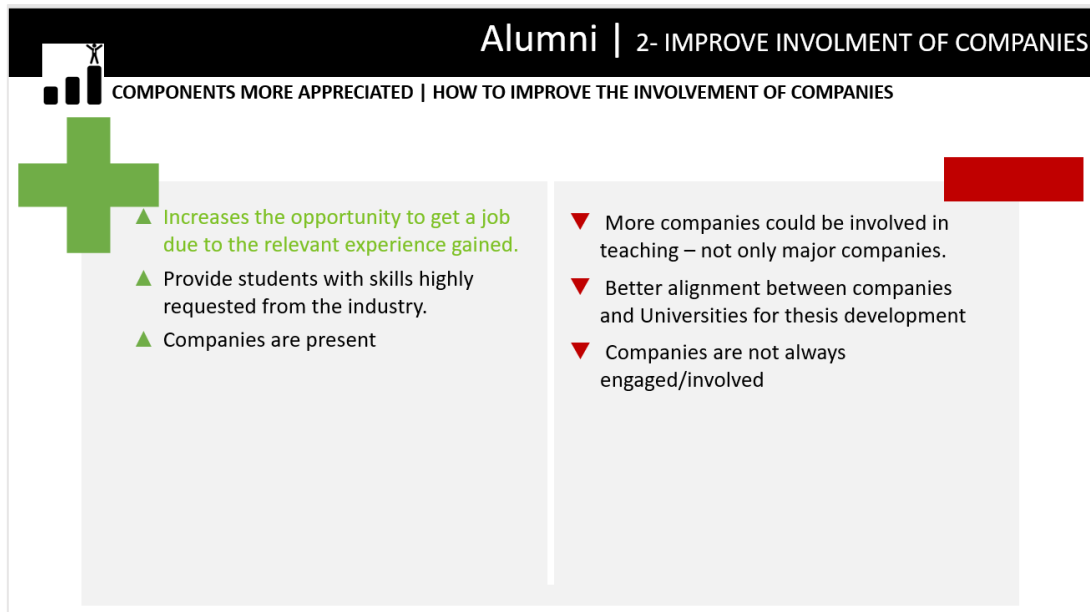
### 5.2.3 Main analysis/tables

Alumni report that they had a great time during their international JP with direct company involvement for different reasons. They mention the high-level training as well as the intercultural experience of study and work in different countries. The international JP gave them the opportunity to get in touch with students with different backgrounds in a supportive

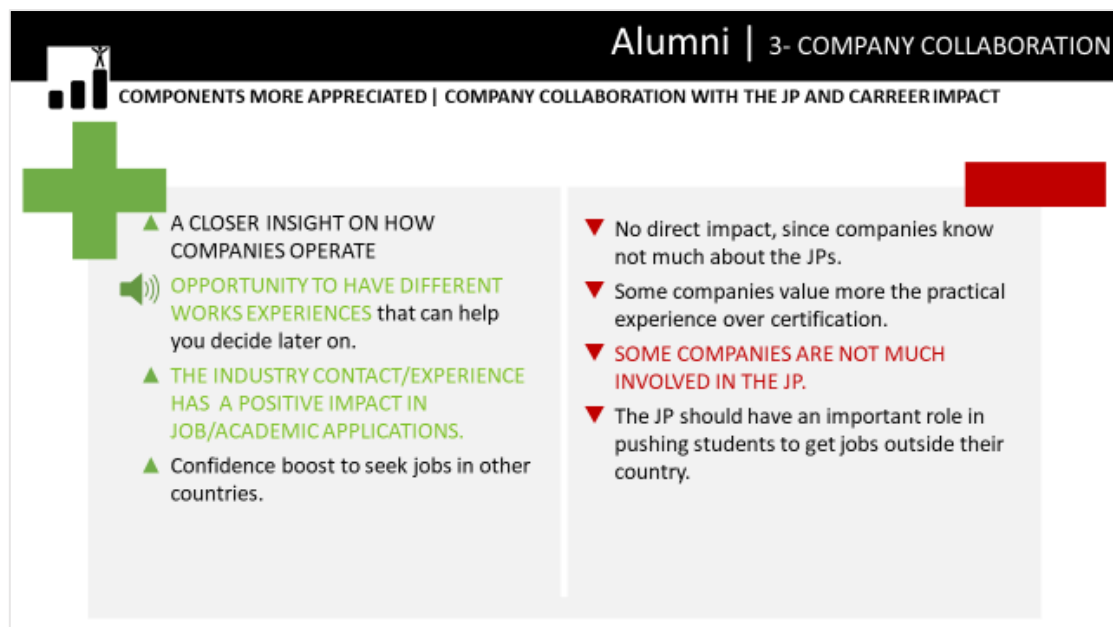
environment. Moreover, alumni highlight great industry connections that allowed them to combine theoretical and practical experience within a short time.



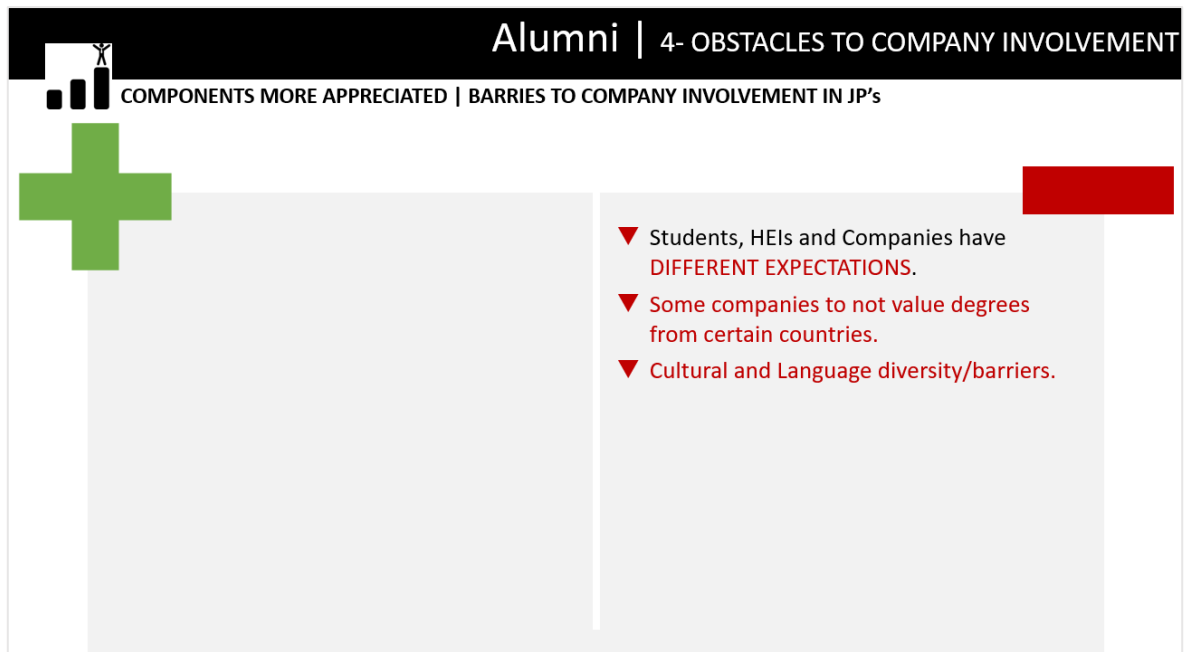
All alumni underline that the JP gave them the opportunity to work in one or even more companies during their studies, which did not only provide them with practical experience, but also gave them insights into different domains and helped them to figure out their future field of interest. They clearly state that the integrated practical experience is an advantage and a positive factor when it comes to employability. Thanks to the different practical experiences acquired during their JP, the alumni became aware of their personal ambitions and gained skills (e.g. project management, working in international teams, communication) that are not conveyed during an ordinary study course. The JP clearly had a positive impact on their personal and professional development. Moreover, the alumni mention the network in JPs, which provides a great opportunity to the students and to the program itself (fertile circle, because students are future alumni and future company contacts).



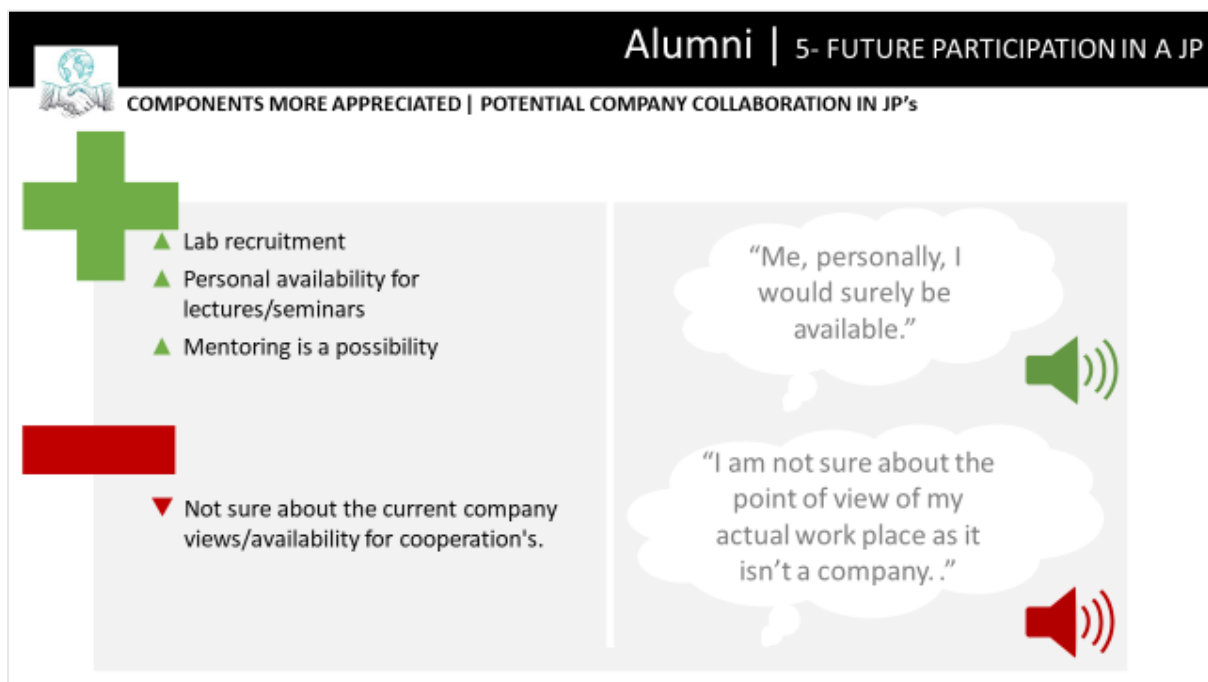
Still, there are also alumni reporting that the connection to companies was missing or that the link to companies was more via the university than through the JP itself. The contact to alumni and the organisation of alumni events are seen as means to better involve companies in JPs. In addition, alumni remark that the co-development of master's thesis subjects could be a good way to activate the industrial partnerships. Companies do not necessarily know about the potential an international JP student offers for their work. Therefore, a closer relationship as well as more events of companies on university campuses are needed.

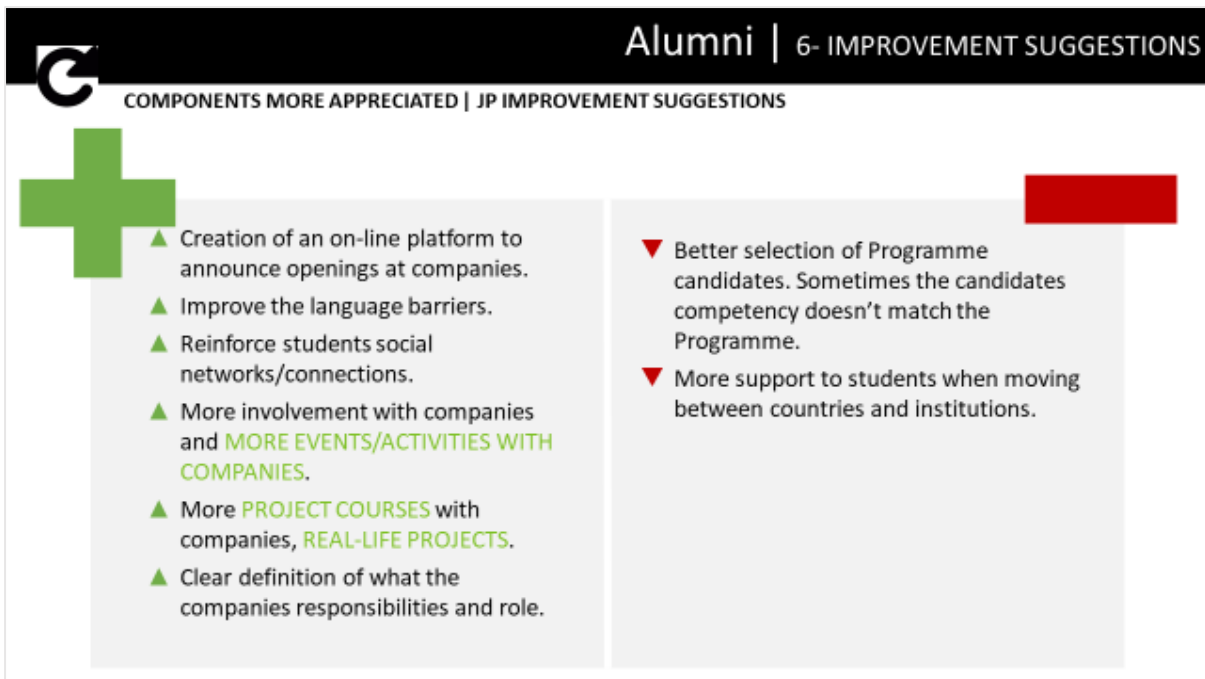


As for the main obstacles to companies' involvement in JPs, the fact that expectations of students, universities, and companies with respect to the collaboration do not agree seems to be a major critical factor. Students are eager to learn in a real-life environment, but companies do not have the time needed to coach the students.



Additionally, the language and cultural differences are identified to be major barriers to the involvement of companies.






Alumni identify several obstacles when it comes to the co-operation with companies. As companies and students have different expectations, it is important to align them and consider factors, such as time and resources, when assigning a task to students. Mentoring, the co-development of student projects and master's theses, as well as internships are ways to improve the co-operation and communication between JPs and companies. Moreover, the JP alumni can create a prolific network to enhance this relationship once they are in a company and get the opportunity to co-operate with a JP.


Besides this fact, alumni mention the need for more assistance in finding accommodation while attending international JPs. Although the different backgrounds of the JP students are inspiring, they may level down the academic experience. A more appropriate selection of candidates as well as choice of courses are mentioned as a solution.

#### 5.2.4 Main sentences




## Companies | 1- JP EXPERIENCE


COMPONENTS MORE APPRECIATED | INVOLVEMENT OF COMPANIES



▲ VERY GOOD EXPERIENCE


"One of the added values of the program is definitely the great industry connections the students have the opportunity to make."






▼ COMPANIES VALUE THE BACKGROUND


"The company was not very interested about JP as such but relevant background was more important."






## Companies | 1-Perception of Company Collaboration


COMPONENTS MORE APPRECIATED | INVOLVEMENT OF COMPANIES



▲ VERY GOOD EXPERIENCE


"One of the added values of the program is definitely the great industry connections the students have the opportunity to make."





▼ COMPANIES VALUE THE BACKGROUND

"The company was not very interested about JP as such but relevant background was more important."





## Alumni | 5- FUTURE PARTICIPATION IN A JP

### COMPONENTS MORE APPRECIATED | POTENTIAL COMPANY COLLABORATION IN JP's



- ▲ Lab recruitment
- ▲ Personal availability for lectures/seminars
- ▲ Mentoring is a possibility



- ▼ Not sure about the current company views/availability for cooperation's.

"Me, personally, I would surely be available."



"I am not sure about the point of view of my actual work place as it isn't a company."



## Companies | 1-Perception of Company Collaboration

### COMPONENTS MORE APPRECIATED | INVOLVEMENT OF COMPANIES



- ▲ EXPERIENCE VALUED BY EMPLOYERS

"They value students with experience and not coming directly from master programme."




- ▼ NO SMOOTH PATH FROM UNIVERSITY TO JOBMARKET

"My expectations changed completely. The programme should have a big role in pushing the graduates to job market in these countries."




## Companies | 4- OBSTACLES TO COMPANY INVOLVEMENT


COMPONENTS MORE APPRECIATED | BARRIES TO COMPANY INVOLVEMENT IN JP's



▲ EXPERIENCE VALUED BY EMPLOYERS


"They value students with experience and not coming directly from master programme."






▼ NO SMOOTH PATH FROM UNIVERSITY TO JOBMARKET

"My expectations changed completely. The programme should have a big role in pushing the graduates to job market in these countries."




## Companies | 6- IMPROVEMENT SUGGESTIONS


COMPONENTS MORE APPRECIATED | JP IMPROVEMENT SUGGESTIONS



▲ MORE INVOLVMENT WITH COMPANIES


"Involve more companies, to be exposed for students, hackathons, encourage students to participate to these events."





▼ DIVERSITY OF CANDIDATES

"Program candidates with diverse backgrounds. Is good for personality development, its drawback at the level of competency."



### 5.2.5 Conclusions






The feedback of the alumni can be summarised as follows: The more diverse the relationship between the JP and the companies is, the better it is. Communication and close partnership between JPs and companies seem to be essential for a successful JP experience for both sides.



## 5.3 Current JP students (Aalto)

### 5.3.1 Introduction

# Current DD Students | Analyzed Dimensions

PERCEPTION		1- WHAT'S YOUR <b>PERCEPTION OF COMPANY COLLABORATION</b> IN THE JP DURING YOUR STUDIES?	Components more appreciated Involvement of companies Others Thesis
EVALUATION		2- HOW YOU <b>EVALUATED THE INVOLVEMENT OF COMPANIES</b> IN INTERNATIONAL JPS?	Mentoring Seminars Teaching Lecturers Recruitment Sponsoring Others
IMPROVEMENT		3- HOW TO <b>IMPROVE</b> THE INTERNATIONAL JPS REGARDING THE <b>INVOLVEMENT OF COMPANIES</b> AND WHY?	How to improve Why What you get out of the participation
EXPECTATIONS		4- WHAT DO YOU <b>EXPECT</b> TO GET FROM THE <b>INVOLVEMENT OF COMPANIES</b> IN INTERNATIONAL JPS?	
UPDATE		5- <b>SUGGESTIONS</b> TO IMPROVE/UPGRADE THE JP	

Current students were interviewed at five different universities. The purpose of the interviews was to find out the students' views on company collaboration and its different forms in the joint programmes. The interviews were executed as round table interviews with a total of 26 current JP students. Each university used the same questions as a basis for the round table discussions.

The interviewed students represent 16 nationalities, including 12 students with an EU citizenship. The students' distribution between different joint programmes is as follows:

Type of the programme	Number of current students
Bilateral joint programme	10
EIT master's programme	7
Erasmus mundus (EM)	9
Total	26

Interviewed students came from the following five universities:

	JP	EIT	Mundus	Total
Aalto	0	0	5	5
KTH		5		5
KIT	3		2	5
TUD	1	1	1	3
IST	6	1	1	8
UPC			4	4
	10	7	13	30

Almost all the programmes involved are implemented in collaboration with other European universities. Only one interviewee completes the studies in Germany and a university located in non-EU country (Vietnam).

### 5.3.2 Literature

Leena Kunttu's study on "Educational Involvement in Innovative University-Industry Collaboration" (2017) presents a comparative, qualitative multiple case study of nine long-term university-industry relationships in Finland. All nine cases represent a close and long-term collaboration between a university research group (typically led by a professor or assistant professor) and an industrial firm's R&D function. All the cases include educational collaboration. The interview data reveal that the cases include the following four forms of educational collaboration:

- 1) Student projects for groups of undergraduate students, usually organized as a part of the curriculum. Topics are initiated by the research project on university-industry relationships and are jointly supervised by industrial and university staff
- 2) Thesis projects (master's or PhD level): also initiated by the research project and co-supervised by university professors and industrial managers
- 3) Tailored degree courses: organized by the university in cases where the industrial partner needs certain types of unique skills – often provides employment opportunities for students who passed the course. Also R&D staff from the firm taught and studied on these courses
- 4) Jointly organized courses on topics related to the project on university-industry relationship. University and company R&D staff jointly organize teaching.

As a result of this study, Kunttu (2017) presents an analysis of the interview data collected from each case in terms of knowledge sharing, joint sense making, and knowledge integration (Selnes F., & Sallis J. 2003). According to Kunttu, perhaps the most important form of educational knowledge transfer in the cases studied consists in different kinds of thesis projects. The data also revealed that thesis projects could be successful when the student writing the thesis is able to obtain relevant and good quality supervision from both sides (university and company).

Another form of knowledge transfer happens in jointly organized courses. Kunttu's (2017) survey shows that joint educational activities have improved the knowledge transfer, interaction, and communication between the partners. According to Selnes and Sallis (2003), the next step, "joint sense making" is about the development of new knowledge, ideas, and innovations in the collaborative relationship. Kunttu mentions student projects as a central form of joint sense making between the university and industry. The interview data emphasized the importance of students' projects as a valuable research resource in the joint research projects (page 19). "The industrial actors especially appreciated the student groups' ability and eagerness to provide the firms with new views, ideas, and insights on the novel areas that were not so familiar to the firms' internal development staff". In addition, student groups' ability to collect and analyze field data was underscored. The third step (Selnes & Sallis, 2003) is knowledge integration and implementation. This may involve the industrial commercialization of jointly developed innovations or technological solutions, processes or

prototypes. Thesis projects and student group projects are typical examples of educational outcomes.

Kunttu summarized a number of factors that may facilitate relational learning, collaborative practices, and the creation of new knowledge in university-industry relationships as shown in the following table:

“A summary of the main findings of the study on university-industry relationship” (p.21)

	Knowledge sharing	Joint sense making	Knowledge integration
Student projects	An effective method for transferring practical knowledge from research on the field	Establish interaction between the students and industrial partner  Joint efforts to solve practical industrial problems  Provide new insights and fresh ideas from the outside world	Provide practical results  Involvement in industrial implementation
Thesis projects	An important way of transferring practical academic knowledge  Joint supervision of thesis facilitates university -industry collaboration and interaction	Open new development areas  Deepen university-industry collaboration  Provide industrial partners with easy opportunities to collaborate with research groups	Clear documentation facilitates industrial utilization  Employing the graduate is an easy way of integrating the knowledge in industry
Tailored degree courses	Facilitate gaining of new academic competence and resources that can be accessed by industry	Joint working and discussions in the courses facilitate joint knowledge creation and deepen research-based collaboration	Integrating the new competence through recruitment
Jointly organized courses	Represent an effective way of gaining knowledge	Joint working and discussions in the courses facilitate	Implementing the most promising

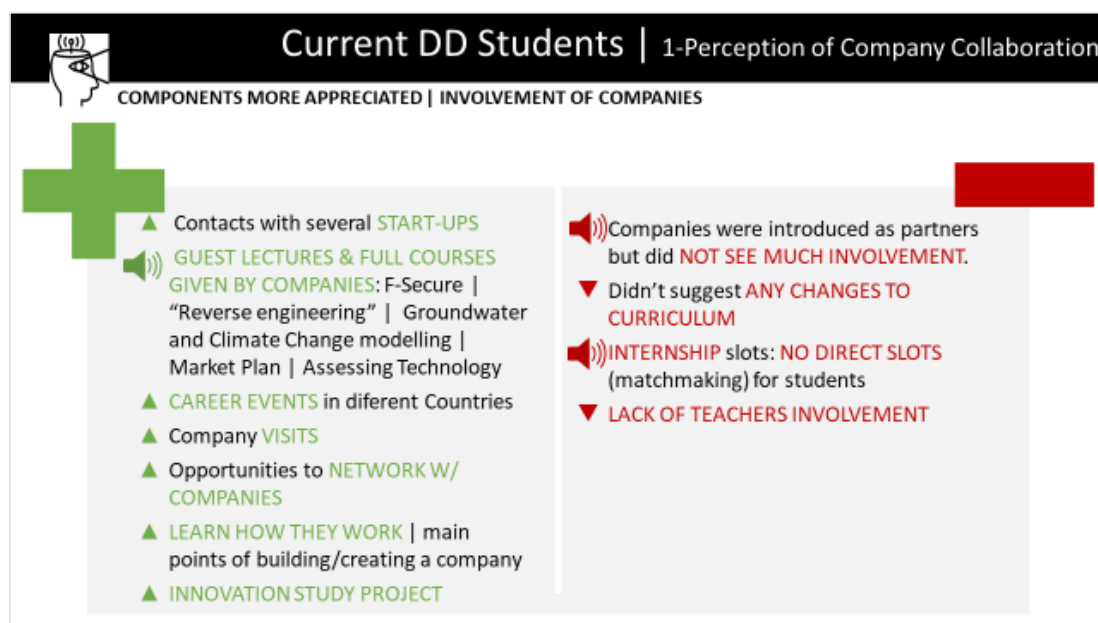
	and competences in a new research area (on both sides of the collaboration)	joint knowledge creation and deepen research-based collaboration	ideas developed in the coursework
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Kunttu interviewed industry and university participants, typically research managers and leaders of research groups at universities.

In Pollocks' (2014) study on employability, the step from campus to career was analyzed and the survey showed that students are struggling to make the next step in their career. 87% of graduates would like more careers advice from the university and 79% of graduates need help in finding employment.

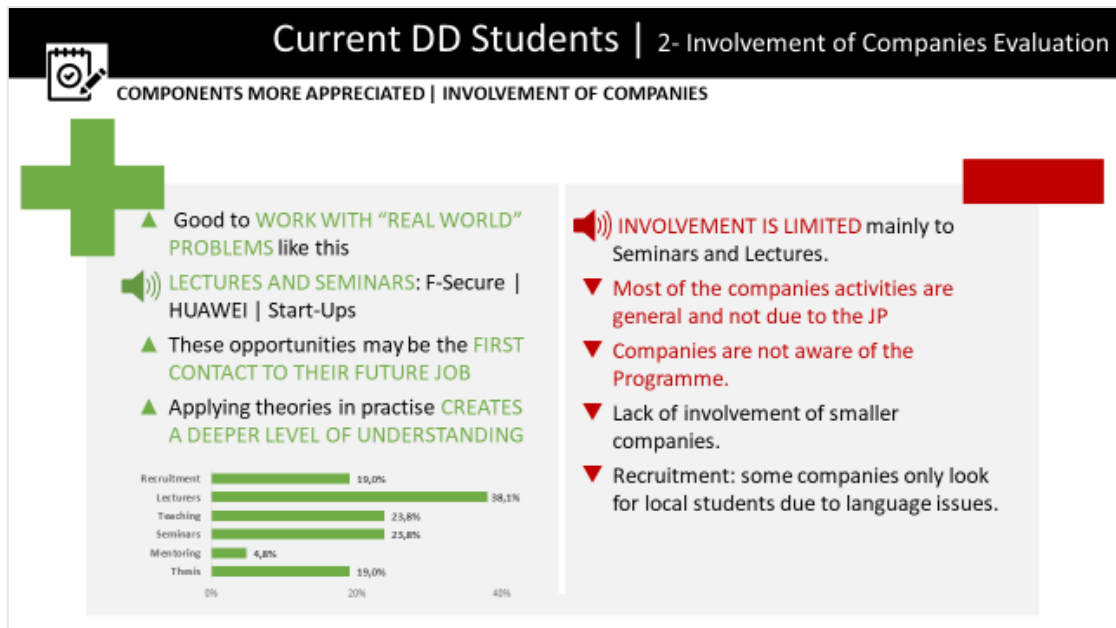
The ISB (International Student Barometer) survey was launched in 2014-2015. This survey was directed at international students at the participating HEIs (not necessarily double-degree students, but including all international students). According to the ISB (International Student Barometer) survey, the element that has the highest impact on a high recommendation score for the institution and the issue that is considered to be of highest importance to international students is **employability** (Nilsson, Ripmeester, 2016). Among the most important aspects for prospective students is **opportunities for work placement or practical experiences**. 92% of the survey respondents stated that this aspect was either important or very important when deciding for a certain HEI. Being employable is a driver for both current and prospective international students (Nilsson, Ripmeester, 2016). Therefore, strengthening the career services is important and the students expect support in making the transition from graduation to their first steps in the world of work.

### 5.3.3 Main analysis/tables



The students' experiences and perceptions of company collaboration vary widely. Even students attending the same programme answer either that there was no company collaboration or that they are happy with the company contacts. Some students are aware of partnering companies in the EU funding their programmes, but their active participation or role is not visible. 11 students out of 26 have no knowledge of company collaboration.

Forms of company collaborations are reported to include recruitment events, lectures, development projects for the companies, or theses for the company. The experience of Erasmus Mundus students relating to company collaboration is mostly positive even though some students feel a total lack of visibility of companies. As an example, the companies are reported to be listed on the programme website, but students see no actual activity. On the other hand, some students mention that guest lectures by company representatives are interesting and company visits are useful. In bilateral Joint Programmes, company involvement is reflected by a scholarship pool, but does not include mentoring or other professional support. Several JP students state that there is neither company collaboration nor an involvement in the programme. EIT students mention meetings with start-up companies, courses for problem-based studies, and several business challenges with companies, also during winter and summer schools. Surprisingly, these students also mention low interaction with companies. To summarize, 11 students out of 26 have no knowledge of company collaboration.



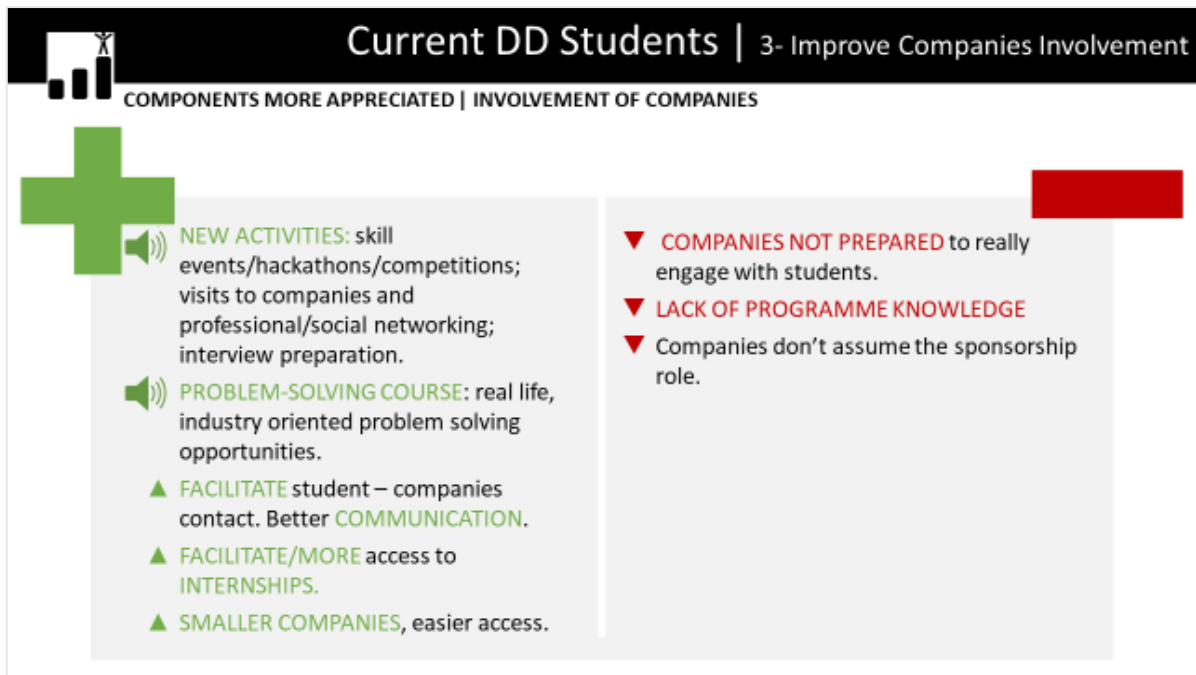
The interviewed students say that the main reason for company involvement is supporting the students' employment opportunities with the company.

"So I would like to interact with some managers or CEOs of the companies to learn some hints for applications and to get to know the crucial factors of choosing the employees".

"My perception of collaboration within the JP is to get a view into companies, to learn how they work, and to understand the main points of starting a company."

Surprisingly, the perception of company collaboration does not necessarily include thesis work even though master's thesis work is carried out quite often within a company project. Our interpretation is that students do not see thesis work at a company as an outcome of "JP - company collaboration" but as a result of their own activity.

Some students point out that studies at their home university do not include an industrial internship or thesis, whereas the joint programme allow the student to work at a company during the host university studies.



The interviews produced a wide range of suggestions to improve the involvement of companies. The following categories can be distinguished:

### Learning and teaching

#### 1) Development of curriculum and course -related activities

- guest lectures, lectures on hot topics, current trends
- development of courses based on the company needs
- real case studies, challenge-based teaching and learning
- involvement of companies in the educational process
- internship/work experience as part of the curriculum

#### 2) Extra-curriculum activities with companies

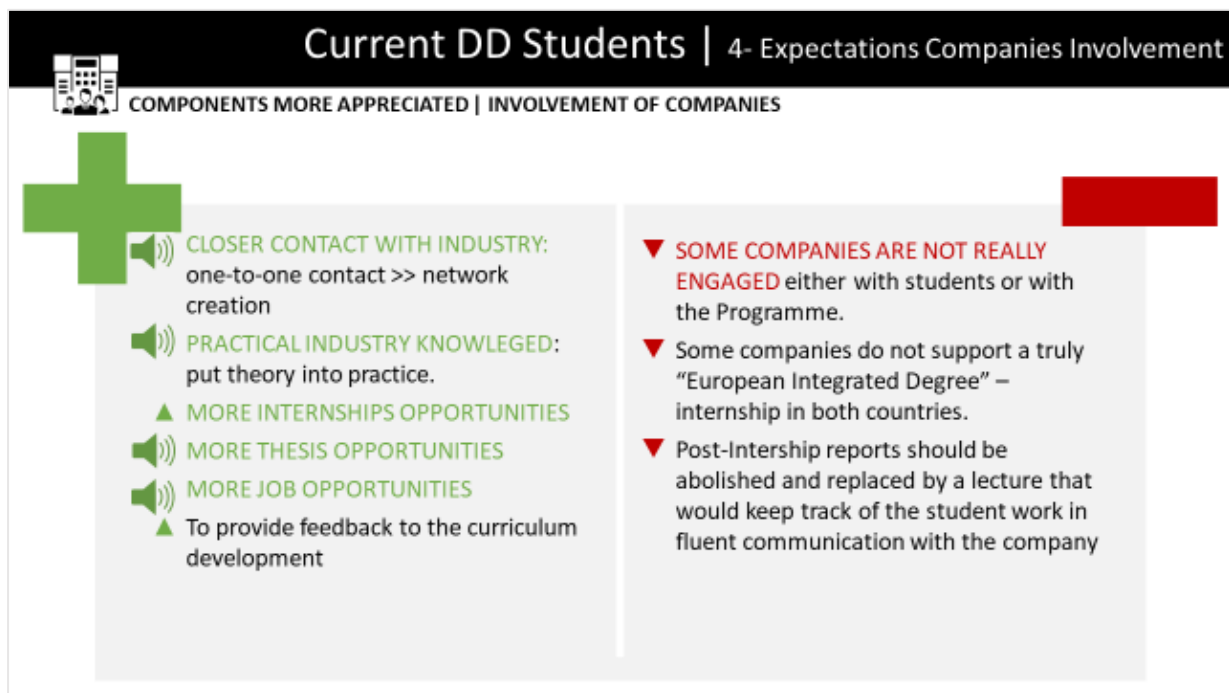
The following more company-focused activities were mentioned by current students:

- sponsoring a course
- promotion of competitions, hackathons
- offering scholarships
- company visits and events
- establishing “research clubs” or platforms on campus (industry- oriented problem solving)
- include smaller companies
- tutoring or mentoring of students during internships

#### 3) Recruitment and employability

- additional support (for example) by the university’s career services to improve students’ capabilities for job hunting

- to make companies compete to catch the best students
- to raise the companies' awareness of the programme
- to create a platform to support collaboration with companies
- to invite experts to train how to apply for jobs /to know more about the recruitment procedures (lessons learned from the interviews)
- improve the communication between the companies and university staff
- improve the direct contact between the students and companies



The interviewed students' expectations of "what to get out of the involvement of companies" vary from very concrete practical matters to the development of skills and further networking opportunities.

The students expect to obtain and widen their industry knowledge: to get to know what is happening in industry and to get inside information from outside of the university and to understand whether the company is interesting to join. Some students would also like to gain experience on smaller companies and start-ups, especially if they plan to start their own business later on.

Establishing personal contacts with company staff and creation of networks are considered to be very important. The same is true for mentoring or guidance by the company. Development of job skills and obtaining a broader vision of different cultures are also mentioned.

"With this experience, I expect a broader vision of the different cultures as well as of the ways of teaching, thus enriching my academic curriculum. Consequently, I will be better prepared for my future professional career and for work in multi-diversity working environments (local or international)."

Students also have concrete expectations in terms of the salary paid or scholarships provided by companies.

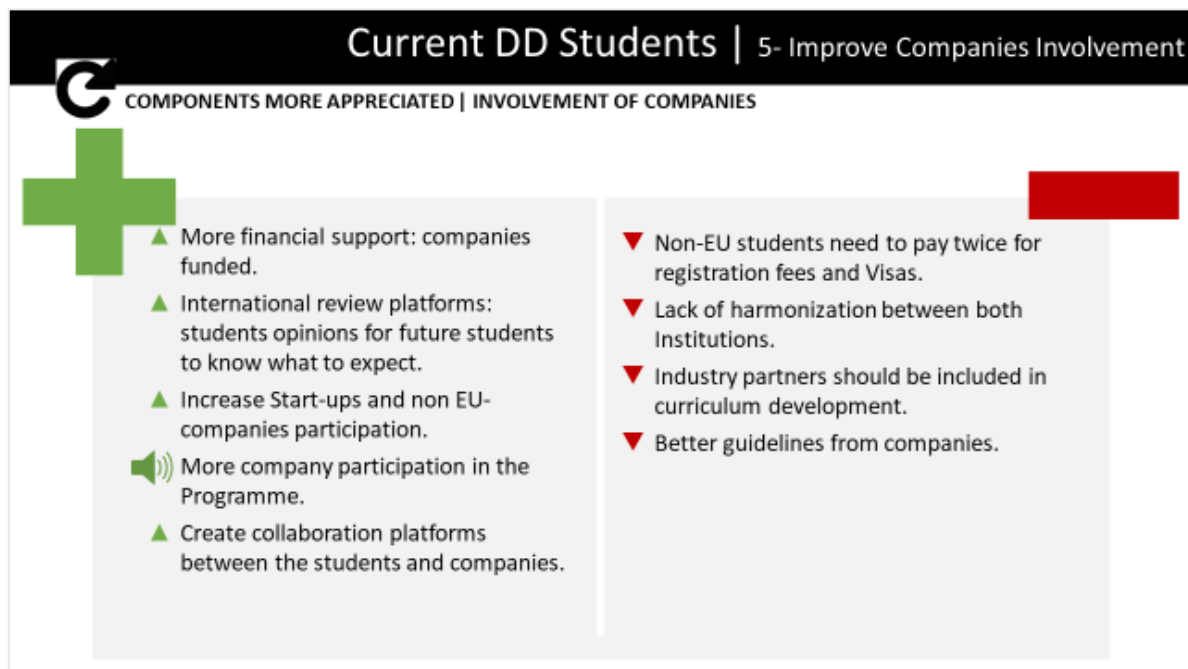


Students identify and suggest very diverse forms of company collaboration.


In addition, students raise many practical issues that are not related to company collaboration, but more to administration or legal aspects of mobility. Students claim to face many practical problems ranging from visa issues to double registration fees when studying/working in several countries under the programme. In addition, some language barriers are experienced when companies announce thesis positions in the local language only (not in English).

Industry partners should have a “voice” in curriculum development and alumni insight could be included into the programme. Barriers for non-EU students in getting positions/internships within the programme should be lowered, for example by including companies also from non-EU countries.

Active talent search could be accomplished by the company and matchmaking opportunities should be created.




### 5.3.4 Main statements




## Current DD Students | 1-Perception of Company Collaboration


COMPONENTS MORE APPRECIATED | INVOLVEMENT OF COMPANIES



▲ GUEST LECTURES & FULL COURSE GIVEN BY COMPANIES:


"Positive perception, academic and career wise collaboration: course with F-Secure and guest lectures"






▼ NOT SEE MUCH INVOLVEMENT.


"They never sent us emails declaring themselves as program partners and or offered something"






## Current DD Students | 2-Involvement of Companies Evaluation


COMPONENTS MORE APPRECIATED | INVOLVEMENT OF COMPANIES



▲ REAL LIFE PROBLEM SOLVING:


"We have met start-up companies (...) where we worked in groups on problems given by companies (...) it is a mandatory course"






▼ VERY RESTRICT INVOLVEMENT

"I don't see the company involvement except teaching, lectures."




### Current DD Students | 3- Improve Companies Involvement


COMPONENTS MORE APPRECIATED | INVOLVEMENT OF COMPANIES



▲ DEVELOP NEW OPPORTUNITIES:


"More practically driven events and courses (...) real-problem solving course would be needed"






▼ LACK OF AWARENESS

"Companies should be more aware of the programme (meetings with programme people (...) platform of positions to be offered/built)."




### Current DD Students | 4- Expectations Companies Involvement


COMPONENTS MORE APPRECIATED | INVOLVEMENT OF COMPANIES



▲ DEVELOP A LINK WITH INDUSTRY:


"Get a practical sight for things learned (...), to create networks, get a feel how industry works, to know relevant stakeholders"






▼ LACK OF AWARENESS

"Wish for companies to support the concept of internationalization if they want to take part in a double degree"




### Current DD Students | 5- Improve Companies Involvement


COMPONENTS MORE APPRECIATED | INVOLVEMENT OF COMPANIES



▲ MORE CONTACT WITH COMPANIES


"Be able to meet companies during the project to ask for suggestions and mentoring"





▼ MORE INDUSTRY INVOLVEMENT

"Develop the curriculum (opinions from industry and companies). Industry partners should have a "voice"."



### 5.3.5 Conclusions

The interviewed students interpret “company collaboration” to mean “ready-made positions” and direct matching to positions, for instance. This kind of collaboration scheme is quite rare and maybe not even possible (not fitting to company’s recruitment strategy).

”I thought the X [the program consortium] would help us more with network building events. We should have at least 10-15 job openings reserved to programme students that we could apply for. They require us to go to industry so I think they should offer some safety net [to get that]”.

On the other hand, if student apply for the positions on their own, the learned job-hunting skills are an important part of working life skills even if they do not think so while being students. It is important to communicate with students on the recruitment process and the working life cultures in different European countries and train them in this area.

When evaluating the students’ responses, it should be kept in mind that students understood company collaboration differently or did not consider the on-going educational collaboration a “company involvement”. In Erasmus Mundus or EIT programmes, for example, a wide network of companies typically is attached to the programme, but the roles and tasks of these stakeholders are unclear for students, who might have expectations that are not met. The roles and tasks of the industry members should be communicated to students in the very beginning of the programme. Those JP programmes, whose specific requirements result from the funding instrument (EIT, Erasmus Mundus), such as compulsory internship/thesis in industry, which is why they have industrial consortium members should find ways of securing the students’ access to the world of work. In Erasmus Mundus programmes, in fact, a strong connection with the field of work has been one of the selection criteria for the programmes, but responsibility for finding the position lies with the student only.

Students identify and suggest very diverse forms of company collaboration. Their contribution to the programme development is worth considering and ensuring a continuous way to gather student feedback.

The design of the programme (whether it includes a compulsory traineeship/internship/thesis in industry) and the provision of various career orientation are important points when planning and implementing the JP. The inclusion of companies in the programme set-up does not mean that collaboration activities will happen spontaneously. This was experienced and commented by several interviewed students.

The findings from REDEEM2 current student interviews are in line with Kunttu’s (2017) observations, especially concerning course and curriculum development and educational collaboration activities.

”A company could sponsor a course, along an academic year, where the students of this programme were faced with a real challenge and work directly with a company’s representatives. Besides, it would be a win-win situation for all parties involved. The company would have students working and contributing with ideas or best practices to solve practical problems, as well, as gaining visibility in the academic community, further, to the students that would have

contact with a real company's situation, preparing them for their future professional career and, lastly, for both universities that would establish a closer relationship with the company. Throughout the academic year, the students would have presentations to present the evolution of the work."

As shown in both Pollock's (2014) and Nilson and Ripmeesters's (2016) studies, strengthening the career services is important and the students expect support in making the transition from graduation to their first steps in the world of work.

In case JPs include compulsory internship abroad, this makes the hunting and finding of positions more difficult. JP students probably need more support services (from programme staff or university career services) to ensure that all of them find a position in due time and are able to complete the programme as expected.

The employers' side should be targeted by raising the awareness of the JP within the company and strengthening the communication between the programme and the company. The company's understanding of the concept as a whole, including compulsory mobility abroad, should be improved. When joining the JP as an industry member/associate member, companies should have a clear concept of how to reach the maximum benefit from the programme and what to offer to support the collaboration for the benefit of both sides.

It is evident that the students' experience of industry involvement varies, which may also be due to the different academic regulations of the universities. For example, some students experienced big differences in study-related requirements concerning the internship report. It might be reasonable to harmonize the requirements of the partner universities offering the joint programme so that students would not be forced to make double efforts and submit two different internship reports, for instance.

Although the interviewed students represented joint programmes, their suggestions of how to involve companies are also relevant to "normal" programmes including industry involvement.








The answers given by the Redeem1 target group to the question of how employability can be improved by reforming joint programmes are very similar to the answers given by the alumni in Redeem 2, such as more extra-curricular activities, bringing experts from companies to the classroom and bringing the students to the companies also through internships, and master thesis topics developed jointly by industry and academia. Students also mentioned that offering mandatory language courses to learn the language of the host country should be included in joint programmes taught in English.

## **5.4 ADMINISTRATORS**

Of course, interviews were also conducted with administrators and academics in order to gather input from all target groups. We use the terms administrators and academics for all those involved in the implementation, design, and realisation of joint programmes and dual-degree programmes, including academic staff, coordinators, designers, and administrators at

HEIs. The interviews focused on the involvement of companies in the administrator's or academic's JP. Analysed dimensions of the interviews included the perception of the involvement of companies, the topic of improvement of the companies' contribution to JPs, the impact that company involvement might have, barriers that could arise by the involvement of companies, the issue of promoting the sustainability of a JP, and suggestions to improve and update and upgrade their JPs.

### 5.4.1 Introduction

JP Administrators and Academics   Analyzed Dimensions			
	PERCEPTION	 1- DESCRIBE THE INVOLVEMENT OF COMPANIES IN INTERNATIONAL JP?	How it was initiated How did you made it work Components more appreciated Teaching involvement
	IMPROVEMENT	 2- HOW WOULD YOU EXPECT THE COMPANIES TO CONTRIBUTE TO THE INTERNATIONAL JP, BEYOND OF THE CURRENT INVOLVEMENT?	What you get out of the participation Research interests Recruitment interests
	IMPACT	 3- DO YOU KNOW IF THE STUDENTS OF THIS KIND OF INTERNATIONAL JPS ARE MORE EMPLOYABLE THAN THE OTHERS? THE PROFILE OF THE INTERNATIONAL JP GRADUATES HAD A DIFFERENT IMPACT IN THE COMPANIES COMPARING WITH OTHER GRADUATES?	
	BARRIERS	 4- OBSTACLES/CHALLENGES YOU SEE FOR A LONG TERM COMMITMENT OF COMPANIES WITH INTERNATIONAL JP?	
	SUSTAINABILITY	 5- HOW TO PROMOTE THE SUSTAINABILITY OF INTERNATIONAL JP (FINANCIAL, ORGANIZATION, COLLABORATION, COMPANY POLICY TO OFFER SCHOLARSHIPS FOR THIS INTERNATIONAL JPS)	Financial Organization Collaboration Scholarships
	UPDATE	 6- SUGGESTIONS TO IMPROVE/UPGRADE THE JP	

### 5.4.2 Main analysis/tables

The **feedback** by JP designers in our qualitative interviews is diverse. On the one hand, designers are underlining the experience graduates have obtained in an international programme, on the other hand, they are valuing JPs for the contribution to the internationalization of the institution, its visibility and prestige, and recruitment benefits. The **focus** still lies on the JP's mobility component and on the complementarity or compatibility of the programmes (much more than in the case of the graduates) and curricula and the heavy administrative burden to create and manage JPs seems to be a deterrent on the academic side. The main challenges in setting up JPs are funding, sustainability, and designing a joint curriculum. However, a common degree duration and even matching time spans in various academic calendars are hard to find. In addition, institutional regulations complicate the setting up of JPs. For example, there are minimum requirements in terms of duration, language requirements, minimum credit requirements, and a prohibition of issuing two diplomas for the same amount of work, which should be essential for a JP.

Designers state that a direct involvement of companies in the design of JPs is rare due to various reasons. For some existing JPs, however, the involvement of companies is well established. Even though small companies can be involved rather easily, it is difficult to keep them as a partner after they have grown. In this case, as with many large companies, the following happens: the fluctuations in companies' staff is quick, which is why it is impossible to find a coordinator who is keen on taking all the administrative steps required at the companies. However, company involvement may have various forms, such as small field visits, curricular internships, defining and hosting master theses, sponsoring scholarships, and providing prizes. Fewer companies offer extracurricular internships, give lectures, and are in

#### Keynotes from the Designers

The **INTERNATIONAL EXPERIENCE** is a very positive differentiation

**VALUE** personal experience vs internationalization of the institution

**FOCUS** on mobility and compatibility with the partner university

**ADMINISTRATIVE BURDEN** is the main deterrent

**EMPLOYABILITY ASPECT** often neglected and seen as short-sighted

#### INVOLVEMENT OF COMPANIES


- › Project Development
- › Scholarships or other financial support
- › Field trips, visits, and social events




some way involved in developing the curriculum and the programme itself.

The **involvement of companies** needs to be beneficial for both parties, the institution of higher education and the company itself. At the same time, the role of the industry needs to be clearly defined when it comes to teaching and curriculum development. For example, it helps if more social and mentoring activities are organized with companies. The aim for universities is to work together on a long-term basis. However, this is usually not possible on the part of the company, as they usually focus on short-term planning and commitments. This indicates that there often is a lack of a clear structure and of strict agreements to formalize the co-operation.

## Administrators & Academics | 1- Involvement of Companies

COMPONENTS MORE APPRECIATED | How was the company involvement in the JP




-  Involvement with MSc thesis development.
  - ▲ Involvement with Projects development
  - ▲ Financial support = scholarships
-  Organization of activities in/with the company: visits, social events.
-  Recruitment.
  - ▲ Present in an Advisory Board, providing feedback to MSC thesis agreements & curriculum development.




- ▼ There are still room for development regarding industry involvement.
- ▼ Support in curricula development would be appreciated (as an Advisory Board).
- ▼ COMPANIES INVOLVEMENT DOES NOT EXIST IN ALL JPS, ALTHOUGH FOR OTHERS IS VERY WELL STABLISHED (EIT).

The **expectations** on companies and their contributions to a JP are clear. Companies provide support on various levels. However, involvement of companies may also have a negative impact on the JP or its students. On the pro side, companies have access to new ways of thinking and solve problems through research. Moreover, their financial contribution is important, as scholarships and financial support help to attract students, for example. Companies assist with internships and placements during semester breaks or mandatory work phases. On the con side, company involvement should not lead to the exploitation of students. Companies need to be aware that the co-operation must be beneficial for both parties, the HEIs and the company. Improvement should be made by clearly defining the role of industry when it comes to teaching and curriculum development.

## Administrators & Academics | 2- Expectations towards companies

COMPONENTS MORE APPRECIATED | How would you expect the companies to contribute to JP's



- ▲ Companies have access to new ways of thinking the problems-solutions and research hints.
-  More financial support = scholarships
-  Organization of activities in/with the company: visits, social events.
-  Support with recruitment, internships or summer placements.
  - ▲ Connect each course content with a company interface.
  - ▲ Use alumni to reach the companies and create links and bring academia and industry together.

- ▼ Students exploitation must be avoid.
- ▼ Companies need to be aware that the cooperation must be beneficial for both parties.
- ▼ More social and mentoring activities should be organized with companies.
- ▼ Industry doesn't always have the needed H&R to supervise thesis work properly.
- ▼ Clearly define the role of industry when it comes to teaching and curriculum development.



Some academics are not concerned about their students' **employability** rate after studying one of their programmes and the component of knowledge related to the profession of the academic researcher is still valued more than soft skills. In addition, "JP graduates had a very extensive experience abroad and stand out from the mass of applicants with their two master's degrees". Academics seem to consider the reputation of the university as the factor for students to be more employable. Employability is one of the components of the provided education, but not the main one and often expressed as being not the primary duty of research universities that need to avoid focusing too much on applied knowledge, since "the statistics about the international student's employability rates are poor." Direct impact on employability differs regionally and cannot be generalized.

## Administrators & Academics | 3- JP's Employability impact

COMPONENTS MORE APPRECIATED | JP's students employability and profile impact

THE JP'S INTERNATIONAL EXPERIENCE IS VERY A POSITIVE DIFFERENTIATION

- ▲ JP's seems more mature and better communication skills
- ▲ Direct impact on employability differs regionally

Students have more training there for they are more attractive to companies when applying to a position


Students seems more prone to apply to international job positions

▼ No clear difference between both students profiles in what concerns to employability


▼ Statistics are either not available or data doesn't distinguish between JP and regular degree students.


When involving companies in JPs, there might be **obstacles and barriers**. Smaller companies are, for example, easier to engage with, but once they grow, the interest in being involved in JPs decreases and the involvement is lost. Moreover, companies are planning on a short-term basis due through various reasons. HEIs, however, need long-term collaborations to make their JPs and the involvement of companies more sustainable. In addition to these problems, which appear to be rather small, there are other problems that may arise when work with companies is desired. Legal issues tend to block the way to collaboration and then there is a lack of a clear structure and agreements to formalise the co-operation. Contracts are often signed on an individual rather than on the institutional basis.

## Administrators & Academics | 4- Obstacles and barriers



COMPONENTS MORE APPRECIATED | Barriers to companies commitment with JP's






Match making (students' skills and the companies' needs), making the cooperation easy for the companies.

▲ Smaller companies are easier to engage, but once they get bigger the interest is lost.


- ▼ Administrative procedures
- ▼ Financing needed from companies
- ▼ Legal issues
- ▼ Long term collaboration is hard due to short term planning in companies.
- ▼ Contacts with companies sometimes made on an individual (not institutional) bases.
- ▼ Lack of a clear structure/agreements to formalize the cooperation.


The subject of **sustainability** is a very important one when it comes to joint programmes. Administrators and academics state that strategies have to be developed to attract and engage students in JPs. It could help to make a JP more sustainable to define an annual fee for partner institutions to ensure a JP's financial health and appoint a liaison officer to improve the relation with stakeholders involved, such as partners at companies. Financial and funding dependency still is a difficult issue, as funds are needed to make a programme more sustainable.

## Administrators & Academics | 5- JP's Sustainability




COMPONENTS MORE APPRECIATED | How to promote JP's sustainability





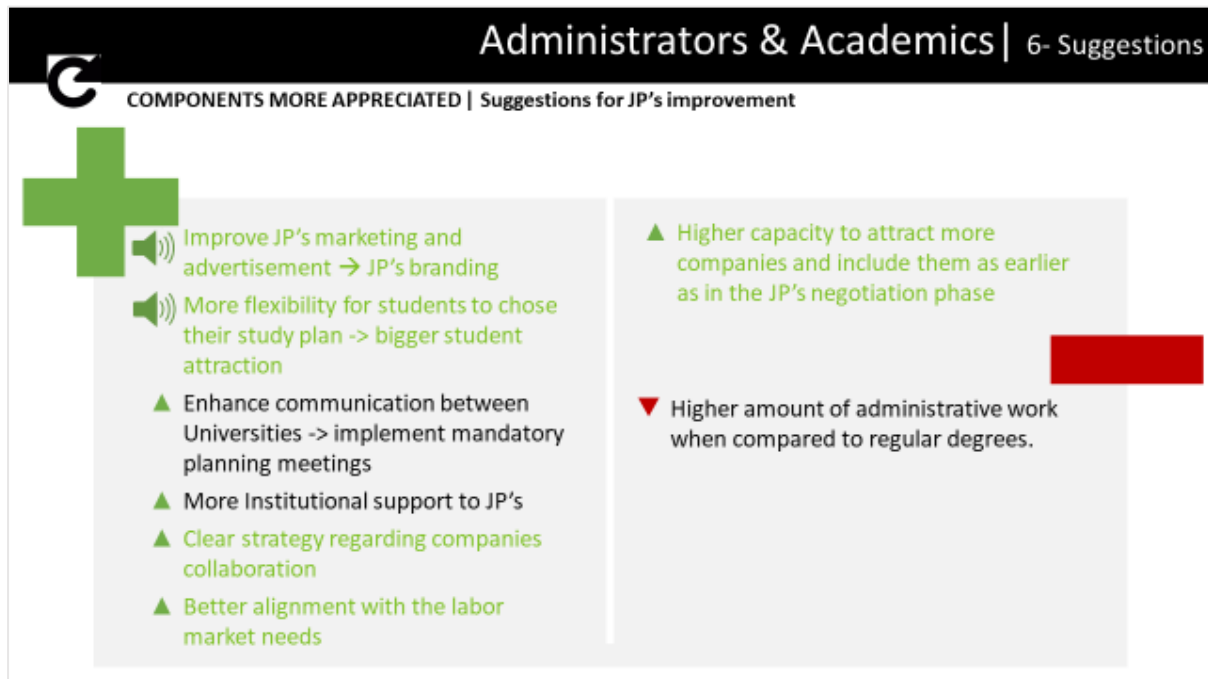
- ▲ Develop strategies to attract and engage students in the JP
- ▲ Define annual fees for partners in order to assure JP's financial health.
- ▲ Create a liaison officer to follow-up the relation with the companies



**FINANCIAL/FUNDING DEPENDENCY**

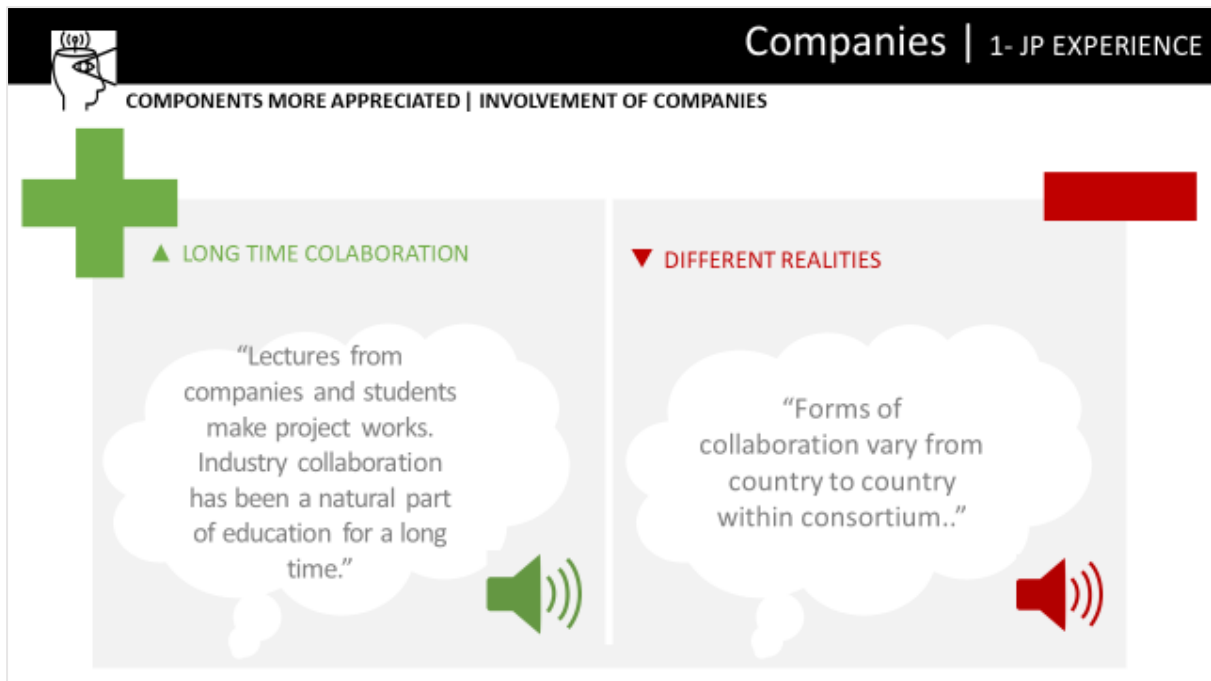
**Suggestions** by administrators and academics for the **improvement of JPs** are diverse: the marketing and advertisement strategy is a very important tool. More flexibility for students

choosing the study plan leads to the attraction and accreditation of more students. Enhancing the communication between partner universities, claiming more institutional support, having a clear strategy regarding company collaboration, a better alignment with the labour market needs, and a higher capacity to attract more companies and include them as early as possible in the JP's negotiation phase would improve JPs.

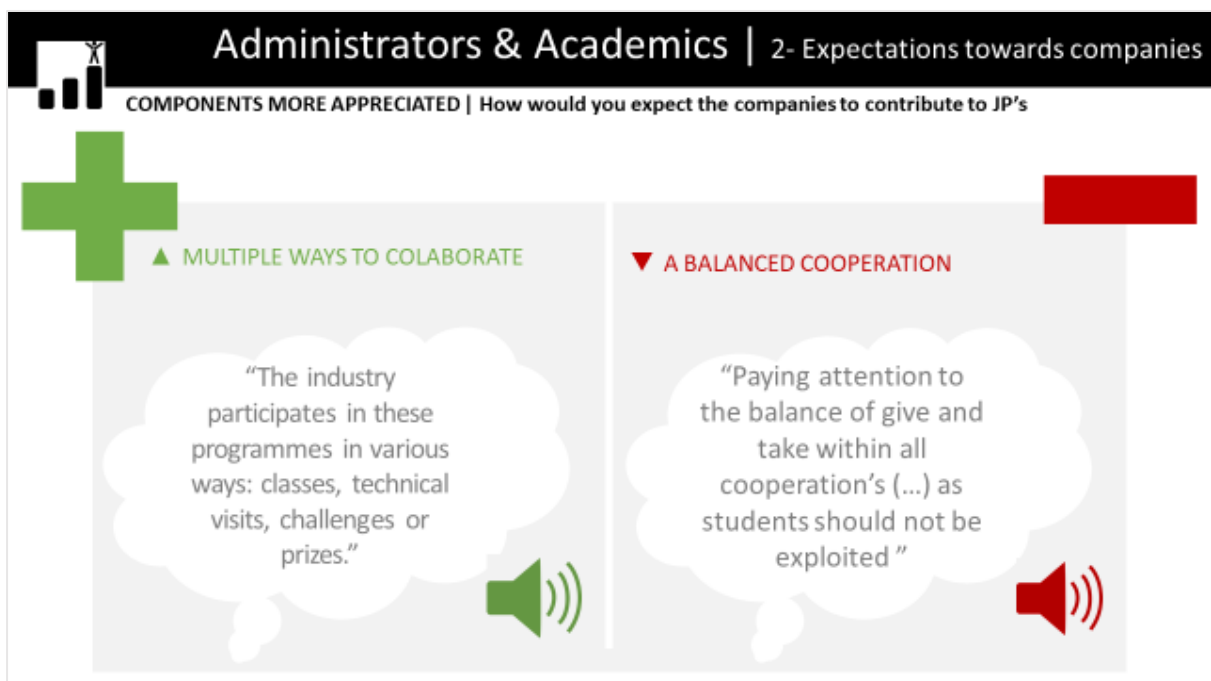


### 5.4.3 Main sentences

Administrators and academics report various **experiences** regarding the overall contribution of companies to joint programmes and improvement of company involvement in JPs. Incorporating features together with and participation of industry are widely seen as attractive and sought after, but also as very difficult to achieve in practice. The “forms of collaboration vary from country to country within the consortium [...]” of partner institutions, which shows that there are different realities within the consortium. Collaborating with companies takes a higher amount of administrative work when compared to regular degrees and “it is extremely important to show the added value to the companies so that they keep their willingness [to contribute to a JP and to offer financial support]”. The goals are to improve the marketing and branding of the JPs, to provide a clear structure, and to increase the capacity to attract more companies and get them more easily and quickly into the JP's work as early as in the negotiation phase, since “industry collaboration has been a natural part of education for a long time”, which shows that long-time collaboration is needed.

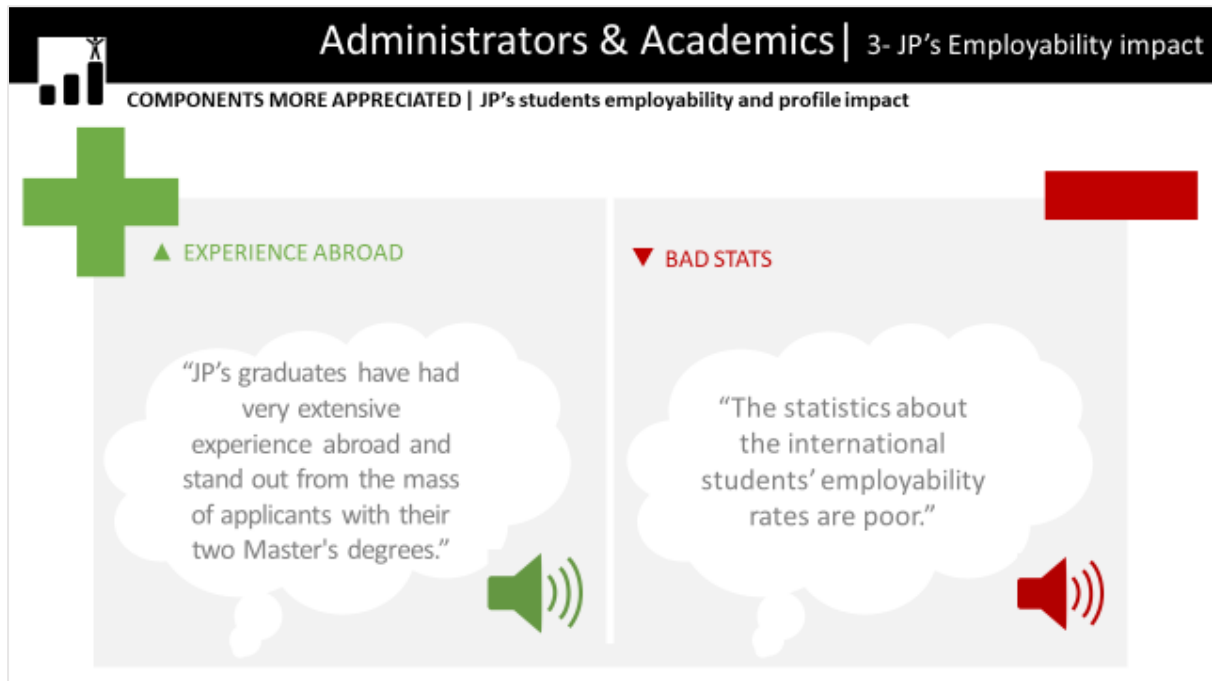


However, the nature of the collaboration varies, as there are multiple ways to collaborate which lead to different **expectations on companies**. "Industry participates in these programmes in various ways: classes, technical visits, challenges, or prizes." However, one must pay "attention to the balance of give and take within all co-operations [...] as students should not be exploited" by too many offerings. Therefore, the co-operation needs to be balanced.




Company involvement, however, has an impact on the **employability** of JP students. For example, "JP graduates have very extensive experience abroad and stand out from the mass

of applicants with their two master's degrees" and yet "the statistics about the international students' employability rates are poor".




Academics and administrators reported different **obstacles and barriers** that are caused by company involvement in JPs. One academic states that "many of the companies that collaborate with us are start-ups of former students", which shows that the companies involved are rather small. To reach established companies and have a **financial commitment**, for example, "it is extremely important to show the added value to the companies so that they keep their willingness to pay" and yet "the company's commitment [always] depends on the amount of external funding". This leads to **sustainability** of the programme, because even if the funding would be granted and "if the programme is established, there is no guarantee that it will continue without any problem. All parties have to put a constant effort and work on it."

## Administrators & Academics | 4- Obstacles and barriers





**COMPONENTS MORE APPRECIATED | Barriers to companies commitment with JP's**



**▲ COMPANY DIMENSION**


"Many of the companies that collaborate with us are start-ups of former students."





**▼ FINANTIAL COMPROMISE**

"It is extremely important to show the added value to the companies so that they keep their willingness to pay."



## Administrators & Academics | 5- JP's Sustainability



**COMPONENTS MORE APPRECIATED | How to promote JP's sustainability**



**▲ CONTINUOUS EFFORTS**

"Even, if the program is established there is no guarantee that it will continue without any problem. All parties have to put a constant effort and work on it."



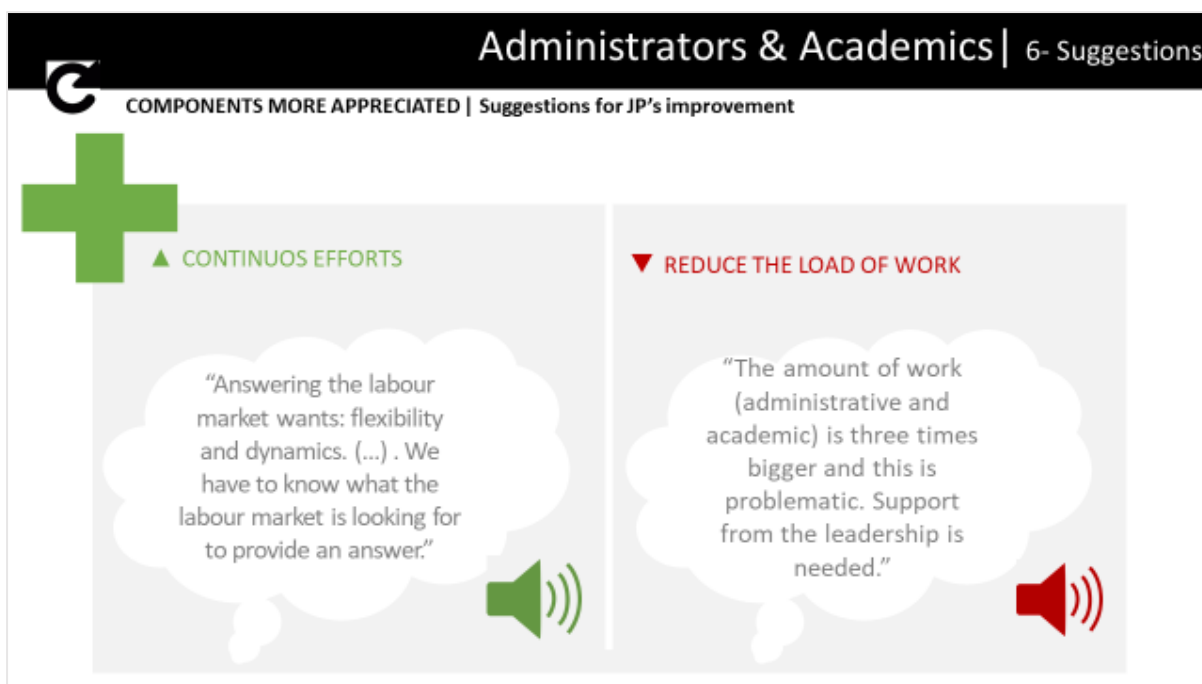


**▼ FINANTIAL COMMITMENT**

"The company's commitment depends on the size of the external funding."



Administrators and academics therefore **suggest** that the labour market's needs, e.g. "flexibility and dynamics", have to be addressed. Moreover, the workload needs to be reduced: "the amount of work (administrative and academic) is three times bigger and this is problematic. Support from the management level is needed" on both sides: HEIs and companies.



#### 5.4.4 Conclusions

The inclusion of companies in joint programmes seems to be of high importance to academics and administrators. According to them, many obstacles and barriers make it difficult to collaborate with industry in a way to make it attractive for both parties, HEIs and companies, to accredit students. That is why the involvement of companies should be discussed and considered from the very start of developing a JP, so that all stakeholders can be included in the realisation of a good collaboration. On the other hand, involvement of industry is needed to make the programme sustainable. Sustainability needs to be thought about, from funding and financial support to marketing and advertising strategies to attract enough students not only in the early years of a JP, but also after it is established and has been on the market for a longer period of time. Collaboration with companies in the joint programme can achieve exactly that goal.

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## 6: THE REDEEM 2 ONLINE APPLICATION

The results of the institutional survey and the alumni/control group surveys described above are available for the general audience on the project website and at the following address: <https://redeem2.fit.cvut.cz>

Through the app, the users will be able to filter the results and customize them according to their needs:

- Students can display the results of the alumni survey by filtering them by country of origin, country of destination, type of programme and field of study. In this way, they can get insights that will help them to take a decision on which Joint Programme is more suitable for their needs and expectations.
- Universities can filter the results so to better understand what are the expectations of the students, what should be improved in Joint Programmes and what should be taken into account before and during the negotiations with partners from a specific country.
- Researchers have access to a large and flexible amount of comparable data to be used for more in-depth studies in the field and further research on specific aspects not covered by this study.

**ANNEX 1: GUIDELINES FOR REFORMING AND CREATING JOINT  
PROGRAMMES TO ENHANCE STUDENT EMPLOYABILITY AND ACADEMIC  
COOPERATION**