GEDC INDUSTRY FORUM

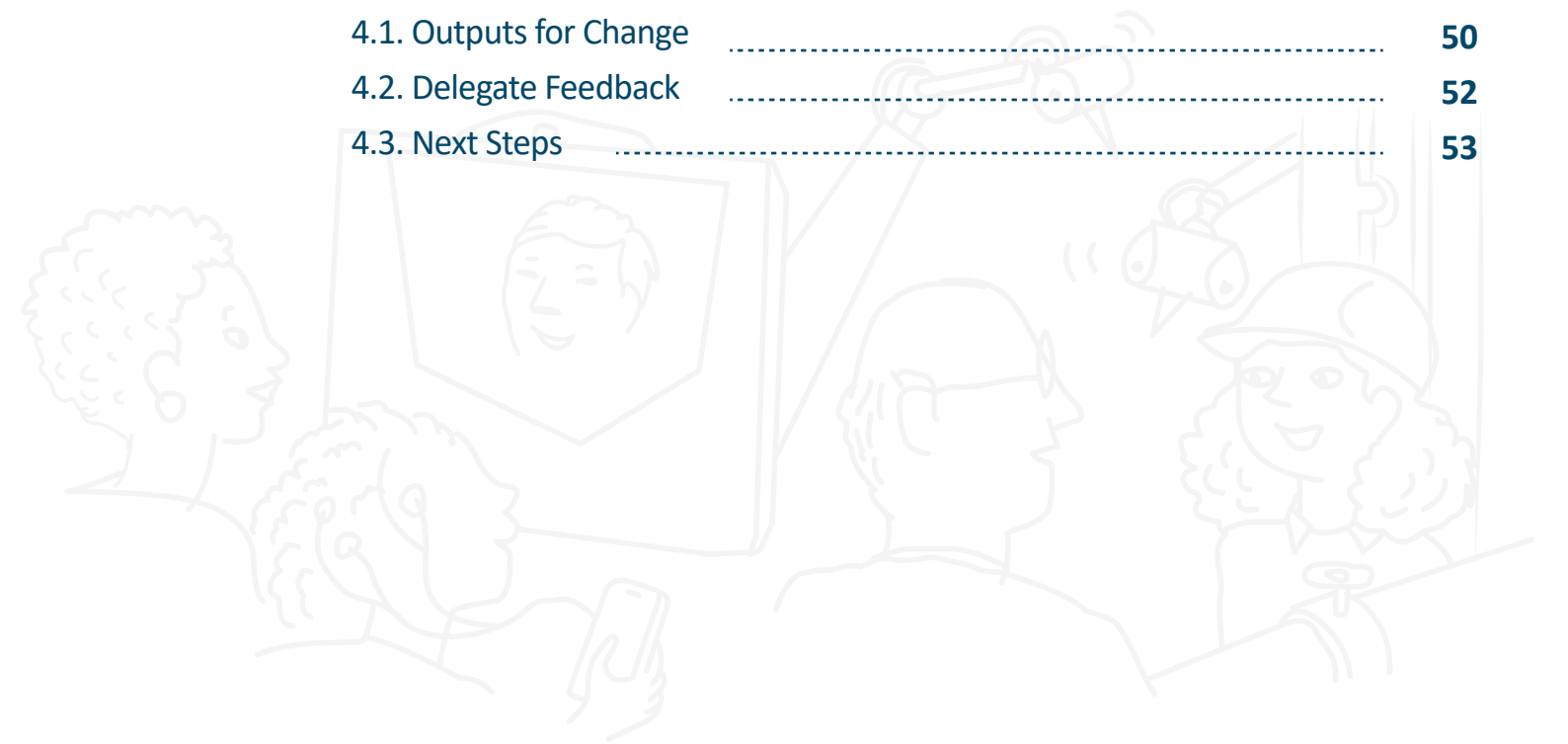
BUCHAREST, ROMANIA
2019 REPORT

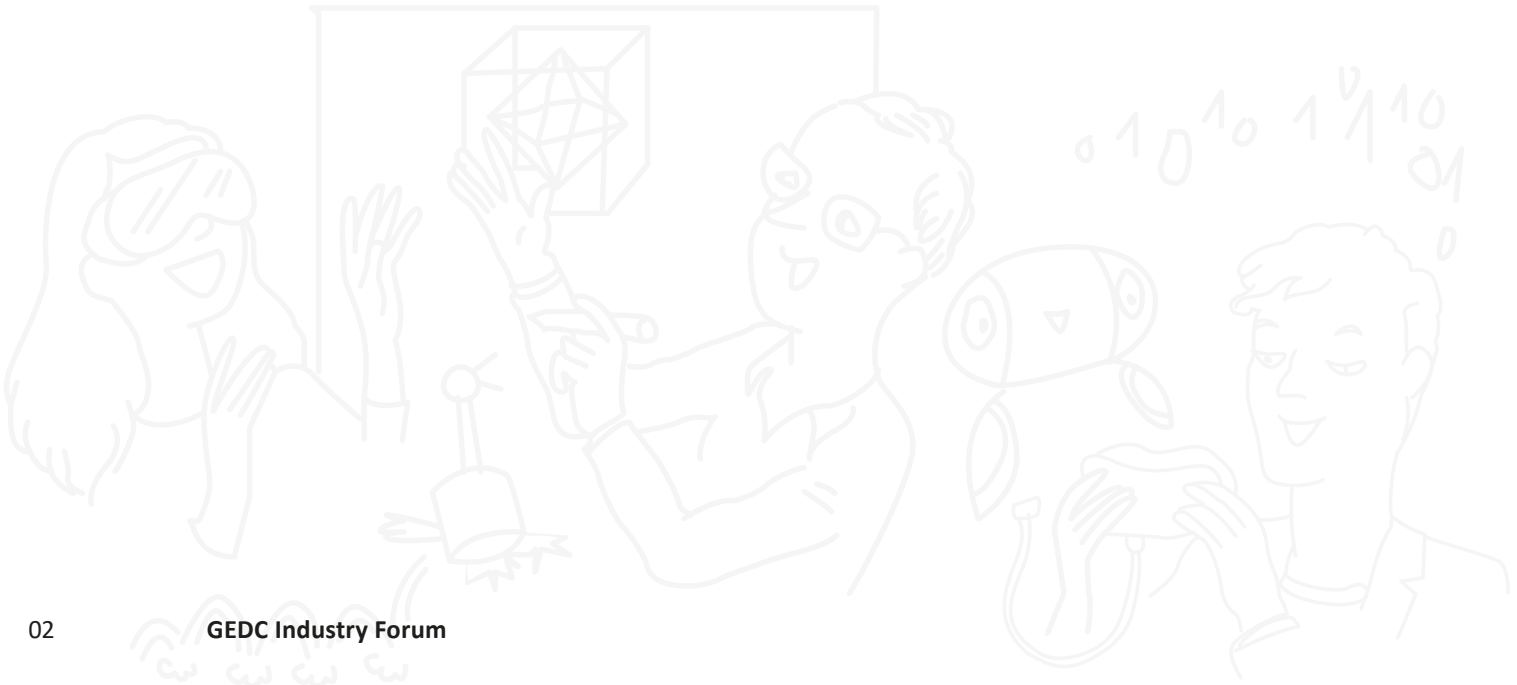
Developing the next generation of
engineering experts and leaders

GEDC
Global Engineering Dean's Council

Petrus
COMMUNICATIONS

CONTENTS





1.

INTRODUCTION + EVENT OVERVIEW

Building on the immense success of the 2017 GEDC Industry Forum, the second edition of the Industry Forum took place in Bucharest, Romania in March 2019. Designed by Petrus Communications1 and the Global Engineering Dean's Council (GEDC)2, the Industry Forum aims to develop the next generation of engineering leaders and experts through closing the gap between the skills employers need and those available in graduates through university-industry collaboration, innovation, and knowledge sharing. This event, being the first regional one, focused on these topics in the context of Central and Eastern Europe (CEE). The vibrant gathering included representatives from Arctic, The Boeing Company, The Scientific and Technological Research Council of Turkey, and Global Women in Tech.

[1] *www.petruscommunications.com*

[2] *www.gedcouncil.org*

ORGANISERS

Petrus
COMMUNICATIONS

The Global Engineering Deans Council (GEDC) was created on 9 May 2008 in Paris as a recognition of the global need for a world-wide forum of engineering deans and rectors. The main goal of the GEDC is to provide engineering deans and rectors with ideas, tools, and “best” practices necessary to become innovative leaders of engineering education.

The GEDC’s goal is to provide a space for leaders of engineering institutions to connect and share the successes and challenges of providing world class engineering education programs in an increasingly interconnected and fast-paced world community.

www.gedcouncil.org

Petrus Communications is a multi-award winning international agency that specialises in linking our clients - engineering and business employers - with students and the global education community. Created in 2005, Petrus now comprises a team of 30 research, communication and digital experts creating and implementing projects world-wide. We support our clients in building productive and results focused relationships with key university stakeholders, ensuring that their messages are heard and a meaningful dialogue established. Our hallmark is the design and delivery of creative programmes, campaigns and events that lead to impactful outcomes.

www.petruscommunications.com

Leveraging on the rich and diverse technological ecosystem of Central East Europe, the GEDC Industry Forum in Bucharest successfully engaged academic and industry leaders in a dialogue to build on knowledge and best practices. We joined forces to develop the engineering workforce to embrace and contribute to the accelerated changes in technology innovation that are transforming the region, its economic development and overall future.

Natacha DePaola

Dean of the Armour College of Engineering, Illinois Institute of Technology, USA and Chair of the Global Engineering Deans Council

I am incredibly grateful to all the participants who made the second GEDC Industry Forum so enjoyable, and a great success! Thank you for your valuable contributions, and for fully embracing the interactive nature of this event, where speeches and listening were for the most part replaced with group interaction and dialogue. By sharing our needs, experience and ideas, the Forum's content and output was rich and productive. I am looking forward to following the process of the initiatives and the ideas shared in Bucharest.

Kirsten Williamson

Founder & CEO,
Petrus Communications

YOUR SUPPORT MADE THE GEDC INDUSTRY FORUM POSSIBLE

We'd like to thank the many people whose commitment, hard work and creativity made the Industry Forum and this detailed event report possible. Thank you to all 50 delegates from 16 countries, including rectors & deans, heads of research & human resource directors, CEOs, learning executives & innovation officers, as well as our panel of leaders from the student organisations BEST & EESTEC, and of course to our gala evening sponsor Arctic.

Special thanks go to all the speakers, hosts and Dynamic Design Group moderators who helped to make the event such a success. The Working Group of industry and education leaders whose names you'll see here, who shaped the content to ensure its relevance. Chantal De Barra whose engaging, challenging and good-humoured facilitation was the thread that wove the forum together and ensured we delivered the event we had imagined many months before.

We couldn't have made the event happen without support from our friends and colleagues across the region. We would like to mention in particular: Prof. Dr. Doru Ursutiu (Transilvania University of Brașov), Nigel Bellingham (British Council), Dr. Emilia Pecheva (British Embassy Sofia), Prof. Dr. George Darie (University Politehnica of Bucharest), Gerard Healy (British Embassy Bucharest), our friends at the British Romanian Chamber of Commerce and Franco-Romanian Chamber of Commerce and Murat Büyükerk of Arctic and his team - all of whom have provided invaluable advice, insights and encouragement.

And of course, to the whole team at Petrus whose commitment to delivering an exceptional event in terms of content, experience and impact was evident for everyone who joined us.

WORKING GROUP

Arlene Fajutrao Dosen
McMaster University
Ontario, Canada

Ishwar Puri
McMaster University
Ontario, Canada

Jaime Bonilla Ríos
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Richard Tracy Schoephoerster
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UAE

Sirin Tekinay
Sabancı University
Istanbul, Turkey

Zhenghe Xu
University of Alberta,
Canada &
Southern University of
Science and Technology,
SUSTech, Shenzhen, China

Natacha DePaola
Illinois Institute of
Technology and Chair,
GEDC, USA

Hans Jürgen Hoyer
GEDC and IFEES,
USA

PROGRAMME

Our host for the event is Natacha DePaola, Dean of the Armour College of Engineering, Illinois Institute of Technology, USA and Chair, Global Engineering Deans Council

WEDNESDAY 20 MARCH

HILTON LOBBY & FIRST FLOOR BUSINESS CENTRE FOYER

From 15:30 **Registration & Welcome Coffee**

BUSINESS CENTRE, GEORGE ENESCU SUITE

16:30 **Welcome & Introductions**

Natacha DePaola, Dean of the Armour College of Engineering, Illinois Institute of Technology, USA
and Chair, Global Engineering Deans Council

Mihnea Cosmin Costoiu, Rector of the University Politehnica of Bucharest

17:00 **Interactive Panel:** "University-Industry Relationships for Innovation and Skills"

University-industry collaboration (UIC) has been shown to promote innovation in many different ways, at many different levels. For example, UIC can develop innovation skills in students and other individuals leading to intra- and entrepreneurship, as well as improve the knowledge and technology transfer process. This panel session will explore the challenges and creative opportunities in global engineering, and share good practice in UIC in relation to innovation, both overall and in terms of skill development.

Moderator

Dr. Emilia Pecheva, Science and Innovation Officer (Bulgaria and Romania) at the British Embassy Sofia, Bulgaria

Speakers

Michael Fors, Executive Leader in Leadership, Learning, and Organizational Capability, Boeing

Prof. Adina Florea, Dean of the Faculty of Automatic Control and Computer Science, University Politehnica of Bucharest

Prof. Dr. Hasan Mandal, President of TUBITAK, The Scientific and Technological Research Council of Turkey

Lucian Andrei, Innovation Grants & Tenders at Zitec

18:00 **The Student Perspective:** A panel of international student leaders from the region's technical student organisations engaged in skill development and employer engagement. Hosted by Zinyat Agharzayeva, Reservoir Engineer at Total.

BUSINESS CENTRE TERRACE

19:00 *Get to Know You* Cocktail & Buffet Dinatoire

THURSDAY 21 MARCH

BUSINESS CENTRE, GEORGE ENESCU SUITE

08:30 **Digital Dialogue on 'Skills for the Future'** hosted by Simona Sandru, leader of the NGO 'Global Women in Technology'

With inspiration from Colin Lovering, Senior Vice-President at Avison Young Commercial Real Estate and Vice Chairman of the British Romanian Chamber of Commerce, and featuring special guest Greg Konstantinov, Director, Human Resources at The Boeing Company

09:30 **Dynamic Design Groups*: Rotating Brainstorm and Dialogue**

Lead facilitators:

Chantal De Barra, Head of International Research Publications, CEVIPOF, Sciences Po, France and Consultant, Petrus Communications

12:00 **Taking Up the Challenge: Delegates form Design Groups on theme of choice**

RESTAURANT Lunch is with selected Design Group in the hotel restaurant

13:30 **Dynamic Design Groups continue …**

18h30 Meet in the hotel lobby for an early evening Romanian wine tasting opportunity, and an occasion to appreciate some of the city centre historical landmarks.

LES COLONNADES & LE DIPLOMATE BALLROOM

19:30 **Cocktail, followed by dinner in the presence of our guest of honour,** Mihnea Cosmin Costoiu, Rector at University Politehnica of Bucharest in the country's most iconic dining room, a historical monument recognised as part of Romanian national heritage. The evening is generously hosted by Arçelik.

FRIDAY 22 MARCH

From 07:30 Breakfast & Design Group final preparations

BUSINESS CENTRE, GEORGE ENESCU SUITE

08:45 Dynamic Design Groups: Presentations

11:30 Conclusions & Next Steps

RESTAURANT

12:00 **Farewell Lunch:** Celebrating the diversity of Central East Europe

From 13:00 Optional Visits (See below) / Transfers

Exact timings during each day may change according to final group numbers, but overall start and finish times will remain as stated.

RESOURCES, NETWORKING AND FUTURE EVENTS

About

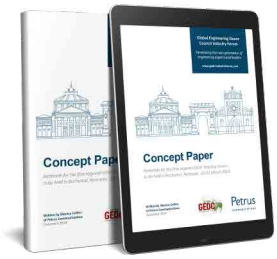
The Global Engineering Deans Council (GEDC) was created on 9 May 2008 in Paris as a recognition of the global need for a world-wide forum of engineering deans and rectors. The main goal of the GEDC is to provide engineering deans and rectors with ideas, tools, and "best" practices necessary to become innovative leaders of engineering education. Find out more at: www.gedcouncil.org

GEDC Regular Members include deans, rectors, or principals of engineering colleges and faculties. The GEDC also has categories of membership for industry affiliates, former deans and other leaders in the field. GEDC members represent more than 50 countries spanning every continent.

The GEDCExchange is the new GEDC digital platform designed to serve as a forum to exchange information and opportunities supporting members around the world. Built by Quanser, the GEDCExchange will become the main place to learn about the GEDC, activities, and opportunities available to members, as well as a platform to strengthen networks with the ability to effectively communicate, share, and exchange anytime.

www.gedcouncil.org

Resources



2019 Regional Concept Paper

Discover the rationale for the first regional GEDC Industry Forum that took place in Bucharest, Romania, from the 20th to the 22nd March 2019.

The 2017 GEDC Industry Forum Event Report

This is a comprehensive summary of the knowledge and ideas shared, the discussion outputs and the creative presentations delivered at the 2017 Industry Forum. The report is available to read online, or for download. It is an essential read, and a valuable resource, for anyone engaged in improving and innovating engineering education for the future.

The 2017 GEDC Industry Forum Concept Paper

This document was used to set the stage for the first Industry Forum event by providing a review of the important body of work looking at the globally discussed skills and attributes required in a graduate engineer.

Delivering Skills for the Future: A Global Survey from Total Campus

An original piece of research commissioned by Total. The research explores the global perspective on which workplace skills are considered critical for success, as well as the activities likely to best to develop those skills during higher education.

GEDC Industry Forum Engineering Initiatives

An extensive list of good practices in university-industry collaboration provided by Industry Forum delegates.

Future Events

GEDC Industry Forum

Fontainebleau (3 – 5 July 2019)

The next Global Engineering Deans Council Industry Forum will take place from Wednesday 3rd to Friday 5th of July 2019 in Fontainebleau, France. Our host will once again be CEDEP, a unique executive education club, just 1 hour from Paris. We'll gather just 80 delegates, again 50/50 senior representatives from Industry and Education, with a focus on how to scale the 'High Impact Practises' that can improve the engineering education experience for more students with better outcomes for all.

To get involved, send an email to

contact@gedc-industryforum.com

World Engineering Education Forum

Chennai (11 – 16 November 2019)

The 9th World Engineering Education Forum is taking place in Chennai, India from the 11th to the 16th November 2019. The theme of the event is Disruptive Engineering Education for Sustainable Development.

GEDC Conference

Santiago (20 – 23 October 2019)

From the 20th to the 23rd October 2019, the city of Santiago in Chile will host the annual Conference of the Global Engineering Deans Council (GEDC). This prestigious event, held for the second time in Latin America, features a world-wide global forum of engineering deans and rectors, industry partners, and other stakeholders in engineering education.

GEDC 2019 Santiago

Engineering minds, hearts and hands: Impact with a purpose

October 20 - 23, 2019

From October 20 through 23, 2019, the city of Santiago in Chile host the annual Conference of the Global Engineering Deans Council (GEDC). This prestigious event, held for the second time in Latin America, features a world-wide global forum of engineering deans and rectors, industry partners, and other stakeholders in engineering education.

The Global Engineering Deans Council's vision is to enhance the capabilities of engineering deans to transform schools in support of societies in a global economy. Their mission is to serve as a global network of engineering deans, and to leverage on the collective strengths, for the advancement of engineering education and research. The Council's network includes over 500 leaders and stakeholders representing over 40 countries from all continents.

The School of Engineering of Pontificia Universidad Católica de Chile will host GEDC 2019 Santiago.

GEDC2019.ORG

1.1 Developing the engineering experts and leaders of the future

With creativity and engagement at the core, and the desire to harness the expertise and knowledge of every single participant, Petrus Communications launched the Industry Forum with their partner the GEDC in 2017. We agreed to make several considerations critical to the success of the event; short speaker slots with much more time dedicated to dialogue, group work and networking; a very strong focus on maintaining diversity amongst speakers and facilitators (with 50% gender balance, 5 continents represented and a balance between industry and academic input); a challenge to delegates – which was enthusiastically taken up – to share and learn from each other.

This series of invitation-only events brings together leading engineering and technology employers and engineering deans from around the world for dialogue, to network, and share knowledge and good practice. The primary aim of the Industry Forum is to develop the next generation of engineering experts and leaders and improve how we innovate together.

What makes the Industry Forum *unique?*

- An innovative format which ensures that no matter how many people attend, every single voice is heard, creating a great opportunity to leverage collective knowledge whilst developing an influential and meaningful dialogue.

- Designed for participants, the Industry Forum presents a 'challenge' addressing pain points for industry and for educators, to create workable solutions together. This challenge was enthusiastically taken up by everyone who joined us in Bucharest, demonstrated by their willingness to share and learn from each other.

- The level of trust and engagement inspired by this unique format ensures that the Industry Forum presents a remarkable opportunity for participants to go beyond networking, to build real, useful and lasting relationships.

1.2 WHY CENTRAL AND EASTERN EUROPE?

Central and Eastern Europe (CEE) is one of the fastest growing regions in Europe. A long-time engineering powerhouse, CEE today has the potential to become a global innovation hub as the countries in the region transition to knowledge-intensive economies. Innovation has been described as an 'economic necessity' in CEE and a crucial way to promote innovation is to facilitate collaboration between universities and industry, making the region a perfect location for the Industry Forum.

Participants of the 2019 regional Industry Forum built networks and discussed university-industry collaboration in Bucharest, Romania: a location that serves as a great example of present and future success in the region. Not only is Romania one of the fastest growing economies in all of Europe, but in recent years the country has been establishing itself as a tech hub. Industry Forum participants addressed issues specific to the region while inspiring and developing regional university-industry relations in this exciting environment of innovation and growth in Romania.

Traditional Romanian gifts offered at the GEDC Industry Forum in Bucharest

1.2.1 Event Sessions

Sessions at the Industry Forum were designed specifically to provide context for delegates and frame collaborative work. Kicking off the event in Bucharest was an interactive panel session entitled "University-Industry Relationships for Innovation and Skills" which brought together both university and industry leaders to explore the challenges and creative opportunities in global engineering, and share good practice in University-industry collaboration (UIC) in relation to innovation, both overall and in terms of skill development.

The following day, a Digital Dialogue was held, entitled 'Skills for the Future'. This brought together expert global industry leaders to discuss in depth the perceived gap between the skills engineering students are graduating with, and those required by industry. The session also addressed how universities and industry can work together to best develop the skills and attributes needed of 21st century engineers.

The rest of the day was dedicated to brainstorming and creative group work. Themes for discussion included developing high demand digital skills, the increasing importance of soft skills and lifelong learning, and how stakeholders can work together to ensure that new graduates are prepared to work in increasingly diverse workplaces. In addition, delegates discussed ways to tackle brain drain – a significant problem in CEE as many high-skilled workers leave for what they perceive to be better opportunities in other countries.

After an intense rotating brainstorm and dialogue session, the delegates broke up into five Dynamic Design groups to build inspiring implementable solutions related to some of the biggest challenges shared by engineering and technology employers and educators globally and in the CEE region:

1. Closing the skills gap for digital and scarce skills
2. Graduate employability skills
3. Intrapreneurship and entrepreneurship skills
4. Innovating together
5. Digital skills and learning to learn

1.2.2 What is a Dynamic Design Group?

Dynamic Design Groups are a concept developed specifically for the Industry Forum by its organisers and working group members. The groups (the structure of which are detailed in Section 2) are a real-life example of multi-stakeholder, collaborative innovation in practice, the benefits of which have been the subject of multiple academic studies.[3]

Output for Change

Output will be shared for wider dissemination via the GEDC's global and regional network of events and meetings, to support the overall aim of enabling universities and employers worldwide to work efficiently together on the development of future engineers, innovators and leaders.

[3] **See for example:**

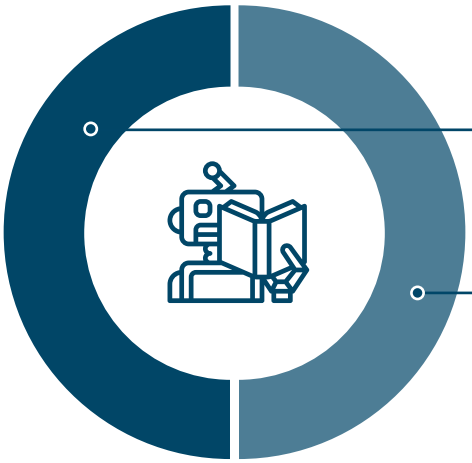
- Gloor, P. A. (2005). Swarm creativity: Competitive advantage through collaborative innovation networks. Oxford, UK: Oxford University Press.
- Roberts, N. C., & Bradley, R. T. (1991). Stakeholder collaboration and innovation. Journal of Applied Behavioral Science, 27, 209-227.
- Sørensen, E. & Torfing, J. (2011). Enhancing Collaborative Innovation in the Public Sector. Administration & Society, 43(8), 842-868.

1.3 INDUSTRY FORUM PARTICIPANTS

Designed as a unique gathering of industry and academic engineering leaders, the event brought together engineering deans from the region, deans from the GEDC global network, leading regional employers and representatives from global companies to discuss in depth how to work together to develop the next generation of engineers and better understand each other's needs. With delegates coming from over 16 countries across 5 regions, and a 40% female representation, the GEDC Industry Forum provided industry, Human Resources (HR) and academic leaders with a platform for expressing a diversity of thought and exchange of knowledge, experience and ideas.

50
PARTICIPANTS

16
COUNTRIES



50%
EDUCATION

50%
INDUSTRY

60%
MALE

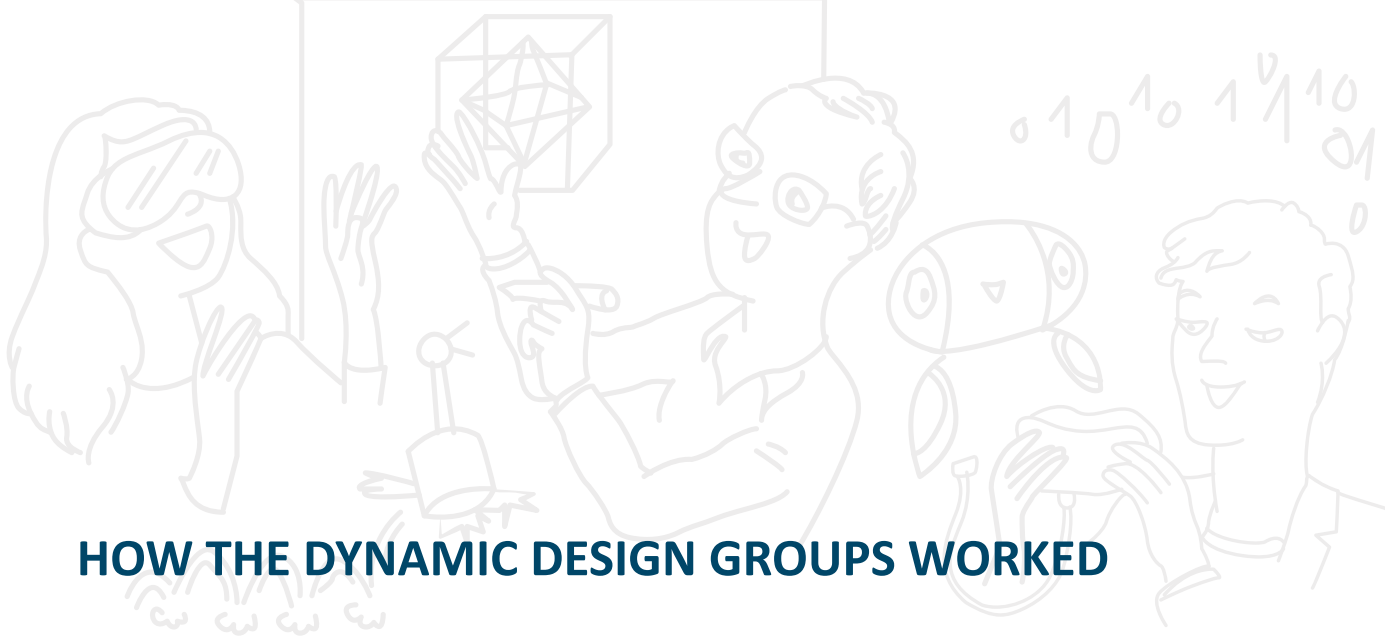
40%
FEMALE

2.

DYNAMIC DESIGN GROUPS

The overarching aim of the Industry Forum was to draw on the collective strengths and expertise of every delegate present, ensuring that each and every voice was heard and each and every creative idea captured. With this in mind, the Dynamic Design Groups were born.

> Everybody had a chance to communicate, to contribute - a major change from other events.
>
> **Education Representative**



2.1 HOW THE DYNAMIC DESIGN GROUPS WORKED

A series of five themes were developed by the Industry Forum working group after in-depth reflection on the issues at stake. Divided up into small groups, delegates were asked to brainstorm their ideas on each topic circulating from theme to theme until they had covered each one. Each theme was assigned a rapporteur who collected all the ideas aired and then made a cohesive summary of the whole. Once the main ideas had been collated and all ideas shared with the assembled company, the scene was set for delegates to decide which theme they wanted to work on and this is what they focused on for the remainder of the event.

Delegates were challenged to design solutions relative to their chosen theme, coming up with a workable concrete proposal on how to overcome the obstacles identified by all. In keeping with the underlying innovative and creative environment of the event, they were also challenged to make a presentation unlike any they had made before. The idea was that an innovative presentation format opened the gateway to innovative thinking, freeing the groups from the constraints of standard conference presentations and reflecting the Industry Forum's goal to move from theory to action, from 'this is the way it is' to 'this is the way it could be'. The resulting output was extraordinary in the dynamism of the format and the scope of ideas presented.

Throughout all of the Dynamic Design Group work, Chantal De Barra, International Publications Editor for Research, CEVIPOF, Sciences Po, France and Petrus Communications Consultant, acted as the overall facilitator. She not only helped keep the groups on track and productive, but was also widely praised for contributing to the enjoyment of the event.

Dynamic Design Groups Designed and Led by:

Chantal De Barra
International Publications Editor for Research, CEVIPOF, Sciences Po, France and
Consultant, Petrus Communications

2.2 OVERARCHING THEMES

1. Closing the skills gap for digital and scarce skills

To minimise current and future talent shortages when we cannot predict with certainty what skills will be needed, how can we create a kind of 'rapid response' system to identify high-demand skill needs as they arise, in particular 'digital' skills, and ensure they are quickly being developed as needed?

2. Graduate employability skills

Students need to develop skills such as communication, teamwork, cultural awareness and ethics which some employers say engineering graduates do not possess sufficiently or are not sufficiently evaluated alongside technical skills. How can we work together to create and implement scalable High-Impact Practices which ensure that all graduates are developing the required employability skills, and how can we assess this?

3. Intrapreneurship and entrepreneurship skills

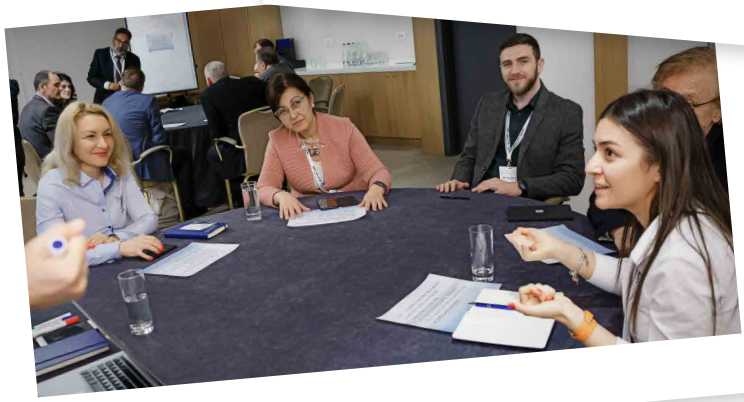
Engineering graduates are increasingly creating their own companies, which can help drive economic growth in a country and region. At the same time, established companies are looking for engineering graduates with intrapreneurship skills – those who can drive new projects and explore new directions for business development. How can universities and industry, including small and medium-sized enterprises (SMEs), work together to develop intra- and entrepreneurial engineers of the future?

4. Innovating together

In a time of rapid technological change, innovation is critical for an individual, organisation, country, or region to remain competitive. What are some ways that innovation can be developed through university-industry collaboration, for example through the development of an innovation ecosystem, individual innovation skills, or through the creation of a culture of innovation?

5. Digital skills and learning to learn

Lifelong learning is a necessity in today's dynamic labour market, particularly the fast-changing technical skills required for a successful ongoing career in engineering. How can universities and employers work together to equip the workforce with skills for the new 'knowledge economy' as well as develop in graduates the ability and desire to continue to learn and provide the mechanisms for reskilling to take place when needed?



2.3 THEME BRAINSTORM CONCLUSIONS

At the end of the first phase, a summary of the brainstorming sessions was given by each rapporteur. These summaries provided a wealth of ideas that generated a full picture of the multi-facetted nature of each theme.

Antonia Nănău

BRAINSTORM FACILITATOR

BRAINSTORM QUESTION

What rapid response system could employers and universities develop to identify and provide essential digital or technical skills when emerging technologies create gaps?

Building a flexible "ecosystem for success" among employers, universities, students, and others, that focuses on short cycles is key to ensure rapid responses when skills gaps emerge. A principal role for employers in this ecosystem is to provide information regularly to universities regarding which skills are most needed. Employers could then assist universities in teaching these skills by giving universities real problems to solve, and acting as mentors to students while they solve these problems.

Universities' principal role in this ecosystem would be to ensure that students have the essential basics so that in courses focused on rapidly changing skills they would have a good foundation to build and adapt upon. Universities in this ecosystem also need to strive to be more flexible with their curriculum and have less rigid bureaucracy.

Then, working together, through regular communication, universities and employers could provide several different options for students to stay on top of the most in-demand skills. These could include Innovation or Tech Days at universities, site visits in both directions, internships with regular feedback from students, summer school, and/or an open online platform that would inform students and universities about emerging technologies and give short courses.

Graduate Employability Skills

Aurelia Florea

BRAINSTORM FACILITATOR

BRAINSTORM QUESTION

How can we work together to create and implement scalable High-Impact Practices which ensure that all graduates are developing the required employability skills and how can we assess this?

Before implementing practices to develop employability skills in students and graduates, it is essential both to define these skills, and to ensure that industry and academia are in agreement regarding the definitions. Because employability skills can differ by location, global definitions should be the goal. To determine these global employability skills and students' understanding of these skills, research could be done which could include focus groups and surveys.

Once global employability skills have been defined and agreed on, efforts to raise awareness about the importance of employability skills should be made. Making sure that students understand how they will use these skills is crucial.

In terms of implementation, there are several ways in which employability skills could be developed, including exchange programs for professors, industry representatives and students through workshops and seminars, international exchange programmes, systematic internships, and involving academia in industry R&D. Whichever method of developing employability is chosen, it should be transparent so it can be easily scalable to other institutions and industries.

Intrapreneurship and Entrepreneurship Skills

Prof. Şirin Tekinay

BRAINSTORM FACILITATOR

BRAINSTORM QUESTION

Imagine engineering students graduated with commercial awareness, intra- and entrepreneurship skills. How did that happen and what was the role of SMEs and industry?

While the skills required for intrapreneurs and entrepreneurs differ in some ways, there is significant overlap. The skills common to both of these roles are: leadership, or the ability to motivate others to achieve shared goals; intelligence and vision, which includes a balance between passion and innovation with business acumen; and adaptability, or the ability to quickly respond to and problems and challenges and effectively shift directions.

To develop these skills in university, there needs to be collaboration between multiple stakeholders, including universities, industry, SMEs, incubators, and governments. With funding from governments and incubators, universities can implement programmes to develop intra- and entrepreneurship including start-up hubs, student competitions, design thinking events, and other extracurricular activities. Industry and SMEs can contribute to these programmes by providing coaching, mentoring by alumni and others, and the disruption needed to promote innovation. Regarding innovation, students should be given time off in order to innovate without the pressure of their other academic work.

THEME 4

Innovating Together

Prof. Dineshkumar Harursampath

BRAINSTORM FACILITATOR

BRAINSTORM QUESTION

How can we maximise opportunities for university-industry collaboration to lead to the development of innovation skills, a culture of innovation or a thriving innovation ecosystem?

Change is the only constant when it comes to technology, and the speed of this change is increasing. Innovation is the key to dealing with these realities, and this innovation needs to be sustainable, which includes taking into account local and regional contexts. In order to foster sustainable innovation ecosystems, skills, and culture, there needs to be more mobility between universities and industry.

One of the first steps that can be taken to foster innovation is to identify students who have a creative and innovative spirit, then helping them to become more confident and unlocking opportunities for them. Some concrete ways that universities and industry can then work together to do this include internships run by start-ups, making innovation skills including tech transfer mandatory for students, creating university innovation centres hosted in dedicated headquarters that can seed and collate good ideas, holding long-term competitions where students work with industry representatives, and overall fostering an appreciation for failure. During these activities, universities should work to instil confidence in industry that their ideas will not be stolen so that they are more open to sharing.

THEME 5

Digital Skills and Learning to Learn

Paul Gilbert

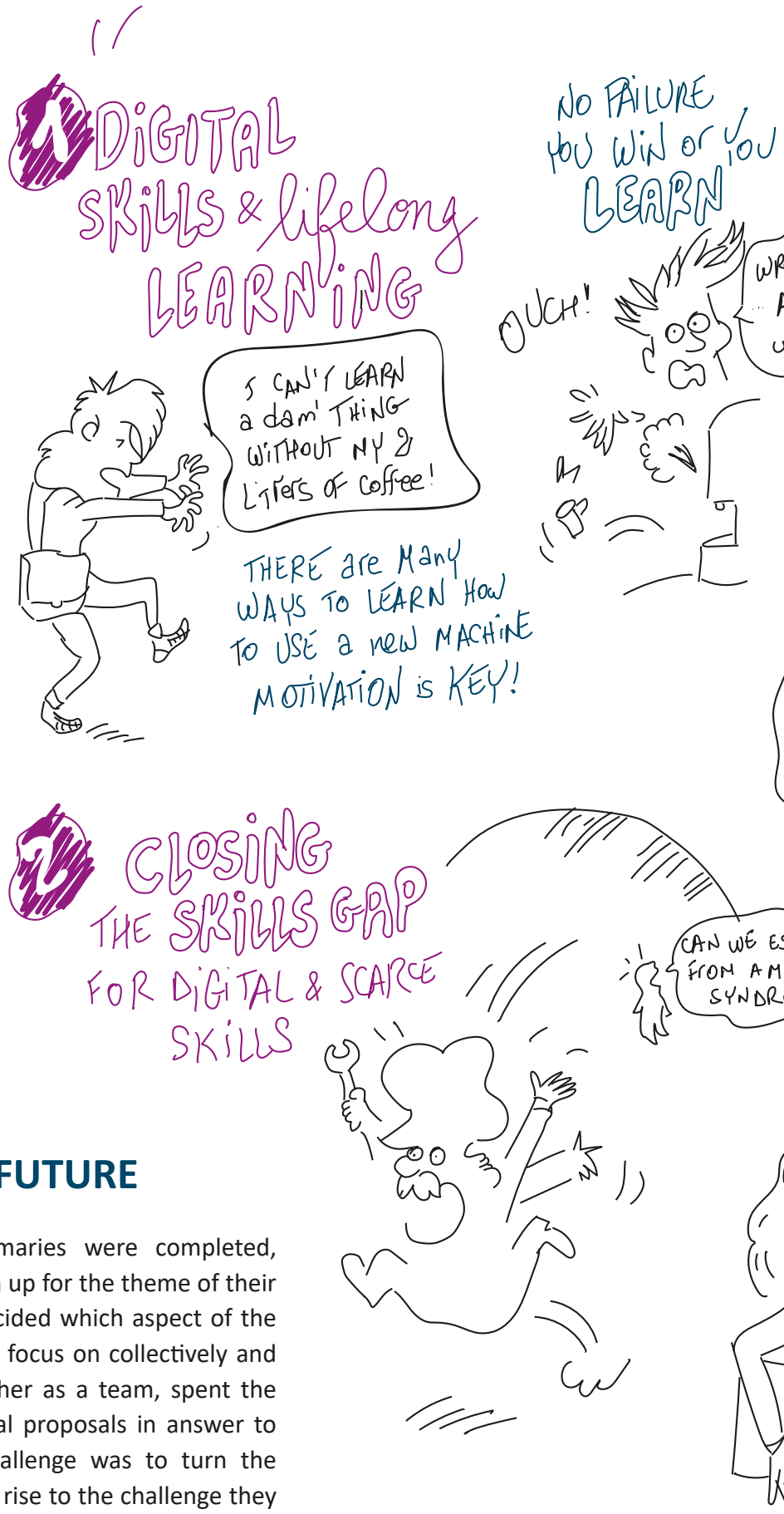
BRAINSTORM FACILITATOR

BRAINSTORM QUESTION

How can we equip the workforce with skills for the new 'knowledge economy', ensuring our graduates have the ability and desire to continue to learn and providing the mechanisms for reskilling to happen?

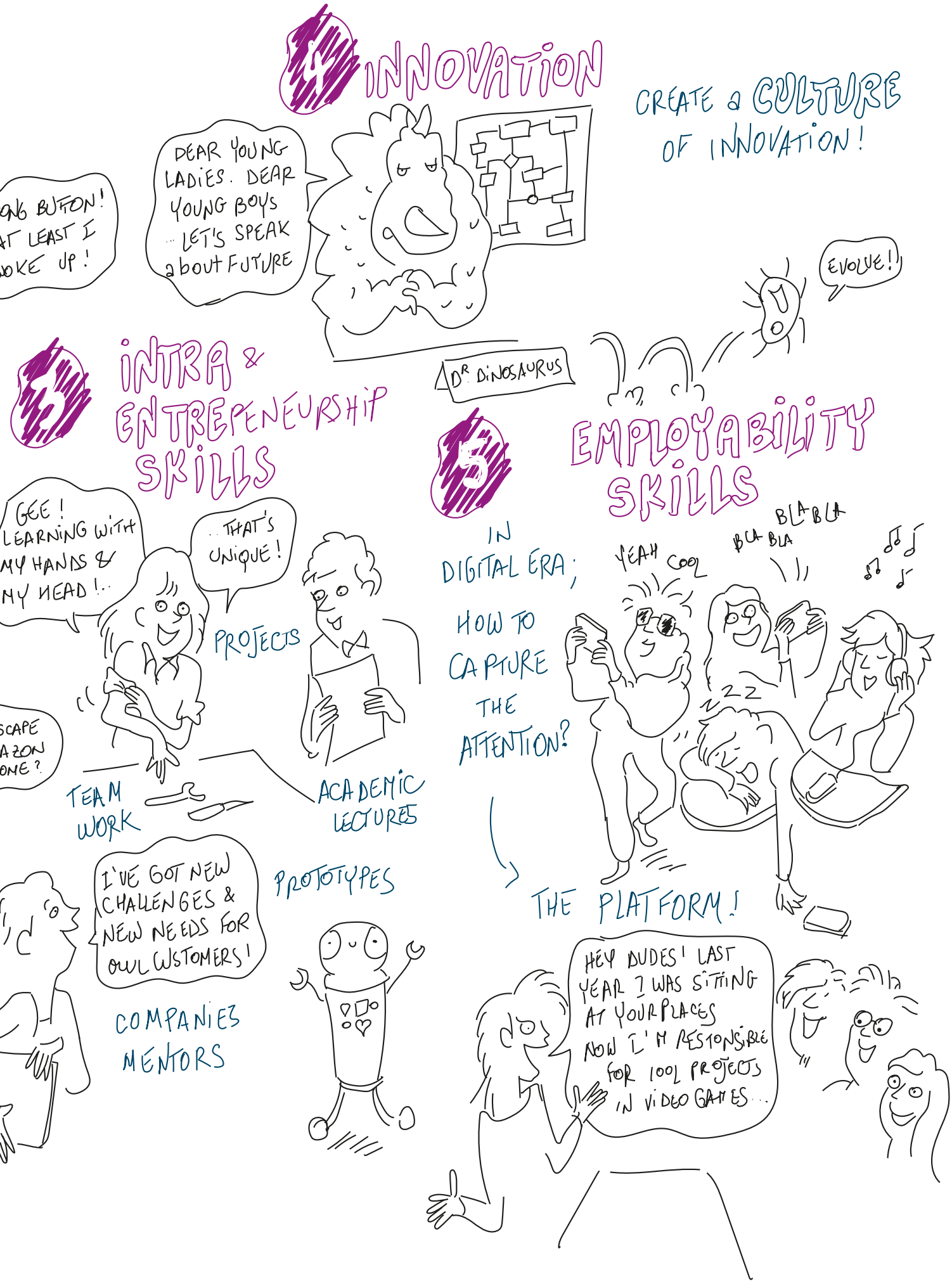
Crucial to promoting lifelong learning is instilling curiosity in students, which current engineering education does not do well today. To change this, it is important to: create motivational environments in universities, provide credits for going outside of universities to learn, position professors as part of the learning process, give more access to technology, and have mixed generation classes.

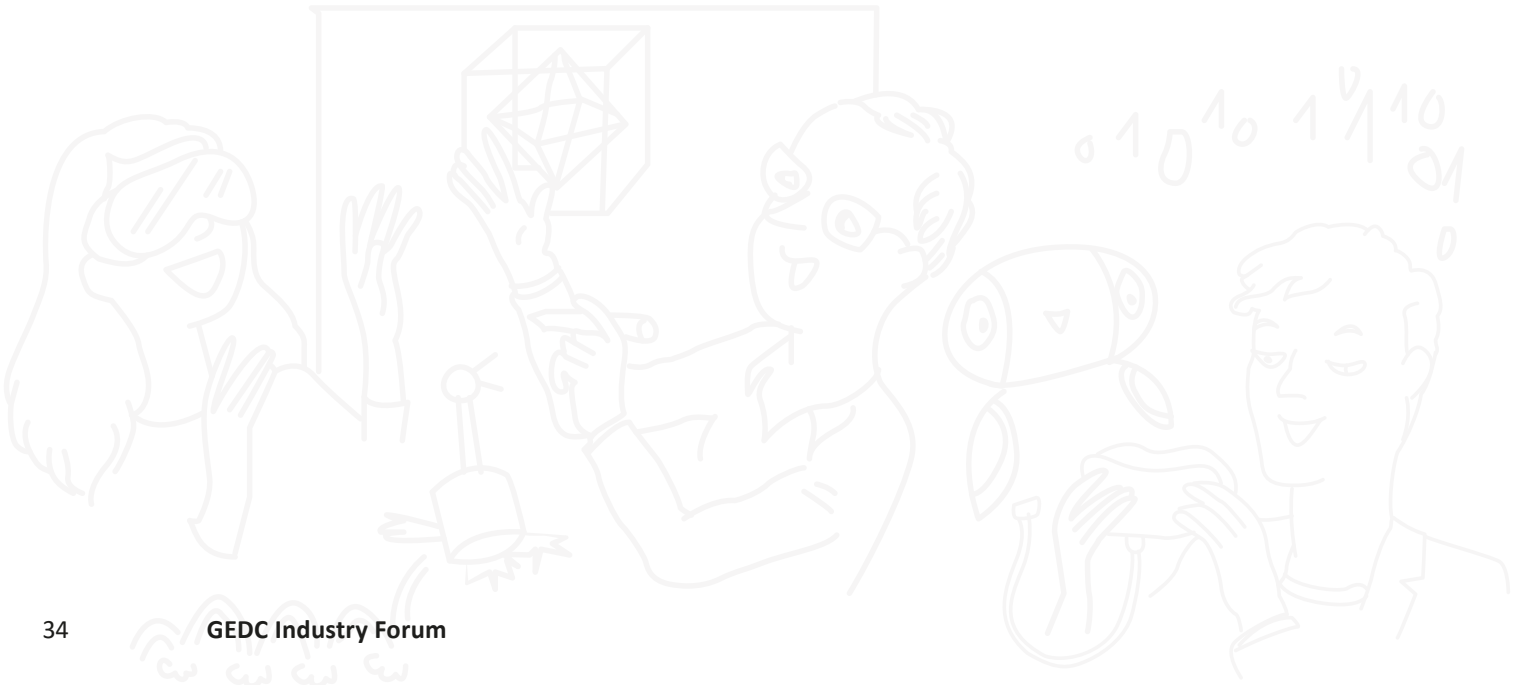
Once curiosity is encouraged, some concrete actions to reskill individuals during and after their university careers can be taken. The first step is to work with industry to identify which skills are needed most. Then, courses can be provided in collaboration between universities and industry, either online or in person. Short, stackable courses which are enjoyable are the key to successful lifelong learning. Certificates or badges can be given to individuals upon course completion, signalling to employers the acquisition of relevant skills.



2.4 DESIGNING THE FUTURE

Once the energising summaries were completed, delegates were asked to sign up for the theme of their choice. The groups then decided which aspect of the problematic they wanted to focus on collectively and then, working closely together as a team, spent the afternoon designing practical proposals in answer to the issues raised. Their challenge was to turn the present into the future. And rise to the challenge they did, as we saw in the output sessions the following morning.


INNOVATION
CREATE a CULTURE OF INNOVATION!
DEAR YOUNG LADIES. DEAR YOUNG BOYS ... LET'S SPEAK about FUTURE
NG BUTTON! T LEAST I OKE UP!
Dr DINOSAURUS
EVOLVE!
INTRA & ENTREPENEURSHIP SKILLS
EMPLOYABILITY SKILLS
GEE! LEARNING WITH MY HANDS & MY HEAD!..
...THAT'S UNIQUE!
PROJECTS
SCAPE A ZON ONE?
TEAM WORK
ACADEMIC LECTURES
IN DIGITAL ERA; HOW TO CAPTURE THE ATTENTION?
YEAH COOL
BLA BLA
BLA BLA
ZZ
I'VE GOT NEW CHALLENGES & NEW NEEDS FOR OUR CUSTOMERS!
PROTOTYPES
THE PLATFORM!
COMPANIES MENTORS
HEY DUDES! LAST YEAR I WAS SITTING AT YOUR PLACES NOW I'M RESPONSIBLE FOR COOL PROJECTS IN VIDEO GAMES...



3.

PRESENTATIONS
WITH A DIFFERENCE

On the final day of the Industry Forum, delegates showcased their ideas on how to turn the present into the future with a series of team designs that were as innovative in their format as they were in their content. During this part of the event, given the breadth of techniques used to present their ideas, the atmosphere could only be described as electric. Again, facilitator Chantal de Barra kept the teams on track, ensuring that the morning was both inspiring and fun. What follows is a summary of the concrete proposals put forward.

> One of the most valuable aspects of the event was that academia, industry and students got to work together, so we had an opportunity to get an insight into how people think and what they expect from each other.
>
> **Fabian Henze**
> Head of Software Development, Miele Tehnica, Romania

GROUP MEMBERS

Dr. Carmen Gerigan

Fabian Henze

Martin Koczmann

CLOSING THE SKILLS GAP FOR DIGITAL + SCARCE SKILLS

DYNAMIC DESIGN GROUP ONE

Dynamic Design Group One explored ways to help ensure that students are developing the skills required, in sync with rapid changes in technology and society. Discover their solution to closing the skills gap here.

What challenge did your group address?

Dynamic Design Group (DDG) One took up the challenge of how to minimize current and future talent shortages when we cannot predict with certainty what skills will be needed.

What was your group's solution?

Currently, the way education is structured, the expectation is for individuals to go to school, then to university to get a degree, and then enter the workforce until retirement. As most people do not go back to university for another degree, this leads to a clear separation between a 'theoretical study stage' and a 'practicing stage' in life.

DDG One's solution, then is to make the system much more flexible and combine theory and practice closely and throughout an individual's career.

How would this solution work?

Universities are already offering semesters or years of work-based learning programmes like internships, apprenticeships, etc. However, these programmes are not flexible enough, and often do not help students understand what drives them, and why they are in higher education other than because of a sense of obligation.

A more fluid approach, where students go back and forth between university and work is key to ensuring that the skills students are learning are kept in sync with the evolution of technology and society. For example, students could learn foundational skills in their first year, then go to work for years two and three, then return to university for the fourth year to 'tie it all together'. An online platform could also be developed to give students and employees more options. In this way, they are applying studied theory directly in industrial practice, or vice-versa, finding at university the answers to the questions they are facing at work. This in turn helps students remain motivated throughout their studies, with up-to-date skills.

What would be the role of stakeholders?

As work-based learning programmes already exist in some forms, the roles of stakeholders should already be fairly clear. To implement this solution, it is rather a change in attitudes that would be required. Stakeholders need to understand that their own desires and goals are not necessarily the most important ones – and it is only in this way that effective compromise can be found.

More specifically, employers need to understand that the responsibility of ensuring students have required skills does not fall on universities alone. Additionally, companies need to be more willing to collaborate with not only universities, but other companies as well – even if these are competitors – in order to be most effective in developing needed skills.

For their part, universities need to be more open to flexible programmes involving industry, in addition to provoking critical thinking skills in students so that they are able to move more easily between theory and practice.

Vitally, both universities and employers need to understand the young generation's view of life, their ideals, and desires in order to adapt. Students, on the other hand can help this understanding by giving feedback on what works for them and what they find valuable and not in higher education.

What would be the immediate next steps towards implementation?

The first step towards implementation of this solution would be the establishment of a concrete working group that designs a solution together, that is ready for implementation. This process can be viewed as similar to devising an industry standard, where there is cooperation in standardisation, and competition in implementation.

It is the cooperation step that is most crucial, and difficult, because it is challenging to find people who share the same vision and trust each other enough to cross university-industry boundaries. It is evident today that there is a lack of this needed cooperation, as industry says it lacks skilled people, universities offer new courses hoping that students will take them, and students are asking why they should study certain subjects. So, the working group should first work on alignment, and mutual understanding, followed by a concrete plan for implementation.

What obstacles might there be regarding implementation?

One obstacle is schedules that are too rigid. Employers need to be flexible enough to allow their staff to reduce working schedules for education and likewise, universities need to recognise that students can't dedicate 100% of their time to study, so for example they need to be more flexible with exam dates and presence times.

Another obstacle – or even danger – could be the concentration of education providers. The internet was devised as a democratic way of openly sharing knowledge and services, but what has happened in reality is concentration as there is often only space for one, or very few, companies and organisations.

If this also applies to the plurality of education currently enjoyed, there is a severe risk of limiting the freedom of thought and thus advancement in the service of humanity.

Are there examples of your group's solution being partially or fully implemented elsewhere?

Prof. Peter Jimack, Executive Dean of the Faculty of Engineering at the University of Leeds, and an Industry Forum Bucharest delegate, gave an example of something similar to the group's solution. At the University of Leeds, the new Engineering Management degree is taught online and is flexible, allowing students to take only individual modules rather than the whole degree course if desired.

The modules are still assigned materials and credit points, however, that count towards a degree that is awarded if all the modules are taken within a two- to four-year time span. This is an important step in the right direction, closing the gap between 'a couple of days training' and 'a full-fledged degree course'.

What could be the GEDC's role in implementing your group's solution?

The GEDC is the ideal forum to bring stakeholders together, nurture ideas and to get 'kick-started'. Through the Industry Forum, which brings together industry, academia, and – most importantly – students, the GEDC has thus already provided the right framework. Students are usually the group that gets overlooked in university-industry events, even though both universities and industry should be focussed on them. Additionally, the GEDC can act as a an 'interpreter', not only bringing stakeholders together, but also actively helping them understand each other's perspectives and needs.

GROUP MEMBERS

Dr. Zoran Cekić
Aurelia Florea
Prof. Dineshkumar Harursampath
Liviu Moroianu
Antonia Năndău
Ioana Neamțu
Dr. Emilia Pecheva

GRADUATE EMPLOYABILITY SKILLS

DYNAMIC DESIGN GROUP TWO

Dynamic Design Group Two tackled the challenge of developing graduate employability skills in all engineering students. Discover their solution below, as explained by Prof. Dineshkumar Harursampath.

What challenge did your group address?

Dynamic Design Group (DDG) Two addressed the challenge of how to ensure that all students are developing required employability skills, such as communication, teamwork, cultural awareness, and ethics. Currently some employers say that engineering graduates do not sufficiently possess these skills, or that they are not sufficiently evaluated alongside technical skills.

What was your group's solution?

DDG Two's solution focusses primarily on overhauling the 3M's of skillset delivery: mechanism, medium and marketing. The employability skills which are lacking in many of the recent engineering graduates globally are already well known. The deficient skillsets are mostly generic as only a few are industry specific. While the industry-specific skillsets may be delivered in the corresponding engineering departments and/or the particular industries themselves, the generic skillsets need to be put in place well before graduation.

Examples of desired generic employability skillsets are work ethics, critical thinking, problem definition, problem solving and communication.

How would this solution work?

This solution would work by communicating with students in a way that they can relate to, and therefore be more open to. The mechanism of the solution would involve identifying and involving self-motivated final year students and/or highly successful recent graduates already in the workforce to bridge the gap between students overall and other stakeholders such as faculty and industry representatives. Representatives from academia, industry, government ministries dealing with skill development, and non-governmental organisations (NGOs) working in the field would also need to be identified and involved.

The solution medium would be a mixture of an online platform and face-to-face meetings. As students today are quite adept at and interested in online tools, a mixed media approach could stoke more interest in employability skills. Online platforms are also much more easily scaled up. Content used on the platform and for in-person meetings could be taken from already established teaching materials and presented in a way that is as interesting for students as possible.

Once the mechanisms and media are in place, effective marketing of the solution is critical to its success. Here again, using motivated students and successful recent graduates is important, especially in early stages, as students' choices are often based on word-of-mouth feedback from key students and other relatable individuals.

What would be the role of stakeholders?

Universities would take the first steps in this solution, which would be to identify self-motivated final year students who have a natural aptitude for the generic skillsets required for employability. These students would then become part of the solution itself.

Industry would need to spare some of their high-performing employees who have been recruited in the last few years, so this helps with marketing and actual delivery of face-to-face courses.
From the government, motivated representatives from ministries relevant to skill-building need to be identified and contacted. NGOs working on similar topics should also be identified and contacted, as well as alumni with interest in skill development of students.

What would be the immediate next steps towards implementation?

After identifying appropriate individuals from each of the stakeholder groups mentioned above, the next step would be to initiate a pilot project in a specific region. The online platform should be developed before other in-person courses to give the project more initial exposure. Not all content can be successfully delivered online, so identifying appropriate learning materials to put on the online platform would need to be done by participants in the pilot.

What obstacles might there be regarding implementation?

Stimulating interest in students could be an obstacle, as students have limited time, but once they see the value of developing employability skills, they would make the time. The message that there is always time if priorities are set can always be addressed by the marketing team of the project. Otherwise, scalability of the solution across industries and regions is challenging, as the funding required could be massive.

Are there examples of your group's solution being partially or fully implemented elsewhere?

DDG Two members were aware of examples of the solution existing in parts and parcels in different areas, but not of any with the comprehensive structure and format of delivery that is proposed. Nonetheless, a more detailed and formal study of best practices from around the world is required to identify similar solutions, if any.

What could be the GEDC's role in implementing your group's solution?

The leadership of the GEDC and their growing databases could be leveraged in creating a dynamic core group of self-motivated final year students, high-performing new industrial employees who have been recruited in the last 2-3 years, representatives of academia, industry, government ministries dealing with skill development, and NGOs already working in this field to brainstorm on this concept and take it forward, with appropriate funding.

GROUP MEMBERS

Maria Cristina Banu
Dr. Natacha DePaola
Boglárka Duray
Dr. Peter Jimack
Greg Konstantinov
Prof. Octavian Thor Pleter

INTRAPRENEURSHIP + ENTREPRENEURSHIP SKILLS

DYNAMIC DESIGN GROUP THREE

Engineering graduates are increasingly creating their own companies, while established companies are looking for graduates with intrapreneurship skills, or those who can drive new projects and explore new directions in business development. Discover Dynamic Design Group Three's solution for developing these skills below.

What challenge did your group address?

Dynamic Design Group (DDG) Three focussed on how universities and industry, including small- and medium-sized enterprises (SMEs) can work together to develop intra- and entrepreneurial engineers of the future.

What was your group's solution?

The solution developed by DDG Three is a four-year university programme carried out in collaboration with industry called Growing Entrepreneurial Traits (GET) that would help students develop relevant skills. This programme does not consist of curricula in itself but is instead principally a way to structure the content of the learning programme.

How would this solution work?

Intra- and entrepreneurship skills fall into three groups: soft skills, leadership skills, and technical skills. The GET programme would address all three groups over a four-year period. In the first year, called GET United, the focus would be on collaboration skills and new ways of working such as agile. Students would form small teams and over the course of the year, they would be required to take part in different activities with associated deliverables. Teams could use different methodologies such as Scrum to complete activities

In the second year of the programme, called GET Purpose, students would participate in activities meant to help them understand what they would like their focus in engineering to be. Students could do site visits, shadow different types of engineers, or be assigned career mentors or coaches. Industry would not only provide support for the above, but would also go to campus to present their work. During the summer after this second year, students would be required to either complete an internship or shadow someone.

The third year of the programme, called GET Ready, would require students to participate in weekend start-up activities supported by industry, where they would work in teams to develop ideas for start-ups. Doing this would allow students to put into practice the soft skills and engineering skills that they learned in previous years while developing leadership skills. In the second semester, the student teams would pitch their ideas to industry representatives, who could possibly decide to fund certain projects.

During the fourth year of the programme, called GET Real, students would work on a thesis project in collaboration with industry. The project would be something that could be used by a company, and the student could even go work at the company during this time.

What would be the role of stakeholders?

The role of universities in the GET programme would be to have a team develop the content of the programme, and find ways to deliver this content alongside already existing curricula. They would also need to identify industry partners from companies, both large companies and SMEs.

For companies, their role is to first recognise the utility of the GET programme, and find a place for it in their strategy. They would then need to identify and allocate employee representatives who would be directly involved with students, and who would find facilitators and speakers to participate as necessary. Companies would also need to provide prize money for the third year start-up activity, if it is decided that winning teams would be rewarded with funding.

Students could be part of the team that develops the GET programme within the university, and could help implement the programme for incoming freshmen. For their part, the government could contribute in different ways depending on the country. For example, some governments have accelerators, which could be integrated with the third and/or fourth year of the programme and provide funding for student projects. Otherwise, the government could make the GET programme mandatory as part of university standards.

What would be the immediate next steps towards implementation?

In order to implement the GET programme, a project team would have to be created by each university, as mentioned above. It would be this group who would design the programme in such a way that suits the university and its existing curricula, as well as identify appropriate companies to work with.

What obstacles might there be regarding implementation?

One obstacle would be the hesitance of stakeholders to implement a programme like GET. The programme could be started in one university as a pilot, however, and then with some strong advocacy the idea could spread.

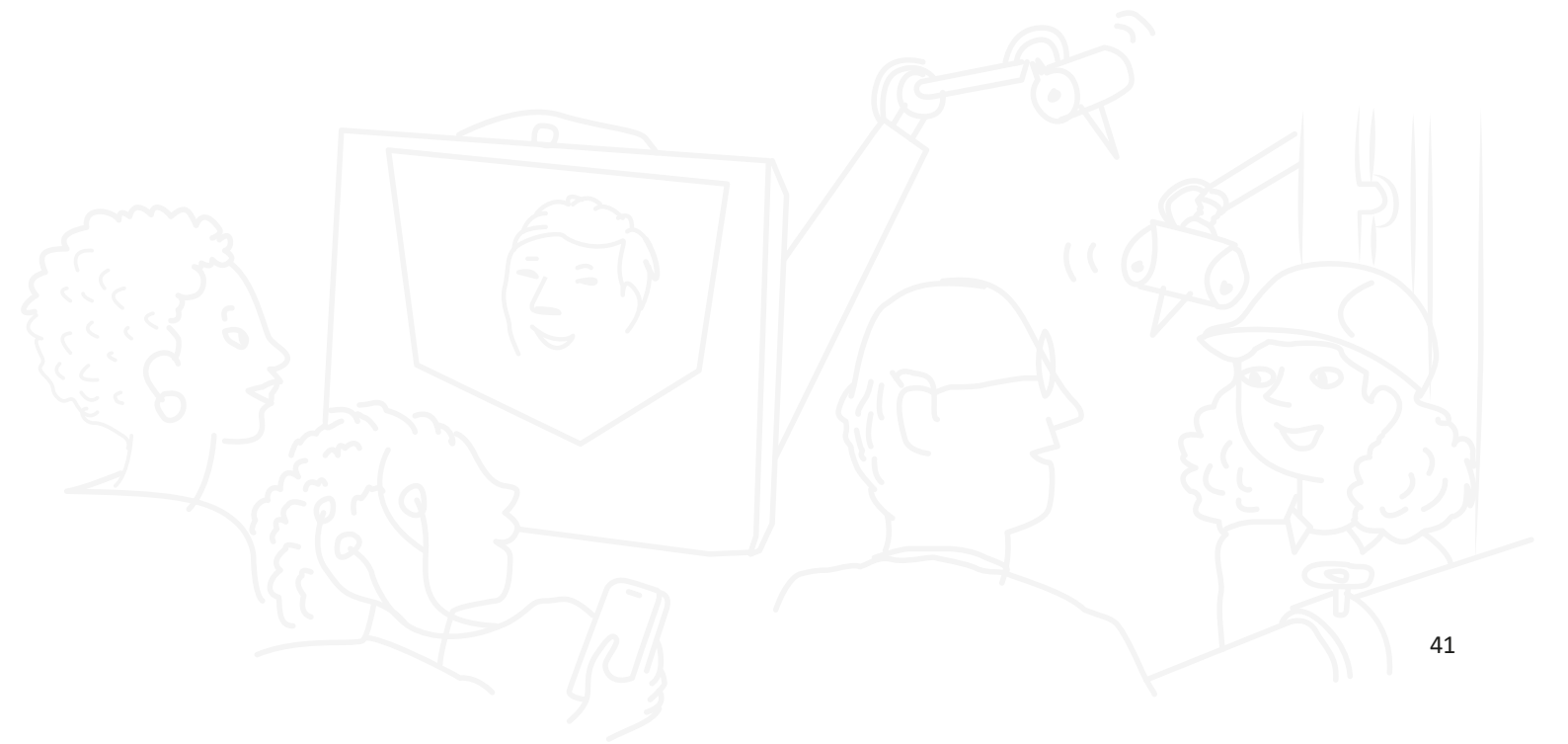
Finding sufficient resources could also be challenging. In companies, for example, it could be difficult to convince management to allow for employees to spend the required time working with universities on the GET programme, as well as to provide funding for student projects.

Are there examples of your group's solution being partially or fully implemented elsewhere?

There are some universities who have different pieces of the GET programme, but none known to have a similarly comprehensive programme.

What could be the GEDC's role in implementing your group's solution?

The GEDC could promote the GET programme among their members, who could implement pilot programmes in their universities. This could be followed up with assistance in branding and structure.



GROUP MEMBERS

Zinyat Agharzayeva
Dr. Alaa Ashmawy
Dr. Michael Fors
Paul Gilbert
Prof. Şirin Tekinay
Prof. Dr. Doru Ursuțiu
Prof. Dr. Daniel Vizman

INNOVATING TOGETHER

DYNAMIC DESIGN GROUP FOUR

In a time of rapid technological change, innovation is critical for an individual, organization, country, or region to remain competitive. Discover more about Dynamic Design Group Four's approach to developing innovation in this interview with Prof. Şirin Tekinay.

What challenge did your group address?

Dynamic Design Group Four addressed how to best develop collaborative innovation through university-industry relationships, whether through the development of an innovation ecosystem, individual innovation skills, or through the creation of a culture of innovation.

What was your group's solution?

Developing collaborative innovation is difficult in that there is no one solution that would work in all contexts. DDG Four used its collective experience and knowledge about how not to innovate, however, and came up with a new approach to innovation. In this approach, the focus was on providing a flexible, creative, and collaborative environment to give innovators the freedom to explore new ideas and interact with others. The idea behind this approach is that if creative individuals are given a space that is not too structured, they will be more likely to put their own internal resources to good use. No matter the process used in developing these spaces, the goal should be open innovation, open science, and open design.

How would this solution work?

In this flexible, creative, and collaborative workspace, failure should be allowed, as the intolerance of failure is one key obstacle to promoting innovation. Universities are one of the best places to accept failure, and these can be reported and used for evaluation.

To find students to participate in these collaborative innovation spaces, both university administration and faculty need to be on alert for innovative students, and be ready to put them in touch with SMEs and global companies so that they can work together. Governments should also be involved in the creation of these innovation spaces, as they can really facilitate their development especially through providing resources.

What would be the role of stakeholders?

The principal role of universities in this new approach to innovation would be to ensure that collaborative innovation spaces are allowing failure and identifying innovative students to work with industry partners in the space.

Industry should work towards a more open mindset when dealing with universities. Although industry may be concerned with sharing competitive ideas, there should be more awareness that ideas from universities are also stake. To protect both parties, standard, straight forward non-disclosure agreements need to be made openly available so they can be used each time a university and company collaborate.

Students, for their part should acknowledge their own creativity in taking part in the collaborative innovation space. A specific action that they could take to be an effective collaborative innovator would be to keep a detailed record of all ideas and actions, which can help facilitate collaboration and aid educators in creating individualised learning programmes.

The role of government in this new approach to innovation would be to facilitate the creation of collaborative innovation through the provision of resources, as well as updating intellectual property (IP) laws to allow for the movement towards open access to information to prosper.

What would be the immediate next steps towards implementation?

Some concrete next steps would be to instigate discussions between stakeholders to decide how to implement individual collaborative innovation spaces. Funding sources and the provision of physical space needs to be agreed upon. These discussions, as well as the creation of the collaborative innovation spaces, should help a culture of innovating prevail, and shift the mindsets of individuals from being a user of technology to a producer of technology. Existing fab labs could also be improved upon and promoted as joint innovation spaces.

What obstacles might there be regarding implementation?

IP restrictions are one of the largest obstacles facing the development of open, collaborative innovation. One individual can very rarely innovate alone today, therefore teams are necessary, but IP regulations can hamper innovation through restricting the open sharing of ideas and information. Agreements need to be made among stakeholders on what information to keep and how long. Overcoming these obstacles should result in open innovation, open design, and open science, which are crucial to progress in the 21st century.

Are there examples of your group's solution being partially or fully implemented elsewhere?

There are some initiatives that exist that promote open science, which helps lead to open collaborative innovation. In Europe, the 'Open Aire' project provides open access to a searchable cloud-based repository.
In Turkey, the government is actively involved in promoting innovation through TÜBITAK, the Scientific and Technological Research Council. TÜBITAK's Industrial PhD programme, for example, brings doctoral students and the private sector together through cooperation protocols. Through the Council's multiphase innovation network programme, the generation and flow of knowledge between universities and industry is funded and supported through a technology-based innovation hub.

The United States Small Business Innovation Research programme (SBIR) stimulates high-tech innovation and promotes entrepreneurial spirit through a competitive awards-based approach that encourages small businesses to engage in Federal Research and/or research and development (R&D).

What could be the GEDC's role in implementing your group's solution?

The GEDC, by its very nature can aid in facilitating open, collaborative innovation through the provision of a platform and exchange of best practices. Additionally, the Industry Forum initiative brings people together with the common goal of bridging the gap between universities and industry in terms of knowledge transfer and generation.

GROUP MEMBERS

Razvan Ciolacu
Dr. Mariana Mocanu
Katarzyna Olbromska
Dr. Idris Hadi Salih

DIGITAL SKILLS + LEARNING TO LEARN

DYNAMIC DESIGN GROUP FIVE

Lifelong learning is a necessity in today's dynamic labour market, particularly the fast-changing technical skills required for a successful ongoing career in engineering. Dr. Mariana Mocanu, representing Dynamic Design Group Five, provided insight into this topic. Discover the highlights of this interview below.

What challenge did your group address?

Dynamic Design Group (DDG) Five addressed the challenge of how to best equip the workforce with skills for the new 'knowledge economy' as well as develop in graduates the ability and desire to continue to learn and provide the mechanisms for reskilling to take place when needed.

How would this solution work?

Through developing deep thinking skills using digital tools, students will be prepared to learn throughout their entire careers and lives.

What was your group's solution?

DDG Five focussed not on developing a specific solution, but on exploring how teaching to learn can be optimised in a digital environment. Approaching learning to learn in a systematic way is crucial to encouraging students to practice more comprehensive problem solving.

As learning styles vary among individuals, teaching should be personalised in order to ensure each student is gaining the deep thinking skills necessary. These skills encourage students to not just find the information required to solve a problem, but to understand the context of the problem and/or find alternative solutions.

Strong feedback systems should also be in place to inform teachers on how effectively students are learning so that they can be better guided. During the entire educational process, the use of digital tools to support learning should be intelligently optimised. In this way, digital skills can be built as complements to deep thinking skills.

What would be the role of stakeholders?

Universities should tailor course organisation to the knowledge areas covered. For example, some courses can be taught in large groups, while others need smaller class sizes that allow for individual interaction between teacher and student. Degree programmes should be designed to offer flexibility and allow students to work for credit according to their own individual learning styles. Supervised independent study could be one possibility.

Additionally, universities should involve industry in the learning process so that theoretical discussions in class can be balanced with initiatives for the practical application of student knowledge and skills.

Industry should facilitate student interaction with company representatives. This could be achieved through campus activities, student internship programmes, and industry speakers in class, among other initiatives.

As more personalised learning requires more resources, the principal role for government would be to help provide these resources. Non-profit organisations could also get involved by organising contact between students and industry.

What would be the immediate next steps towards implementation?

Communication is key to teaching digital skills and how to learn. Developing channels of communication between students, teachers, industry, and other stakeholders can help students understand the value of course content beyond their immediate needs and understanding.

What obstacles might there be regarding implementation?

An increased pace of life, which often forces students to split their attention between overburdened course loads and work-related activities is one of the primary obstacles to implementing the learning environment necessary to developing deep thinking skills. Research requirements and publication pressures on professors can also limit time available for developing their teaching methods and skills.

Course size and rigidity of degree requirements and course structures present another obstacle, for example in some countries study programmes are strictly defined by governing bodies which make personalised learning challenging. This places significant responsibility on the individual teacher.

Are there examples of your group's solution being partially or fully implemented elsewhere?

There is no ideal model or global solutions that can be applied to all. Some partial solutions exist such as combining interdisciplinary and theoretical approaches. Regarding development of digital skills, digital learning is fairly ubiquitous today.

What could be the GEDC's role in implementing your group's solution?

The GEDC can play an important role by organising as many events, debates, and discussions as possible on the topic of digital skills and learning to learn. Examples of good practices should also ideally be shared.

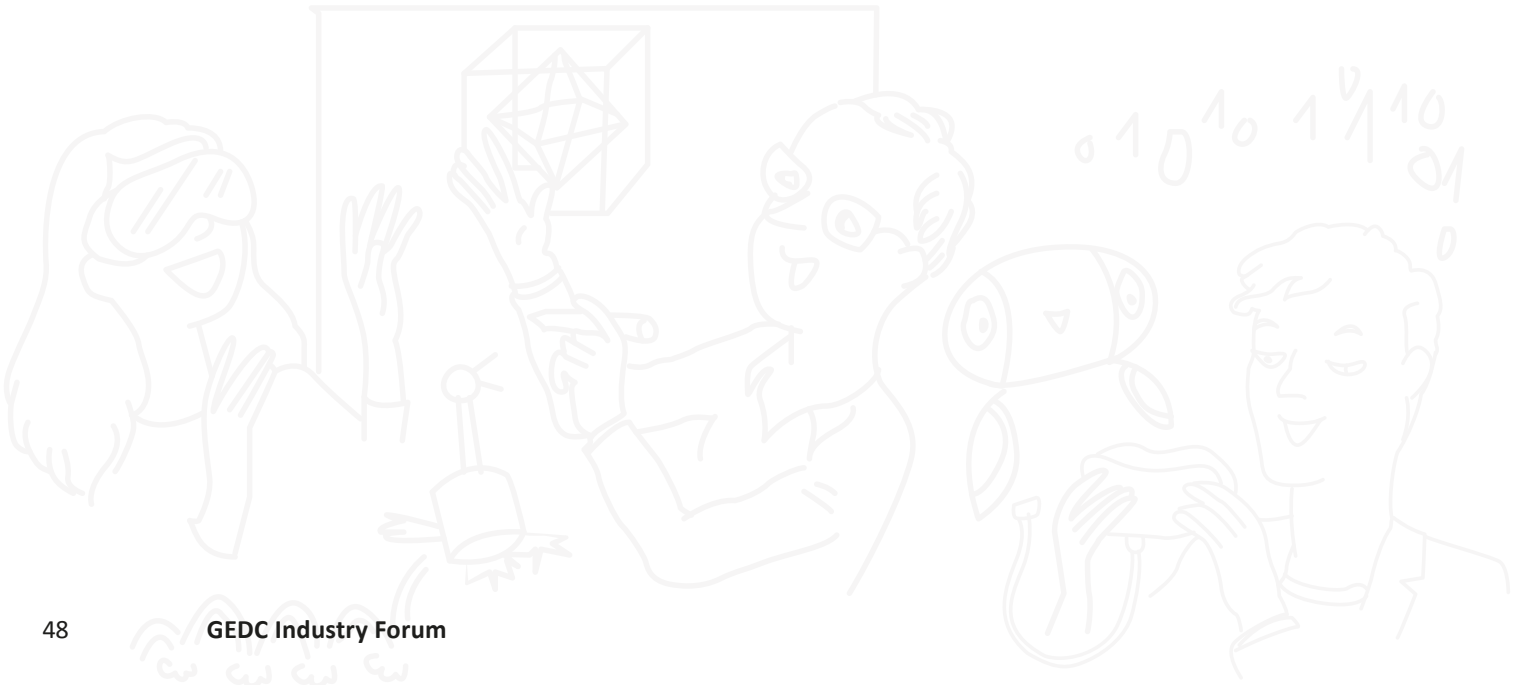
Active networks can also be created by the GEDC in various domains so that questions specific to different types of engineering can be addressed. Teaching oriented working groups can also be developed throughout the GEDC network.

‘The fun & involvement of all participants made all the difference between this event & most others. It helped create a deep impact in sustainable ways.’

Industry Representative


PRESENTATION 1
PRESENTATION 3


GEDC
Petrus
ONLINE TRAINING
LECTURES



4.

CONCLUSION: WHAT NEXT?

Throughout the brainstorming sessions and the Dynamic Design Group presentations – which produced a number of concrete proposals and valuable ideas to build on – some common themes emerged. These included areas in need of change, and ideas for implementing change. They are all outlined briefly in this chapter and our coming events in Fontainebleau and beyond pick up on these themes very strongly.

> Everybody had a chance to communicate, to contribute - a major change from other events.
>
> **Education Representative**

4.1 OUTPUTS FOR CHANGE

4.1.1 Areas for Improvement

The following were mentioned repeatedly in brainstorm sessions and Dynamic Design Group summaries. These are areas that need to change in order to best design and implement the future of engineering education.

Flexibility of Education Systems

More flexibility is needed when it comes to how education systems are structured. This will better allow educators to respond – in collaboration with other stakeholders – to the fast pace of change in technology and society overall today.

Building Trust for Openness and Transparency in Collaboration

Stakeholders across the board need to find the confidence with each other to be open and transparent with ideas, information, ways of working, and more, in order to promote innovation. Strong relationships of trust, coupled with transparent, authentic communication between stakeholders are the foundation of this. Engineering education today needs to enable students and recent graduates to understand what is trust, how it is built (or destroyed), and maintained among those they work with and beyond.

Spaces for Creativity and Innovation

More spaces – whether physical or virtual – need to be created to bring individuals from all stakeholder groups together. These spaces should facilitate exchange and experimentation in order to cultivate creativity and innovation.

Promotion of the Value of University-Industry Collaboration

To implement the kinds of solutions discussed during the Industry Forum, there needs to be a broader recognition of the value of university-industry collaboration. This will help new innovative programmes receive the vital resources they need, such as funding, time, support by management, and more.

4.1.2 Ideas to Implement Change

Some ideas about how specifically to go about promoting change in engineering education for the future were mentioned across multiple brainstorm and Dynamic Design Groups.

Identify Innovative and Motivated Individuals

Identifying individuals who are innovative and motivated was often stated as a crucial first step towards implementing Dynamic Design Group solutions. These individuals could come from many different stakeholder groups. Examples include self-motivated students that are needed not only to take part in university programmes, but to promote these programmes among their peers; individuals in relevant government ministries could help draw attention to different programmes and provide a framework for scaling up; and employees of companies who can help drive programmes with universities internally through advertising the value of university-industry collaboration to peers and management.

Include Additional Stakeholders

The Industry Forum focuses on university-industry relations, but as touched on in the previous idea, that does not mean that universities and companies are the only stakeholders that can help facilitate collaboration between these two groups in order to help develop the engineers of the future. Throughout discussions about solutions with facilitators and focal points for Dynamic Design Groups, the idea to bring other stakeholders into the mix was proposed repeatedly. These other groups include:

- the government, which sets the framework for collaboration and innovation through policy and is a potential source of funding
- non-governmental organisations (NGOs), who have broad expertise on a number of topics relevant to the Industry Forum
- university alumni who can sometimes connect on a different level with students
- student groups who can give insight into the student perspective and who can also effectively advocate for different programmes.

Research on Scaling Up Global Skill Development Programmes

There is a considerable amount of valuable research on what global skills could be promoted and developed through university-industry collaboration programmes, for example the American Society for Engineering Education (ASEE) Attributes of a Global Engineer Project, and the 2017 Industry Forum Concept Paper which compiles a list of skills from multiple sources on the topic. While research on global skills needed in future engineers exists, what is needed today is research and exchange on how to create scalable high impact programmes that could deliver these global skills in an effective way through university-industry and other stakeholder collaboration.

[4] The ASEE research can be found at this link: www.gedcouncil.org/sites/default/files/ASEE%20Attributes%20of%20a%20Global%20Engineer%20Paper_0.pdf
The GEDC Industry Forum Concept Paper 2019 can be found at this link: www.gedc-industryforum.com/GEDC-Industry-Forum-2019-Concept-Paper.pdf

4.2 DELEGATE FEEDBACK

Delegate feedback was gathered from the 26 participants who completed a survey following the 2019 GEDC Industry Forum (12 education representatives, 9 industry representatives, 4 student representatives, and 1 government organisation representative).

- Feedback was very positive, with 96% of delegates satisfied with the event. There was also great interest in participating in the next edition of the Industry Forum (87% would like to participate in another regional GEDC Industry Forum). The vast majority of activities were highly rated and the documents shared during the event were considered to be impactful and useful.
- The most valued aspects of the Industry Forum were the networking and brainstorming sessions. Participants felt that they had a great interaction and got to acknowledge valuable points of view from industry, academia and students.
- Activities particularly highlighted by participants (all scoring close to 6 out of 6) were the student perspective session, the "Get to Know You" cocktail, the team work on 5 questions, and the Dynamic Design Group rotating brainstorms and presentations.
- The GEDC Industry Forum Concept Paper 2019, as well as the delegate brochure and event joining instructions, were all held in high regard by participants who considered it to be rich and useful for their activity.[5]
- Participants consider the impact of the event to be best achieved by providing follow up on the ideas and suggestions made, receiving documents, presentations and conclusions generated from the event, and being updated on ongoing progress of agreed actions.
- Bringing more students on board, offering a workshop on learning methods to attendees and moving away from the traditional classroom seating format were mentioned as things to be improved or added to next editions.

[5] The GEDC Industry Forum Concept Paper 2019 can be found at the link given in the previous footnote.

4.3 NEXT STEPS

Building on the momentum of this edition of the GEDC Industry Forum will be essential for meaningful change to occur. The next opportunity to continue the collaboration between university and industry leaders will come during the next GEDC Industry Forum, which is taking place once again in Fontainebleau, France from 3rd to 5th July 2019.
Given the extremely positive feedback from delegates and the overwhelming interest in continuing the collaboration and work done, the decision has been made by the GEDC and Petrus Communications to hold further regional Industry Forum events, in addition to the annual global Industry Forum. This will allow delegates further opportunity to progress with ideas they have begun to implement at their organisations.

For more information and updates on actions and timelines, please visit the GEDC Industry Forum website[6], or join our LinkedIn group[7].

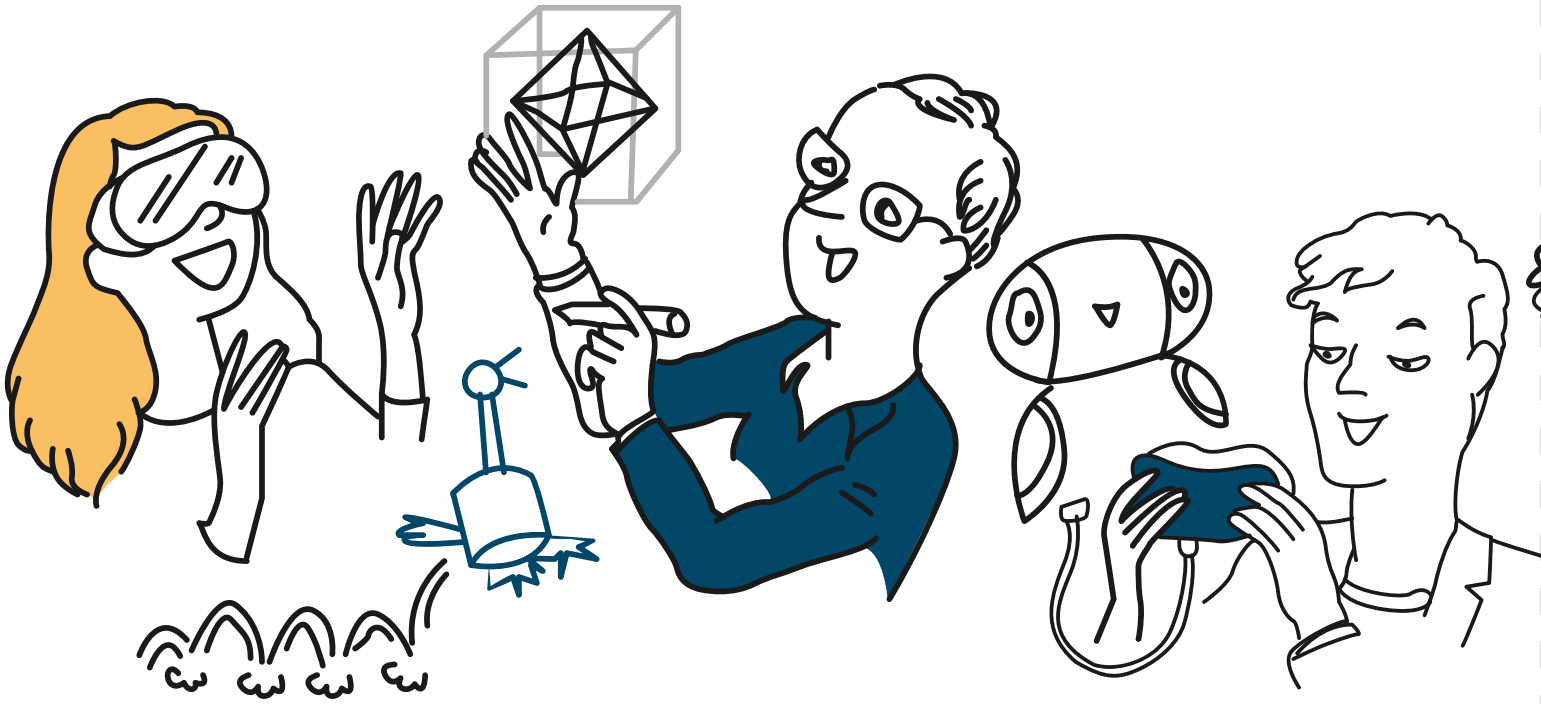
Additional materials and resources are also available online:

- The 2019 Industry Forum in Bucharest – Infographic[8]
- The 2019 Industry Forum in Bucharest – Concept Paper[9]
- The 2017 Industry Forum in Fontainebleau – Report[10]
- Engineering Employability Initiatives provided by Industry Forum delegates[11]

JOIN THE CONVERSATION!

Find out more about the next Industry Forum event and request an invitation here: **www.gedc-industryforum.com**

[6] http://gedc-industryforum.com/
[7] https://www.linkedin.com/groups/13533707
[8] http://gedc-industryforum.com/GEDC-IF-Bucharest-Feedback-Infographic.pdf
[9] http://gedc-industryforum.com/wp-content/uploads/2019/03/GEDC-Industry-Forum-2019-Concept-Paper.pdf
[10] http://gedc-industryforum.com/download-report/
[11] http://gedc-industryforum.com/wp-content/uploads/2017/10/GEDC-Industry-Forum-Engineering-Employability-Initiatives.pdf



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