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## Report on the Prioritization of Skills and Competences Required by Future Engineers as part of A-STEP 2030 project

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# REPORT OF ACTIVITY 2: TASK 2

## REPORT R4:

# THE PRIORITISATION OF SKILLS AND COMPETENCIES REQUIRED FOR FUTURE ENGINEERS

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## 1.0 Executive summary

This document reports on the outcomes of three separate studies 1) Universum's study about university students' and graduates' different aspects of their career expectations and their ideal employers. 2) On-line-survey of 16-year-old pupils in Finland: Self-assessment tool: How much of an engineer are you? 3) Outcomes from two BEST (Board of European Students of Technology) symposia about Diversity in STEM (Science, Technology, Engineering and Mathematics) education in 2019 as part of the A-STEP 2030 project (EU Erasmus + project funded under call number 2018-1-FR01-KA203-047854).

The aim of the Universum study was to carry out EU mapping of future engineering profession with the values of engineering students of today. The data for this analysis was collected from responses to the Universum survey between September 2018 and April 2019. The data used in this study was collected from 6 countries; Belgium, Denmark, Finland, France, Ireland and Sweden. Three questions were selected for the study: 1) which of these career goals are most important to you? (Select 3) 2) how do you rate yourself in the following skills? (Select 3 strong skills and 3 weak skills) 3) which of these employer attributes are most important to you? (Select 3). For each question, the differences between male and female engineering students, engineering and humanities students and students from generation Y and Z were investigated in six target countries. This analysis is included in Report 3. This report R4 presents a more detailed view and comparison between Denmark, Finland, France and Ireland.

The key findings show that there are differences between countries among engineers, among humanities students and among generations Z (age 17 to 22) and Y (age 23 to 38). Generally, it can be said that there is a tendency among students in all countries to rate issues surrounding environmental and social responsibility as more important than economic issues, issues which certainly had formerly been accorded greater prominence. Especially humanities students - but also female engineering students - rated these environmental and social responsibility issues very highly among their career goals and attractive employer attributes. The other difference between humanities and engineering students' attitudes was that the goal: "To be a leader or manager of people" was, in all studied countries, more important to engineering students than to humanities students.

All students rated the career goal "Work/life balance" as very important and - at the same time - all of them said that their weakest soft skill was "Time management". The other weakest soft skill common to all students was "Integrity". Concerning "Communication" skills, there still seems to be room for development for all students - even though humanities students trust themselves more than engineering students in this regard. Engineering students think that their strongest soft skills are "Problem-solving", "Responsibility" and "Teamwork", while humanities students consider their strongest soft skills to be: "Responsibility", "Positive attitude" and "Adaptability". Regarding "Responsibility", the younger generation Z looks to be a bit more responsible than the older Generation Y.

For the humanities students - "To be dedicated to a cause or to feel that I am serving a greater good" was the most important career goal. Nearly two thirds of all humanities students selected this career goal from among the three most important ones. On the contrary, only slightly more than one third (35,1%) of engineering students rated this goal among their three most important. Among engineering students in all studied countries, "Commitment to diversity and inclusion" and "Corporate social responsibility" were the two least attractive employer attributes. For this group, on average, the most important work attribute was "Innovation", the second most important being "A creative and dynamic work environment" and the third most important "Professional training and development".

The Finnish 16-year-old pupils' attitudes towards the Sustainable Development Goals - according to the on-line-survey completed by Metropolia University of Applied Sciences - showed that the most important SDG to them was "Good Health and Well-Being". Also, more than 60% of pupils had selected "Quality Education", "Zero Hunger" and "Climate Action" among the three most important Sustainable Development Goals. The least votes were accorded to the following: "Sustainable Cities and Communities", "Industry, Innovation and Infrastructure", "Decent Work and Economic Growth", and "Affordable and Clean Energy". Over 75 % of pupils wanted to promote SDGs. Pupils were also asked about their willingness to learn the following: a) skills needed for sustainable development, b) problem solving skills, c) interpersonal skills, d) skills to work responsibly and d) time management skills. The survey indicated that most of the pupils recognized the need for all the skills mentioned, while only a very small number accorded them no importance at all. According to their responses, most of the pupils were willing

to work in groups, ready to apply technology, and prepared to solve challenging problems in multicultural environments.

The various ideas and recommendations from BEST's two symposia about Diversity in STEM education is presented in chapter 7. Diversity can be seen to play a key role in the Sustainable Development Goals (SDGs) and that's why it is important to take it into account in developing engineering education.

According to BEST's results, the ten most important skills for STEM graduates are: critical thinking, analytical skills, problem solving, innovation, collaboration, communication, customer orientation, adaptability, social responsibility and balance. The skills needed in STEM professions - according to BEST - are: teamwork (25.5 %), ability to learn (17.6 %), adaptability (17.6 %), communication (11.8 %), Leadership (5.9 %) and versatility (5.9 %).

The findings of all these three studies will be published as Intellectual Output 2 of the A-STEP 2030 project.

## 1.1 The structure of the document

The document begins by explaining the aims of the overall research project and, more specifically, the research questions associated with Activity 2: Task 2. This report 4 of the A-STEP 2030 project combines the analysis and outcomes in report 3 of the A-STEP2030 project with the results of the Activity 2: Task 2 on-line survey: self-assessment tool (*How much of an engineer are you?*), as well as with the outcomes of BEST's (Board of European Students of Technology) symposia in 2019.

Chapter 3 describes the Universum study about the EU *mapping of the future engineering profession with the values of engineering students' of today*. It contains the methodology used by Universum for the quantitative study and it highlights the context of the study, the sample selection, and the data collection. Both the methodology used for data analysis and general ethical considerations are also described.

Chapter 4 presents the findings from Universum studies concerning Danish, Finnish, French and Irish students' career goals, their perceptions about their strong and weak soft skills, and those employer attributes which they feel are important. The differences between engineering and humanities students, between male and female engineering students, and between engineering students at different ages are analysed in all these categories.

Chapter 5 summarises the overall results from the whole Universum study.

Chapter 6 presents the on-line-survey: "*Self-assessment-tool: How much of an engineer are you?*" and highlights the findings from it.

Chapter 7 describes the recommendations to universities and other higher education organizations and companies, which can improve diversity. General recommendations and ideas are also listed from the BEST symposia.

In chapter 8 conclusions are made combining the results from all these three studies, focusing on the results which are the most relevant to the overall research objectives.

## 2.0 Summary of Overall Research Project

The main objective of the A-STEP 2030 (Attracting diverSe Talent to the Engineering Professions of 2030) project is to develop new and innovative teaching approaches - relevant to learners' values yet appropriate for teaching new sets of skills and competencies needed for the future. Our goal is to create an attractive and fascinating learning environment, thereby encouraging young people and adult learners with diverse backgrounds to engage in engineering studies and in the engineering profession.

The project comprises the following three activities:

**Activity 1:** Determine future roles and skills requirements of engineers to enhance the sustainable development of society.

**Activity 2:** Investigate the values and motivations of young people, students and adult learners to determine how these influence their future career choices and use this knowledge to make a career in engineering more attractive to all young people.

**Activity 3:** Develop new and innovative teaching and learning practices to respond to these findings.

The project consortium has 7 members from six EU countries (France, Denmark, Finland, Ireland, Sweden and Belgium) and 10 associated partners. The team includes four different European HEIs all involved in Engineering Education Research. (ENSTA Bretagne, France, TU Dublin, Ireland, Aalborg University, Denmark and Metropolia University, Finland.) The team is also complemented by representatives from SEFI and BEST (Board of European Students of Technology) which represents HEI students in STEM, and Universum - experts in research relating to student motivations and career choices.

Figure 1 shows the main activities associated with the project. This report focuses on the result of Activity 2: Task 2: Identify soft skills, motivational values and attributes for young and adult learners' future career perspectives.

# A-STEP 2030 - PERT Diagram



## PROJECT MANAGEMENT, ADMINISTRATION AND COORDINATION

### ACTIVITY 1

Future role of engineers in society and the skills and competencies required to achieve SDGs.

**TASK 1** → Define the future role of engineers in society and the skills and competencies required of engineers to achieve the SDGs in 2030

**TASK 2** → Identify engineering skills and competencies required to enable a successful and sustainable European society

### ACTIVITY 2

Attracting young people from diverse backgrounds to study Engineering.

**TASK 1** → Define the values and motivations of the young generation, current students and adult learners which affect their career decisions

**TASK 2** → Identify soft skills, motivational values and attributes for young and adult learner future career perspectives

### ACTIVITY 3

New and innovative teaching and learning practices to attract students with diverse background.

**TASK 1** → EU mapping of good practices and pedagogical approaches

**TASK 2** → Development of new pedagogical approaches in order to fit the future needs of engineering education

**TASK 3** → Co-creation and test of an innovative learning activity

## DISSEMINATION

IO1

IO2

## DISSEMINATION

IO3

The outcomes of this task are the focus of this report.

Figure 1: Overall Project details showing the aims of each activity.



## 2.1 Research Questions

The purpose of this Activity 2: Task 2 was to identify the overlap between future skills and motivational values in order to give policy recommendations for skill and competency development in engineering education.

The overall research questions associated with this activity were:

1. How do the values and career goals of diverse students reflect the future needs of working life?
2. How could engineering education respond and thus become more attractive to these diverse students?
3. What attributes could attract teenagers to study STEM and continue to higher engineering education?

The analysis of these research questions will be summarized as the Journal Article will be published.

## 3.0 EU mapping of the engineering profession of the future with the values of engineering students' of today (Universum study)

EU mapping of the engineering profession of the future with the values of engineering students' of today was undertaken by means of a Universum study. The questions from the study which were used are:

1. **Which of these career goals are most important to you?**
2. **How would you rate yourself in the following skills?**
3. **Which of these employer attributes are most important to you?**

For each question, the differences between male and female engineering students, engineering and humanities students and students from generations Y (age 17 to 22) and Z (age 23 to 38) were investigated in six target countries, namely: Belgium, Denmark, Finland, France, Ireland and Sweden. Overall results are included in report 3. This report 4 presents a deeper analysis using Danish, Finnish, French and Irish data.

## 3.1 Context of the Universum study

Universum is a leading company in the field of employer branding. On a yearly basis, Universum surveys over 1 million students and graduates concerning different aspects of their career expectations and their ideal employers. The study has been run every year in 40 different markets for the past 25 years. Universum uses a standardized questionnaire and methodology, allowing comparisons among students' expectations between countries.

Each market has a dedicated Analytics Project Manager (PM), responsible for ensuring the quality of the data collected. One main objective for the PM is to ensure the sample is a correct reflection of the reality of the market, and thus it can be considered a representative sample for the target population. Universum investigates many different variables to ensure this, such as: gender proportion, degree choice, area of study and university proportion.

The sample details of the countries considered in this analysis are displayed below. This includes, the total number of respondents collected in the different fields of study and the gender proportion in the engineering field - the focus of this report.

### 3.2 Sample selection of the Universum study

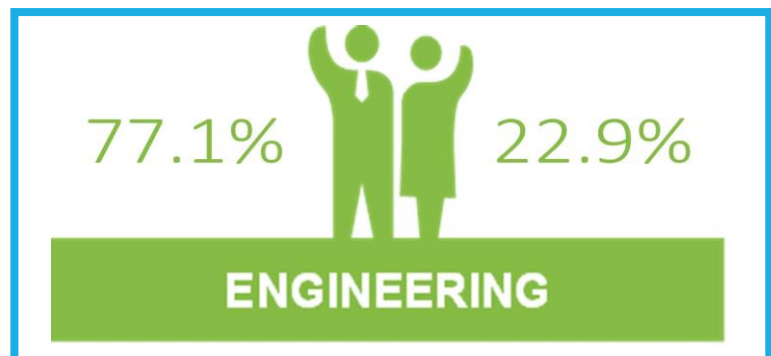
#### **Belgium**

In Belgium, the survey was run from October 2018 to April 2019, summary details are included in Table 1 and Figure 2.

In total, 13 102 students in Belgium participated in the study, of those 1 329 were Engineering students. The gender balance was 77.1 % men and 22.9 % women.

**Table 1: Sample Selection Engineering Students Belgium 2019**

Main field of study	Total number
Business	3593
Engineering	1329
IT	631
Natural Sciences	1027
Humanities	3222
Law	782
Health/Medicine	2518



**Figure 2: Gender Proportion Engineering Students Belgium 2019**

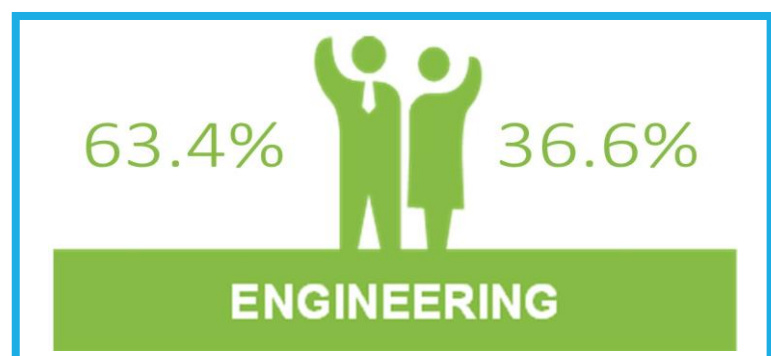
#### **Denmark**

In Denmark, the survey was run from October 2018 to April 2019, summary details are included in Table 2 and Figure 3.

In total, 14 624 students in Denmark participated in the study, of those 2 334 were Engineering students. The gender balance was 63.4 % men and 36.6 % women.

**Table 2: Sample Selection Engineering Students Denmark 2019**

Main field of study	Total number
Business	4018
Engineering	2334
IT	1177
Natural Sciences	1174
Humanities	3803
Law	844
Health/Medicine	1274



**Figure 3: Gender Proportion Engineering Students Denmark 2019**

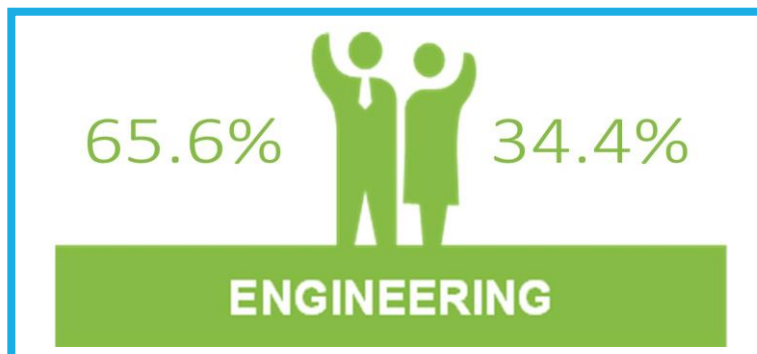
## Finland

In Finland, the survey was run from October 2018 to April 2019, summary details are included in Table 3 and Figure 4.

In total, 12 633 students in Finland participated in the study, of those 2 360 were Engineering students. The gender balance was 65.6 % men and 34.4 % women.

**Table 3: Sample Selection Engineering Students Finland 2019**

Main field of study	Total number
Business	3398
Engineering	2360
IT	978
Natural Sciences	716
Humanities	3100
Law	507
Health/Medicine	1574



**Figure 4: Gender Proportion Engineering Students Finland 2019**

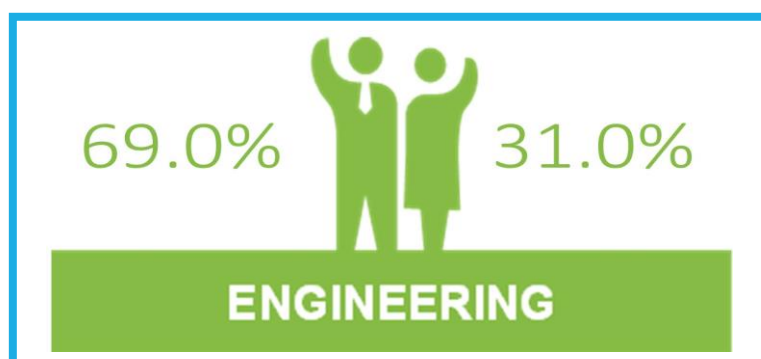
## France

In France, the survey was run from September 2018 to February 2019, summary details are included in Table 4 and Figure 5.

In total, 36 578 students in France participated in the study, of those 12 615 were Engineering students. The gender balance was 69.0 % men and 31.0 % women.

**Table 4: Sample Selection Engineering Students France 2019**

Main field of study	Total number
Business	20153
Engineering	12615
IT	2449
Natural Sciences	574
Humanities	467
Law	150
Health/Medicine	170



**Figure 5: Gender Proportion Engineering Students France 2019**

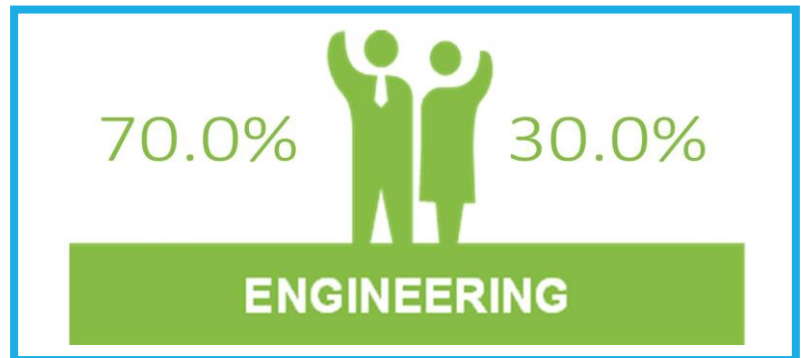
## Ireland

In Ireland, the survey was run from September 2018 to March 2019, summary details are included in Table 5 and Figure 6.

In total, 10 086 students in Ireland participated in the study, of those 1 220 were Engineering students. The gender balance was 70.0 % men and 30.0 % women.

**Table 5: Sample Selection Engineering Students Ireland 2019**

Main field of study	Total number
Business	2567
Engineering	1220
IT	749
Natural Sciences	1487
Humanities	2547
Law	531
Health/Medicine	985



**Figure 6: Gender Proportion Engineering Students Ireland 2019**

### Sweden

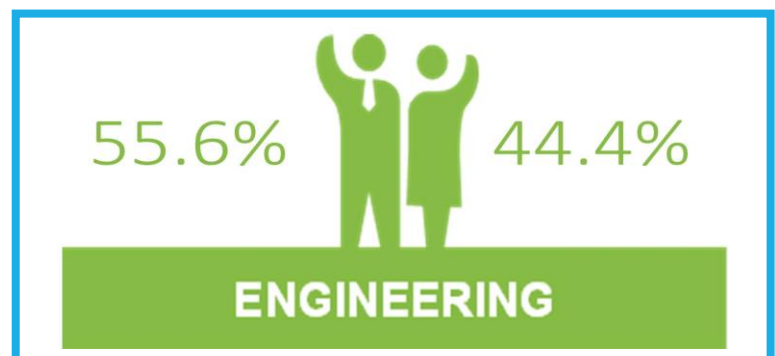
In Sweden, the survey was run from October 2018 to January 2019, summary details are included in Table 6 and Figure 7.

In total, 25 188 students in Sweden participated in the study, of those 1 674 were Bachelor’s Engineering students and 4 066 were Master’s Engineering students.

The gender balance was 55.6 % men and 44.4 % women.

**Table 6: Sample Selection Engineering Students Sweden 2019**

Main field of study	Total number
Business/Economics	5169
MSc Engineering	4062
IT	1955
BSc Engineering	1674
Natural Sciences	1134
Social sciences/Communications/ Education	3941
Law	1222
Health/Medicine	1277
Pharma	130
Real estate agent	154
Teacher/Preschool Teacher	1861
Nurse	1201
Doctor	489
Social Worker	919



**Figure 7: Gender Proportion Engineering Students Sweden 2019**

## 3.3. Ethical Considerations

Aggregate data is used to ensure anonymity. Universum strives to exclude from the survey any questions that might be perceived to be sensitive. Participation is 100% voluntary and respondents can choose to stop the “Universum CareerTest” at any time. The “Universum CareerTest” has complied with the European

regulation on personal data ever since this came into effect in May 2018. This means that no personal data is kept unless the participant has given his/her agreement.

## 3.4. Data collection process

The field periods for each market are mentioned above. The “Universum CareerTest” is promoted through several channels in order to be able to reach different student target audiences, and is available online on any computer, smartphone or tablet. The survey is promoted through direct partnerships with universities, adverts on popular social media channels, organisational partnerships (Enactus, AIESEC, Jade etc.) and ambassadors.

## 3.5. Data description and analysis

In the survey, mainly closed-ended questions are used. When an extensive list of options is offered, the option ‘other’ is included to give the students the possibility to express their opinion. For this document, the following professional dimensions were analysed: career goals, soft skills and employer attributes.

Tables 7, 8 and Figure 8 summarise the questions asked in each section that were analysed.

### Career goals

**Table 7: Survey questions and potential answers related to career goals.**

<b>Question: Which of these career goals are most important to you?</b>
<i>Please select a maximum of 3 alternatives.</i>
To be a technical or functional expert
To be a leader or manager of people
To be autonomous or independent
To be secure or stable in my job
To be entrepreneurial or creative/innovative
To be dedicated to a cause or to feel that I am serving a greater good
To be competitively or intellectually challenged
To have work/life balance
To have an international career

## Soft Skills

**Table 8: Survey questions and potential answers related to soft skills.**

Question: How would you rate yourself in the following skills?
Reliability
Responsibility
Communication skills
Positive attitude
Team work
Problem-solving
Work ethic
Adaptability
Dedication
Integrity
Flexibility
Stress management
Time management

## Employer attributes

In this question students are asked the following question:

*Which of these are most important to you? Please, select a maximum 3 of alternatives*

## The Universum Drivers of Employer Attractiveness



1 This framework has been developed by Universum and is based on specific research within HR, as well as focus groups and general communication with both our clients, students and professionals.

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**Figure 8: Survey questions and potential answers related to Employer Attractiveness**

## 4.0 Results analysis from the Universum study

The main objective of this section is to highlight the differences and similarities between Danish, Finnish, French and Irish students' future career choices, their perceptions about their skills to be improved, and about their future ideal employer. The data to be analysed is reported in the modification of A-STEP 2030 Report 3 and presented in this document in Appendix A. The results of this analysis will be combined with the results of the on-line survey of 16-year-old pupils' perceptions about the engineering profession and SDGs. Both these surveys aim to provide answers to the whole project's research questions about the motivational factors and values of young people and adult learners' career choices.

Research questions concerning the analysis of differences and similarities of engineering and humanities students' views according to Universum's data in the modification of the A-STEP 2030 Report 3 are:

- What are students' preferences in making their future career choices?
- What are students willing to learn and what skills do they need to improve?
- How do students perceive both the engineering profession and their ideal future employer?

### Structure of the analysis

The analysis of students' career goals, soft skills and attractive employer attributes are reported by country from Denmark, Finland, France and Ireland. In each section analysis is focused on the similarities and differences:

- between engineering and humanities students,
- between male and female engineering students,
- between engineering students of GEN Y and GEN Z

and the results are compared to the average of those six countries included in report 3 (Belgium, Denmark, Finland, France, Ireland and Sweden).

## 4.1. Students' career goals

The analysis investigated the career goals of young students and adult learners to better understand the drivers of their career decisions. Understanding the factors driving their decisions will be an important consideration for the development of new learning and teaching activities in order to make it more attractive and specifically adapted for a new generation of students.

The data about the career choices of engineering students, engineering students and humanities students, male and female engineering students, engineering students of Gen Y and of Gen Z are in tables 1 - 13 in the Appendix.

### 4.1.1. Students' career goals in Denmark

#### *Engineering students' career goals in Denmark*

The Danish engineering students are mostly focused on having work/life balance (47,5%) and to be dedicated to a cause which is serving a greater good (45,2%). In Denmark we see a burgeoning trend among highly educated people to eschew careers and material benefits in favour of children and family - this burgeoning trend is visible in certain areas of the big cities. However, in relation to this report it still is interesting to see that Danish student's career goals are focused on 'balance and good causes' as opposed to being 'autonomous or independent' (12,4%).

### *Humanities students' career goals in Denmark*

The Danish humanities students to a great extent match the profile of engineering students' career goals, but the tendency, however, is ever more significant in that 'good causes and balance' – in that order - form the focus. The 'good cause' could be, for instance, children and family. This is visible first and foremost amongst students with a humanities background. 'Technical or functional expert' and 'autonomous or independent' are the lowest ranked goals among humanities students. The differences between engineering and humanities in percentage terms (%) are perhaps not that interesting to see in comparison to the overall ranking of the statements by the two groups – at least not from a Danish perspective as the rankings are comparable.

### *Female and male engineering students' career goals in Denmark*

The most important career goals for female engineering students are a 'good cause' (61,1%) and 'work/life balance' (53,1%). Whereas the most important career goals for male engineering students are 'work/life balance' (44,3%) and 'leader or manager of people' (40,5%). The most interesting observation is that male students tend to rank the 'good cause' (36.1%) lower, which is very different from the above-mentioned female students, but otherwise the two profiles are very similar in their ranking profiles.

### *Gen Y and Gen Z engineering students' career goals in Denmark*

Comparing the Danish Gen Y and Gen Z students does not indicate anything especially noteworthy, however one small remark should be made concerning the 'good cause' goal, which is on the rise.

## 4.1.2. Students' career goals in Finland

The data about the career choices of engineering students, engineering students and humanities students, male and female engineering students, engineering students of Gen Y and of Gen Z are in tables 1 - 13 in the Appendix.

### *Engineering students' career goals in Finland*

For nearly half of the engineering students in all studied countries, the most important career goal was "To have work/life balance". The only exception was Belgium, where the most important career goal was "To be entrepreneurial or creative/innovative". The least important issue to all engineers was "To be autonomous or independent". 48.7 % of Finnish engineering students included the goal "To have work/life balance" among their three most important career goals. Also, for these students, the goal "To be autonomous or independent" was less important with a percentage of 13.4% favouring this.

The second most important career goal to Finnish - as also to Danish and French - engineering students, was "To be dedicated to a cause or to feel that I am serving a greater good". Belgian engineering students rated this as the least important career goal, while the Irish and Swedish gave it the 4<sup>th</sup> most important position. Despite being the least and the last for some, one important career goal in Finland was "To be autonomous and independent". Compare this with Denmark, Ireland, Belgium, France and in Sweden, too, where it was accorded a low position. In Finland "To be a technical or functional expert" climbed to the third position while, for example, in France, Sweden and Denmark it was ranked lower or was even the least valued of all the skills. Still, this surely remains an important issue as a career goal. (Tables 1- 2 in Appendix)

### *Humanities students' career goals in Finland*

To Finnish humanities students' the two most important career goals are the same as Finnish engineering students' career goals, only the order is reversed. The goal "To be dedicated to a cause or to feel that I am serving a greater good" is in the first position with a percentage of 73.0% and the goal "To have work/life balance" takes the second position with a percentage of 57.0%. Both percentage numbers are much higher than in engineering students' answers, which means that these career goals are important to most humanities students.

The least important career goal for humanities students was "To be a technical or functional expert". The same result was found in all studied countries. In addition to this career goal, the goal "To be a leader



or manager of people” was - in all studied countries - more important to engineering students than to humanities students. On the contrary, humanities students in all studied countries appreciated the goal “To be dedicated to a cause or to feel that I am serving a greater good”, rating it more highly than did engineering students. Humanities students also rated “To have work/life balance” higher than did engineering students everywhere except in France. The same difference can be seen in the career goal “To be secure and stable in my job”. An interesting result from the Finnish answers was that both engineering and humanities students ranked the goal “To be entrepreneurial or creative/innovative” as highly as each other (19%), while in other countries this goal was much more important to engineers than to humanities students. (Tables 1 - 5 in Appendix).

### *Female and male engineering students’ career goals in Finland*

The most important career goals for male engineering students in Finland were both “To be a technical or functional expert” and “To have work/life balance”. 44.9% of Finnish male engineering students marked these among the most important career goals. To female Finnish engineering students, the career goal “To be dedicated to a cause or to feel that I am serving a greater good” was the most important issue (55.9%) and the second important - with a percentage of 54.8% - was “To have work/life balance”. (Tables 6 - 10 in Appendix)

The biggest difference between Finnish male and female engineering students’ career goals was that female engineering students valued “to be dedicated to a cause or to feel that I am serving a greater good” much more highly than did males. The same result was visible in other countries. Women, too, appreciated the goal “to have work/life balance” and “to be secure or stable in my job” more than men did. The result was the same in other countries with the exception that in Ireland men appreciated “to be secure or stable in my job” more than women did. Otherwise, for males especially, “to be leader or manager of people” was more valued as well as “to be technical or functional expert”. The situation was the same in other countries as well. (Tables 6 -10 in Appendix)

### *Gen Y and Gen Z engineering students’ career goals in Finland*

Nearly 50% of participants’ - from both generations Y and Z - answers in Finland had put the career goal “To have work/life balance” among the three most important career goals. About 45% of answers of Gen Y and Z contained the career goal “To be dedicated to a cause or to feel that I am serving a greater good” among the three most important goals (in Gen Z’s answers a slightly higher value, 46.4% was accorded to this). The least important career goal in both generations’ answers in Finland was “To be autonomous or independent”, in Gen Y’s answers, 13.9% and in Gen Z’s answers, 9.7% (Tables 11 - 12 in Appendix).

The biggest difference between Finnish Gen Z and Gen Y engineering students’ expectations about their career goals was that the Gen Z (the younger ones) considered the career goals “To be a leader or manager of people” and “To be entrepreneurial or creative/innovative” to be much more important than did Gen Y. Then again, Gen Y valued the career goals “To be autonomous or independent” and “To be secure and stable in my job” more highly than did Gen Z. The Finnish result concerning the career goal “To be secure and stable in my job” was an international exception, because in all other countries it was more appreciated among Gen Z. In all studied countries the career goal “To be competitively or intellectually challenged” was more appreciated among Gen Y than in Gen Z, as was the career goal “To have work/life balance” with the exception of Ireland - where it was more important to the Gen Z. (Table 11 - 13 in Appendix)

## 4.1.3. Students’ career goals in France

### *Engineering students’ career goals in France*

For French engineering students, the most important career goal (at 53.6%) - similarly to other participating countries’ engineering students - is having a good balance between their professional and private life. Ranked in the second place as the most important career goal was their dedication to a good cause or their feeling for serving a greater good (43,9%). It is interesting that having a stable and secure job is less more important for French engineering students compared to other participating countries (25.4% compared to an international average of 36.0%). On the other hand, they are much more motivated to pursue an international career (35.4%) than engineering students in the other

participating countries (with an average of 25.9%). Also, they are less motivated to become a technical and functional expert in engineering (16.0%), which is much lower than the average (26.8%) of all countries. In accord with the results of other countries (16.2%), French engineering students career choices are only weakly motivated by the opportunity of an independent and autonomous work (18.6%).

### *Humanities students' career goals in France*

For French humanities students the most important reasons for choosing their future career is to be dedicated to a cause or to feel that they are contributing to the greater good of society (69.4%). They show themselves to be much more dedicated to this than the other humanities students from other participating countries (69.4% to an average 59.5%). Surprisingly, they give less importance to having a good balance between their professional and private life (38.0%) than all the other countries (with an average of 53.1%). They are very motivated, much more than humanities students from the other countries (26.4% and 20.4%), to pursue an international career (41.1%) or to become a leader or manager of people (32.6%). Just as for the other countries, the least motivating career goal for French humanities students is to become a technical and functional expert (13.2%). It is very interesting that having a stable and secure job is significantly less motivating for them (19.6%) than for humanities students' in the other countries (with an average of 44.5%).

### *Female and male engineering students' career goals in France*

Comparing female and male French engineering students' career goals, we can observe that being dedicated to a good cause is more important for female than male French engineering students (+12.7%). Moreover, female French engineering students are more motivated to have a secure and stable job (+10.1%) or a well-balanced life (+9.9%) than their male comrades. On the contrary, female French engineering students show the same tendencies as female engineering students in the other countries: they give less importance to becoming a leader or manager of people (-9.6%), to being a technical or functional expert (-6.8%) or to being competitively or intellectually challenged (-7.1%). Also, female French engineering students are less motivated to pursue an entrepreneurial or innovative career (-7.8%) than are male students. However, in the other countries, with the exception of the Irish and Belgian female engineering students, female and male engineering students have approximatively the same motivation for entrepreneurship and innovation (with an average of +0.1%).

### *Gen Y and Gen Z engineering students' career goals in France*

In France, we can observe only slight differences between engineering students' career goals from generations Y and Z. Engineering students from generation Z are slightly more motivated by an international career (+4.9%) and less motivated by a career choice to become a technical or functional expert (-4.1%). Comparing this to other countries, French engineering students from generation Y give significantly less importance in their career choices to becoming a technical and functional expert (18.5% compared to an average of 29.7%). However, if we compare them to the other countries' students, French engineering students from generation Z are keen to pursue an international career (37.4% compared to an average of 26.2%) but less motivated by the prospect of obtaining a stable and secure job (26.8% contrary to an average of 37.3%).

## 4.1.4. Students' career goals in Ireland

Data relating to the career goals of Irish engineering and humanities students, differentiated by gender and age are included in Appendix 1, Tables 1-13.

### *Engineering students' career goals in Ireland*

Irish engineering students' career goals typically followed the career goals of all countries except for four notable exceptions. Ranked in first place as the most important career goal "To have work/life balance" was selected by 57.0% of Irish engineering students, the highest percentage of any country and significantly higher than the average score of 48.7%. Similarly, "To be secure or stable in my job" was selected by 45.4% of Irish engineering students, again the highest percentage of any country. This appears to be more important to Irish engineering students than students in other countries. Only 26.2% of Irish engineering students wish to be "competitively or intellectually challenged" compared to an average score of 31.2%, the lowest score across all countries. Finally, only 30.7% of Irish engineering

students selected “to be dedicated to a good cause or to feel that I am serving a greater good” as a career goal and whilst this is not as low as Belgian students (12.7%) it is still lower than the average score of 35.1% across all countries.

### *Humanities students’ career goals in Ireland*

A similar picture arises when we look at Irish humanities students. Again, “to have a work life balance” (62.5%) and “to be secure and stable in my job” (58.1%) are ranked first and second for Ireland and have the highest selection of these goals across all countries. Humanities students align with the all-country average when selecting “To be competitively or intellectually challenged” (27.2% compared to 29.9%) which was not the case with Irish engineering students.

The most revealing differences when comparing Irish engineering students and Irish humanities students’ career goals are those related to being “a technical or functional expert” and “to be dedicated to a good cause or to feel that I am serving a greater good”. The least important career goal for humanities students is “to be a technical or functional expert” (12.4%) and this contrasts significantly with Irish engineering students, of whom 28.3% chose this as a career goal. Conversely, 53.5% of humanities students chose “to be dedicated to a good cause” compared with only 30.7% of Irish engineering students, whose priorities with regard to career goals lie elsewhere.

### *Female and male engineering students’ career goals in Ireland*

Analysis of the career goals of Irish male and female engineering students highlights three key differences. Irish female engineering students ranked “To be competitively or intellectually challenged” in fourth place (34.0%) compared to male engineering students who ranked this in eight position (23.6%). Whilst this is a more important career goal for females, the opposite is true of “To be entrepreneurial or creative/innovative”, which was selected in third place for males and seventh place for females (25.5%). Females are also more likely to value the career goal “to be dedicated to a good cause” (40.4%) compared to males (27.5%). To a lesser extent, Irish female engineering students are more likely to want a “work life balance” (differential 9.3%) compared to males, and males are more likely to choose to “be a technical or functional expert” (differential 9.4%) compared to females.

### *Gen Y and Gen Z engineering students’ career goals in Ireland*

Initially, comparing the Irish Gen Y and Gen Z students to the all-country average highlights that Gen Y students (23-38) align very closely to the average career goal selection across all countries. However, there are more startling differences in the Irish Gen Z (17-22) selection of career goals. Most notably, 53.9% of Irish Gen Z students chose “to be secure or stable in my job” compared to 27.4% of Gen Y students. It is clear that career stability is more important to the younger generation of Irish Gen Z students than to the older Gen Y students.

## 4.1.5. Summary of students’ career goals

“To have work/life balance” was the most important career goal to all engineering students in the survey. Its importance was especially high in Ireland, where also “To be secure or stable in my job” was more important than in other countries. These two were also the most important career goals for Swedish engineering students. 44 - 46% of Danish, French and Finnish engineering students appreciated “To be dedicated to a cause or to feel that I am serving a greater good” to the second important career goal while in Ireland and in Sweden only one third of engineering students had raised it among the three most important career goals and in Belgium it was considered the least important career goal. Finnish engineering students appreciated “To be technical or functional expert” much more than others. French engineering students were less worried about secure and stable jobs and were more motivated to have an international career than others. Belgian engineering students were most interested to be entrepreneurial or creative/innovative and to be leader or manager of people. “To be autonomous and independent” was the least important career goal to all engineering students in all countries.

“To be dedicated to a cause or to feel that I am serving a greater good” was the most important career goal to all humanities students with a percentage of 59,4% , which means that nearly two thirds of them had selected this career goal among the three most important ones. On the contrary slightly more than one third (35,1%) of engineering students had selected this career goal. Instead “To have work/life

balance” was as much appreciated among humanities as among engineering students (53,1% of humanities and 48,7% of engineering students). Irish humanities students ranked “To be secure and stable in my job” as the second most important career goal, as did the Irish engineering students, but for humanities students it was even more important than for engineering students. Danish humanities and engineering students’ career goals ranking was very similar. Only the percentages of humanities students were higher than engineering students’ percentages. Finnish engineering students as well as humanities students appreciated the career goal “To be entrepreneurial or creative/innovative” less (19,1%) than in other countries. This career goal was particularly high among Belgian students - both engineering (52,0%) and humanities (44,7%). French humanities students differ from others in that they are less worried about “to be secure and stable in my job” and “To have work/life balance”. The least important career goal for humanities students in all studied countries was “To be a technical or functional expert”. The goal “To be a leader or manager of people” was - in all studied countries - more important to engineering students than to humanities students.

The difference between male and female engineering students was that women appreciated “To be dedicated to a cause or to feel that I am serving a greater good” and also “To have work/life balance” more than men. This was the situation in all studied countries. On the contrary, men in all countries appreciated “To be a technical or functional expert” and “To be a leader or manager of people” more than women.

The differences of career goals between generations Z and Y varied in studied countries. Generally, it can only be said that the older generation Y appreciated more “To be competitively or intellectually challenged”, “To be a technical or functional expert” and “To have work/life balance” than did generation Z. In Ireland also, generation Z’s appreciation “To be secure and stable in my job” is especially high compared to generation Y’s answers. In Belgium, Finland, France and Sweden younger generation Z seems to be more interested in “To be entrepreneurial or creative/innovative” than generation Y.

## 4.2. Students’ soft skills

The data about perceptions of students’ strong and weak soft skills are in tables 14 - 41 in the Appendix.

### 4.2.1. Students’ soft skills in Denmark

#### *Engineering students’ perception of their soft skills in Denmark*

The three highest ranking soft skills among Danish engineering students are (1) problem-solving, (2) responsibility and (3) team-work. This ranking very much matches the pedagogical approach of Problem Based Learning (PBL) which is practiced at some Danish engineering institutions. The backbone of PBL is problem orientation and the leading principles are student-centered and teamwork, which train the students in responsibilities towards their own learning and education. However, the engineering students learning in a PBL environment are also trained in time management – which, in this survey, is placed as a soft skill which students perceive as being very difficult or lacking entirely. Communication is at the same level as the other EU countries in the survey.

#### *Humanities students’ perception of their soft skills in Denmark*

The three highest ranking soft skills among Danish humanities students are (1) responsibility, (2) positive attitude and (3) communication. It is interesting to observe that “responsibility” has a high score in both groups of students. Perhaps not so surprising is that humanities students tend to evaluate their communication skills within the top three ranks where engineering students rank communication as no. eight. Humanities students identify ‘problem solving’ skills as weak skills in comparison to engineering students – but engineering is and has been considered as synonymous with problem solving. However, the two groups have in common their perception of their mastery of time management, which they perceive as being low.

*Female and male engineering students' perception of their soft skills in Denmark*

An overall understanding of female and male engineering students' perception of their strong soft skills shows that these are more-or-less identical, indicating a gender balance. If differences should be highlighted, the male students' perception of their mastery of problem-solving skills (58,9%) is higher than that of the female students (37,5%) – first and third respectively. The ranking of the soft skills “time management” and “communication” is low for both genders. Differences though, are seen in the ‘work ethic’ where the male students rank it higher (23,5%) than do the female students (16,2%) - thus the female students have a weaker perception of their work ethic skills than the male students.

*Gen Y and Gen Z engineering students' perception of their soft skills in Denmark*

The overall perception of Y and Z students' soft skills are identical in that they consider themselves good at problem solving and responsibility but have difficulties with time management. A minor difference exists when it comes to ‘positive attitude’ here - it is evident that the generation Y (34,8%) has a stronger perception of its skills than does the generation Z (29,9%).

## 4.2.2. Students' soft skills in Finland

*Engineering students' perception of their soft skills in Finland*

The three highest soft skills of Finnish engineers were Problem-solving (45,3%), Responsibility (43,9%) and Positive attitude (41,8%). Problem-solving was the strongest soft skill in other countries too, except in France, where the strongest was responsibility. The weakest soft skill among Finnish engineers was Time management (11,8%) closely followed by Work ethic (12,8%). Comparing the results to other countries, Time management was considered a weak soft skill like in other countries, but Work ethic was ranked the lowest of all six participating countries in Finland.

*Humanities students' perception of their soft skills in Finland*

The three strongest soft skills of Finnish humanities students were the same as engineers', except that the strongest was Responsibility (45,8%), the second Positive attitude (44,1%) and the third was Problem-solving (32,9%). In all countries, the humanities' ranking was the same. The weakest soft skill was the same among humanities in all countries, namely Time management. Humanities also raised Communication to their second weakest soft skill. Engineers felt their communication skills much weaker than humanities. Even though humanities think that they are quite strong in problem-solving, they think that it is nonetheless their third-weakest soft skill. It seems that engineering students rely on their problem-solving skills more than humanities students.

*Female and male engineering students' perception of their soft skills in Finland*

Finnish male engineers' three strongest soft skills are in this order: Problem-solving (48,9%), Responsibility (40,2%) and Positive attitude (39,3%). Yet not far behind comes Adaptability (38,9%). Finnish female engineers' three strongest soft skills are Responsibility (49,6%), Positive attitude (41,3%) and Problem-solving (39,8%), but they do not consider themselves as adaptable (32,1%) as the males do. For both Finnish males and females, the two weakest soft skills are Time management (58,1 % of men and 57,0 % of women) and Communication (49,3 % of men and 45,1 % of women). In Team work, 32 % of both male and female engineers think that they are quite competent.

*Gen Y and Gen Z engineering students' perception of their soft skills in Finland*

As in other countries, in Finland there are only slight differences between Gen Y and Gen Z perceptions of their soft skills. The biggest difference is in Time management, in which 62,4 % of Gen Y engineers keep it as their weakest soft skill, while only 49,6 % of Gen Z think the same way. In any case, Time management is the weakest soft skill for both generations. The three strongest soft skills for both these generations are the same as for all engineering students and also for humanities students in Finland, namely Problem-solving, Responsibility and Positive attitude.

### 4.2.3. Students' soft skills in France

#### *Engineering students' perception of their soft skills in France*

French engineering students perceived that their strongest soft skills are responsibility (46.2%), positive attitude (44.1%) and adaptability (42.7%). They were the only group from all six countries for whom problem solving was not ranked as the strongest soft skill. They felt themselves less competent in time management (56.1%), communication (55.9%) and team work (29.8%) and considered these skills as their weakest. It is interesting that, compared to the all-country average, French engineering students scored (with only few exceptions) their strongest soft skills higher than their comrades from other countries. On the contrary, they scored their weakest soft skills (with only few exceptions) not far from the other countries' average.

#### *Humanities students' perception of their soft skills in France*

French humanities students perceived that their strongest soft skills are: responsibility (56.9%), adaptability (52.7%) and positive attitudes (42.9%). Effectively, these results show very similar - we could say nearly identical - tendencies with French engineering students' perceptions, but with significantly higher scores (+10.7% for responsibility and +10.0 % for adaptability). In all countries, with the only exception of Irish students, humanities students perceived responsibility as their strongest soft skill compared to problem solving for engineering students. Compared to the all-country average, French humanities students scored their adaptability skill significantly higher (52.7% to average of 33.2%).

They considered time management (55.9%), communication (44.7%) and team-work (39.9%) as their weakest soft skills. These results show the same ranking as for French engineering students, but with lower scores for communication (-11.2%) and higher scores for teamwork (+10.1%). In all countries, without any exception, time management was perceived by humanities students as their weakest soft skill. Compared to all the countries averages of weakest soft skills, teamwork was significantly higher scored (39.9% to an average of 29.0%).

#### *Female and male engineering students' perception of their soft skills in France*

Even if they perceived the same three skills as their strongest soft skills, we can observe significant differences between French female and male engineering students' perceptions. Male engineering students feel themselves to be stronger in problem solving (+10.2%) and in flexibility (+6.4%) compared to female engineering students. On the other hand, female engineering students perceived themselves to be more responsible (+9.8%). For their weakest soft skills, they considered the same skills with only slight differences in their scoring – apart from problem-solving. Female engineering students scored themselves significantly higher in problem solving (+9.1%) compared to male engineering students.

#### *Gen Y and Gen Z engineering students' perception of their soft skills in France*

French engineering students from generations Z and Y showed a similar appreciation of their strongest soft skills with only slight differences: students from generation Z feel themselves to be less adaptable (-6.3%) and a little bit less efficient in problem solving (-4.4 %) but declared having more positive attitudes (+4.5%) compared to students from generation Y. For their weakest soft skills, they had generally the same perception, with the exception that students from the generation Z perceived themselves better in teamwork (+5.2%) compared to students from the generation Y.

### 4.2.4. Students' soft skills in Ireland

#### *Engineering students' perception of their soft skills in Ireland*

Engineering students were asked to indicate their top three soft skills, where they felt they were most competent. Comparing Irish engineering students' perceptions to the all country average highlights two issues. Irish engineering students perceive that they are weaker in "Flexibility" (15.9%) and "Responsibility" (30.7%) compared to the all country averages (24.6% and 43.2%). In fact, Irish engineering students scored themselves significantly lower than any other country in both these skills.

With regard to “Responsibility” in particular, Irish engineering students ranked this as their sixth strongest skill compared to a rank of first or second in other countries.

Conversely, Irish engineering students perceive that their “work ethic” is one of their stronger skills (ranked in third place), with 37.4% of students choosing this skill. Irish engineering students were most likely to select this skill (37.4%) compared to any of the other countries, and significantly higher than the all country average of 24.9%.

### *Humanities students’ perception of their soft skills in Ireland*

A similar finding appears with Irish humanities students who perceive themselves to be weaker in “Responsibility” (37%) and “Flexibility” (14.9%) compared to the all country averages (49.2% and 22.1%). Again, Irish humanities’ students perceive one of their strongest skills to be “work ethic” (40.7%) and this is significantly stronger than the all country average (29.7%).

When we compare the perceived strongest skills between Irish engineering and humanities students, two issues are highlighted. Whilst engineering students in all countries perceived their “problem solving” skills as strong compared to humanities students, there is a much larger gap in the perceptions of Irish engineering students compared to Irish humanities students (differential 26.1%) and compared to the average gap in all countries at 16.9% differential. The engineering students’ perception of their problem-solving skills is slightly stronger than the average of other countries and similarly, the Irish humanities student perceptions are slightly weaker than other countries, hence the disparity does not lie with one group of students but is rather a combination of both.

At the other end of the scale, Irish humanities’ students consider their “Communication skills” as strong, one of the strongest of all the countries, whereas Irish engineering students perceive their “Communication Skills” to be weaker, but in line with the average of all countries. This results in another gap between Irish engineering and Irish humanities students.

### *Female and male engineering students’ perception of their soft skills in Ireland*

Comparing Irish male and female engineering students’ perceptions of their strongest and weakest soft skills highlights two issues. Whilst “work ethic” was selected as a strong soft skill by Irish students generally, there is a small difference in gender when this result is differentiated.

Irish male engineering students ranked “Work ethic” third in their list of strongest skills with 35.4%, however females ranked it in sixth position, although with a similar percentage (31%). Surprisingly when invited to select their weakest soft skill, 24.7% (ranked fourth) of Irish male engineering students and 13.3% (ranked ninth) of Irish female engineering students selected “work ethic”. This suggests that although there are students who believe they have a strong work ethic (35.4% of males and 31% of females), more males (24.7%) compared to females (13.3%) believe that having a “work ethic” is one of their weakest skills.

### *Gen Y and Gen Z engineering students’ perception of their soft skills in Ireland*

Irish Gen Y (23-38) and Gen Z (17-22) students were also invited to select their strongest and weakest skills. The results show that Gen Y students perceive themselves to be more “flexible” than Gen Z students (21.4% compared to 13.4%), yet both score below the average of all countries.

The starkest contrast relates to “responsibility”, where even though 34.5% of Gen Z students selected this as a strong skill (compared to an average of 45.2%), even less (23.1%) Gen Y students selected this compared to an average of 41.3% across all countries. Gen Y students clearly feel that “responsibility” is not one of their strongest skills and this contrasts against the average for all countries.

## 4.2.5. Summary of students’ soft skills

About half of the engineering students in the studied countries think, that “Problem-solving” is their strongest soft skill. The only exception is France, where it was ranked only 5<sup>th</sup>. In France their strongest soft skill was “Responsibility”, which was the second strongest also in other countries except in Ireland. In Ireland, “Team-work” was the second strongest soft skill. “Team-work” was raised to the 3<sup>rd</sup> or 4<sup>th</sup> position

in Denmark and in France, but in Finland and Sweden it was only in 6<sup>th</sup> position. “Time management” and “Integrity” were the two weakest soft skills among all engineering students. “Communication” was the 3<sup>rd</sup> weakest engineering students’ soft skill.

About half of humanities students in the studied countries think, that “Responsibility” is their strongest soft skill. The exception in this is Ireland, where it was ranked only 4<sup>th</sup>. Irish humanities students’ strongest soft skill was “Positive attitude”, which was also ranked 2<sup>nd</sup> or 3<sup>rd</sup> position in other countries. Engineering students’ strongest soft skill, “Problem-solving’s” position varied among humanities students’ answers, but on average it was in the 5<sup>th</sup> position. In both engineering students and humanities students - the weakest soft skill was “Time management” and the second weakest “Integrity”. On average, humanities students think that their “Communication” skills are better than engineering students’.

In comparing male and female engineering students’ perceptions about their strongest soft skills we can observe that male engineering students assert as their strongest soft skill “Problem-solving” and female engineering students “Responsibility”. For men, “Responsibility” is the second strongest and “Positive attitude” the 3<sup>rd</sup>. For women “Positive attitude” was the second strongest and “Problem-solving” the 3<sup>rd</sup>. “Integrity” was, for women, the weakest soft skill while for men this was “Time management”. The second weakest for men was “Integrity” and for women “Time management”. There were no differences between male and female engineering students’ perceptions about their “Communication” or “Team-work” skills.

Nearly half of the engineering students of both Gen Z and Gen Y think, that “Problem-solving” is their strongest soft skill. In “Responsibility”, Gen Z looks to be a bit more responsible than Gen Y. In other soft skills there are very little differences between the generations.

### 4.3. Attractive employer attributes

The data about the attractive employer attributes of engineering students, engineering students and humanities students, male and female engineering students, engineering students of Gen Y and of Gen Z are in tables 42 - 52 in the Appendix.

#### 4.3.1. Attractive employer attributes in Denmark

##### *Engineering students’ attractive employer attributes in Denmark*

The attractive employer attributes high score among Danish engineering students is “Creative and dynamic work environment” and also the opportunity for “Professional training and development” in order to maintain skills and competences to stay employable. The low score is - like in the other EU countries - “Commitment to diversity and inclusion” and “Corporate social responsibility”, and “Support for gender equality”. This is very interesting ... since the core of this project (A-Step) is diversity, which apparently is NOT at all in the interest and commitment of the students!

##### *Humanities students’ attractive employer attributes in Denmark*

The attributes are slightly different when we compare our results with the humanities students. Humanities students are not focused on new technologies and a competitive based salary. But, like the engineering students, they assign less value to diversity and inclusion. However, they want ‘inspiring purpose’ and, like the engineers, value ‘creativity and dynamic’. Again, overall the tendencies are similar between the two groups of students and, compared to the EU rank average, the Danish students do not have any significant differences.



### *Female and male engineering students' attractive employer attributes in Denmark*

Female students (38,4%) find “Competitive based salary” less attractive than the male students (45,3%) likewise, “Innovation” has female (34,4%) versus male students (45,1%). On the other hand, female students find “Support for gender equality” with (41,6%) finding this more attractive than male students with (12,5%) – which perhaps is not that surprising with a glance at history. Also, female students put more value on an “Inspiring purpose” than do the male students.

### *Gen Y and Gen Z engineering students' attractive employer attributes in Denmark*

From the Danish students we see that generation Z (33,0%) are less concerned with the “Respect for its people” than the generation Y (39,9%). Both generation Y and Z find the attribute “Creative and dynamic work environment” the most important and devalue the “Commitment to diversity and inclusion”, which again is very interesting in the light of the A-step project. However, this is not confined to the Danish generation Y and Z as it is seen as a strong tendency among all six countries.

## 4.3.2. Attractive employer attributes in Finland

### *Engineering students' attractive employer attributes in Finland*

As an exception to all the other countries, Finnish engineering students raised “Competitive base salary” as the most attractive employer attribute. The second one was “Professional training and development”. “Commitment to diversity and inclusion” was recognized in all countries as the least important work attribute of the given list. The second least important was “Corporate Social Responsibility”.

### *Humanities students' attractive employer attributes in Finland*

For humanities students, a “Competitive base salary” was ranked exceptionally high in Finland compared to other countries, namely to the third most important work attribute (48,9 %). “Ethical standards” (49,5 %) and “Respect for its people” (49,2 %) were considered slightly more important. “Embracing new technologies” was the least important for them and “Commitment to diversity and inclusion” the second least attractive work attribute. The biggest difference between humanities and engineering students work attributes were over “Ethical standards”, which humanities appreciated much more than engineering students, who in turn appreciated “Embracing new technologies” much more than the humanities students.

### *Female and male engineering students' attractive employer attributes in Finland*

For both Finnish male and female engineering students, the most important employer attribute is “Competitive base salary” (50,7 % of men and 48,1 % of women). For females, the second most important issue is “Support for gender equality” (46,1 %) and for men it is “Embracing new technologies” (40,3 %). Only for 11,7 % of men in Finland was “Support for gender equality” one of the three most important work attributes. Compared to other countries, Finland seems to be an exception in that engineering students don't appreciate “Innovation” and “A creative and dynamic work environment” as much as others seem to. In all countries there is big difference between male and female engineering students in “Support for gender equality”, so that females appreciate it very much (43,9 %) and males hardly at all (13,7 %). Also, ethical standards are more important for females. It seems that men appreciate “Competitive base salary” and “Challenging work” more than females.

### *Gen Y and Gen Z engineering students' attractive employer attributes in Finland*

There is no difference in Gen Z and Gen Y attitudes about attractive employer attributes compared to all engineers' attitudes. For all, a “Competitive base salary” is the most important issue - for 46,9 % of Gen Z students and 50,8 % of Gen Y students. There are very little differences between these generations. The biggest one in Finland is that Gen Z is keener on “Embracing new technologies” than Gen Y, and Gen Y is keener on “Challenging work”. “Embracing new technologies” seems to be more interesting to the younger Z generation than to the older Y generation. Generation Y in all countries appreciate “Encouraging work-life balance” and “Competitive base salary”. In “Commitment to diversity and inclusion” as well as in “Ethical standards” there are very little differences between these generations.

### 4.3.3. Attractive employer attributes in France

#### *Engineering students' attractive employer attributes in France*

French engineering students ranked the opportunity of having a challenging work as the most attractive attributes for an employer. Comparing their first choice to the all country average, we can notice a significant difference of +15.4%. Their second most important employer's attribute was innovation, which is in accord with the other countries' students' choices as well as their third choice for a creative and dynamic working environment. It is surprising that, for French engineering students, embracing new technologies at their future workplace (-11.3%), benefiting professional training and development (-9.3%) and respect for employees (-7.2%) are significantly less important than for engineering students from other countries.

#### *Humanities students' attractive employer attributes in France*

French humanities students, like French engineering students, ranked in the first place the opportunity of having challenging work as the most attractive employer attribute. However, in the second and third place we find inspiring purpose and ethical standards.

Comparing French humanities students' perceptions to the all country average, having challenging work (+21.8%) and strong ethical standards (+7.0%) are significantly more attractive attributes of an employer. However, similarly to French engineering students' results, the respect of employees (-16.4%) and the opportunity of professional training and development (15.5%) are perceived as less attractive attributes compared to the average of other humanities students' perceptions.

French humanities students perceived ethical standards (+23.3%), inspiring purpose (+19.2%) and commitment to diversity and inclusion (+16.6%) as significantly more important employer attributes than French engineering students.

#### *Female and male engineering students' attractive employer attributes in France*

As for the other countries, the most significant difference between French female and male engineering students' perceptions is the importance given to the support for gender equality by female engineering students (+30.9%). This attribute has, for French female students, the same importance as having challenging work. French female engineering students are less interested in having a competitive base salary (-11.0%) and put more emphasis on ethical standards (+13.9%) than their male comrades.

#### *Gen Y and Gen Z engineering students' attractive employer attributes in France*

Our results show that French students from generation Z give less importance to having opportunities for professional training and development (-7.00), inspiring purposes (-6.9%) and encouraging work life balance (-6.4%) compared to the French students from generation Y. However, they are more interested in support for gender equality (+5.1%) and having interaction with international colleagues and clients (+5.0%).

### 4.3.4. Attractive employer attributes in Ireland

#### *Engineering students' attractive employer attributes in Ireland*

Students were asked to select their top three employer attributes. Comparing Irish engineering students' perceptions to the all country average highlights two issues. The first is that Irish Engineering students ranked an employer attribute of "Encouraging work-life balance" in fourth position, where the average rank for other countries was in ninth position (41.9 % compared to an average of 30.7 %.) To a lesser extent, Irish engineering students ranked "embracing new technologies" and "ethical standards" at a higher rank than the average for all counties. "A creative and dynamic work environment" and "challenging work" are less important employer attributes for Irish engineering students compared to other countries.

### *Humanities students' attractive employer attributes in Ireland*

The picture is very different when we look at attractive employer attributes for humanities students in Ireland. The most significant difference relates to “Corporate Social Responsibility” which is ranked in 13<sup>th</sup> place for Irish humanities students, compared with an average rank of eighth in other countries. Irish humanities students also place less importance on “Challenging work” compared to other countries. However, similar to Irish engineering students, Irish humanities students place much more importance on “Encouraging work life balance” (in 6<sup>th</sup> position compared to an average of 10<sup>th</sup>) and on “Innovation” (in 7<sup>th</sup> position compared to an average of 11<sup>th</sup>) than other countries.

Comparing Irish engineering and humanities students attractive employer attributes shows us that engineering students are attracted to employers who “Embrace new technologies” and have “innovation”, whereas humanities students are more attracted to attributes such as “Inspiring purpose” and “Ethical standards”. These disparities are similar in all countries.

### *Female and male engineering students' attractive employer attributes in Ireland*

Attractive employer attributes for male and female engineering students typically align with the averages for all countries. Irish female engineering students are more likely to value “Support for gender equality” (35.5%) compared to male engineering students (10.5%), whereas male engineering students are more attracted to a “competitive base salary” (41.1%) compared to females (25.5%). It is notable that the average score for “Support for Gender Equality” for all female students (all countries) is 43.9%, however Irish female engineering students are the lowest scoring group within the survey. They consider it less important or attractive than other female engineering students in Europe.

### *Gen Y and Gen Z engineering students' attractive employer attributes in Ireland*

Irish Gen Y (23-38) and Gen Z (17-22) were also invited to select their attractive employer attributes. The results show that “Challenging work” is much more important to Gen Y students than to Gen Z students. Similarly, the opportunity to gain “Professional Training and Development” is more likely to be selected by older Gen Y students than younger Gen Z students. Gen Z students in Ireland are more likely to be attracted to an employer who “embraces new technologies” than a Gen Y student.

## 4.3.5. Summary of attractive employer attributes

The most attractive employer attributes of engineering students were not similar in all studied countries, but the least attractive was, in all countries, “Commitment to diversity and inclusion” and the second least attractive was “Corporate social responsibility”. On average the most important work attribute for engineering students in studied countries was “Innovation”, the second most important being “A creative and dynamic work environment” and the third most important “Professional training and development”. The most attractive work attribute in Ireland and in Belgium was “Innovation”, in Denmark and in Sweden it was “A creative and dynamic work environment”, in France “Challenging work” and in Finland “Competitive base salary”.

Amongst engineering students and humanities students - the most attractive employer attribute varied between countries. “Inspiring purpose” was, on average, the most important and in first position in Denmark, Ireland and in Sweden. Among Belgian humanities students, the most attractive was “A creative and dynamic work environment”, in France “Challenging work” and in Finland “Ethical standards”. The least attractive work attribute was the same in all countries, namely: “Embracing new technologies”. The second least was “Interaction with international clients and colleagues”. “The sponsorship of future education” was the 3<sup>rd</sup> least attractive work attribute.

The biggest difference between male and female engineering students' attractive employer attributes is in “Support for gender equality”. On average about 44 % of female engineering students in studied countries had raised this issue to among the three most attractive work attributes. “Competitive base salary”, “Challenging work” and “Embracing new technologies” were also work attributes which were more appreciated among male than among female engineering students in all countries. Female engineering students appreciated “Ethical standards”, “Corporate social responsibility”, “Inspiring purpose”, “Encouraging work-life balance”, and “Respect to its people” more than male engineering students.

For men, “Innovation” was the most attractive, the second was “A creative and dynamic work environment”, the third “Challenging work” and the fourth “Competitive base salary”. All these work attributes were among more than 40 % of male engineering students’ choices on average in all studied countries. Only 9 % of male engineering students placed “Commitment to diversity and inclusion” among the three most important work attributes.

For female engineering students, the work attribute “A creative and dynamic work environment” was the most attractive, the second one was “Support for gender equality”, the third “Innovation” and the fourth “Professional training and development”. All these got more than 40% support. Also, for female engineering students “Commitment for diversity and inclusion” was the least important issue with the percentage 13 % in average in all countries.

When we look at the younger generation Z’s answers about attractive work attributes, we can notice that, on average, the percentage numbers do not differ much. There are only two percentage numbers over 40 % - namely 46 % to each of the attractive work attributes: “A creative and dynamic work environment” and “Innovation”. On average the least important choice for them was “Commitment to diversity and inclusion” (10.4 %). For older engineering students - Gen Y - there are already on average five attractive work attributes, which got over 40 % support - namely “A creative and dynamic work environment”, “Professional training and development”, “Innovation”, “Competitive base salary” and “Challenging work”. The biggest differences between Gen Z and Gen Y were that older generation Y appreciated “Encouraging work-life balance”, “Competitive base salary”, “Sponsorship for future education”, “Professional training and development” and “Inspiring purpose” more than Gen Z. Here the difference was more than 3 %. On the other hand for the younger generation Gen Z there was only one work attribute, which showed more than 3 % difference compared to Gen Y’s answers. It was “Embracing new technologies”.

## 5.0. Overall Summary of EU mapping of the engineering profession of the future with the value of engineering students' of today (Universum study)

### 5.1. Students' career goals

“To have work/life balance” was the most important career goal for all engineering students in the survey. Its importance was especially high in Ireland, where “To be secure or stable in my job” was more important than in other countries. These two were also the most important career goals for Swedish engineering students. 44 - 46% of Danish, French and Finnish engineering students rated “To be dedicated to a cause or to feel that I am serving a greater good” as the second most important career goal whereas in Ireland and in Sweden only one third of engineering students had raised it to among the three most important career goals, while in Belgium it was the least important career goal. “To be autonomous and independent” was the least important career goal to all engineering students in all countries.

“To be dedicated to a cause or to feel that I am serving a greater good” was the most important career goal for all humanities students with a percentage of 59,4% , which means that nearly two thirds of them had placed this career goal among the three most important ones. On the contrary, slightly more than one third (35,1%) of engineering students had selected this career goal. Instead “To have work/life balance” was as much appreciated among humanities as among engineering students (53,1% of humanities and 48,7% of engineering students). The least important career goal to humanities students in all studied countries was “To be a technical or functional expert”. The goal “To be a leader or manager of people” was, in all studied countries, more important to engineering students than to humanities students.

The difference between male and female engineering students was that women appreciated “To be dedicated to a cause or to feel that I am serving a greater good” and also “To have work/life balance” more than men. This was the situation in all studied countries. On the contrary, men in all countries appreciated “To be a technical or functional expert” and “To be a leader or manager of people” more than women.

The differences in career goals between generations Z and Y varied in studied countries. Generally, it only can be said that the older generation Y appreciated “To be competitively or intellectually challenged”, “To be a technical or functional expert” and “To have work/life balance” more than did generation Z.

### 5.2. Students' soft skills

The engineering students' perceptions about their strongest soft skills varied by country, but generally it can be said, that “Problem-solving”, “Responsibility” and “Team-work” were their three strongest soft skills. “Time management” and “Integrity” were the two weakest soft skills among all engineering students and “Communication” was the 3<sup>rd</sup> weakest engineering students' soft skill.

Humanities students' perceptions about their strongest soft skills also varied by country, but in general their three strongest soft skills were in this order: “Responsibility”, “Positive attitude” and “Adaptability”. Engineering students' strongest soft skill - “Problem-solving” - was the 3<sup>rd</sup> weakest humanities students' soft skill. For both engineering and humanities students the weakest soft skill was “Time management”. Among this group, the second weakest soft skill was “Communication”. On average humanities students think that their “Communication” skills are better than those of engineering students.

In comparing male and female engineering students' perceptions about their strongest soft skills we can observe that there are variations in sequence, but the three strongest soft skills were the same, namely: “Problem-solving”, “Responsibility” and “Positive attitude”. The same situation was found in the weakest soft skills, for instance, “Integrity” was for women the weakest soft skill while for men this was “Time management”. The second weakest skill for men was “Integrity” and for women “Time management”. There were no differences between male and female engineering students' perceptions about their “Communication” or “Team-work” skills.

Nearly half of the engineering students of both Gen Z and Gen Y think that “Problem-solving” is their strongest soft skill. Regarding “Responsibility”, Gen Z looks to be a bit more responsible than Gen Y. In other soft skills there are very little differences between these generations.

### 5.3. Attractive employer attributes

The most attractive employer attributes of engineering students were not similar in all studied countries, but the least attractive from the given list was - in all countries - “Commitment to diversity and inclusion” and the second least attractive was “Corporate social responsibility”. On average, the most important work attribute for engineering students in studied countries was “Innovation”, the second most important being “A creative and dynamic work environment” and the third most important “Professional training and development”.

Just as among engineering students, for humanities students the most attractive employer attribute varied between countries. “Inspiring purpose” was, on average, the most important one. The least attractive work attribute among humanities students was the same in all countries, namely: “Embracing new technologies”. The one but least was “Interaction with international clients and colleagues”. “The sponsorship of future education” was the 3<sup>rd</sup> least attractive work attribute.

The biggest difference between male and female engineering students’ attractive employer attributes is found in “Support for gender equality”. On average about 44 % of female engineering students in studied countries had raised this issue to among the three most attractive work attributes, while among male engineering students the percentage was only 14 %.

For men “Innovation” was the most attractive attribute, the second was “A creative and dynamic work environment”, the third “Challenging work” and the fourth “Competitive base salary”. All these work attributes were among more than 40 % of male engineering students’ choices on average, and in all studied countries. Only 9 % of male engineering students rated “Commitment to diversity and inclusion” among the three most important work attributes.

For female engineering students, the work attribute “A creative and dynamic work environment” was the most attractive, the second one was “Support for gender equality”, the third “Innovation” and the fourth “Professional training and development”. All these got more than 40% support. Also, for female engineering students “Commitment for diversity and inclusion” was the least important issue with the percentage of 13 % on average in all countries.

The biggest differences between Gen Z and Gen Y were that the older generation Gen Y appreciated “Encouraging work-life balance”, “Competitive base salary”, “Sponsorship for future education”, “Professional training and development” and “Inspiring purpose” more than Gen Z. Here the difference was more than 3 %. On the other hand, for the younger generation Gen Z there was only one work attribute which received more than a 3 % difference when compared to Gen Y’s answers. It was “Embracing new technologies”.

## 6.0 On-line-survey: Self-assessment tool: How much of an engineer are you?

In the original application it was intended that the online focus group (FO2) would be used to validate the findings of Activity 2 Task 1 and that a gap analysis would be carried out using focus groups with 9<sup>th</sup> graders in each focus country: Finland, Sweden, Denmark, Belgium, France and Ireland (A2/T2). Unfortunately, the special digital tool, which was meant for this purpose, was no longer valid. There was also concerns about ethical approval of focus groups with 9<sup>th</sup> graders. Therefore all participants agreed in the Helsinki meeting in October 2019 that this work would be completed using a questionnaire in e-form-system and piloted only in Finland.

The survey was carried out in a Finnish high school to gather information on 16-year-old pupils’ values, interests, and expectations related to the Sustainable Development Goals. We received 195 responses to the survey. Great care was taken in order to guarantee that we followed GDPR and good research ethics. The electronic questionnaire was implemented with an e-form -system, which runs on the Metropolia server and has been proven to be safe and secure. The questionnaire form was fully anonymous, with no

identification data. We applied for the research permit from the high school, and obtained the guardians' permission before the study.

The survey was in four parts. First, we asked the students to select the three most important Sustainable Development Goals. Each goal was provided with a short explanation, and a link to the United Nations Sustainable Development Goals website (in Finnish) was also provided. The pupils valued “Good Health and Well-Being”, “Quality Education”, “Zero Hunger”, and “Climate Action” the most important Sustainable Development Goals” (see Figure 9: Most important SDG based on the on-line-survey.9). The least votes were received for “Sustainable Cities”, “Industry, Innovation, and, Infrastructure”, “Decent Work and Economic Growth”, and “Affordable and Clean Energy”.

Survey: Most important Sustainable Development Goals

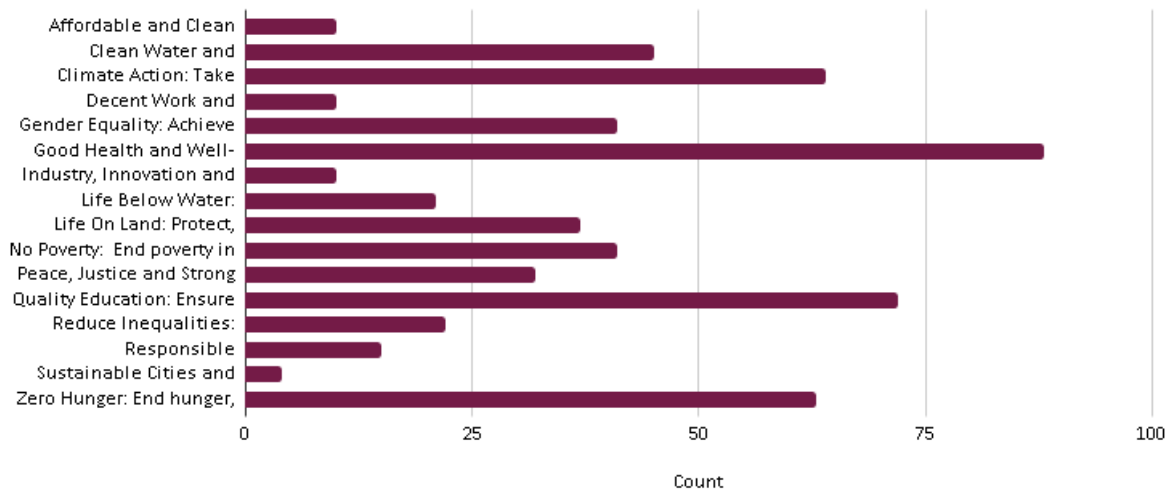
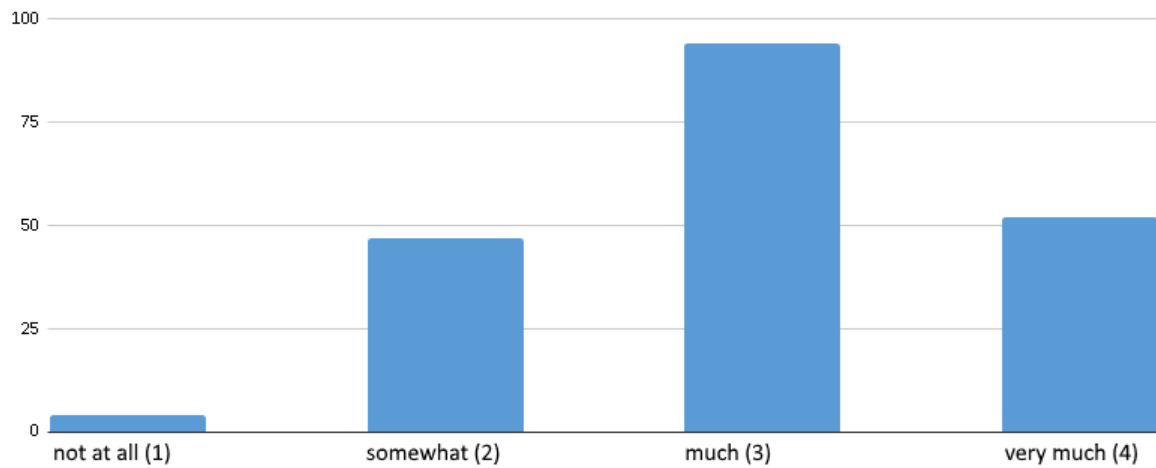


Figure 9: Most important SDG based on the on-line-survey.

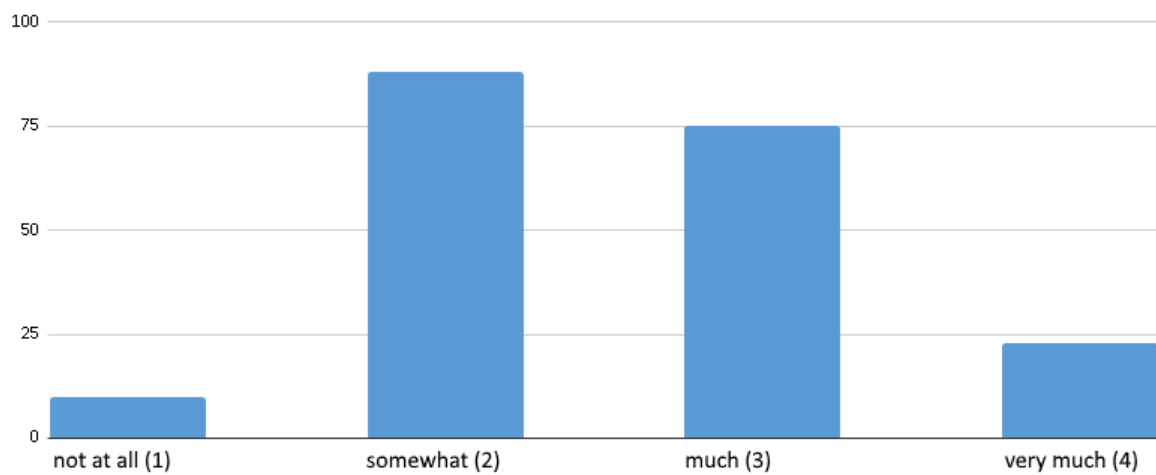
In the second part we asked pupils to rate on a scale “not at all (1)/ somewhat (2)/much (3)/very much (4)” if they wanted to a) promote sustainable development, b) solve challenging problems, c) work in groups, d) apply technology, and d) work in multicultural environments. Only a few students answered that they were not interested in promoting sustainable development, while about 75% wanted to promote it (Figure 10). The second claim “I want to solve challenging problems” divided the students into roughly equal groups of either “not at all (1)/somewhat (2)” and “much (3)/very much (4) (11). For the claim “I want to work in group”, the answers are concentrated on the “somewhat (2)/much (3)” scale, indicating the students are mentally prepared to work in groups (Figure 12). Responses to the claim “I want to apply technology” received very similar results as the previous (Figure 13). The responses to the last claim “I want to work in multicultural environments” indicated that most of the pupils are at least ready to work in multicultural environments, and only a marginal number of pupils were opposed to the claim (Figure 14).

I want to promote sustainable development



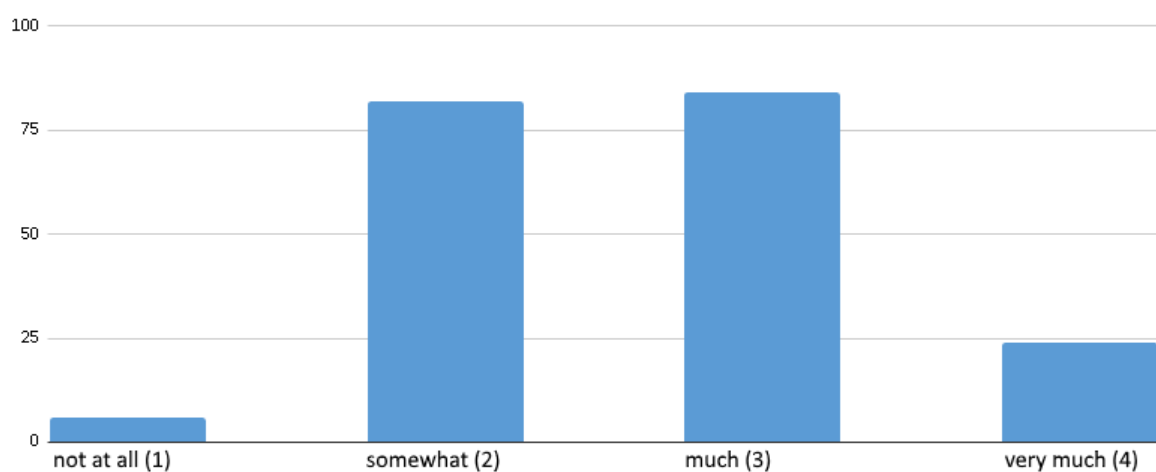
**Figure 10:** Answers to claim “I want to promote sustainable development”

Histogram of solve challenging problems



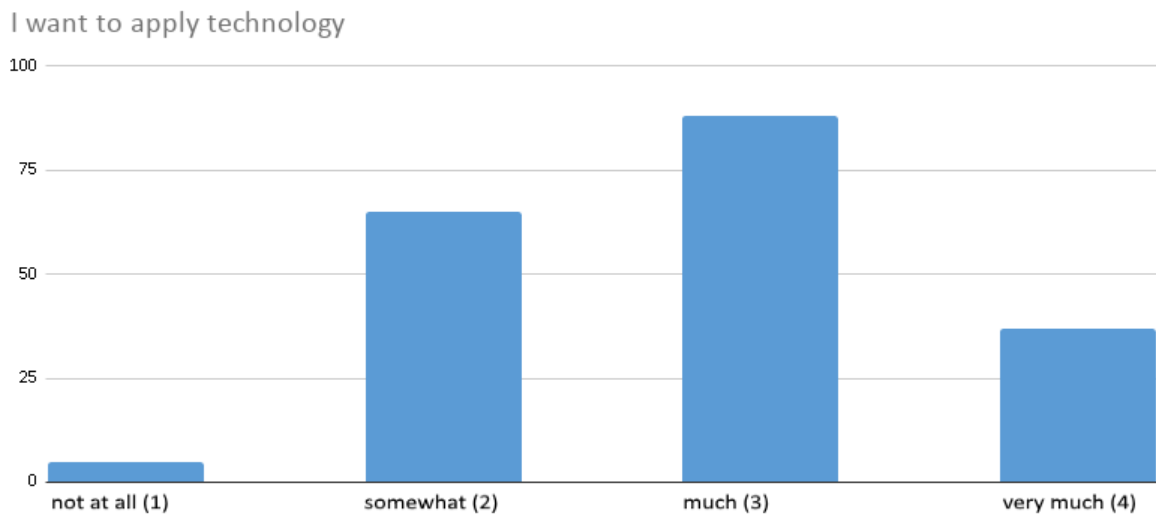
**Figure 11:** Answers to claim “I want to solve challenging problems”

I want to work in group

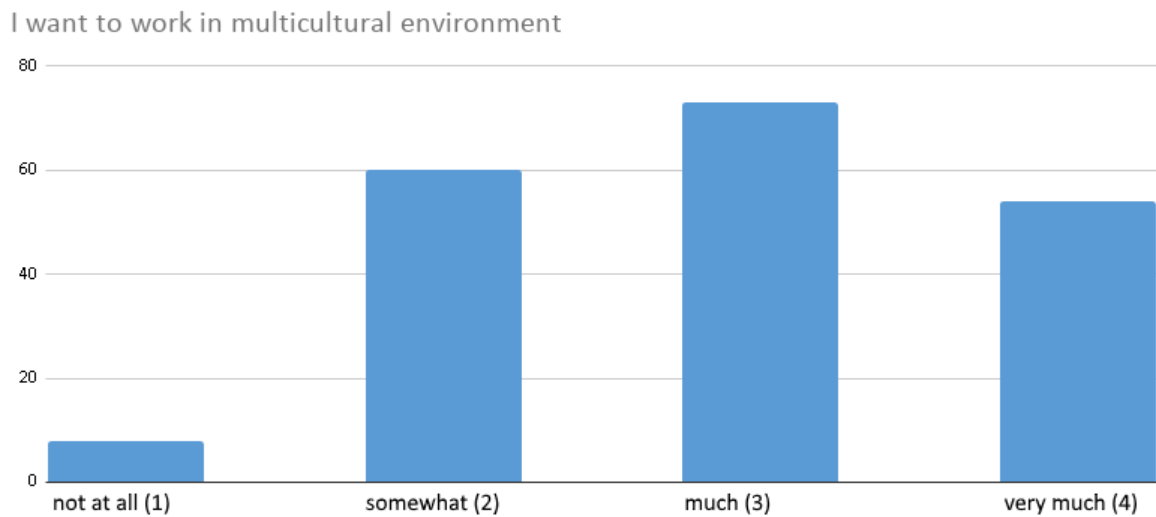


**Figure 12:** Answers to claim “I want to work in groups”





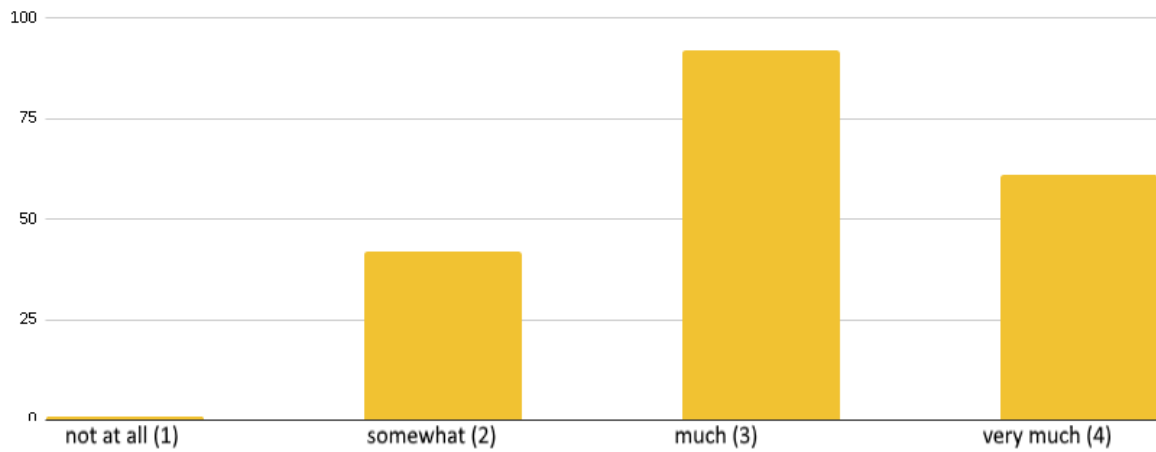
**Figure 13:** Answers to claim “I want to apply technology”



**Figure 14:** Answers to claim “I want to work in multicultural environments”

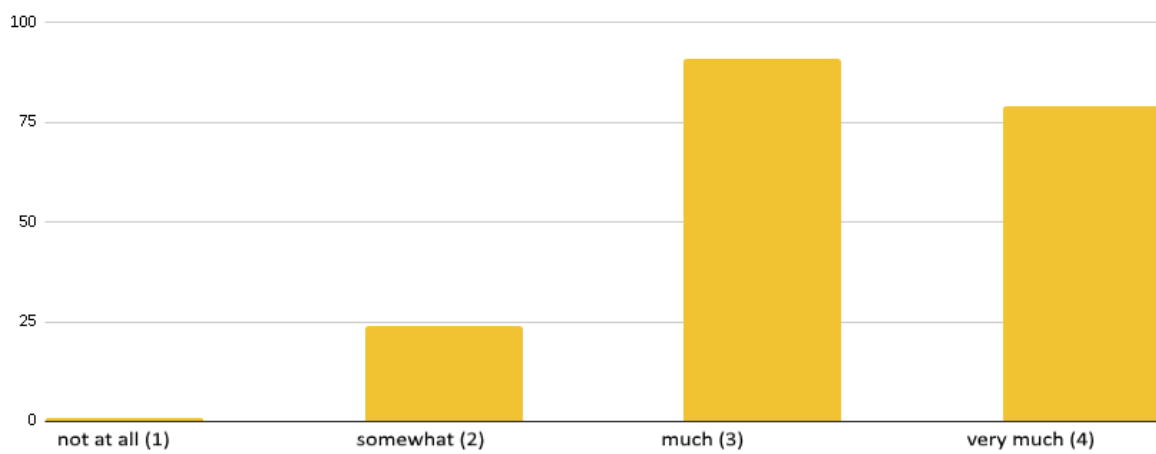
In the third part of the survey we asked pupils to rate the skills and knowledge they would like to acquire on the same scale: “not at all (1)/ somewhat (2)/much (3)/very much (4)”. They answered if they wanted to know a) skills needed for sustainable development, b) problem solving skills, c) interpersonal skills, d) skills for working in a responsible manner, e) time management skills. The survey indicated the students recognized the need for all mentioned skills, while only a very small number thought these to be of no importance at all (15 - 19).

## Skills needed for sustainable development



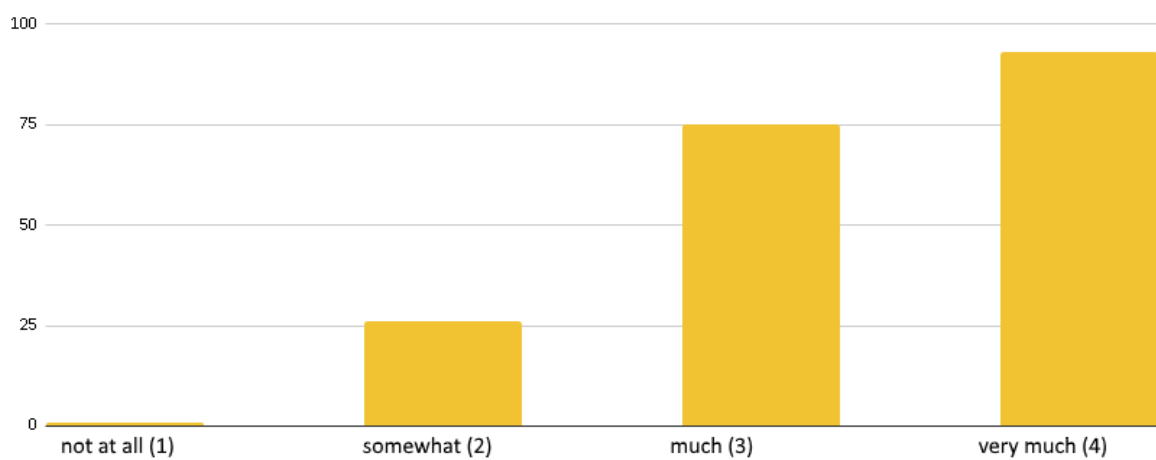
**Figure 15:** Skills needed for sustainable development

## Problem solving skills

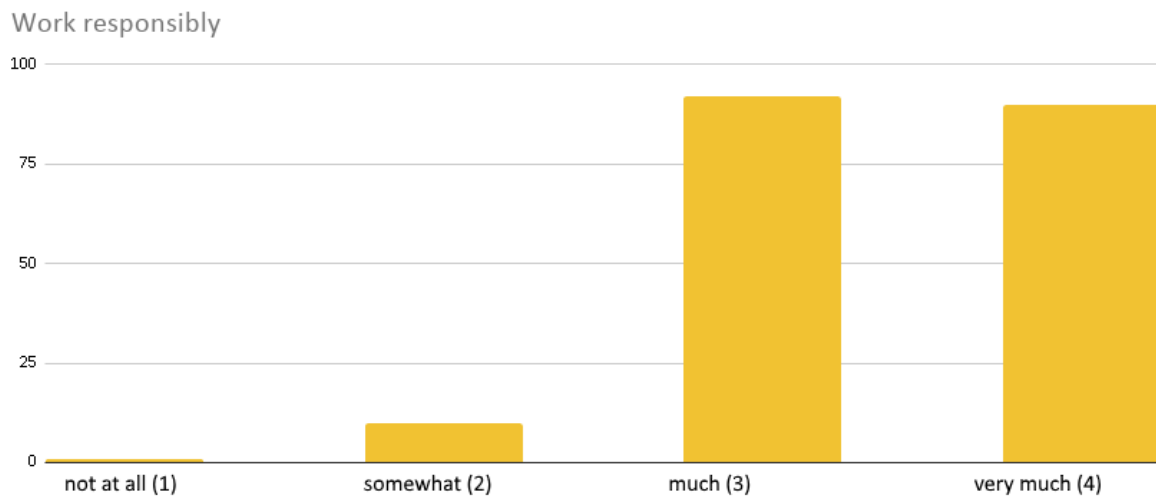


**Figure 16:** Problem solving skills

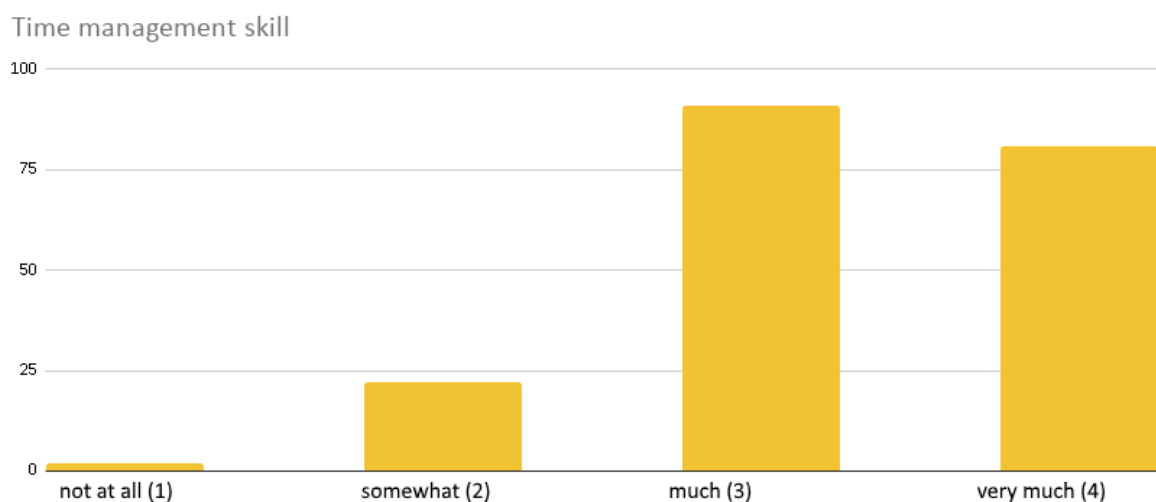
## Interpersonal skills



**Figure 17:** Interpersonal skills



**Figure 18:** Working in a responsible manner



**Figure 19:** Time management skills

The fourth part was added in order to open pupils' minds towards engineering disciplines: "Did you know... Achieving the Sustainable Development Goals requires a deep understanding of technology and natural sciences. "Engineering education teaches you these skills and you can affect the shape of the future."

## 6.1 Summary of the on-line-survey: Self-assessment tool: How much of an engineer are you?

The most important SDG to these pupils was "Good Health and Well-Being". Moreover, over 60% of pupils had selected "Quality Education", "Zero Hunger" and "Climate Action" among the three most important Sustainable Development Goals. The least votes were received by "Sustainable Cities and Communities", "Industry, Innovation and Infrastructure", "Decent Work and Economic Growth", and "Affordable and Clean Energy".

Only a few pupils answered that they were not interested in promoting sustainable development, while about 75% wanted to promote it. The second claim "I want to solve challenging problems" divided the students into roughly equal groups of either "not at all (1)/somewhat (2)" and "much (3)/very much (4)". The responses to the claims "I want to work in group" and "I want to apply technology" are concentrated on the "somewhat (2)/much (3)" end of the scale, indicating the students are mentally prepared to work in groups and ready to apply technology. Responses to the last claim "I want to work in multicultural

environment” indicated that most of the pupils are at least ready to work in multicultural environments, and only a marginal number of pupils were opposed to this claim. So, these pupils want to promote sustainable development, want to work in groups in multicultural environments and are at least somewhat willing to apply technology and solve challenging problems.

Pupils were also asked about their willingness to learn a) skills needed for sustainable development, b) problem solving skills, c) interpersonal skills, d) skills for working in a responsible manner and d) time management skills. The survey indicated that the pupils are willing to learn all the skills mentioned, while only a very small number thought those of no importance at all.

These pupils can be considered to be engineering minded as their outcomes of the survey indicated their interests to be parallel to skills and competences achieved in engineering education.

## 7.0 Outcomes from BEST Symposia

Diversity can be seen to play a key role in the Sustainable Development Goals (SDGs) of the United Nation’s Agenda 2030. BEST, Board of European Students of Technology, organized two symposia in 2019 about Diversity in STEM (Science, Technology, Engineering and Mathematics) Education. The focus of these two events was *Racial and Ethnic Diversity* and *Cultural Diversity*. The theme was, how diversity is connected to organizational or individual social responsibility and how it is taken into account in higher education. The outcomes of these are reported and “Recommendations on what universities and other higher education stakeholders can do in order to improve diversity”, “Recommendations on what companies, employers and other bodies in charge of youth employment can do to improve diversity” and also “General recommendations and ideas” are presented here.

## 7.1 Recommendations on what universities and other higher education stakeholders can do in order to improve diversity

The ideas on how universities could engage the students or the university as an institute itself to be more engaged in social responsibility are presented in table 9:

Table 9: Recommendations to universities and other higher education stakeholders.

Department of Social Responsibility	Create a department inside the university that would be responsible for the institution’s social impact. More specifically this department would: <ul style="list-style-type: none"> <li>• Coordinate workshops and lectures on SR</li> <li>• Create relevant criteria for the selection of the university’s partners</li> <li>• Overview the social impact of projects in which the university is involved</li> </ul>
Evaluation of the social impact	Evaluate university bodies and staff based on their socially responsible actions and create a reward framework.
Content integration	Include topics of SR in the already existing curricula.
ECTS	Have mandatory ECTS for being involved in social activities.
Empower NGOs	Promote NGOs in the university environment
Company lectures	Introduce lectures, in collaboration with companies, on social responsibility and social impact.
Community hours	Establish hours where students gather to help the local community (e.g. clean beaches, plant trees etc.)
SR campaigns	Create campaigns supporting SR and advertise them in the university.

## 7.2 Recommendations on what companies, employers and other bodies in charge of youth employment can do to improve diversity

In the SWOT analysis below in Table 10, we can observe that working in culturally diverse environments has more drawbacks than benefits; notwithstanding, most of the weaknesses could easily be tackled by implementing the strengths. The main outcome is that the workplace is heavily influenced by cultural diversity and more ways than one.

Table 10: SWOT analysis of diversity in workplaces.

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• variety of different opinions</li> <li>• tolerance</li> <li>• the project/work is objective</li> <li>• raising awareness of other cultures</li> <li>• breaking stereotypes</li> <li>• spreading the impact</li> <li>• sharing work methods</li> <li>• increased efficiency</li> <li>• broadening knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• language barrier</li> <li>• different mentality</li> <li>• different schedules</li> <li>• different schedules because of religion</li> <li>• different routines</li> <li>• different working methods which lead to difficulties because not everyone is used to them</li> <li>• different university systems which aren't standardized</li> <li>• different backgrounds</li> <li>• types of humour</li> <li>• attitude towards deadlines - for some people they are absolute, some people take care of them the night before</li> <li>• attitude towards schedules - people being late vs on time</li> <li>• time incompatibility</li> <li>• different perspectives on gender equality in some cultures</li> <li>• different income due to being from a different background</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• increase efficiency from different methods</li> <li>• increase the network across the countries</li> <li>• market trends</li> <li>• increase travel opportunities</li> <li>• worldwide connections</li> <li>• self-improvement (language, courses, etc.)</li> <li>• continuous working hours</li> </ul>	<ul style="list-style-type: none"> <li>• cultural tension</li> <li>• migration policies</li> <li>• biased funding</li> <li>• pushed out by local companies</li> <li>• discrimination from outside</li> <li>• perception of the company due to employment</li> </ul>

Based on BEST's prior research the ten most important skills for STEM graduates are critical thinking, analytical skills, problem solving, innovation, collaboration, communication, customer orientation, adaptability, social responsibility and balance (table 11). BEST symposia's participants' views about important skills needed in STEM professions is presented in figure 20.

Table 11. Top ten skills that employers currently look for in STEM graduates based on BEST's prior research.

Critical Thinking	Define and approach problems and situations from many different viewpoints and analyze every possible solution, as well as anticipate the consequences and outcomes of each option before taking action.
Analytical Skills	Analyze data sets to understand how they relate to other data, systems and processes. Ability to synthesize and interpret complex information from multiple sources.
Problem Solving	Finding solutions that use the smallest amount of effort to the greatest effect and are able to solve multiple issues at the same time. Ability to devise the simplest yet most effective solution.
Innovation	Willingness to take risks and offer creative, even quirky ideas. A fresh perspective and a spirit of inventiveness will outshine those that follow the same old path.
Collaboration	Skill to work with others toward a shared goal. Ability to relate to and collaborate with others in the workplace. Contribute to your team's success, learn from challenges of working with others and encourage the evolution of your working style.
Communication	Convey complex ideas to people of varied backgrounds and job titles, including those who have less or more technical expertise than they do.
Customer Orientation	Create a meaningful experience for each customer while designing solutions that help them achieve their goals today and 10 years from now. Active listening to understand the client's needs, and going above and beyond the call of duty when it comes to customer service.
Adaptability	The quality of being able to adjust to new conditions, environments or people.
Social Responsibility	Ability to share values and demonstrate consistency with those values in their decisions, their actions and their way of working with others.
Balance	Ability to develop and demonstrate work qualities in activities not related to the job, such as hobbies or enthusiasms.

## Skills needed in STEM professions

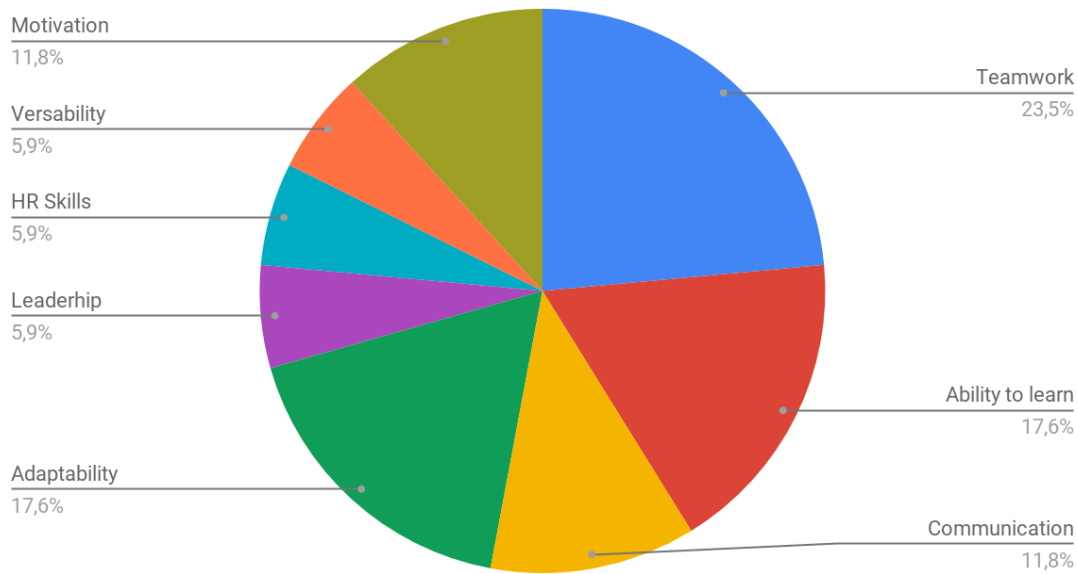


Figure 20: BEST symposia participants' views about skills needed in STEM professions.

## 7.3 General recommendations and ideas from BEST events

### The role of stakeholders

**Companies:** Participants agreed that firms should move to a diverse basis, by means of actions like having the website in different languages, encouraging people to speak English in the work environment and promoting integration activities for the non-formal structure of the company. For recruitment processes, participants supported the idea of positive discrimination, both for women and workers that come from other countries. Other ideas were discussed like having diversity in the mission and vision of the firm, international team-building activities, international internships, collaboration with international universities, sponsoring of integration activities and organizing training programs open to everyone.

**Governments:** Participants found that the governments can take many actions to promote diversity like investing in mobility programs and in international cooperation, using social media to create awareness of the problem, regulate advertisements to avoid propaganda, ease the process for foreigners to come to the country, avoid religious preferences and regulate education to focus on global history and not only on local histories. As a final proposal, participants debated mandatory education, which agreed to continue until the age of 16, to ensure every citizen has basic knowledge.

**Universities:** The ideas proposed for this stakeholder were: increase the number of English classes, joining in more exchange study or internship programmes and promoting them more effectively, raise awareness of foreign students, achieve union between universities to get double diplomas, offer free courses in native language, provide opportunities for students to earn some money to lower the cost of living, improve students' living conditions, providing modern equipment for laboratories, promoting free or cheap activities for foreign students, introducing positive discrimination for minorities, providing extra lessons to catch up, improving tutor programs, and improving the offer of cultural activities.

**Ideas of integration techniques to better integrate minorities into society found in BEST events are:**

**University:** Participants thought that the university could organize social events, tandem meetings where languages are exchanged, create a language club, or organize cultural trips. Universities should also support student NGOs in their activities and encourage the staff to communicate in English when possible, to eliminate the language barrier. Regarding the teachers, participants thought that they should implement more inclusive teaching methods, promote and reward cooperation in their students and be internationally involved, so they can understand the need for integration.

**Students:** Some ideas were posed, like organizing non-formal meetings for sharing, with international students and alumni, or focusing on actions of everyday life, like working with different people in projects, including international students in the lessons, have breaks together and avoid creating ghettos. Finally, some students' initiatives were presented – such as: an international lunch for a better bonding experience between local and international students, sharing sessions, cultural activities, parties and a big social media promotion of all these events.

**Companies and NGOs:** The ideas put forward for companies were: supporting NGOs in their activities, open a research program about the diversity in the company to better understand the situation, prepare lectures in English if a worker is delivering a lesson in the university, offer international internship programs, generalize an English speaking environment or make the HR team aware of the lack of diversity. For NGOs, participants suggested that they should include diversity and integration in their priorities, that they should be open to welcome every kind of student and eventually, organize some integration activities like language exchange or guidance programs.

**Government and Institutions:** Participants suggested that international institutions such as the Council of Europe should research the problem and find the causes. They also stated that government at all levels - from the local and the regional to the national scale - should promote and sponsor initiatives that aim to promote diversity.

The evaluation of all the ideas is presented in Table 12.

Table 12: Evaluation of the ideas from BEST symposia.

	Lower effort	Higher effort
Higher impact	<ul style="list-style-type: none"> <li>• Spend time with international students and people of other ethnicities</li> <li>• Share actions and activities on social media</li> <li>• Sponsor integration activities</li> <li>• Organize social events, like tandem meetings or international meals</li> <li>• Being open-minded</li> <li>• Mixed accommodation</li> <li>• Guidance programs for international students</li> <li>• Make group projects with international students</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Implement new laws/regulations</li> <li><input type="checkbox"/> A generalized use of English</li> <li><input type="checkbox"/> Sponsor NGOs</li> <li><input type="checkbox"/> European Programme</li> <li><input type="checkbox"/> Meetings with alumni</li> <li><input type="checkbox"/> Research about the lack of diversity</li> <li><input type="checkbox"/> Ease the process for foreigners to come to a new country</li> <li><input type="checkbox"/> Internationally involved teachers</li> <li><input type="checkbox"/> International internship program</li> <li><input type="checkbox"/> Cultural trips</li> </ul>
Lower impact	<ul style="list-style-type: none"> <li>• Guest lectures in English</li> <li>• Actions for religious groups</li> <li>• Hiring international students</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Changing teaching methods</li> </ul>



## 8.0 Summary of this report R4

This A-STEP 2030 project's Activity 2 has presented the values of university students, considering both engineering students and humanities students, and also bringing in pupils at the age of 16. The particular focus is to find out how these values match the views about the future of work, where the sustainable development goals of the United Nations are seen to play an ever more important role.

The key findings show that there are differences between countries among engineers, among humanities students and among generations Z and Y. Generally, it can be said that there is a tendency among students in all countries to rate environmental and social responsibility issues more highly when compared to economic issues, issues which were formerly accorded a greater importance. Especially humanities students, but also female engineering students, placed these environmental and social responsibility issues high among both their career goals and their vision of what renders employer attributes attractive. The other difference between humanities and engineering students' attitudes was that the goal "To be a leader or manager of people" was, in all studied countries, more important to engineering students than to humanities students.

For all students, "Work/life balance" as their career goal was very important and at the same time all of them said that their weakest soft skill was "Time management". The other weakest soft skill to all students was "Integrity". In "Communication" skills there still seems to be room for development within all categories of students even though humanities students trust on themselves more in this respect than do engineering students. Engineering students think that their strongest soft skills are "Problem-solving", "Responsibility" and "Teamwork", while humanities students consider their strongest soft skills to be the following: "Responsibility", "Positive attitude" and "Adaptability". Regarding "Responsibility", the younger generation Z looks to be a bit more responsible than the older Gen Y.

For all humanities students, "To be dedicated to a cause or to feel that I am serving a greater good" was the most important career goal. Nearly two third of humanities students placed this career goal among their three most important. On the contrary, only slightly more than one third (35,1%) of engineering students considered this to be among their three most important career goals. Among engineering students in all studied countries "Commitment to diversity and inclusion" and "Corporate social responsibility" were the two least attractive employer attributes. For them, on average, the most important work attribute was "Innovation", the second most important being "A creative and dynamic work environment" and the third most important "Professional training and development".

The Finnish 16-year-old pupils' attitude towards Sustainable Development Goals - according to the on-line-survey – showed that the most important SDG to them was "Good Health and Well-Being". Also, more than 60% of the participating pupils selected "Quality Education", "Zero Hunger" and "Climate Action" among the three most important Sustainable Development Goals. The least votes were received by "Sustainable Cities and Communities", "Industry, Innovation and Infrastructure", "Decent Work and Economic Growth", and "Affordable and Clean Energy". Over 75 % of pupils wanted to promote SDGs. Pupils were also asked about their willingness to learn a) skills needed for sustainable development, b) problem solving skills, c) interpersonal skills, d) skills to work responsibly and d) time management skills. The survey indicated that the pupils are willing to learn all mentioned skills, while only a very small number thought those to be of no importance at all. According to the answers, most of the pupils were willing to work in groups, ready to apply technology, and prepared to solve challenging problems in multicultural environments. The pupils of this on-line survey can be considered to be engineering minded as their outcomes of the survey indicated their interests to be parallel to skills and competences achieved in engineering education.

BEST symposia participants found many ways, how universities can integrate social responsibility into STEM studies and University's own working principles. According to BEST workshops' results workplaces are in many ways influenced by cultural diversity and very often there are more drawbacks than benefits. Focusing to the strengths of diversity could change the situation for the better. According to BEST's results, the ten most important skills for STEM graduates are Critical Thinking, Analytical Skills, Problem Solving, Innovation, Collaboration, Communication, Customer Orientation, Adaptability, Social Responsibility and Balance. The skills needed in STEM professions according to BEST are the following:

Teamwork (23,5 %), Ability to learn (17,6%), Adaptability (17,6%), Communication (11,8%), Motivation (11,8%), Leadership (5,9%), HR skills (5,9%) and Versatility (5,9%).

## 9.0 Acknowledgements

We would like to acknowledge the EU Erasmus+ funding body and all partners and associated partners in the A-STEP 2030 project for their help in this Activity and report. Many thanks also to all the students who completed the Universum Career Test survey which was used to provide data for this report and external experts of the project, who made reviewing.

The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

## APPENDIX A: Data of the Universum study

### 5.1. Students' career goals

#### Engineering students' career goals

Table 1. Career goal choices of engineering students in each country and the average of these.

Engineering students - Career goals	BE	DK	FI	FR	IE	SE	Aver.
To be a leader or manager of people	41,7%	34,5%	31,9%	36,6%	30,2%	22,3%	<b>32,9%</b>
To be a technical or functional expert	35,5%	19,2%	40,6%	16,0%	28,3%	21,3%	<b>26,8%</b>
To be autonomous or independent	15,2%	12,4%	13,4%	18,6%	12,9%	24,9%	<b>16,2%</b>
To be competitively or intellectually challenged	33,0%	34,6%	30,3%	33,0%	26,2%	29,8%	<b>31,2%</b>
To be dedicated to a cause or to feel that I am serving a greater good	12,7%	45,2%	45,8%	43,9%	30,7%	32,2%	<b>35,1%</b>
To be entrepreneurial or creative/innovative	52,0%	27,1%	19,3%	25,2%	31,0%	33,7%	<b>31,4%</b>
To be secure or stable in my job	28,6%	36,8%	35,1%	25,4%	45,4%	44,5%	<b>36,0%</b>
To have an international career	25,9%	27,9%	18,4%	35,4%	25,2%	22,6%	<b>25,9%</b>
To have work/life balance	37,5%	47,5%	48,7%	53,6%	57,0%	47,9%	<b>48,7%</b>

Table 2. Ranked career goals of engineering students' choices. Dark green colour refers to the most important (number 1 - the highest ranked career goal) and dark red to the least important (number 9 - the lowest ranked career goal).

Engineering students - career goals	BE	DK	FI	FR	IE	SE	Rank average
To be a leader or manager of people	2	5	5	3	5	8	4
To be a technical or functional expert	4	8	3	9	6	9	7
To be autonomous or independent	8	9	9	8	9	6	9
To be competitively or intellectually challenged	5	4	6	5	7	5	6
To be dedicated to a cause or to feel that I am serving a greater good	9	2	2	2	4	4	3
To be entrepreneurial or creative/innovative	1	7	7	7	3	3	5
To be secure or stable in my job	6	3	4	6	2	2	2
To have an international career	7	6	8	4	8	7	8
To have work/life balance	3	1	1	1	1	1	1

## Humanities students' career goals

Table 3. Humanities students' career goals in each country. The percentage indicates how many put the career goal amongst the three most important ones.

Humanities students	BE	DK	FI	FR	IE	SE	Aver.
To be a leader or manager of people	19,0%	19,6%	14,6%	32,6%	20,2%	16,3%	<b>20,4%</b>
To be a technical or functional expert	6,2%	4,1%	9,7%	13,2%	5,0%	5,7%	<b>7,3%</b>
To be autonomous or independent	22,9%	10,4%	17,9%	23,8%	12,4%	27,4%	<b>19,1%</b>
To be competitively or intellectually challenged	27,5%	34,5%	26,2%	34,5%	27,2%	29,4%	<b>29,9%</b>
To be dedicated to a cause or to feel that I am serving a greater good	46,8%	63,0%	73,0%	69,4%	53,5%	50,7%	<b>59,4%</b>
To be entrepreneurial or creative/innovative	44,7%	22,5%	19,1%	18,0%	23,9%	20,4%	<b>24,8%</b>
To be secure or stable in my job	42,6%	45,3%	44,7%	19,6%	58,1%	56,7%	<b>44,5%</b>
To have an international career	21,8%	26,3%	22,3%	41,1%	25,1%	21,5%	<b>26,4%</b>
To have work/life balance	51,5%	58,9%	57,0%	38,0%	62,5%	50,8%	<b>53,1%</b>

Table 4. The ranked position of humanities students' career goals in each country.

Humanities students - career goals	BE	DK	FI	FR	IE	SE	Rank average
To be a leader or manager of people	8	7	8	5	7	8	7
To be a technical or functional expert	9	9	9	9	9	9	9
To be autonomous or independent	6	8	7	6	8	5	8
To be competitively or intellectually challenged	5	4	4	4	4	4	4
To be dedicated to a cause or to feel that I am serving a greater good	2	1	1	1	3	3	1
To be entrepreneurial or creative/innovative	3	6	6	8	6	7	6
To be secure or stable in my job	4	3	3	7	2	1	3
To have an international career	7	5	5	2	5	6	5
To have work/life balance	1	2	2	3	1	2	2

Table 5. Differences between engineering and humanities students' career goals. The percentages in the table are the engineering students' percentage and the humanities students' percentage.

Engineering vs Humanities differences	BE	DK	FI	FR	IE	SE	Average
To be a leader or manager of people	22,8%	14,9%	17,3%	4,0%	10,0%	5,9%	<b>12,5%</b>
To be a technical or functional expert	29,3%	15,1%	30,9%	2,8%	23,4%	15,6%	<b>19,5%</b>
To be autonomous or independent	-7,7%	2,1%	-4,5%	-5,2%	0,4%	-2,6%	<b>-2,9%</b>
To be competitively or intellectually challenged	5,5%	0,1%	4,1%	-1,5%	-1,0%	0,4%	<b>1,3%</b>
To be dedicated to a cause or to feel that I am serving a greater good	-34,1%	-17,8%	-27,2%	-25,4%	-22,8%	-18,5%	<b>-24,3%</b>
To be entrepreneurial or creative/innovative	7,3%	4,5%	0,1%	7,2%	7,0%	13,3%	<b>6,6%</b>
To be secure or stable in my job	-14,1%	-8,5%	-9,6%	5,8%	-12,7%	-12,2%	<b>-8,5%</b>
To have an international career	4,1%	1,5%	-4,0%	-5,7%	0,1%	1,0%	<b>-0,5%</b>
To have work/life balance	-14,0%	-11,4%	-8,2%	15,5%	-5,5%	-2,9%	<b>-4,4%</b>

## Female and male engineering students' career goals

Table 6. The importance of career goals to male engineering students. The percentage indicates how many put the career goal amongst the three most important ones.

MALE - Engineering	BE	DK	FI	FR	IE	SE	Aver.
To be a leader or manager of people	46,1%	40,5%	35,6%	39,7%	31,3%	24,5%	<b>36,3%</b>
To be a technical or functional expert	40,0%	24,5%	44,9%	18,1%	30,6%	29,2%	<b>31,2%</b>
To be autonomous or independent	14,5%	13,7%	14,0%	17,8%	13,7%	23,8%	<b>16,3%</b>
To be competitively or intellectually challenged	36,2%	37,7%	32,7%	35,0%	23,6%	33,1%	<b>33,0%</b>
To be dedicated to a cause or to feel that I am serving a greater good	9,9%	36,1%	39,5%	39,9%	27,5%	28,4%	<b>30,2%</b>
To be entrepreneurial or creative/innovative	48,4%	24,9%	20,4%	27,6%	32,4%	35,1%	<b>31,5%</b>
To be secure or stable in my job	26,4%	32,6%	30,2%	22,4%	47,2%	37,8%	<b>32,8%</b>
To have an international career	27,0%	31,3%	18,5%	35,6%	23,9%	23,9%	<b>26,7%</b>
To have work/life balance	33,3%	44,3%	44,9%	50,9%	54,6%	43,0%	<b>45,2%</b>

Table 7. The ranked career goals choices of male engineering students

MALE - Engineering	BE	DK	FI	FR	IE	SE	Rank average
To be a leader or manager of people	2	2	4	3	4	7	2
To be a technical or functional expert	3	8	1	8	5	5	6
To be autonomous or independent	8	9	9	9	9	9	9
To be competitively or intellectually challenged	4	3	5	5	8	4	3
To be dedicated to a cause or to feel that I am serving a greater good	9	4	3	2	6	6	7
To be entrepreneurial or creative/innovative	1	7	7	6	3	3	5
To be secure or stable in my job	7	5	6	7	2	2	4
To have an international career	6	6	8	4	7	8	8
To have work/life balance	5	1	1	1	1	1	1

Table 8. The importance of career goals to female engineering students. The percentage indicates how many put the career goal amongst the three most important ones.

FEMALE - Engineering	BE	DK	FI	FR	IE	SE	Aver
To be a leader or manager of people	26,3%	23,8%	24,0%	30,1%	26,6%	18,5%	<b>24,9%</b>
To be a technical or functional expert	20,2%	10,0%	35,5%	11,3%	21,3%	12,1%	<b>18,4%</b>
To be autonomous or independent	18,2%	10,0%	9,4%	20,5%	9,6%	24,0%	<b>15,3%</b>
To be competitively or intellectually challenged	23,2%	29,3%	31,9%	27,9%	34,0%	25,7%	<b>28,7%</b>
To be dedicated to a cause or to feel that I am serving a greater good	22,2%	61,1%	55,9%	52,6%	40,4%	40,1%	<b>45,4%</b>
To be entrepreneurial or creative/innovative	64,6%	30,5%	17,2%	19,8%	25,5%	31,6%	<b>31,6%</b>
To be secure or stable in my job	35,4%	44,4%	39,7%	32,6%	41,5%	53,0%	<b>41,1%</b>
To have an international career	22,2%	22,2%	20,4%	35,3%	29,8%	18,6%	<b>24,7%</b>
To have work/life balance	53,5%	53,1%	54,8%	59,9%	63,8%	56,8%	<b>57,0%</b>

Table 9. The ranked career goals choices of female engineering students.

FEMALE - Engineering	BE	DK	FI	FR	IE	SE	Rank average
To be a leader or manager of people	4	6	6	5	6	8	6
To be a technical or functional expert	8	8	4	9	8	9	8
To be autonomous or independent	9	8	9	7	9	6	9
To be competitively or intellectually challenged	5	5	5	6	4	5	5
To be dedicated to a cause or to feel that I am serving a greater good	6	1	1	2	3	3	2
To be entrepreneurial or creative/innovative	1	4	8	8	7	4	4
To be secure or stable in my job	3	3	3	4	2	2	3
To have an international career	6	7	7	3	5	7	7
To have work/life balance	2	2	2	1	1	1	1

Table 10. Female versus male engineering students' career choice

FEMALE vs MALE diff.	BE	DK	FI	FR	IE	SE	Aver.
To be a leader or manager of people	-19,8%	-16,7%	-11,6%	-9,6%	-4,7%	-6,1%	-11,4%
To be a technical or functional expert	-19,8%	-14,6%	-9,4%	-6,8%	-9,4%	-17,1%	-12,8%
To be autonomous or independent	3,7%	-3,8%	-4,6%	2,6%	-4,2%	0,2%	-1,0%
To be competitively or intellectually challenged	-13,0%	-8,5%	-0,8%	-7,1%	10,5%	-7,4%	-4,4%
To be dedicated to a cause or to feel that I am serving a greater good	12,4%	25,0%	16,4%	12,7%	13,0%	11,7%	15,2%
To be entrepreneurial or creative/innovative	16,2%	5,6%	-3,2%	-7,8%	-6,9%	-3,5%	0,1%
To be secure or stable in my job	9,0%	11,8%	9,5%	10,1%	-5,7%	15,2%	8,3%
To have an international career	-4,7%	-9,1%	1,9%	-0,3%	5,8%	-5,3%	-2,0%
To have work/life balance	20,2%	8,7%	9,9%	9,1%	9,3%	13,8%	11,8%

## Gen Z and Gen Y career goals

Table 11. The career goals of generation Z in each country. The percentage indicates how many put the career goal amongst the three most important ones.

GEN Z (today at the age of 17-22 years)							
Career goals	BE	DK	FI	FR	IE	SE	Average
To be a leader or manager of people	44,2%	38,1%	35,4%	36,5%	27,2%	25,2%	34,4%
To be a technical or functional expert	32,9%	15,3%	41,5%	14,4%	26,0%	22,7%	25,5%
To be autonomous or independent	13,6%	14,6%	9,7%	18,3%	13,0%	20,8%	15,0%
To be competitively or intellectually challenged	31,6%	31,3%	30,5%	31,8%	23,2%	31,3%	30,0%
To be dedicated to a cause or to feel that I am serving a greater good	12,6%	48,9%	46,4%	44,8%	29,5%	33,4%	35,9%
To be entrepreneurial or creative/innovative	54,5%	26,5%	22,3%	26,0%	29,9%	37,7%	32,8%
To be secure or stable in my job	30,9%	39,9%	31,3%	26,8%	53,9%	40,7%	37,3%
To have an international career	26,2%	26,1%	18,5%	37,4%	24,8%	24,6%	26,3%
To have work/life balance	34,9%	44,0%	46,7%	52,2%	58,7%	42,7%	46,5%

Table 12. The career goals of generation Y in each country. The percentage indicates how many put the career goal amongst the three most important ones.

GEN Y (today at the age of 23-38 years)							
Career goals	BE	DK	FI	FR	IE	SE	Average
To be a leader or manager of people	36,7%	33,0%	29,8%	36,8%	34,7%	21,4%	32,1%
To be a technical or functional expert	40,8%	20,9%	41,8%	18,5%	33,9%	22,2%	29,7%
To be autonomous or independent	18,4%	11,3%	13,9%	18,9%	12,9%	22,0%	16,2%
To be competitively or intellectually challenged	36,1%	36,2%	33,4%	34,8%	32,3%	34,3%	34,5%
To be dedicated to a cause or to feel that I am serving a greater good	12,9%	43,4%	44,8%	42,6%	33,9%	37,1%	35,8%
To be entrepreneurial or creative/innovative	46,9%	27,7%	17,6%	24,0%	33,9%	32,0%	30,4%
To be secure or stable in my job	23,8%	35,2%	35,0%	23,5%	27,4%	39,6%	30,7%
To have an international career	25,2%	28,9%	19,2%	32,4%	26,6%	22,7%	25,8%
To have work/life balance	42,9%	48,9%	49,4%	55,6%	53,2%	51,1%	50,2%



Table 13. The career goals differences between generation Z and Y in each country. The positive number refers to the goal being more important to Gen Z than to Gen Y and it is marked green. The minus number refers to the goal being more important to Gen Y than to Gen Z and it is marked red. The percentage in the table is Gen Z students' percentage - Gen Y students' percentage.

GEN Z / GEN Y difference							
Career goals	BE	DK	FI	FR	IE	SE	Average
To be a leader or manager of people	7,5%	5,1%	5,5%	-0,4%	-7,5%	3,8%	2,3%
To be a technical or functional expert	-7,9%	-5,6%	-0,2%	-4,1%	-7,9%	0,5%	-4,2%
To be autonomous or independent	-4,7%	3,3%	-4,2%	-0,6%	0,1%	-1,2%	-1,2%
To be competitively or intellectually challenged	-4,5%	-4,9%	-2,9%	-3,0%	-9,0%	-3,0%	-4,6%
To be dedicated to a cause or to feel that I am serving a greater good	-0,3%	5,5%	1,6%	2,1%	-4,3%	-3,8%	0,1%
To be entrepreneurial or creative/innovative	7,5%	-1,2%	4,7%	2,0%	-4,0%	5,7%	2,5%
To be secure or stable in my job	7,1%	4,7%	-3,7%	3,4%	26,5%	1,2%	6,5%
To have an international career	1,1%	-2,8%	-0,8%	4,9%	-1,8%	1,9%	0,4%
To have work/life balance	-8,0%	-4,9%	-2,7%	-3,4%	5,4%	-8,4%	-3,6%

## 5.2. Students' soft skills

### Engineering students' perception of their soft skills

Table 14. Engineering students' perception about their **strongest** soft skills

Soft skills - Strong	BE	DK	FI	FR	IE	SE	Average
Adaptability	27,6%	29,4%	35,2%	42,7%	31,8%	32,5%	33,2%
Communication	20,4%	19,3%	19,5%	20,1%	23,2%	18,3%	20,1%
Flexibility	30,8%	25,1%	32,7%	21,3%	15,9%	21,9%	24,6%
Integrity	7,2%	11,8%	23,3%	22,5%	13,7%	7,5%	14,3%
Positive attitude	44,8%	33,3%	41,8%	44,1%	35,2%	39,8%	39,8%
Problem-solving	52,3%	51,5%	45,3%	24,1%	53,6%	55,9%	47,1%
Responsibility	45,2%	47,8%	43,9%	46,2%	30,7%	45,3%	43,2%
Team work	33,7%	34,5%	27,2%	40,3%	37,7%	24,3%	32,9%
Time management	13,8%	9,9%	11,8%	16,9%	16,8%	14,1%	13,9%
Work ethic	14,5%	32,9%	12,8%	17,7%	37,4%	34,2%	24,9%

Table 15. Engineering students' perception about their **strongest** soft skills (ranked from strongest (1) to the weakest (10) skills)

Engineering Students	BE	DK	FI	FR	IE	SE	Average
Adaptability	6	6	4	3	5	5	4
Communication	7	8	8	8	7	8	8
Flexibility	5	7	5	7	9	7	7
Integrity	10	9	7	6	10	10	9
Positive attitude	3	4	3	2	4	3	3
Problem-solving	1	1	1	5	1	1	1
Responsibility	2	2	2	1	6	2	2
Team work	4	3	6	4	2	6	5
Time management	9	10	10	10	8	9	10
Work ethic	8	5	9	9	3	4	6

Table 16. Engineering students' perceptions of their **weak** soft skills.

Engineering students	BE	DK	FI	FR	IE	SE	Average
Adaptability	22,0%	22,3%	16,1%	11,7%	26,0%	17,8%	<b>19,3%</b>
Communication	49,5%	50,1%	46,8%	55,9%	42,7%	46,8%	<b>48,6%</b>
Flexibility	15,7%	17,2%	13,3%	18,2%	24,6%	21,3%	<b>18,4%</b>
Integrity	14,5%	16,7%	15,1%	8,0%	11,6%	18,7%	<b>14,1%</b>
Positive attitude	14,3%	17,2%	12,9%	18,7%	19,8%	16,2%	<b>16,5%</b>
Problem-solving	19,6%	28,6%	32,0%	25,0%	23,2%	25,4%	<b>25,6%</b>
Responsibility	20,1%	23,7%	13,6%	18,3%	22,3%	14,9%	<b>18,8%</b>
Team work	24,8%	24,2%	27,5%	29,8%	24,6%	24,8%	<b>25,9%</b>
Time management	57,2%	49,2%	59,1%	56,1%	52,3%	46,8%	<b>53,4%</b>
Work ethic	19,6%	20,8%	17,4%	12,3%	21,2%	12,4%	<b>17,3%</b>

Table 17. The ranking of the perceptions of engineering students' **weak** soft skills.

	BE	DK	FI	FR	IE	SE	Average Rank
Adaptability	4	6	6	9	3	7	5
Communication	2	1	2	2	2	1	2
Flexibility	8	8	9	7	4	5	7
Integrity	9	10	7	10	10	6	10
Positive attitude	10	8	10	5	9	8	9
Problem-solving	6	3	3	4	6	3	4
Responsibility	5	5	8	6	7	9	6
Team work	3	4	4	3	4	4	3
Time management	1	2	1	1	1	2	1
Work ethic	6	7	5	8	8	10	8

## Humanities students' perception of their soft skills

Table 18. Humanities students' perceived **strongest** soft skills.

<b>HUMANITIES Strong Skills</b>	BE	DK	FI	FR	IE	SE	<b>Average</b>
Adaptability	24,6%	26,3%	34,6%	52,7%	29,6%	31,6%	<b>33,2%</b>
Communication	32,5%	39,2%	29,1%	19,6%	39,1%	28,7%	<b>31,4%</b>
Flexibility	31,2%	18,9%	29,6%	16,3%	14,9%	21,9%	<b>22,1%</b>
Integrity	17,3%	14,9%	18,5%	24,7%	16,2%	14,3%	<b>17,7%</b>
Positive attitude	48,4%	40,7%	44,1%	42,9%	48,1%	41,2%	<b>44,2%</b>
Problem-solving	33,0%	30,5%	32,9%	19,1%	27,6%	38,0%	<b>30,2%</b>
Responsibility	51,9%	53,4%	45,8%	56,9%	37,0%	50,4%	<b>49,2%</b>
Team work	28,1%	28,3%	28,3%	24,9%	28,8%	17,2%	<b>25,9%</b>
Time management	12,4%	5,7%	14,5%	14,5%	15,7%	12,9%	<b>12,6%</b>
Work ethic	16,0%	38,8%	20,2%	24,5%	40,7%	38,2%	<b>29,7%</b>

Table 19. Humanities students' ranked perceived **strongest** soft skills.

	BE	DK	FI	FR	IE	SE	Average
Adaptability	7	7	3	2	5	5	3
Communication	4	3	6	7	3	6	4
Flexibility	5	8	5	9	10	7	8
Integrity	8	9	9	5	8	9	9
Positive attitude	2	2	2	3	1	2	2
Problem-solving	3	5	4	8	7	4	5
Responsibility	1	1	1	1	4	1	1
Team work	6	6	7	4	6	8	7
Time management	10	10	10	10	9	10	10
Work ethic	9	4	8	6	2	3	6

Table 20. Engineering versus humanities students' differences of perceived **strongest** soft skills.

Engineering/Humanities students differences							
<b>Soft skills - Strong</b>	BE	DK	FI	FR	IE	SE	<b>Average</b>
Adaptability	3,0%	3,2%	0,5%	-10,0%	2,3%	0,9%	<b>0,0%</b>
Communication	-12,2%	-20,0%	-9,6%	0,6%	-15,9%	-10,4%	<b>-11,3%</b>
Flexibility	-0,4%	6,2%	3,1%	5,0%	1,0%	0,0%	<b>2,5%</b>
Integrity	-10,0%	-3,1%	4,8%	-2,2%	-2,6%	-6,8%	<b>-3,3%</b>
Positive attitude	-3,6%	-7,4%	-2,3%	1,2%	-12,9%	-1,4%	<b>-4,4%</b>
Problem-solving	19,2%	21,0%	12,4%	5,0%	26,1%	17,9%	<b>16,9%</b>
Responsibility	-6,7%	-5,6%	-1,9%	-10,7%	-6,3%	-5,1%	<b>-6,1%</b>
Team work	5,6%	6,2%	-1,1%	15,4%	8,9%	7,1%	<b>7,0%</b>
Time management	1,4%	4,2%	-2,7%	2,4%	1,0%	1,2%	<b>1,2%</b>
Work ethic	-1,5%	-5,9%	-7,4%	-6,8%	-3,2%	-3,9%	<b>-4,8%</b>

Table 21. Engineering versus humanities differences in their perceptions about their **strongest** soft skills.

Engineering/Humanities diff.	Rank						
	BE	DK	FI	FR	IE	SE	Average
<b>Soft skills - Strong</b>							
Adaptability	1	1	-1	-1	0	0	-1
Communication	-3	-5	-2	-1	-4	-2	-4
Flexibility	0	1	0	2	1	0	1
Integrity	-2	0	2	-1	-2	-1	0
Positive attitude	-1	-2	-1	1	-3	-1	-1
Problem-solving	2	4	3	3	6	3	4
Responsibility	-1	-1	-1	0	-2	-1	-1
Team work	2	3	1	0	4	2	2
Time management	1	0	0	0	1	1	0
Work ethic	1	-1	-1	-3	-1	-1	0

Table 22. Humanities students' perception of their **weak** soft skills.

HUMANITIES							
<b>Soft skills - Improve</b>	BE	DK	FI	FR	IE	SE	Average
Adaptability	20,9%	22,2%	20,8%	7,4%	27,8%	18,4%	19,6%
Communication	36,7%	34,0%	36,4%	44,7%	32,7%	36,1%	36,7%
Flexibility	16,8%	22,8%	14,4%	19,9%	24,4%	21,9%	20,0%
Integrity	12,5%	13,3%	18,0%	7,5%	16,1%	22,0%	14,9%
Positive attitude	19,5%	18,2%	17,2%	23,8%	17,4%	15,2%	18,5%
Problem-solving	26,8%	35,2%	37,2%	19,3%	36,5%	29,7%	30,8%
Responsibility	16,9%	18,1%	12,2%	14,8%	20,1%	11,3%	15,6%
Team work	32,4%	27,6%	23,1%	39,9%	25,9%	25,4%	29,0%
Time management	56,0%	44,8%	63,3%	55,9%	51,2%	45,5%	52,8%
Work ethic	13,7%	17,5%	8,7%	10,9%	13,9%	9,9%	12,4%

Table 23. Ranking of the humanities students' perception of their **weak** soft skills.

	BE	DK	FI	FR	IE	SE	Average
Adaptability	5	6	5	10	4	7	6
Communication	2	3	3	2	3	2	2
Flexibility	8	5	8	5	6	6	5
Integrity	10	10	6	9	9	5	9
Positive attitude	6	7	7	4	8	8	7
Problem-solving	4	2	2	6	2	3	3
Responsibility	7	8	9	7	7	9	8
Team work	3	4	4	3	5	4	4
Time management	1	1	1	1	1	1	1
Work ethic	9	9	10	8	10	10	10

Table 24. Engineering versus humanities students' differences of their perceptions of their **weak** soft skills.

Engineering/Humanities diff.							
<b>Soft skills - Improve</b>	BE	DK	FI	FR	IE	SE	<b>Average</b>
Adaptability	1,0%	0,1%	-4,7%	4,3%	-1,8%	-0,6%	<b>-0,3%</b>
Communication	12,9%	16,2%	10,4%	11,2%	9,9%	10,7%	<b>11,9%</b>
Flexibility	-1,1%	-5,6%	-1,1%	-1,8%	0,1%	-0,6%	<b>-1,7%</b>
Integrity	2,0%	3,4%	-2,9%	0,6%	-4,5%	-3,3%	<b>-0,8%</b>
Positive attitude	-5,2%	-1,0%	-4,3%	-5,1%	2,4%	1,1%	<b>-2,0%</b>
Problem-solving	-7,1%	-6,5%	-5,2%	5,7%	-13,3%	-4,3%	<b>-5,1%</b>
Responsibility	3,2%	5,6%	1,4%	3,5%	2,2%	3,6%	<b>3,2%</b>
Team work	-7,6%	-3,4%	4,4%	-10,1%	-1,3%	-0,5%	<b>-3,1%</b>
Time management	1,2%	4,3%	-4,3%	0,2%	1,1%	1,3%	<b>0,6%</b>
Work ethic	6,0%	3,2%	8,7%	1,3%	7,3%	2,5%	<b>4,8%</b>

Table 25. Ranking of the differences of engineering versus humanities students' perceptions of their **weak** soft skills.

Engineering/Humanities diff.	Rank						
	BE	DK	FI	FR	IE	SE	Average
<b>Soft skills - Improve</b>							
Adaptability	1	0	-1	1	1	0	<b>1</b>
Communication	0	2	1	0	1	1	<b>0</b>
Flexibility	0	-3	-1	-2	2	1	<b>-2</b>
Integrity	1	0	-1	-1	-1	-1	<b>-1</b>
Positive attitude	-4	-1	-3	-1	-1	0	<b>-2</b>
Problem-solving	-2	-1	-1	2	-4	0	<b>-1</b>
Responsibility	2	3	1	1	0	0	<b>2</b>
Team work	0	0	0	0	1	0	<b>1</b>
Time management	0	-1	0	0	0	-1	<b>0</b>
Work ethic	3	2	5	0	2	0	<b>2</b>

## Female and male engineering students' perception of their soft skills

Table 26. Male engineering students' perception about their **strongest** soft skills.

<b>MALE Strongest soft skills</b>	BE	DK	FI	FR	IE	SE	Average
Adaptability	31,4%	31,6%	38,9%	42,3%	31,8%	35,4%	<b>35,2%</b>
Communication	18,8%	16,4%	18,0%	20,8%	23,6%	16,9%	<b>19,1%</b>
Flexibility	32,8%	24,4%	31,0%	23,1%	17,1%	24,1%	<b>25,4%</b>
Integrity	8,4%	13,6%	29,4%	22,0%	15,7%	8,4%	<b>16,2%</b>
Positive attitude	43,5%	32,3%	39,3%	44,8%	34,7%	35,5%	<b>38,4%</b>
Problem-solving	58,0%	58,9%	48,9%	27,6%	56,4%	61,7%	<b>51,9%</b>
Responsibility	41,0%	43,9%	40,2%	42,8%	29,2%	40,7%	<b>39,6%</b>
Team work	31,1%	32,5%	25,7%	40,2%	35,7%	26,9%	<b>32,0%</b>
Time management	12,0%	8,2%	9,1%	14,8%	15,7%	10,3%	<b>11,7%</b>
Work ethic	14,5%	32,6%	13,4%	17,1%	35,4%	33,3%	<b>24,4%</b>

Table 27. Female engineering students' perception about their **strongest** soft skills.

FEMALE Strongest soft skills	BE	DK	FI	FR	IE	SE	Average
Adaptability	25,0%	26,7%	31,8%	43,8%	35,9%	29,2%	<b>32,1%</b>
Communication	26,8%	20,8%	17,8%	20,1%	27,6%	20,0%	<b>22,2%</b>
Flexibility	31,5%	26,7%	32,6%	16,7%	11,0%	17,9%	<b>22,8%</b>
Integrity	9,1%	7,6%	14,9%	23,2%	11,0%	7,0%	<b>12,1%</b>
Positive attitude	43,8%	37,5%	45,1%	42,7%	34,5%	44,5%	<b>41,3%</b>
Problem-solving	41,3%	37,5%	43,0%	17,4%	51,7%	48,2%	<b>39,8%</b>
Responsibility	48,2%	57,0%	50,9%	52,6%	35,2%	53,4%	<b>49,6%</b>
Team work	32,2%	33,8%	26,0%	38,8%	42,1%	19,3%	<b>32,0%</b>
Time management	19,2%	11,5%	17,8%	21,6%	17,9%	20,3%	<b>18,1%</b>
Work ethic	13,4%	37,8%	15,4%	19,5%	31,0%	35,2%	<b>25,4%</b>

Table 28. Male engineering students' perception about their ranked **strongest** soft skills.

Soft skills – Strong - Male	BE	DK	FI	FR	IE	SE	Average
Adaptability	5	6	4	3	5	4	4
Communication	7	8	8	8	7	8	8
Flexibility	4	7	5	6	8	7	6
Integrity	10	9	6	7	9	10	9
Positive attitude	2	5	3	1	4	3	3
Problem-solving	1	1	1	5	1	1	1
Responsibility	3	2	2	2	6	2	2
Team work	6	4	7	4	2	6	5
Time management	9	10	10	10	9	9	10
Work ethic	8	3	9	9	3	5	7



Table 29. Female engineering students' perception about their ranked **strongest** soft skills.

Soft skills – Strong - Female	BE	DK	FI	FR	IE	SE	Average
Adaptability	7	6	5	2	3	5	4
Communication	6	8	7	7	7	7	8
Flexibility	5	6	4	10	9	9	7
Integrity	10	10	10	5	9	10	10
Positive attitude	2	3	2	3	5	3	2
Problem-solving	3	3	3	9	1	2	3
Responsibility	1	1	1	1	4	1	1
Team work	4	5	6	4	2	8	5
Time management	8	9	7	6	8	6	9
Work ethic	9	2	9	8	6	4	6

Table 30. Female versus male engineering students' difference of perceived **strongest** soft skills

FEMALE vs MALE	Rank						
Soft skills - Strong	BE	DK	FI	FR	IE	SE	Average
Adaptability	-2	0	-1	1	2	-1	0
Communication	1	0	1	1	0	1	0
Flexibility	-1	1	1	-4	-1	-2	-1
Integrity	0	-1	-4	2	0	0	-1
Positive attitude	0	2	1	-2	-1	0	1
Problem-solving	-2	-2	-2	-4	0	-1	-2
Responsibility	2	1	1	1	2	1	1
Team work	2	-1	1	0	0	-2	0
Time management	1	1	3	4	1	3	1
Work ethic	-1	1	0	1	-3	1	1

Table 31. Male engineering students' perception of their **weak** soft skills.

<b>MALE Soft skills Improve</b>	BE	DK	FI	FR	IE	SE	<b>Average</b>
Adaptability	20,10%	20,60%	15,40%	11,40%	28,10%	16,00%	<b>18,60%</b>
Communication	48,30%	50,90%	48,90%	56,00%	43,20%	48,80%	<b>49,30%</b>
Flexibility	15,40%	15,30%	14,20%	17,40%	23,50%	20,20%	<b>17,70%</b>
Integrity	13,50%	15,50%	12,20%	8,80%	13,40%	17,80%	<b>13,50%</b>
Positive attitude	14,40%	17,30%	15,00%	17,20%	17,00%	16,20%	<b>16,20%</b>
Problem-solving	16,40%	25,60%	29,40%	22,00%	23,50%	23,30%	<b>23,30%</b>
Responsibility	21,20%	24,50%	16,00%	20,20%	21,60%	17,70%	<b>20,20%</b>
Team work	25,60%	23,30%	26,80%	30,40%	23,70%	24,70%	<b>25,80%</b>
Time management	60,90%	52,30%	58,10%	58,20%	50,80%	51,80%	<b>55,40%</b>
Work ethic	21,60%	23,50%	19,10%	13,30%	24,70%	15,40%	<b>19,60%</b>

Table 32. Female engineering students' perception of their **weak** soft skills.

<b>FEMALE Soft skills improve.</b>	BE	DK	FI	FR	IE	SE	<b>Average</b>
Adaptability	23,0%	25,0%	19,5%	12,7%	24,5%	18,7%	<b>20,6%</b>
Communication	40,0%	45,2%	47,1%	55,5%	37,8%	45,2%	<b>45,1%</b>
Flexibility	13,3%	18,5%	12,8%	19,3%	31,5%	24,4%	<b>20,0%</b>
Integrity	11,9%	15,5%	18,2%	6,0%	11,9%	19,9%	<b>13,9%</b>
Positive attitude	17,8%	18,1%	13,9%	22,7%	23,1%	15,7%	<b>18,6%</b>
Problem-solving	28,5%	37,2%	34,0%	31,1%	26,6%	28,5%	<b>31,0%</b>
Responsibility	20,0%	22,1%	7,5%	14,2%	19,6%	11,1%	<b>15,8%</b>
Team work	29,3%	27,1%	29,4%	29,0%	25,2%	26,9%	<b>27,8%</b>
Time management	51,5%	40,8%	57,0%	51,9%	57,3%	40,1%	<b>49,8%</b>
Work ethic	17,0%	16,2%	11,0%	9,6%	13,3%	8,9%	<b>12,7%</b>

Table 33. Ranking of the **weak** soft skills of male engineering students.

Soft skills - Improve	BE	DK	FI	FR	IE	SE	Average
Adaptability	6	7	7	9	3	9	7
Communication	2	2	2	2	2	2	2
Flexibility	8	10	9	6	6	5	8
Integrity	10	9	10	10	10	6	10
Positive attitude	9	8	8	7	9	8	9
Problem-solving	7	3	3	4	6	4	4
Responsibility	5	4	6	5	8	7	5
Team work	3	6	4	3	5	3	3
Time management	1	1	1	1	1	1	1
Work ethic	4	5	5	8	4	10	6

Table 34. Ranking of the **weak** soft skills of female engineering students.

	BE	DK	FI	FR	IE	SE	Average
Adaptability	5	5	5	8	6	7	5
Communication	2	1	2	1	2	1	2
Flexibility	9	7	8	6	3	5	6
Integrity	10	10	6	10	10	6	9
Positive attitude	7	8	7	5	7	8	7
Problem-solving	4	3	3	3	4	3	3
Responsibility	6	6	10	7	8	9	8
Team work	3	4	4	4	5	4	4
Time management	1	2	1	2	1	2	1
Work ethic	8	9	9	9	9	10	10

Table 35. Female versus male engineering students' difference of perceived weak soft skills

Soft skills - Improve	BE	DK	FI	FR	IE	SE	Average
Adaptability	-1	-2	-2	-1	3	-2	-2
Communication	0	-1	0	-1	0	-1	0
Flexibility	1	-3	-1	0	-3	0	-2
Integrity	0	1	-4	0	0	0	-1
Positive attitude	-2	0	-1	-2	-2	0	-2
Problem-solving	-3	0	0	-1	-2	-1	-1
Responsibility	1	2	4	2	0	2	3
Team work	0	-2	0	1	0	1	1
Time management	0	1	0	1	0	1	0
Work ethic	4	4	4	1	5	0	4

## Gen Z and Gen Y engineering students' perception of their soft skills

Table 36. Perception of their **strongest** soft skills of Gen Z.

GEN Z (today at the age of 17-22 years)							
Soft skills - Strong	BE	DK	FI	FR	IE	SE	Average
Adaptability	24,6%	31,4%	34,9%	40,2%	31,9%	33,4%	32,8%
Communication	21,8%	20,3%	18,3%	20,2%	21,4%	17,4%	19,9%
Flexibility	33,8%	26,1%	28,6%	20,7%	13,4%	16,6%	23,2%
Integrity	6,1%	9,6%	22,5%	22,6%	14,7%	7,4%	13,8%
Positive attitude	43,0%	29,9%	45,2%	45,9%	35,3%	38,4%	39,6%
Problem-solving	52,6%	52,5%	45,5%	22,3%	51,7%	61,0%	47,6%
Responsibility	45,1%	48,3%	46,8%	47,1%	34,5%	49,4%	45,2%
Team work	35,8%	33,0%	25,4%	39,2%	37,8%	20,3%	31,9%
Time management	13,7%	10,3%	14,0%	18,4%	16,8%	16,8%	15,0%
Work ethic	13,0%	35,2%	11,9%	18,4%	39,1%	32,1%	25,0%

Table 37. Perception of their **strongest** soft skills of Gen Y.

GEN Y (today at the age of 23-38 years)							
Soft skills - Strong	BE	DK	FI	FR	IE	SE	Average
Adaptability	33,6%	28,8%	37,6%	46,5%	32,5%	33,3%	35,4%
Communication	17,5%	19,1%	17,6%	20,0%	26,5%	18,8%	19,9%
Flexibility	24,8%	25,0%	32,7%	22,0%	21,4%	21,9%	24,6%
Integrity	9,4%	12,3%	24,7%	22,4%	11,1%	9,3%	14,9%
Positive attitude	48,3%	34,8%	39,6%	41,4%	35,0%	37,6%	39,5%
Problem-solving	51,7%	50,8%	47,9%	26,8%	57,3%	58,8%	48,9%
Responsibility	45,6%	47,5%	42,4%	44,5%	23,1%	44,4%	41,3%
Team work	29,5%	35,3%	26,6%	41,8%	38,5%	26,2%	33,0%
Time management	14,1%	9,7%	11,0%	14,7%	15,4%	12,7%	12,9%
Work ethic	17,5%	32,2%	15,1%	16,7%	34,2%	31,8%	24,6%

Table 38. Gen Z versus Gen Y perception of their **strongest** soft skills.

GEN Z / GEN Y difference							
Soft skills - Strong	BE	DK	FI	FR	IE	SE	Average
Adaptability	-9,0%	2,6%	-2,7%	-6,3%	-0,5%	0,1%	-2,6%
Communication	4,4%	1,2%	0,7%	0,2%	-5,1%	-1,3%	0,0%
Flexibility	9,0%	1,0%	-4,1%	-1,2%	-7,9%	-5,3%	-1,4%
Integrity	-3,3%	-2,7%	-2,2%	0,2%	3,6%	-1,9%	-1,0%
Positive attitude	-5,3%	-4,9%	5,6%	4,5%	0,3%	0,9%	0,2%
Problem-solving	0,9%	1,7%	-2,4%	-4,4%	-5,6%	2,2%	-1,3%
Responsibility	-0,6%	0,7%	4,4%	2,6%	11,4%	5,0%	3,9%
Team work	6,3%	-2,3%	-1,2%	-2,6%	-0,6%	-5,8%	-1,0%
Time management	-0,4%	0,6%	3,0%	3,7%	1,4%	4,1%	2,1%
Work ethic	-4,5%	3,1%	-3,2%	1,8%	4,9%	0,3%	0,4%

Table 39. Engineering students of Gen Z's perception of their **weak** soft skills.

GEN Z (today at the age of 17-22 years)							
Soft skills - Improve	BE	DK	FI	FR	IE	SE	Average
Adaptability	22,8%	20,1%	17,2%	13,5%	24,5%	17,5%	19,3%
Communication	49,5%	45,0%	48,3%	55,0%	42,6%	45,4%	47,6%
Flexibility	15,3%	18,9%	16,4%	18,9%	20,7%	21,7%	18,7%
Integrity	17,1%	15,7%	18,3%	8,3%	12,2%	14,3%	14,3%
Positive attitude	13,9%	20,1%	14,6%	18,2%	19,4%	15,6%	17,0%
Problem-solving	19,2%	27,7%	31,3%	23,9%	24,9%	25,1%	25,4%
Responsibility	20,3%	27,3%	15,1%	18,3%	22,4%	14,6%	19,7%
Team work	23,8%	30,1%	31,3%	31,9%	26,6%	29,6%	28,9%
Time management	56,2%	45,4%	49,6%	55,9%	52,7%	47,3%	51,2%
Work ethic	18,9%	22,9%	19,4%	11,9%	21,9%	16,4%	18,6%

Table 40. Engineering students of GEN Y's perception of their weak soft skills.

GEN Y (today at the age of 23-38 years)							
Soft skills - Improve	BE	DK	FI	FR	IE	SE	Average
Adaptability	20,4%	23,3%	15,8%	8,9%	28,9%	17,6%	19,1%
Communication	49,7%	52,4%	48,3%	57,2%	43,0%	48,8%	49,9%
Flexibility	16,3%	16,5%	11,8%	17,1%	33,3%	23,1%	19,7%
Integrity	9,5%	17,2%	12,7%	7,7%	10,5%	20,5%	13,0%
Positive attitude	15,0%	15,9%	15,2%	19,4%	19,3%	15,7%	16,8%
Problem-solving	20,4%	29,1%	30,0%	26,7%	19,3%	24,7%	25,0%
Responsibility	19,7%	22,4%	11,9%	18,4%	22,8%	14,6%	18,3%
Team work	26,5%	21,9%	25,9%	26,6%	20,2%	24,0%	24,2%
Time management	59,2%	50,6%	62,4%	56,4%	51,8%	47,8%	54,7%
Work ethic	21,1%	20,1%	14,9%	12,7%	20,2%	11,3%	16,7%

Table 41. Gen Z versus Gen Y differences of their perception of their **weak** soft skills. A positive number indicates that Gen Z percentages are greater than Gen Y percentages and a negative number indicates that Gen Y percentages are greater than Gen Z percentages.

GEN Z / GEN Y difference							
Soft skills - Improve	BE	DK	FI	FR	IE	SE	Average
Adaptability	2,4%	-3,2%	1,5%	4,6%	-4,5%	-0,1%	0,1%
Communication	-0,2%	-7,4%	0,0%	-2,2%	-0,4%	-3,5%	-2,3%
Flexibility	-1,0%	2,4%	4,7%	1,8%	-12,7%	-1,3%	-1,0%
Integrity	7,6%	-1,5%	5,6%	0,6%	1,7%	-6,2%	1,3%
Positive attitude	-1,1%	4,1%	-0,6%	-1,2%	0,1%	-0,2%	0,2%
Problem-solving	-1,2%	-1,4%	1,3%	-2,8%	5,6%	0,4%	0,3%
Responsibility	0,6%	4,9%	3,2%	-0,1%	-0,4%	0,0%	1,4%
Team work	-2,7%	8,2%	5,4%	5,2%	6,4%	5,7%	4,7%
Time management	-3,0%	-5,2%	-12,8%	-0,5%	1,0%	-0,5%	-3,5%
Work ethic	-2,2%	2,8%	4,5%	-0,8%	1,8%	5,1%	1,8%

## 5.3. Attractive employer attributes

### Engineering students' attractive employer attributes

Table 42. Engineering students' attractive employer attributes

Attractive employer attributes	BE	DK	FI	FR	IE	SE	Aver.
A creative and dynamic work environment	46,6%	48,6%	34,0%	42,8%	41,8%	53,9%	44,6%
Challenging work	50,2%	36,0%	23,9%	55,0%	29,0%	43,5%	39,6%
Commitment to diversity and inclusion	7,1%	9,5%	11,5%	9,6%	9,5%	16,7%	10,7%
Competitive base salary	33,8%	42,8%	50,0%	41,3%	37,5%	32,9%	39,7%
Corporate Social Responsibility	16,4%	18,4%	17,2%	18,1%	11,7%	18,6%	16,7%
Embracing new technologies	45,6%	40,6%	38,0%	25,1%	42,3%	26,8%	36,4%
Encouraging work-life balance	20,6%	25,4%	30,6%	32,4%	41,9%	33,1%	30,7%
Ethical standards	11,0%	20,3%	23,6%	29,5%	26,0%	18,6%	21,5%
Innovation	53,2%	41,3%	39,6%	45,9%	50,8%	38,6%	44,9%
Inspiring purpose	20,1%	37,7%	25,3%	34,6%	28,2%	42,8%	31,4%
Interaction with international clients and colleagues	23,0%	28,4%	17,6%	24,4%	16,9%	21,8%	22,0%
Professional training and development	40,6%	42,9%	40,3%	31,5%	44,7%	45,0%	40,8%
Respect for its people	37,7%	37,7%	39,6%	28,7%	34,6%	37,3%	35,9%
Sponsorship of future education	28,2%	25,2%	19,5%	23,5%	23,1%	20,6%	23,3%
Support for gender equality	19,2%	23,1%	23,9%	27,3%	16,9%	29,4%	23,3%



Table 43. Ranking of attractive employer attributes of engineering students

	BE	DK	FI	FR	IE	SE	Rank of Average
A creative and dynamic work environment	3	1	6	3	5	1	2
Challenging work	2	8	9	1	8	3	5
Commitment to diversity and inclusion	15	15	15	15	15	15	15
Competitive base salary	7	3	1	4	6	8	4
Corporate Social Responsibility	13	14	14	14	14	14	14
Embracing new technologies	4	5	5	11	3	10	6
Encouraging work-life balance	10	10	7	6	4	7	9
Ethical standards	14	13	11	8	10	13	13
Innovation	1	4	3	2	1	5	1
Inspiring purpose	11	7	8	5	9	4	8
Interaction with international clients and colleagues	9	9	13	12	12	11	12
Professional training and development	5	2	2	7	2	2	3
Respect for its people	6	6	4	9	7	6	7
Sponsorship of future education	8	11	12	13	11	12	10
Support for gender equality	12	12	10	10	13	9	11

## Humanities students' attractive employer attributes

Table 44. Humanities students' attractive employer attributes.

Humanities students –attractive employer attributes	BE	DK	FI	FR	IE	SE	Average
A creative and dynamic work environment	52,9%	52,0%	43,7%	40,5%	42,0%	53,1%	47,4%
Challenging work	49,2%	33,9%	20,3%	60,2%	25,8%	41,3%	38,4%
Commitment to diversity and inclusion	29,6%	17,6%	16,7%	26,1%	27,1%	34,0%	25,2%
Competitive base salary	23,4%	34,7%	48,9%	36,4%	24,8%	25,2%	32,2%
Corporate Social Responsibility	36,3%	45,9%	36,6%	27,2%	19,5%	38,5%	34,0%
Embracing new technologies	16,0%	12,3%	12,7%	11,8%	18,2%	7,0%	13,0%
Encouraging work-life balance	25,3%	29,1%	30,6%	26,7%	38,5%	33,0%	30,5%
Ethical standards	45,1%	40,6%	49,5%	52,8%	49,0%	37,9%	45,8%
Innovation	27,6%	20,8%	31,7%	26,8%	33,4%	17,5%	26,3%
Inspiring purpose	45,3%	58,1%	47,7%	53,8%	52,9%	70,0%	54,6%
Interaction with international clients and colleagues	19,6%	25,2%	20,2%	27,2%	16,9%	20,2%	21,6%
Professional training and development	35,4%	38,7%	33,4%	20,8%	45,4%	43,9%	36,3%
Respect for its people	49,9%	38,4%	49,2%	26,7%	49,5%	45,0%	43,1%
Sponsorship of future education	32,1%	18,0%	19,3%	20,9%	24,8%	21,4%	22,8%
Support for gender equality	47,9%	37,4%	44,6%	43,1%	31,8%	43,0%	41,3%

Table 45. Ranking of humanities students' attractive employer attributes

	BE	DK	FI	FR	IE	SE	Rank of Average
A creative and dynamic work environment	1	2	6	5	5	2	2
Challenging work	3	9	11	1	10	6	6
Commitment to diversity and inclusion	10	14	14	12	9	9	12
Competitive base salary	13	8	3	6	12	11	9
Corporate Social Responsibility	7	3	7	8	13	7	8
Embracing new technologies	15	15	15	15	14	15	15
Encouraging work-life balance	12	10	10	10	6	10	10
Ethical standards	6	4	1	3	3	8	3
Innovation	11	12	9	9	7	14	11
Inspiring purpose	5	1	4	2	1	1	1
Interaction with international clients and colleagues	14	11	12	7	15	13	14
Professional training and development	8	5	8	14	4	4	7
Respect for its people	2	6	2	11	2	3	4
Sponsorship of future education	9	13	13	13	11	12	13
Support for gender equality	4	7	5	4	8	5	5

Table 46. Engineering students' attractive employer attributes versus humanities students' attractive employer attributes.

Engineering/Humanities attributes diff.	BE	DK	FI	FR	IE	SE	Aver.
A creative and dynamic work environment	-6,3%	-3,4%	-9,7%	2,4%	-0,2%	0,8%	-2,7%
Challenging work	1,0%	2,1%	3,7%	-5,2%	3,2%	2,2%	1,2%
Commitment to diversity & inclusion	-22,5%	-8,1%	-5,2%	-16,6%	-17,6%	-17,3%	-14,5%
Competitive base salary	10,4%	8,1%	1,1%	4,9%	12,7%	7,7%	7,5%
Corporate Social Responsibility	-19,9%	-27,5%	-19,5%	-9,1%	-7,8%	-19,9%	-17,3%
Embracing new technologies	29,7%	28,3%	25,3%	13,3%	24,1%	19,8%	23,4%
Encouraging work-life balance	-4,7%	-3,7%	0,1%	5,7%	3,4%	0,2%	0,2%
Ethical standards	-34,1%	-20,3%	-25,9%	-23,3%	-23,0%	-19,3%	-24,3%
Innovation	25,5%	20,6%	8,0%	19,1%	17,5%	21,2%	18,6%
Inspiring purpose	-25,1%	-20,5%	-22,4%	-19,2%	-24,7%	-27,2%	-23,2%
Interaction with international clients and colleagues	3,4%	3,2%	-2,6%	-2,8%	0,0%	1,6%	0,5%
Professional training & development	5,2%	4,2%	6,9%	10,7%	-0,6%	1,1%	4,6%
Respect for its people	-12,2%	-0,6%	-9,6%	2,0%	-14,9%	-7,7%	-7,2%
Sponsorship of future education	-4,0%	7,3%	0,1%	2,6%	-1,7%	-0,8%	0,6%
Support for gender equality	-28,6%	-14,3%	-20,7%	-15,8%	-15,0%	-13,6%	-18,0%

## Female and male engineering students' attractive employer attributes

Table 47. Female engineering students' attractive employer attributes

Female - Engineering - attractive employer attributes	BE	DK	FI	FR	IE	SE	Average
A creative and dynamic work environment	52,4%	50,4%	37,1%	42,3%	40,6%	54,3%	46,2%
Challenging work	46,0%	32,6%	18,7%	50,2%	21,9%	38,4%	34,6%
Commitment to diversity and inclusion	7,9%	9,1%	12,5%	12,0%	13,4%	23,5%	13,1%
Competitive base salary	21,0%	38,4%	48,1%	33,5%	25,5%	30,4%	32,8%
Corporate Social Responsibility	23,9%	22,8%	25,1%	20,8%	12,8%	25,4%	21,8%
Embracing new technologies	40,1%	34,7%	34,8%	19,7%	39,8%	18,4%	31,3%
Encouraging work-life balance	25,7%	28,1%	29,6%	35,7%	47,3%	39,1%	34,3%
Ethical standards	12,9%	26,9%	34,6%	39,2%	34,8%	22,3%	28,4%
Innovation	52,9%	34,4%	39,4%	41,4%	52,5%	33,0%	42,3%
Inspiring purpose	29,9%	47,7%	28,7%	38,6%	35,9%	47,3%	38,0%
Interaction with international clients and colleagues	24,2%	29,0%	16,9%	29,2%	16,6%	20,1%	22,7%
Professional training and development	36,9%	43,8%	41,9%	36,3%	43,6%	42,7%	40,9%
Respect for its people	40,7%	42,5%	43,4%	32,8%	32,9%	42,4%	39,1%
Sponsorship of future education	32,1%	23,0%	18,4%	24,7%	27,1%	20,4%	24,3%
Support for gender equality	45,6%	41,6%	46,1%	49,0%	35,5%	45,9%	43,9%

Table 48. Male engineering students' attractive employer attributes

MALE - Engineering - attractive employer attributes	BE	DK	FI	FR	IE	SE	Average
A creative and dynamic work environment	45,3%	47,8%	33,5%	43,1%	41,9%	52,1%	44,0%
Challenging work	51,1%	38,3%	30,2%	56,9%	31,6%	47,7%	42,6%
Commitment to diversity and inclusion	6,8%	9,1%	10,7%	8,4%	8,3%	11,7%	9,1%
Competitive base salary	37,2%	45,3%	50,7%	44,5%	41,1%	35,3%	42,4%
Corporate Social Responsibility	14,4%	15,6%	14,6%	16,7%	11,3%	13,8%	14,4%
Embracing new technologies	47,2%	44,1%	40,3%	27,4%	43,3%	33,1%	39,2%
Encouraging work-life balance	19,5%	23,6%	30,2%	30,9%	39,7%	30,3%	29,0%
Ethical standards	10,5%	16,3%	17,3%	25,3%	22,6%	15,4%	17,9%
Innovation	53,2%	45,1%	39,7%	47,9%	50,1%	43,5%	46,6%
Inspiring purpose	17,8%	32,3%	24,8%	32,9%	25,5%	39,3%	28,8%
Interaction with international clients and colleagues	22,6%	28,3%	17,9%	22,5%	16,9%	22,7%	21,8%
Professional training & development	41,6%	42,5%	37,6%	29,6%	44,9%	47,3%	40,6%
Respect for its people	37,0%	35,1%	36,0%	26,9%	35,1%	33,2%	33,9%
Sponsorship of future education	27,2%	26,6%	18,1%	23,1%	21,5%	20,7%	22,9%
Support for gender equality	12,5%	12,5%	11,7%	18,1%	10,5%	16,8%	13,7%

Table 49. Female versus male engineering students' attractive employer attributes

ENGINEERING - Female vs male attributes	BE	DK	FI	FR	IE	SE	Average
A creative and dynamic work environment	7,2%	2,6%	3,6%	-0,8%	-1,3%	2,2%	2,2%
Challenging work	-5,0%	-5,7%	-11,5%	-6,7%	-9,6%	-9,3%	-8,0%
Commitment to diversity and inclusion	1,1%	0,1%	1,8%	3,6%	5,1%	11,8%	3,9%
Competitive base salary	-16,2%	-7,0%	-2,6%	-11,1%	-15,6%	-5,0%	-9,6%
Corporate Social Responsibility	9,4%	7,2%	10,5%	4,1%	1,5%	11,6%	7,4%
Embracing new technologies	-7,1%	-9,4%	-5,5%	-7,6%	-3,6%	-14,7%	-8,0%
Encouraging work-life balance	6,2%	4,5%	-0,6%	4,8%	7,6%	8,8%	5,2%
Ethical standards	2,5%	10,6%	17,3%	13,9%	12,2%	6,9%	10,6%
Innovation	-0,3%	-10,7%	-0,2%	-6,5%	2,4%	-10,5%	-4,3%
Inspiring purpose	12,1%	15,4%	4,0%	5,7%	10,4%	8,0%	9,3%
Interaction with international clients and colleagues	1,5%	0,6%	-1,0%	6,7%	-0,2%	-2,6%	0,8%
Professional training and development	-4,7%	1,4%	4,2%	6,7%	-1,3%	-4,7%	0,3%
Respect for its people	3,6%	7,4%	7,4%	5,8%	-2,2%	9,2%	5,2%
Sponsorship of future education	4,8%	-3,5%	0,4%	1,6%	5,5%	-0,3%	1,4%
Support for gender equality	33,0%	29,1%	34,4%	30,8%	25,0%	29,1%	30,3%

## Gen Z and Gen Y engineering students' attractive employer attributes

Table 50. Attractive employer attributes of Gen Z.

GEN Z (17-22 years old)							
Attractive employer attributes	BE	DK	FI	FR	IE	SE	Aver.
A creative and dynamic work environment	48,2%	48,6%	36,9%	44,2%	43,0%	54,8%	46,0%
Challenging work	49,5%	37,0%	23,2%	54,0%	26,2%	45,8%	39,3%
Commitment to diversity and inclusion	6,8%	9,2%	11,8%	9,4%	9,0%	16,0%	10,4%
Competitive base salary	31,1%	40,4%	46,9%	39,3%	35,9%	28,7%	37,0%
Corporate Social Responsibility	16,1%	17,5%	15,5%	16,5%	10,3%	16,0%	15,3%
Embracing new technologies	45,7%	40,8%	41,7%	26,2%	44,3%	29,7%	38,1%
Encouraging work-life balance	17,8%	21,3%	27,1%	29,9%	41,5%	29,1%	27,8%
Ethical standards	11,2%	19,9%	23,2%	29,9%	24,7%	16,3%	20,9%
Innovation	52,1%	40,2%	41,6%	48,5%	52,3%	41,6%	46,0%
Inspiring purpose	18,5%	39,7%	25,8%	31,9%	26,7%	40,3%	30,5%
Interaction with international clients and colleagues	21,6%	29,6%	20,1%	26,3%	16,9%	26,8%	23,5%
Professional training and development	39,4%	41,2%	37,3%	28,8%	41,5%	48,8%	39,5%
Respect for its people	37,8%	33,0%	36,0%	29,1%	34,9%	34,5%	34,2%
Sponsorship of future education	24,8%	22,5%	15,2%	22,6%	22,7%	16,2%	20,7%
Support for gender equality	20,3%	22,2%	25,6%	29,3%	17,2%	27,7%	23,7%

Table 51. Attractive employer attributes of Gen Y.

GEN Y (23-38 years old)							
Attractive employer attributes	BE	DK	FI	FR	IE	SE	Aver.
A creative and dynamic work environment	43,3%	48,9%	33,5%	40,6%	40,0%	53,2%	43,3%
Challenging work	51,3%	35,6%	27,9%	56,7%	36,5%	45,6%	42,3%
Commitment to diversity and inclusion	7,9%	9,7%	11,2%	9,8%	10,9%	19,0%	11,4%
Competitive base salary	39,6%	43,8%	50,8%	44,5%	40,8%	37,2%	42,8%
Corporate Social Responsibility	17,0%	18,6%	18,7%	20,6%	14,9%	19,5%	18,2%
Embracing new technologies	45,1%	40,2%	36,5%	23,4%	37,9%	24,7%	34,6%
Encouraging work-life balance	26,5%	27,1%	31,1%	36,3%	43,1%	37,8%	33,7%
Ethical standards	10,6%	20,4%	23,3%	28,9%	28,2%	18,5%	21,6%
Innovation	55,2%	41,7%	38,7%	41,6%	46,8%	41,3%	44,2%
Inspiring purpose	23,0%	36,9%	26,1%	38,8%	32,2%	44,6%	33,6%
Interaction with international clients and colleagues	25,9%	27,9%	16,7%	21,3%	16,7%	20,9%	21,6%
Professional training and development	43,0%	43,6%	40,1%	35,8%	51,7%	45,7%	43,3%
Respect for its people	37,6%	39,9%	40,2%	28,0%	34,7%	35,2%	35,9%
Sponsorship of future education	34,5%	26,2%	20,3%	25,0%	24,5%	20,8%	25,2%
Support for gender equality	17,0%	23,6%	21,9%	24,2%	16,2%	30,7%	22,3%



Table 52. Gen Z versus Gen Y attractive employer attributes.

GEN Z / GEN Y Difference							
Attractive employer attributes	BE	DK	FI	FR	IE	SE	Average
A creative and dynamic work environment	4,9%	-0,3%	3,4%	3,6%	3,0%	1,6%	2,7%
Challenging work	-1,8%	1,5%	-4,7%	-2,6%	-10,3%	0,3%	-2,9%
Commitment to diversity and inclusion	-1,2%	-0,5%	0,6%	-0,3%	-1,9%	-3,1%	-1,1%
Competitive base salary	-8,5%	-3,4%	-3,9%	-5,2%	-4,9%	-8,6%	-5,7%
Corporate Social Responsibility	-0,9%	-1,2%	-3,2%	-4,1%	-4,6%	-3,5%	-2,9%
Embracing new technologies	0,6%	0,6%	5,2%	2,8%	6,4%	5,0%	3,4%
Encouraging work-life balance	-8,7%	-5,8%	-4,0%	-6,5%	-1,6%	-8,7%	-5,9%
Ethical standards	0,6%	-0,5%	-0,1%	1,1%	-3,5%	-2,2%	-0,8%
Innovation	-3,1%	-1,5%	2,9%	6,9%	5,5%	0,3%	1,8%
Inspiring purpose	-4,5%	2,7%	-0,2%	-6,8%	-5,5%	-4,3%	-3,1%
Interaction with international clients and colleagues	-4,3%	1,7%	3,4%	5,0%	0,2%	5,9%	2,0%
Professional training and development	-3,6%	-2,4%	-2,8%	-7,1%	-10,2%	3,1%	-3,8%
Respect for its people	0,2%	-6,9%	-4,3%	1,0%	0,2%	-0,6%	-1,7%
Sponsorship of future education	-9,7%	-3,8%	-5,1%	-2,4%	-1,8%	-4,5%	-4,6%
Support for gender equality	3,3%	-1,4%	3,7%	5,1%	1,0%	-2,9%	1,5%