



ENGINEERS 4 EUROPE

E4E

Engineers for Europe

September 1, 2022 - August 31, 2025

Project Ref. Nr.: 101054872 — E4E — ERASMUS-EDU-2021-PI-ALL-INNO

Fórum Competências em Engenharia

E6.2 Report



The poster features a blue background with a cluster of speech bubbles in white, dark blue, and light blue on the left side. At the top right, there are three logos: the Engineers 4 Europe logo, the FEUP logo (Faculdade de Engenharia, Universidade do Porto), and the Ordem dos Engenheiros logo. The main text is centered and reads: 'Fórum' in white, 'Competências em Engenharia' in orange, and '17 SETEMBRO 2024' in white. Below the date, it says 'Sede da Ordem dos Engenheiros | Lisboa'. A gear icon with a speech bubble inside is positioned above the word 'Fórum'.



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I. Introduction

The ERASMUS+ funded “Engineers for Europe” (E4E) project aims to prepare better equipped engineers through the acquisition of new competences, covering knowledge, attitudes and leadership skills while focusing on digital, green, resilient and innovative entrepreneurship skills. E4E will bridge the gap between education and industry, while operationalising EU competence frameworks (DigComp, LifeComp, EntreComp) for engineering education. E4E’s main outputs, are to:

1. Establish the Engineering Skills Council, a multistakeholder EU platform for enhanced dialogue/collaboration between representatives of education, training, industry and employers.
2. Design a monitoring methodology to gauge the dynamics, challenges and opportunities of the engineering profession, culminating in the yearly Engineering Skills Strategy.
3. Develop & deliver the E4E Curriculum, an innovative training for transversal competences and skills.

Figure 1 shows the project’s work packages (WP) and how they are interconnected to reach the proposed goals. WP 2, 3 and 4 will deliver the most relevant outputs. While in WP2 the E4E Skills Council and monitoring strategy were established, WP 3 and WP4 will develop and deliver an innovative E4E training program directed to engineering professionals. WP5 deals with quality assurance of the project, and WP6 addresses dissemination and exploitation of the project’s results.

A key document of the project is the valorisation plan which defined the objectives of the eight E4E events, namely:

- Presenting the Skills Council of E4E
- Inviting interested parties to join the Council
- Using monitoring methodology to provide input into the Competence Strategy and use the E4E training and curriculum

This document refers to the E4E event E6.2 “Fórum Competências em Engenharia”, which was organized by partners FEUP and Ordem dos Engenheiros.

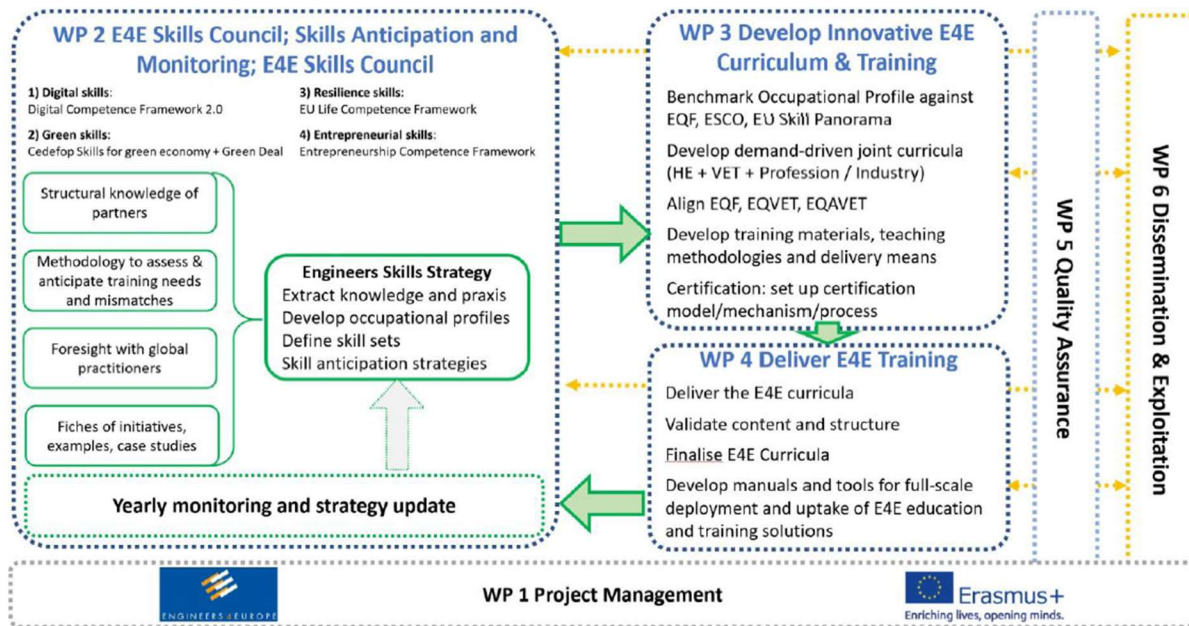


Figure 1 - E4E workpackages flowchart

II. Agenda of the event

The event was idealized with the intent to promote the E4E Skills Council, the E4E Skills Strategy and at the same time to hear the voice of different stakeholders involved in Engineering training and continuous professional development.

The event was organized around two inaugural lectures, followed by four roundtables and a closing session.

The opening session was conducted by the Bastonário (Chairman) of Ordem dos Engenheiros (Figure 1) and the Dean of FEUP (Figure 2).



Figure 1 – Engenheiro Fernando de Almeida Santos,
Bastonário da Ordem dos Engenheiros



Figure 2 - Professor Rui Calçada, Dean of FEUP

The two inaugural lectures addressed “Competences in Engineering” by Professor Sebastião Feyo de Azevedo, President of the Engineering Academy of Portugal and “E4E Skills Strategy Anticipating Skills Requirements for the Engineering Profession” by Engineers Europe General Secretary Dirk Bochar.

The four round tables addressed the following themes:

- Round table #1: **What skills do companies look for in recruiting engineers?**
In this roundtable, representatives of four companies were asked to share their perspectives of the skills gaps they identify when hiring new engineers. The round table was chaired by Engenheiro António André, Skills Council member appointed by Ordem dos Engenheiros. The speakers were Maria Moura, Diretor of the Area on People and communication of Mota Engil, Pedro Pastilha, Director of Vestas Technology Center do Porto & Head of Onshore Product Management, Mariana

Branquinho da Fonseca, Senior Partner and Country Chair of Korn Ferry and Nuno Fernandes, General-Diretor of Casais.



Figure 3 – Professor Sebastião Feyo de Azevedo, President of the Engineering Academy of Portugal



Figure 4 - Engineers Europe General Secretary Dirk Bochar



Figure 5 - Round table #1

- Round table #2: **How can VET providers contribute to the training of engineers?**
Round table number 2 invited representatives of five VET providers to talk about their contributions for engineering education and potential cooperation with all

involved stakeholders. Roundtable #2 was chaired by Bento Aires, President of the Northern Region of Ordem dos Engenheiros and was composed of the following speakers: Rui Abreu, General-Director of Comunilog, Carlos Martins, EPAL's Executive President, João Morim, Training Officer of CINEL, Roberto Cerqueira, Training Manager of LIPOR Academia and Pedro Severino, Business Developer in Certification and Coordinator Auditor at APCER.



Figure 6 - Round table #2

- Round table #3: **What educational models should be implemented in HEIs to develop the skills of future engineers?**

This round table included five presidents or deans of Engineering schools of Portugal. These Higher Education Institutions (HEI) represented the University and the Polytechnical sectors. The round table was chaired by Professor Augusto de Sousa, Skills Council member appointed by FEUP. The speakers were Rogério Colaço, President of Instituto Superior Técnico, Maria João Viamonte, Presidente of Instituto Superior de Engenharia do Porto, Mário Marques Freire, President of the Faculty of Engineering of Universidade da Beira Interior, Carlos Rabadão, President of the Polytechnic Institute of Leiria and Pedro Ferreira, Vice-President of the Polytechnic Institute of Setúbal.



Figure 7 - Round table #3

- **Round table #4: What do Engineers think?**

The last round table was composed of an engineering student and two engineering alumni, who shared their perspectives of the current challenges for engineering professionals. The last round table was chaired by Engenheira Lúcia Santiago from Ordem dos Engenheiros and Engenheiro João Pedro Pêgo, from FEUP. The invited speakers were Francisco Campos, representing BEST Porto, Nuno Cordeiro, Managing Director of TechTailors and Célia Pedro, representing the Group of Young Engineers of Ordem dos Engenheiros.



Figure 8 - Round table #4



Figure 9 - Engenheira Lídia Santiago (Ordem dos Engenheiros) speaking in the closing session

The event's website is accessible here:

<https://www.ordemosengenheiros.pt/pt/eventos/forum-competencias-em-engenharia/>

The detailed agenda of the event is presented in APPENDIX A

The total number of registrations was 162, and 106 attended the event. The attendance list is included in APPENDIX B.

APPENDIX C is a list of selected photos of the event.



III. Event's main conclusions

During the inaugural lecture, Professor Sebastião Feyo de Azevedo emphasized the relevance of the role of Engineers in society and how they should maintain an open mind, adapt to new times and avoid dramatizing the future. Globalization will bring challenges to the sustainability of society, particularly how to keep progress and maintain the sustainability of the social security systems. Life-long learning (LLL) and a critical mind are essential to managing individual careers. Engineering has always been connected with all the industrial revolutions. Today, the world has shrunk, and the pace of change has increased, but Engineers have the answer to these challenges. Above all, a solid set of values - trust, ethics and ambition – is essential to anticipate the future and dare the change.

Dirk Bochar presented the E4E project, Skills Council and the Skills Strategy. He highlighted the mismatch between what HEI believe are delivering to society regarding engineering skills and what students and company recruiters perceive as skills gaps. Most of the engineering profession is technical skills, but this is not all. Therefore, a stronger collaboration between educational and industry stakeholders is important to introduce in the curriculum more soft skills and partnerships with the industry. The promotion of LLL and recognition of new forms of education, such as micro-credentials, was highlighted as a recommendation for professional organizations. Finally, companies and industrial stakeholders must also embark on mentorship programmes and co-create university labs to close the mentioned skills gaps.

In the round table “What skills do companies look for in recruiting engineers?” the speakers mentioned the relevance of financial literacy, team management skills and soft skills in general for the work of the Engineer. At some point, most professionals will have to lead others in a digital and multi-cultural environment. Resilience and adaptability are key to a thriving career. However, companies must change as well: most industries have difficulties in hiring the number of engineers they need. The new generation of engineers is less prone to endure the hardships and blind sacrifices of the past. Young engineers expect a meaningful and fulfilling professional career balanced with their private lives. Sustainability and the green deal were referred to during the Q&A session. These are already embedded in all companies: to be competitive, companies must be green by nature.

The speakers of the round table “How can VET providers contribute to the training of engineers?” highlighted their contributions to LLL and continuous professional development (CPD). Focus was given to collaboration with industrial partners and also with Ordem dos Engenheiros, which accredits their short courses. The skills in higher demand are those related to digitalization, energetic efficiency, sustainability, critical thinking, engineering to cost, soft skills and, importantly, norms and regulations. From the discussion, it was clear that VET providers have the advantage of being able to create personalized trainings for companies, in niche markets and also that they have other capacities that HEI do not have, such as



specialized labs. The speakers refer the already existing cooperations between VET providers, HEI, industry and regulators, which they see as the path forward.

During round table #3 on “What educational models should be implemented in HEIs to develop the skills of future engineers?” the quality of Portuguese engineers was highlighted. However, Portuguese companies are not the only ones hiring them, and they now compete in a much broader market. This will only compound with the demographic winter and the lower attractiveness that Engineering professions will endure in the coming decade. Relative to the curricula, the speakers referred to the need to make them more flexible and attractive, including more soft skills and project-based learning. But HEIs cannot teach everything, and some skills, i.e. specific software or business management, must be learned extra-curricularly. The GreenComp skills are steadily being introduced in the curricula, along with DigiComp skills. It was also referred that micro-credentials are planned for the future and have been slowly introduced, but that the Agency for Assessment and Accreditation of Higher Education - A3ES raises significant barriers to them. It is also considered that there are skills that must come from high school, such as conflict management, learning to learn, learning to manage oneself, knowing how to research and communication skills.

The final round table on “What do Engineers think?” was lively and reinforced several of the previous report points. On the one hand, all speakers mentioned that several essential skills are not taught in the engineering curricula. On the other hand, they all stated that one must learn them in contexts other than the HEI. These skills could be acquired by participating in extra-curricular activities, like engineering competitions for students or by belonging to student associations. An LLL strategy is also essential to gain the skills that the HEI curricula cannot include such as management and niche skills. It was highlighted that the teaching methods must be modernized, abandoning the learning by memory and introducing more case- and project-based learning.



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REFERENCES

E4E Valorisation Plan - A dedicated plan for Sharing, Promotion & Use of E4E



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APPENDIX A.

Leaflet of the “Fórum Competências em Engenharia”, including detailed agenda.





Introdução

A engenharia é omnipresente. Há engenharia por trás de cada produto e serviço que usamos ou implementamos na nossa vida diária. Cabe aos engenheiros a função de garantir a qualidade, a segurança e o bem-estar dos cidadãos. São os engenheiros que produzem mais-valia, apresentam soluções, inovam e contribuem para o desenvolvimento económico dos países.

A profissão de engenharia está a ser confrontada com mudanças estruturais. Verificam-se, neste tempo, desajustamentos de competências entre as necessidades do mercado de trabalho e a oferta da Academia e da formação contínua, mais evidentes na área das competências transversais (úteis para qualquer engenheiro independentemente da sua área de estudo/atividade), como por exemplo, a colaboração, a comunicação assertiva, o empreendedorismo, a liderança. Por outro lado, percebeu-se que são precisamente estas as competências subjacentes ao sucesso na profissão de engenharia e as que têm sido mais procuradas nos anúncios de emprego para engenheiros.

Documentos oficiais da EU, assim como da literatura internacional, corroboram esses desafios e identificam uma escassez de "engenheiros socialmente motivados", necessários para cumprir as metas de sustentabilidade e economia circular da UE para 2030 e 2050.

O projeto E4E, promovido pela Engineers Europe, é constituído por 13 parceiros e integra as universidades, a formação contínua, as associações profissionais e as empresas, onde se inclui a FEUP e a Ordem dos Engenheiros.

Este projeto pretende criar um Conselho de Competências permanente, que identifique e defina as competências necessárias à formação de engenheiros, melhor equipados através do desenvolvimento de novas competências, transversais a todas as áreas da engenharia, centradas nas áreas da transição digital, sustentabilidade, resiliência e soft skills, assim como empreendedorismo, enquadrando os quadros de referência europeus de competências (DigComp, LifeComp, GreenComp, EntreComp).

Fazem parte Conselho de Competências, por parte da Ordem dos Engenheiros, Laura Seco, António André e Graça Carvalho, e por parte da FEUP, António Augusto de Sousa.

As atividades do projeto E4E, focam-se em:

1. Estabelecer o Conselho Europeu de Competências em Engenharia (European Engineering Skills Council), uma plataforma multisetorial da UE para reforçar o diálogo/colaboração entre representantes da educação, formação, indústria e outros empregadores de engenheiros.
2. Desenvolver uma metodologia de monitorização para avaliar as tendências, os desafios e as oportunidades da profissão de engenharia, culminando na Estratégia de Desenvolvimento de Competências para Engenharia.
3. Desenvolver oferta formativa em competências transversais para engenharia, no formato de microcredenciais, baseada nos quadros europeus de referência para competências.
4. Criar o Passaporte de Competências transversais para engenharia numa perspetiva de desenvolvimento contínuo ao longo da vida.

Com 13 Parceiros e 12 Associados, a E4E é uma Aliança robusta.

URL: <https://www.engineerseurope.com/eng/home>



Programa

9:30 | Sessão de Abertura, presidida pelo Secretário de Estado Adjunto e da Educação*

- Fernando de Almeida Santos, Bastonário da Ordem dos Engenheiros
- Rui Calçada, Diretor da FEUP
- Alexandre Homem Cristo, Secretário de Estado Adjunto e da Educação*

10:00 | Palestra Competências em Engenharia

- Orador: Sebastião Feyo de Azevedo, Presidente da Academia de Engenharia

10:30 | Apresentação do projeto Engineers for Europe

- Orador: Dirk Bochar, Secretário-Geral Engineers Europe

11:00 | Coffee Break

11:30 | 1ª Mesa Redonda: Que competências procuram as empresas nos engenheiros que recrutam?

- Moderador: António André, Skills Council da OE
- Orador 1: Maria Moura, Directora da área de Pessoas e Comunicação da Mota Engil
- Orador 2: Pedro Pastilha, Director do Vestas Technology Center do Porto & Head of Onshore Product Management
- Orador 3: Mariana Branquinho da Fonseca, Senior Partner and Country Chair da Korn Ferry
- Orador 4: Nuno Fernandes, Diretor-Geral da Casais

12:30 – 14:00 | Almoço Livre

14:00 | 2ª Mesa Redonda: Como podem contribuir as entidades de formação contínua para a formação dos engenheiros?

- Moderador: Bento Aires, Presidente Região Norte (OERN) OE
- Orador 1: Rui Abreu, Diretor-Geral da Comunilog
- Orador 2: Carlos Martins, Presidente Executivo da EPAL
- Orador 3: João Morim, Técnico Superior de Formação da CINEL
- Orador 4: Roberto Cerqueira, Gestor de Formação da Academia LIPOR
- Orador 5: Pedro Severino, Business Developer na Certificação e Auditor Coordenador da APCER



15:00 | 3ª Mesa Redonda: Que modelos educativos implementar nas IES para desenvolver as competências dos futuros engenheiros?

- Moderador: António Augusto de Sousa, Skills Council FEUP
- Orador 1: Rogério Colaço, Presidente do IST
- Orador 2: Maria João Viamonte, Presidente do ISEP
- Orador 3: Mário Marques Freire, Presidente da Faculdade de Engenharia UBI
- Orador 4: Carlos Rabadão, Presidente IP Leiria
- Orador 5: Pedro Ferreira, Vice-Presidente IP Setúbal

16:00 | Coffee Break

16:15 | 4ª Mesa Redonda: O que pensam os Engenheiros?

- Moderação: João Pedro Pêgo (FEUP) & Lídia Santiago (Ordem dos Engenheiros)
- Orador 1: Francisco Campos – BEST Porto
- Orador 2: Nuno Cordeiro – Managing Director TechTailors
- Orador 3: Célia Pedro, Grupo de Jovens Engenheiros da OE

17:00 | Sessão de Encerramento

- João Pedro Pêgo, FEUP
- Lídia Santiago, Vice-Presidente da Ordem dos Engenheiros

*a aguardar confirmação de presença



**APPENDIX B.****Attendance list.**

Participant Name	Organisation	Country
Aires Ferreira		Portugal
Alfredo Soeiro		Portugal
Ana Freitas	FEUP	Portugal
Ana Cristina Borges Azevedo	FEUP	Portugal
Ana Filipa Ferreira		Portugal
Ana Guerreiro		Portugal
Ana Nascimento		Portugal
Ana Brás Seguro		Portugal
Ana Pina		Portugal
Andreia Guerreiro		Portugal
António Augusto de Sousa	Skills Council - FEUP	Portugal
António Carias de Sousa		Portugal
António Carlos Guerreiro Morgado André	Skills Council - OE	Portugal
António Menúria Marques		Portugal
Beatriz Martins		Portugal
Bento Aires	OE	Portugal
Carla Malícia		Portugal
Carlos Gonçalves		Portugal
Carlos Manuel Martins	EPAL	Portugal
Carlos Pereira		Portugal
Carlos Rabadão	IP Leiria	Portugal
Carlos Sousa Oliveira		Portugal
Carolina Faria		Portugal
Célia Pedro	Young Engineers - OE	Portugal
Cláudia Carvalho	OE	Portugal
Cristina Reis		Portugal
David Neves		Portugal



Diogo Ferreira Lépori		Portugal
Dirk Bochar	Engineers Europe	Belgium
Elisa Maria de Jesus da Silva		Portugal
Fernando Almeida Santos	OE	Portugal
Filipa Brandão		Portugal
João Duarte		Portugal
Tenente Cor. Gabriel Gomes		Portugal
Filipa França		Portugal
Filipa Mariano		Portugal
Francisco Silva Cunha Campos	BEST - Porto	Portugal
Gabriela Barreto		Portugal
Giovanna Castro		Portugal
Helena Parreira		Portugal
Heliodoro Gomes		Portugal
Hortense Menino		Portugal
Inès Crauwels	Engineers Europe	Belgium
Isabel Duarte		Portugal
João Fernandes Correia		Portugal
Diana Costa		Portugal
Filipe Figueiredo		Portugal
João Gens		Portugal
João Mário Nogueira Santos Morim	CINEL	Portugal
João Pedro Pêgo	FEUP	Portugal
Jorge Miguel Marcelino Ruivo		Portugal
José Manuel Inácio		Portugal
José Alferes		Portugal
José Maria Machado Duque		Portugal
José Vultos		Portugal
Lia Pereira		Portugal
Lídia Santiago	OE	Portugal
Liliana Carvalho		Portugal
Liliana Cunha		Portugal



Luís Araújo		Portugal
Luísa Pedro Brito da Torre		Portugal
Manuela Vieira Fernandes		Portugal
Maria João Viamonte	ISEP	Portugal
Maria Moura	Mota-Engil	Portugal
Mariana Branquinho da Fonseca	Korn Ferry	Portugal
Mário Marques Freira	UBI	Portugal
Marisa Parreira		Portugal
Marta Parrado		Portugal
Marta Ramos		Portugal
Miguel Pereira da Silva Pinto		Portugal
Mário Rui Couto		Portugal
Paulo Neto		Portugal
Nair Sousa		Portugal
Nelson Jerónimo	OE	Portugal
Nuno Cordeiro	Tech Tailors	Portugal
Nuno Fernandes	Casais	Portugal
Nuno Tomás		Portugal
Palmira Pires		Portugal
Paulo Santos		Portugal
Patrícia Figueira		Portugal
Pedro Erick da Silva Rodrigues Guimarães		Portugal
Pedro Ferreira	IP Setúbal	Portugal
Pedro Monteiro		Portugal
Pedro Pastilha	Vestas	Portugal
Pedro Perfeito		Portugal
Pedro Severino	APCER	Portugal
Roberto Cerqueira	LIPOR	Portugal
Rogério Colaço	IST	Portugal
Rolanda Correia		Portugal
Rui Calçada	FEUP	Portugal
Sílvio Pereira		Portugal



Rodrigo Santos		Portugal
Raimundo Macedo		Portugal
Rui Fernando Ribeiro Abreu	Comunilog	Portugal
Rui Pinheiro Marques de Brito		Portugal
Rui Vaz		Portugal
Salomé Moreira		Portugal
Sandrine Ferreira		Portugal
Sebastião Feyo de Azevedo	Engineering Academy	Portugal
Sofia Gonçalves		Portugal
Susana Oliveira		Portugal
Susana Teles		Portugal
Teresa Antunes		Portugal
Sofia Baia		Portugal
Vítor Franco Correia		Portugal
Vasco Magalhães		Portugal



APPENDIX C.

Selected photos of the event







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