First Anniversary
Engineers Europe Advisory Group

“The future engineer: wishes and facts”

Wednesday 11 September 2019
14:30-17:30

European Economic and Social Committee
Room JDE 62
99-101 rue Belliard
1040 – Brussels
Engineers Europe Advisory Group
European Economic and Social Committee, Brussels
11th September 2019
Presenter: Milda Pladaite

Shaping the Future Direction for Europe
WHO ARE WE?

• Leading platform reaching young engineers in Europe and providing skills, network and opportunity to express thoughts

• Founded in 1994, official NGO in 2018

• Developing towards becoming thought leaders who are conscious about their position, role and responsibility for society

• Members of national engineering associations, all disciplines and levels of education
EYE Council OUR MEMBERS

25 member organisations

22 countries

>250,000 young engineers
STRUCTURE

- Leads the organization
- Follows the decisions of the Council
- Organisational development and strategy
- Maintains records and contacts
- Public Relations

EYE Board

- Election

EYE Council

- Representation of Member Associations
- Member Associations give mandate to Council Member
- Decision-making by democratic voting
- Council meets twice a year

EYE CONFERENCE

Member associations
Public Policy

Critically reflects on young engineers’ position in Europe, what challenges we face and recognises what solutions we can contribute to by:

• Analysing EU Commission and industry priorities and proposing working areas for EYE member associations approval.
Energy and Environment

Working Group contributes towards energy transition and Paris Climate Goals by encouraging members of EYE representing more than 250,000 engineers to share best practices and discuss challenges they face in sustainable energy consumption and production.

• To make tangible changes in European markets I am aiming to guide this working group according to Europe energy targets for 2030 and Climate-neutral Europe by 2050
Professional Mobility

• Single Market
• Professional Card for Engineers survey carried by European Young Engineers discussing:
  • The Professional Qualifications Directive
  • Common Training Principles

EUROPEAN YOUNG ENGINEERS
PROFESSIONAL CARD FOR MOBILITY

TAKE SURVEY. CONTRIBUTE TO CHANGE. SHAPE THE FUTURE. MADRID. OCTOBER 19.
Challenges

• Inspiring young engineers to contribute in overcoming challenges at European level

• Unite approach in helping to deliver EU and industry priorities.

Mentoring

• EU
• Industry
• Professional Institutions.
The Voice of Young Engineers in Europe

Milda Pladaitė
Vice President of Public Policy
milda.pladaite@eyengineers.eu
Our people are our power

Antoine Feral
VP EU Affairs

Rolls-Royce plc,
September 11, ECOSOC
Our long term vision and strategy

£1.4bn Invested in R&D in 2018

31 University Technology Centres

892 Patents filed in 2018

7 Advanced Manufacturing Research Centres (AMRC)

Pioneering the Power that Matters
Rolls-Royce pioneers cutting edge technologies that deliver the cleanest, safest and most competitive solutions to meet our planet’s vital power needs

Champion electrification

Reinvent with digital

Transform our Business

Vitalise existing capabilities

Build balanced portfolio
Our engineering expertise

We have over **17,236 engineers worldwide**

*(50,000 employees worldwide / 50 countries incl. 12 EU MS).*

They apply their expert knowledge and experience daily to continually improve the performance and efficiency of our product portfolio.

We support their development through our Specialist Academy and Rolls-Royce Fellowship programme that recognises and rewards industry leading expertise.
**Our people strategy and approach**

**Enabling business transformation** – Embedding a simpler organisation to introduce greater performance enablement, helping our people achieve their potential every day.

**Building strategic capabilities** – Developing key organisational, leadership, technical and functional capabilities for future performance and growth.

**Creating a lean, agile, high performance culture** – Achieving our strategic goals requires that we have the right cultural elements that support our workforce to be enabled, engaged and energised to drive performance and growth.

→ **A diverse and inclusive workforce** (in our employee training, communications and cultural change programme).
Our people are our power

We make sure we have a highly skilled and professional workforce and a strong future talent pipeline.

Global demand for Science, Technology, Engineering and Maths (STEM) qualified employees continues to grow. Our need to recruit and retain locally based diverse leaders intensifies as our global footprint develops.

Our global Diversity and Inclusion strategy has four key phases: awareness, understanding, application and commitment.

Our goals are to:
- Increase awareness and understanding of all employees of the value of diversity and inclusion
- Build diversity and inclusion into the way we work
- Drive commitment to diversity and inclusion
Science, Technology, Engineering and Maths (STEM)

A strong future pipeline of well-qualified scientists and engineers is critical to the future success of our business.

We hope that our STEM education programmes will inspire people to study the STEM subjects and show them the life-long opportunities that STEM careers can offer. Opportunities that might even include a career at Rolls-Royce.

By investing in STEM education we hope to widen the talent pool from which we – and our customers and suppliers - will recruit in the future, ensuring that we have the best people with the right skills to help fulfil our future responsibilities.

Globally we have around 1,400 Rolls-Royce STEM ambassadors who are actively involved in education programmes and activities.

→ We have now extended this target to reach 25 million people by 2030.
Recognising qualifications within and across-borders: New developments and remaining challenges
Trends and challenges

- Globalisation of labour markets
- Mobility of students and workers
- Increased migration
- Automation/digitization
- Polarisation of labour market
- Skills mismatch
Some recent developments in education and training

• National Qualification Frameworks – 150 countries

• Regional Qualification Frameworks – in most regions around the world

• Learning outcomes

• New types of qualifications/credentials eg digital badges

• Lifelong learning approaches to education and training
### Regional Qualifications Frameworks

<table>
<thead>
<tr>
<th>Framework</th>
<th>Region</th>
<th>Countries Adopted</th>
<th>Countries Referencing in Process</th>
<th>Countries</th>
<th>Qualifications</th>
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17 Sustainable Development Goals (SDGs)

SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Global solutions for global challenges

- Global normative instruments

- An internationally shared hierarchy of level descriptors that allows comparisons of any kind of learning

- Strengthen recognition methodologies by developing and providing international guidelines and resources

- International tools such as qualification/skills passport
Towards a global skills recognition framework: World Reference Levels

**Aim:** To translate any outcomes-based qualification, credential, entry requirements, job specification or framework level into an internationally recognised form of description which can be used in deciding on comparing qualifications or negotiating recognition or progression arrangements.
WRL TOOL

- Qualifications
- Credentials
- Badges
- Records of Non-formal & Informal Learning
- Job specifications
- Entry requirements
Key features of the WRL

The WRL uses 11 factors which are commonly found in tools for organising and evaluating qualifications, jobs, etc. to create a description in WRL terms.

Each factor is described in terms of 8 stages and users are asked, factor-by-factor, to decide which stage is the best match for the outcomes of their qualification/credential, entry/work role requirements, or framework level.

The answers are used to create a graphical profile.

Users are also asked to enter the evidence which supports the matching, and this is used to create a more detailed report.

Throughout the process, users can control the sequence of the review and amend their responses and judgements.
# WRL PROFILE: Technical Skills Credential

(Awarded by Quharist.com)

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<tr>
<th>FACTOR / CODE</th>
<th>STAGE</th>
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Source: John Hart, 2018
Thank you

Katerina Ananiadou
k.ananiadou@unesco.org
Engineering is not about engineers (only)
I’m an idealist!

Director of the Danish Science Education Centre - Astra
Independent public organisation affiliated with Ministry of Children and Education

We believe in a better future if:

- *All* children acquires strong motivation and competences in STEM so they can contribute to society in a critical and creative way
- *More* children choose STEM in education and work
We know that more children would choose STEM if

- They tried to experiment themselves
- They knew that we don’t know all answers already
- They could see that STEM can change the world
- They could see that STEM careers are cool
- They knew that you don’t have to be a genius

Sjøberg, S. (2004). The Relevance of Science Education (The Rose-Project)
Engineering methods can support STEM engagement

Some keywords:

- Real-life problems
- Iterative processes
- Learn to fail well
- Working cross-disciplinary
- Working with technology and with a practical approach
- Communicate your findings

BUT: The situation in 2017

- Engineering not used in curriculum
- We don’t even have the word in Danish
- Teachers not used to open-ended processes
An ambitious long-term approach

- Strong Engineering in Schools consortium led by IDA as part of the Engineer the Future programme
- IDA, University Colleges, House of Natural Sciences, Astra and more
- Long-term financing by large foundations
- The plan: to develop and gradually introduce engineering didactics in the Danish school system - and study the results
- 30 workshops
- 100 teacher students and 30 teacher trainers (80%) CPD in engineering
- 2,000 teachers have used the method (15-17% total # of teachers)
- 40,000 pupils has participated in engineering activities
- 20 brand new teaching materials
Some key results (so far)

“I find that the students remember the academic discussions we had in an engineering course better than when we discuss the topics in traditional teaching. This is because students are given the opportunity to link their knowledge to real-life contexts. At the same time, the vast majority of students think that the engineering courses are fun, which is why they remember them better too.

“I often find that students who are bored with science suddenly come alive. They are motivated by being allowed to test their wild ideas, and they experience themselves in a new role as the active and eager student. It’s amazing to see. Those who are usually afraid to raise their hands for fear of saying something wrong also have an easier time voicing their opinions. In engineering there is not a right and wrong.
My point: Engineering is not about engineers (only)

- Generic life skills - approach to learning and to problem solving
- Getting comfortable with failure
- Seeing the relevance of STEM
- Learning STEM
- Learning to be creative and critical
- Confidence that “I can make a difference” (and we do need that more than ever)
- And of course: More engineers
Professional higher education of tomorrow: new skills for a new society

Mr Iskren Kirilov, EURASHE
We represent more than 650 higher education institutions around the world from 34 different countries.
OUR VISION

EURASHE strives to support the development and transformation of European society through professional higher education.

OUR MISSION

EURASHE’s mission is to strengthen the impact of innovative, high quality professional higher education and related user-oriented research in Europe by representing professional higher education institutions and facilitating their multi-stakeholder cooperation and dialogue.
EUROPEAN UNIVERSITIES INITIATIVE

The flagship initiative of the European Education Area. It will enable a new generation of Europeans to cooperate across languages, borders and disciplines, developing a strong European identity.

Transnational alliances that will become the universities of the future, promoting European values and identity, and revolutionising the quality and competitiveness of European higher education. They will:

- include partners from all types of higher education institution and cover a broad geographic scope across Europe

- be based upon a shared long-term strategy focused on sustainability, excellence and European values

- offer student-centred curricula jointly delivered across inter-university campuses, where a diverse student bodies can build their own programmes and experience mobility at all levels of study

- adopt a challenge-based approach according to which students, academics and external partners can cooperate in inter-disciplinary teams to tackle the biggest issues facing Europe today
LIVING IN THE TIMES OF CHANGE

Mega trends today:

• Digitalisation
• Ageing population
• Migration
• Skills mismatch
• Urbanisation
• Smaller families
• Use of the Internet—a new normal
• Entrepreneurial mindset
• Alternative lifestyles
• Sharing economy
• You name it…
NEW SKILLS FOR A NEW SOCIETY

1. Subject-development related skills:
   - Autonomy (self-determination)
   - Self-initiative (initiative and performance competence)
   - Self-management (decision competence)
   - Need/motivation for achievement
   - Personal agility
   - Autonomous learning competence
   - Self-efficacy
   - Tolerance for ambiguity
   - Ability to reflect

2. Object-related/Instrumental skills:
   - Agility
   - Creativity
   - Digital literacy

3. Social world/organisation-related skills:
   - Sense-making
   - Future mindset
   - Cooperation
   - Communication

THE FUTURE OF HIGHER EDUCATION

1. Future skills oriented approach progressively replacing the simply knowledge acquisition

2. Shift from a one-institution to a multi-institutional higher education model

3. Students build their own personalised curriculum

4. Seamless life-long learning will be as important as initial education
THANK YOU!

www.eurashe.eu
27 Signatories of the EEAG Letter of Intent
Initial Goals and Objectives of the EEAG

1. Promote STEM to youngsters

2. Prepare the European Union and society for the challenges of digitalisation and AI

3. Promote the professional profile of engineers in society
Intended Work Program

1. Seek involvement and cooperation of the EEAG-signatories/stakeholders in the project “E4E”.

2. Develop a first report on “Do we know our Engineers” in Europe? (February 2020)

3. Develop a second report on “Engineering Education in Practice” to ensure the development of an “Engineers Europe Education Reform Accelerator”.

4. Develop and draft a third report on “What do Engineers Want” and expect from life, in order to develop and build an Engineers Career Development Tool.
Conclusion

1. EEAG will be turned into “Expert Hearings” to provide feedback on the work in progress.

2. Seek continuity by organizing these EEAG Hearings every six (6) months: March 2020 next

3. Provide market based input for EU-policy making: include companies to provide input

4. Mapping our data and move forward as a profession: in STEM, in profile, in digitalisation