

SEFI ANNUAL REPORT 2024-2025

Educating Responsible Engineers



EUROPEAN SOCIETY FOR ENGINEERING EDUCATION

Since 1973, SEFI is the largest network of higher engineering education institutions (HEIs) and engineering stakeholders in Europe.

SEFI contributes to the development and improvement of Higher Engineering Education (HEE) in Europe, promotes information about HEE and improves communication between teachers, researchers and students, reinforces the university-business cooperation and encourages the European dimension in higher engineering education. SEFI is an international forum composed of HEIs, academic staff and teachers, students, related associations and companies in 41 countries.

Our activities: annual conferences, ad hoc seminars/workshops organised by our working groups, councils and ad hoc committees, organisation of the European conventions for engineering deans, scientific publications (including the European journal of engineering education), European cooperation projects, position papers, cooperation with other major European associations and international bodies such as the European Commission, the UNESCO, the Council of Europe or the OECD. SEFI also participated in the creation of several organisations such as ENAEE, IFEES, IACEE and IIDEA.

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SEFI IN 2024-25

IN-PERSON EVENTS

- SEFI Annual Conference, EPFL Lausanne, CH
- EDUAL Conference, SUT in Gliwice, PL
- UNESCO World Engineering Day, AGH University of Krakow, PL
- SEFI Ethics Spring Symposium, Dun Laoghaire, IE
- SEFI PhD Summer School, TU Eindhoven, NL
- SEFI Seminar on Mathematics in Engineering Education, Ostfalia

University of Applied Sciences, Wolfenbuttel, DE

SEFI@WORK

- Reporting Survey and Questionnaire Studies, Part 1
- Advancing an Integrative Perspective of Identity in Engineering Education
- The Overlooked Impact of Faculty on Engineering Education
- Emotional scaffolding for dealing with epistemic emotions in engineering education
- Hard Hats and Power Suits: Equipping the Next Generation of Engineering Policy-makers
- Enabling a Skilled and Diverse Engineering Workforce with Non-Degree Credentials
- Making Learning from Failure Accessible to All Students: Considerations for Power, Privilege, and Inequity
- Roundtable on Attracting Girls to Engineering by Bridging Industry and Academia
- Compound Problems, Humility and Curiosity a Plea for Slowing Down Learning Processes
- Sustainable Engineers: Guardians of the Green Galaxy
- Educating uncertainty in times of sustainable transition
- Institutionalizing Social Justice in Engineering Curricula
- The Good, the Bad, and the Unethical: AI in Engineering Education
- Educating the Whole Engineer by Integrating Engineering and the Liberal Arts
- Collaborative Learning in Engineering Education
- Triggering ethics competency development in engineering students by integrating irritation as a didactical principle
- Contemporary Approaches to Assessment of Engineering Competencies for Diverse Learners
- Ambiguity in Engineering Problem Solving
- A Selective Review of Computing Education Research
- Building Scholarship of Teaching and Learning with Exploratory Data Analysis
- Continuing Engineering Education Internationalising the 2024 European perspective

EU (CO)FUNDED COOPERATIONS

- TRAINeng-PDP Training engineers for lifelong learning through a personal development process
- In-4-STEM Innovative interventions to improve social & academic integration of STEM university students
- ENHANCE European Universities of Technology Alliance
- EuroTeQ Engineering Campus European Universities Initiative

EUROPEAN ENGINEERING EDUCATORS PODCAST

- Mariana Velho from CERN Switzerland on Public Engagement
- Kurt Coppens from KUL Belgium on Feedback Literacy
- Siara Isaac and Joelyn de Lima from EPFL Switzerland on 3T Play Transversal Skills
- Robyn Mae Paul and Kari Zacharias from Canada on The Iron Ring Ritual of the Calling of an Engineer
- Jorge Membrillo-Hernández from ITESM Mexico on Challenge Based Learning
- Esther Matemba & Lelanie Smith on African Engineering Education
- Thies Johannsen from TUB Germany on Transdisciplinary
- Ann-Kristin Winkens from RWTH Germany on Resilience
- Scott Daniel, Sasha Nikolic & Rezwanul Haque from AAEE Australia on Generative AI
- Inês Direito and Jan Van Maele on Diversity Equity and Inclusion

PUBLICATIONS

- European Journal of Engineering Education
- SEFI Journal of Engineering Education Advancement
- SEFI Code of Conduct
- SEFI 2024 Annual Conference Proceedings
- _ The Routledge Handbook of Engineering Ethics Education
- Complementing the Conventional: Engineering Competencies and Skills for an Uncertain Future SEFI Position Paper

SEFI WAS THERE

- BEST General Assembly 2024, Tallinn, EE
- ESTIEM Council Meeting, Sevilla, ES
- STU Learning and Teaching Forum, Bratislava, SK
- CDEFI: Which and how many engineers for tomorrow? Brussels, BE
- E4E Skills Council, Berlin, DE
- World Engineering Education Forum, Sydney, AU
- European Associations Forum 2025, Brussels, BE
- ESTIEM Council Meeting, Calabria, IT
- 2025 IACEE Symposium, Purdue University, US
- ENAEE Connect Forum 2025, Lisbon, PT
- Engineers 4 Europe Closing event, Brussels, BE
- ASEE 2025 Annual Conference, Montreal, CA
- ICCA Global Associations Summit 2025, Granada, ES
- BEST Symposium on Education, Madrid, ES
- BEST Symposium on Education, Cluj-Napoca, RO

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SEFI 2025 Engineering Education for a Sustainable, Inclusive, and Ethical Future – Achieving the Balanced Application of Technology for Societal Needs

Dear SEFI Members, Colleagues, and Friends,

As we conclude the 2024–2025 SEFI year, I am proud to reflect on our achievements and look ahead with excitement and purpose. The strength of SEFI lies in its vibrant and diverse community of educators, researchers, students, industry representatives, and partners committed to advancing engineering education across Europe and globally. This community is strongly supported by the stable and efficient SEFI office in Brussels and by the many brilliant colleagues contributing from all over Europe and beyond.

Celebrating 2024–2025 Highlights

Our journey this past year has been marked by impactful initiatives and inspiring moments. The SEFI 2024 Annual Conference in Lausanne was a resounding success, bringing together colleagues from around the world to share ideas and forge new collaborations. We celebrated excellence through a record number of quality papers and workshops, as well as the SEFI Awards—recognizing leadership, innovation, and dedication in our field. We also reflected on what it means to educate responsible engineers—and not least, acknowledged that even engineers have feelings!

We deepened our engagement with early-career researchers through the PhD Summer School, and advanced ethical thinking in engineering via the Ethics Spring School in Ireland —growing initiatives that highlight the value of interdisciplinary collaboration.

We expanded our geographical outreach with initiatives such as the SEFI Regional Meeting in Poland and welcomed new voices and perspectives through a wide range of activities including SIG Workshops, SEFI@Work, and our expanding SEFI Podcast series.

SEFI continues to be a leading voice in engineering education research and thought leadership. The European Journal of Engineering Education (EJEE) and the recently launched Journal of Engineering Education Advancement (JEEA) have produced important contributions, while new publications—such as the Ethics Handbook and our Position Paper on Engineering Skills—are helping shape policy and pedagogy at the European level.

Rolling Out the SEFI Strategic Plan

The Board of Directors has launched SEFI's new Strategic Plan for 2025–2027, following a consultative process with the SEFI community. It lays out a forward-looking roadmap aligned with our vision, mission, and values. The plan centers on four strategic pillars—Reputation & Identity, Activities, Membership & Partnerships, and Internal Organization—with the aim of enhancing visibility through impactful collaborations, delivering high-quality publications and events, broadening engagement among stakeholders, and strengthening internal governance for sustainable growth. Designed as a "living document," the plan will be regularly reviewed and adapted based on member feedback and evolving needs, with clear KPIs established to track our progress.



Empowering Special Interest Groups

Our Special Interest Groups (SIGs) remain the engine and backbone of SEFI's knowledge-sharing and innovation. From Diversity, Equity and Inclusion, Sustainability, Engineering Skills, and Engineering Ethics, through Mathematics, Physics, Engineering Education Research, and Digital Learning, to Curriculum Development, Continuing Engineering Education, Capacity Building, Accreditation, and Attractiveness—each SIG fosters meaningful collaboration and contributes significantly to SEFI activities. They play a critical role in shaping the future of our society and our profession. I am particularly pleased that SEFI, with its growing capacity, is able to strongly support the initiatives arising from the SIGs.

Building Stronger Partnerships and Visibility

SEFI continues to grow its strategic partnerships. We are proud of our collaborations with European University Alliances and grateful for the engagement of our corporate partners—Dassault Systèmes, Ansys, MathWorks, Siemens, Airbus, and Bentley Systems—in co-developing future-ready engineering curricula. We also strengthened SEFI's representation in European and global educational dialogues, ensuring that the voice of engineering educators is heard where it matters most. Our close ties with ASEE, AAEE, CEAA, CSEE, IGIP, IFEES leaderships, and other global partners highlight the relevance and impact of the SEFI community and vision worldwide.

Fostering a Strong and Inclusive Community

Membership remains the cornerstone of our strength. We warmly welcome our new institutional, individual, associate, corporate, and honorary members who joined us in 2024–2025. Your contributions, energy, and

insights are key to mission and values of our Society.

Looking Ahead

As we embark on the 2025–2026 SEFI year, let us reaffirm our shared commitment to excellence, equity, and innovation in engineering education. Together, we will continue our structured and well-planned journey to foster impactful research, inclusive practices, ethical reflection, and a deep commitment to the societal relevance of engineering.

As I transition out of the role of President, I want to thank the SEFI community for all your support and for our joint efforts over these past years. I look forward to continuing to contribute to SEFI's mission. Together with this excellent and friendly community, we will keep advancing and inspiring the current European landscape—and, most importantly, the next generation of engineers.

Balázs Nagy

SEFI President 2023-2025



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SEFI ANNUAL CONFERENCE LAUSANNE 2024



EDUCATING RESPONSIBLE ENGINEERS

2-5 September 2024 - EPFL Lausanne, Switzerland

Held from 2-5 September at the École Polytechnique Fédérale de Lausanne (EPFL) in Lausanne, the 52nd SEFI Annual Conference welcomed over 550 participants, half of them attending for the first time. Centred on the theme Educating Responsible Engineers, the event combined cutting-edge research, and stimulating discussions on the future of education.

The opening keynote by **Johanna Lönngren** (Umeå University) explored the role of emotions in engineering, challenging the notion that emotional detachment leads to better decision-making. Her talk set the tone for a conference that consistently emphasised responsibility in technical education.

A roundtable on the second day, chaired by Roman Bruegger (EPFL), brought together industry leaders to discuss essential skills for future engineers and the importance of diversity in engineering teams. The panel featured Tanya Morton (MathWorks), Tatiana Vakhitova (Ansys), Xavier Fouger (Dassault Systèmes), Chris Bradshaw (Bentley Systems), and Martin Koczman (Siemens). The Archimedean Oath, an ethical framework developed at EPFL, also featured prominently in these conversations.

Margarita Boenig-Liptsin (ETH Zurich) delivered a powerful keynote on digital literacy, urging educators to go beyond technical skills and foster critical thinking about



technology's societal impact. A student-led panel followed, with contributions from Pierre Dillenbourg (EPFL), Gerhard Müller (TU Munich), and **Emanuela Tilley** (UCL), reinforcing the need for reflective, ethically grounded engineering education. This was a standout moment as students addressed diversity, ethics, and corporate reflections on the Archimedean Oath.

On the final day, **Donna Riley** (University of New Mexico) delivered a compelling keynote on reimagining ethics education. She called for a shift from isolated courses to a more integrated, reflective approach, urging society to hold engineers to higher ethical standards.

As part of its mission to foster a global academic network, SEFI collaborated with the Chinese Society of Engineering Education (CSEE) to host the very first Asian Forum, offering Exploration and Practice of Asian Engineering Education: Cultivating the Next Generation of Outstanding Engineers. The neering education in Europe and beyond.

event offered the conference attendees valuable insights into engineering education practices from across Asia. Experts from leading universities in China, Japan, Taiwan, Thailand, and Singapore shared case studies and institutional strategies, highlighting the evolving role of engineering education in addressing societal needs.

Organisers eliminated souvenirs to reduce waste, offered delicious fully vegetarian and vegan catering from local suppliers, and provided scholarships for underrepresented participants. Sponsored childcare and inclusivity ribbons—such as "First time at SEFI" and "SEFI Ally"—helped create a welcoming environment. Morning wellness sessions, including yoga and mindfulness, supported participants' well-being.

We are thankful to EPFL for organising the remarkable SEFI 2024, a vibrant, values-driven conference that will shape the future of engi-

DOCTORAL SYMPOSIUM 2024

The 8th SEFI Doctoral Symposium in Engineering Education Research, held on 1 September 2024 at EPFL, brought together 31 PhD students from 13 countries across four continents. Taking place just before the SEFI Annual Conference, this full-day event offered a dynamic and enriching experience for early-career researchers. Participants had the opportunity to present their work, discuss research plans, and build valuable professional networks.

The symposium was supported by 22 senior scholars from diverse regions—including Africa, Australia, North America, and Europe, creating a vibrant environment of learning, mentorship, and collaboration. The structure of the day encouraged meaningful engagement through short introductions by senior academics, group discussions focused on individual PhD projects, speed-networking sessions, and closing reflections offering practical advice.

Participants praised the strong sense of community and belonging, highlighting the quality of feedback and the personalised guidance they received. Conversations extended beyond research topics, touching on personal development and career progression, making the event both intellectually and professionally rewarding.

The SEFI Doctoral Symposium continues to play a vital role in the development



of the engineering education research (EER) community. Many PhD students in this field often work in isolation within their institutions, making the supportive network fostered by SEFI all the more essential. By connecting emerging researchers with experienced mentors, the symposium not only advances academic work but also cultivates a shared sense of purpose and identity within the field.

This year's edition demonstrated the growing global reach and impact of the SEFI network, reinforcing its role as a cornerstone in the evolution of engineering education research by nurturing the most junior members of our community.

The Doctoral Symposium was proudly chaired by:

Jonte Bernhard, Professor Emeritus, Deputy Editor of the European Journal for Engineering Education

Shannon Chance, Professor, Deputy Editor of the European Journal for Engineering Education

Tinne De Laet, Associate Professor, Chair of the SEFI SIG Engineering Education Research

Kristina Edström, Associate Professor, Editor-in-Chief of the European Journal for Engineering Education

SEFI LEONARDO DA VINCI MEDAL

On the occasion of the SEFI 2024 Annual Conference, **Professor John Mitchell** has been awarded the Leonardo da Vinci Medal, the highest honour bestowed by the European Society for Engineering Education. This prestigious award recognises his outstanding contributions to engineering education and his lasting impact on the global academic community.

A Chartered Engineer and Fellow of the IET, Professor Mitchell has held numerous leadership roles, including President of the UK's Engineering Professors' Council and Vice-President of Publications for the IEEE Education Society. At University College London (UCL), he founded the Integrated Engineering Programme,

transforming engineering education through interdisciplinary learning and realworld problem-solving. As Vice Dean of Education, he also helped establish UCL's Centre for Engineering Education.

His influence extends globally through initiatives such as the Transforming Systems through Partnership project with South African universities, and his editorial leadership of the IEEE Transactions on Education. During the COVID-19 pandemic, he launched the Big Engineering Education Research Meet-up (B-EER), uniting 550 participants worldwide in just two weeks.

Professor Mitchell's career exemplifies innovation, collaboration, and community-



Professor John Mitchell receiving the medal from the SEFI president Balázs Nagy

building. SEFI congratulates him on this well-deserved recognition and thanks him for his enduring dedication to advancing engineering education.

SEFI FELLOWS 2024



Gerhard Müller, Technical University Munich

Professor Gerhard Müller has been a committed member of SEFI's Board of Directors since 2017, consistently contributing to the organisation's strategic development and professionalisation. His leadership extended to co-chairing the European Engineering Deans Council (EEDC), where he applied his extensive academic experience to shape the annual European Convention of Engineering Deans (ECED). Under his guidance, the ECED has maintained continuity in its themes and ensured discussions remain at the right strategic level for academic leaders. Beyond SEFI, Professor Müller has played a key role in the EuroTeq University Initiative, promoting collaboration among leading European universities. He has also been actively involved with the Association of German Engineers (VDI) and the Bavarian Chamber of Engineers, helping to shape national standards in engineering education.

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SEFI FELLOWS 2024



Luís Manuel Sánchez Ruiz, Valencia Polytechnic University

A full professor at the Valencia Polytechnic University, Professor Luis Sánchez is a passionate advocate for Peace Engineering. He served on the SEFI Board of Directors from 2012 to 2023, including two terms as Vice President, where he led global partnerships and forged alliances with leading engineering education organisations. He played a key role in establishing the European Engineering Deans Council (EEDC) and co-organised the European Convention of Engineering Deans (ECED), advancing leadership dialogue in the field. As current President of IFEES, Professor Sánchez continues to champion international collaboration and innovation. The SEFI Fellowship is a fitting tribute to his remarkable impact.

SEFI FRANCESCO MAFFIOLI AWARD

This year's Maffioli Award winner is **Dr. Ir. Volkert van Steijn**, Associate Professor and Programme Director Bachelor Molecular Science & Technology and the pre-university Team Lead in the Department of Chemical Engineering/Applied Science University, Delft Technological University, Netherlands. This award recognises innovative contributions to engineering education, particularly in curriculum development and learning environments.

In response to the challenges students face when entering STEM studies, the team developed an open, online pre-university onboarding programme.

Accessible and flexible, it revisits kev high school material while introducing the interdisciplinary nature of university-level engineering. The initiative addresses low intake and high dropout rates, helping thousands of prospective students—both in the Netherlands and internationally—begin their studies with greater confidence and realistic expectations. The programme's success is reflected in overwhelmingly positive student feedback and its growing global reach. SEFI congratulates Dr van Steijn and his team for their outstanding impact on engineering education.



Volkert van Steijn receiving the Maffiolli Award from Emanuela Tilley, chair of Maffioli committee

BEST PAPERS

Best Student Paper Award:

Elizabeth Sara Volpe, Denise Rutledge Simmons (University of Florida, USA)

"Advice for Success: Insights from Early Career Women on Vital Competencies Empowering Their Transition into the Civil Engineering Workforce" <u>link</u>

Best Research Paper Award:

Aditi Kothiyal, Avanish Chauhan, Sameer Sahasrabudhe, Madhu Vadali (IIT Gandhinagar, IN)

"Making Confident Designers: Effect of a design and prototyping course and gender differences in students' engineering design self-efficacy" <u>link</u> Best Practice Paper Award:

Aled Wyn Davies (Cardiff University, UK)

"Using 'Design Shorts' to Engage Engineering Students in Self and Peer Supported Problem Based Learning" link

 Susanne Ihsen Award for Best Paper on Diversity and Inclusiveness:

Shameela Arbi, Corrinne Shaw, Bruce Kloot (University of Cape Town, ZA)

"Using Narratives to Explore Social Influences on the Identities of Women Students in Engineering: Two Case Studies" link

GENERAL ASSEMBLY 2024

The SEFI General Assembly was held on 3 September at EPFL in Lausanne, Switzerland where they elected five new members of SEFI Board of Directors and re-elected a Vice-President.

Re-elected Vice-President

Vice-President **Greet Langie** (KU Leuven) was re-elected for a second term between 2024-2026.

New Board of Directors members

The board of directors got five new members: **Darren Carthy** (Engineers Ireland), **Shannon Chance** (Technical University Dublin), **Annoesjka Cabo** (Delft Technical University), **Helena Kovács** (EPFL), **Stephan Krusche** (Technical University Munich) were all elected for the first three year term starting in October 2024 and ending in September 2027.

Re-elected Board members

Henning Meyer (Technical University Berlin) and Alex Tarchini (Mathworks), were re-elected for a second term until 2027.

The complete list of board of directors and Special Interest Group chairs and co-chairs is now updated here.

Join Europe's leading event on engineering education - **REGISTER TODAY!**



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INTERNATIONAL PERSPECTIVES TO ENGINEERING EDUCATION IN POLAND

On 3–4 March 2025, SEFI co-organised two significant events in Gliwice and Krakow, Poland, highlighting international trends and collaboration in engineering education.

The 9th EDUAL Conference, hosted by the Silesian University of Technology in Gliwice, focused on dual programmes and the evolving needs of engineering education in the digital age. The event brought together academia, industry, and policymakers to discuss topics such as AI, digital learning, and continuing professional development. SEFI President Dr. Balázs Nagy (Budapest University of Technology and Economics) opened the conference by reaffirming SEFI's commitment to innovation and the alignment of academic curricula with industry demands.

SEFI's presence was strong throughout the event, with several Board members and Special Interest Group chairs actively contributing. Aida Guerra (Aalborg University) delivered a plenary on the role of sustainability in engineering education, while Vice President Emanuela Tilley (University College London) participated in a panel on lifelong learning, moderated by Darren Carthy (Engineers Ireland and SEFI Board member). Their discussions underscored the importance of upskilling and the university's role in supporting engineers throughout their careers.



SEFI extends its appreciation to Rector Marek Pawelczyk, Wojciech Sitek, and the entire SUT team for their excellent organisation of this impactful event.

The following day, SEFI joined AGH University in Krakow to celebrate UNESCO World Engineering Day for Sustainable Development with an international conference dedicated to the role of engineers in addressing global challenges and advancing the UN Sustainable Development Goals. SEFI President Balázs Nagy spoke on educating modern engineers from a European perspective, while other Board

members shared insights on future skills, professional development, and energising engineering education. Presentations by **Greet Langie** (KU Leuven), **Helena Kovacs** (EPFL), **Shannon Chance** (TU Dublin), and **Annoesjka Cabo** (TU Delft) enriched the programme with diverse perspectives.

Participants also engaged in technical sessions and lab visits, exploring innovations in sustainable agriculture, space sustainability, AI applications, and energy systems. SEFI warmly thanks **Janusz Szpytko** and the AGH team for hosting this inspiring and forward-looking event.

SEFI ETHICS SPRING SYMPOSIUM 2025



From 24 to 26 March 2025, 35 delegates from across the globe convened at the Royal Marine Hotel in the picturesque seaside town of Dún Laoghaire, Ireland, for the 2025 Ethics Spring Symposium. Organised by **Shannon Chance** on behalf of TU Dublin's School of Architecture, Building and Environment Research (SABER) group, in collaboration with SEFI Ethics SIG co-chairs **Diana Adela Martin** and **Mircea Tobosaru**, the event aimed to strengthen community capacity in engineering ethics education.

The symposium centred on the themes of The Routledge International Handbook of Engineering Ethics Education (RIHEEE), a major initiative by the SEFI Ethics Special Interest Group. This open-access handbook offers a comprehensive and up-to-date guide to teaching ethics to future engineers.

Over three days, participants engaged in a dynamic programme that included keynote talks on care ethics, truth, and the role of techno-anthropology in engineering ethics education. These were complemented by interactive workshops exploring topics such as AI experimental philosophy, the Archimedean Oath, and the integration of quantitative methods in ethics. Panel discussions

brought together diverse perspectives on foundational concepts, interdisciplinary approaches, teaching strategies, assessment, and accreditation. Panellists were invited to reflect on their sections of the handbook, identifying patterns, strengths, and areas for improvement, while considering how to make the content more accessible and impactful for educators and academic leaders.

The symposium welcomed a truly international cohort, with attendees from Europe, Asia, Africa, and North America. The RIHEEE handbook is freely available online in digital format here.

SEFI PHD SUMMER SCHOOL

Supporting the next generation of engineering educators





From 20 to 23 May, the SEFI PhD Summer School 2025 took place at JADS Den Bosch in the Netherlands, bringing together 36 PhD students from 13 countries. Hosted by TU Eindhoven in collaboration with the 4TU.Centre for Engineering Education and the Eindhoven School of Education, this third edition offered four days of intensive learning, reflection, and connection for early-career researchers in engineering education.

Designed for PhD candidates at all stages of their research journey, the summer school provided a welcoming and intellectually stimulating environment. The programme balanced academic depth with personal development, featur-

ing sessions on AI-enhanced research methods, wellbeing, leadership, career planning, academic writing, ethics, and data analysis. Participants benefited from small-group mentoring with experts from the four Dutch technical universities, daily reflection sessions with senior researchers, and dedicated writing time to support ongoing projects.

This event was made possible thanks to the dedication and collaboration of a remarkable team. The summer school was chaired by **Esther Ventura-Medina**, whose leadership helped shape a rich and engaging programme. The organising team included **Karolina Doulougeri**, **Duru Bayram**, **Marieke Thurlings**, **Caroline Vonk**,

Tuba Stouthart, Nienke Nieveen, Ruurd Taconis, Hanna Aarnio, Gonny Schellings, Lia Barnes, and Maiko Cheng, each contributing their expertise and energy to ensure the event's success.

Valuable support also came from **Kristina Eström** (KTH, TUD), **Sofie Craps** (KU Leuven), **Judith Gulikers** (WUR), Cindy Poortman (UT), **Manuel Barbosa de Oliveira, Alaa Abdalla, Ayse Kilic** (TU/e), and external coach **Neset Irsik**, whose guidance and mentorship enriched the experience for all participants.

SEFI SPECIAL INTEREST GROUP IN MATHEMATICS SEMINAR

Hosting this year's SEFI Mathematics Special Interest Group seminar was Dipl.-Stat. **Gabriela Bender** and Prof. Dr. rer. nat. **Kathrin Thiele** at Ostfalia University of Applied Sciences from 25 to 27 June 2025. After a decade of attending as participants, it was a privilege for us to welcome 65 colleagues from over 15 countries to Wolfenbüttel, Germany.

The diversity of backgrounds and perspectives enriched every session. Despite the wide range of topics discussed, common themes quickly emerged—particularly the shared challenges of supporting diverse student populations and easing the transition into higher education. These discussions highlighted the value of international collaboration in addressing such issues.

Feedback from participants was overwhelmingly positive. Many expressed appreciation for the warm and collegial atmosphere, noting how welcome they felt throughout the event. We were especially pleased to see early-career researchers confidently presenting their work for the first time in such an international setting—something we deeply value as organisers.

The meeting also sparked numerous ideas for future collaboration. It was





clear that the SIG is not only a forum for addressing current challenges but also a catalyst for innovative projects and partnerships.

The next edition will be organised at TU Delft under the kind leadership of Prof. **Annoesjka Cabo**, member of SEFI Board of Directors.

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SEFI@WORK

A Year of Engagement and Insights

Over the past year, SEFI@work has continued to flourish as a vibrant platform for knowledge exchange and community engagement in engineering education. With 20 webinars delivered across a variety of formats and themes, the programme has demonstrated its relevance and value to our diverse network.

Diverse engaging series were hosted by several of SEFI's Special Interest Groups, namely:

- Talk Show with authors from The Routledge International Handbook of Engineering Education Ethics - Ethics SIG, coordinated by **Diana Martin**;
- Chapter presentations from The International Handbook of Engineer-

ing Education Research - Engineering Education Research SIG in cooperation with other SIGs: and

- The (Un)certainty and (Dis)comfort Series, - Ethics SIG, coordinated by Siara Isaac, exploring complexity and reflection in engineering education.
- A fourth series, currently in progress, is led by the European Journal of Engineering Education editorial team aiming to improve the scholarly quality of quantitative research.

In addition to these series, four standalone webinars addressed timely topics such as the attractiveness of engineering or lifelong learning.

All the sessions attracted 1.655 registrations with 888 attendees (excluding speakers), reflecting strong and sustained interest across the SEFI community. They can be reviewed on SEFI Youtube channel.

We are proud that the five most attended webinars came from different series and stand-alone events, confirming that engagement spans a wide range of subjects.

This diversity highlights SEFI@work's ability to connect and inspire across disciplines and interests. Sincere thanks to all contributors and participants for making this year's programme a success, and we look forward to another year of impactful conversations!

L. The Good, the Bad, nd the Unethical: AI in engineering education

Ethics SIG

10 Feb 2025

123 attendees

2. Building Scholarship o Teaching and Learning with Exploratory Data Analysis

6 November 2024

162 registrations 104 attendees

3. Roundtable on Attracting Girls to Engineering by Bridging the Gap between Industry and Academia

Attractiveness SIG

28 Mar 2025

121 registrations

1. Contemporary Approaches to Assessment of Engineering Competencies for Diverse Learners

EER SIG

16 Jan 2025

93 registrations 61 attendees

5. Triggering ethics competency development in ngineering students by ntegrating irritation as a didactical principle

Ethics SIG

17 Jan 2025

52 attendees

SEFI PODCAST

European Engineering Educators

In its third year, the SEFI podcast 'European Engineering Educators' continued its mission to serve as an accessible resource for the global engineering education community. Produced and hosted by Professor Neil Cooke (University of Birmingham) and Dr Natalie Wint (University College London), the podcast fosters a global dialogue by giving a platform to leading engineering education experts who stant at the forefront of engineering education innovation.

Interesting statistics

In the last 6 months

- 867 downloads / 54 countries.

Since launch (3 years ago)

- 6390 downloads / 115 countries.

Seasons 5 and 6

Natalie and Neil are immensely grateful to our 16 guests from North and South America, Europe, Africa, and Australia who generously shared their expertise and time this year. Their contributions enabled us to serve listeners across 38 countries. helping them to increase their knowledge and expertise. This year's episodes tackled critical contemporary issues, including advancing DEI and exploring African Engineering Education, navigating the impact of AI, and innovating practice through challenge-based learning and transversal skills development.



Looking ahead

In the upcoming academic year, we will explore new podcast formats while remaining committed to our core purpose: providing a trusted platform that amplifies the voices of leading practitioners and researchers, making their valuable knowledge and advice accessible to all who wish to move Engineering Education forward.

TOP 5 MOST POPULAR SEFI@WORK WEBINARS

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SEFI PUBLICATIONS **2024-2025**





EUROPEAN JOURNAL OF ENGINEERING EDUCATION

Academic year	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
Submitted manuscripts - regular	197	218	212	228	274	285	291	287	354	404
Submitted manuscripts - to special issues	65	74	56	2	35	43	0	30	80	31
Total submitted manuscripts	262	292	268	230	309	328	291	317	434	435

Submissions to the European Journal of Engineering Education (excluding submissions of revised manuscripts).

Submissions

During the academic year 2024/25, the number of manuscripts submitted to the European Journal of Engineering Education remained high. It was a record year in terms of regular submissions. During the same 12-month period, 86 papers were accepted.

Citation metrics

While both indices denote the average number of citations per paper, the CiteScore is far higher than the JIF. The difference is that the longer time window

of CiteScore better reflects the impact and citation patterns in this field, and that Scopus has more comprehensive coverage of educational research and scholarship than the sources on which the JIF is based.

Since the JIF it is based on fewer publications passing through a shorter time window, it can be expected to keep fluctuating. This is a reason to temper the joy over this year's increase to 2,8. On the other hand, the more reliable CiteScore has been increasing in a consistent way

over the years, and we are pleased to see that EJEE is now ranked as a Q1 journal.

Above all, the development demonstrates the increasing impact of the journal as well as a healthy development of the field

Special issues

Four special issues are in the reivew process.

"Metacognition, self-regulation, and socially shared regulation in engineering education," with **Tinne De Laet** and **Lynn van den Broeck** leading the guest editor team.

"Emotions in Engineering Education

– Widening perspectives in a rapidly growing field of research" with Inês Direito
and Johanna Lönngren leading a team of guest editors.

	2020	2021	2022	2023	2024
Journal Impact Factor (Clarivate)	-	-	2.3	2.0	2.8
CiteScore (Scopus)	4.1 (Q2)	5.3 (Q2)	5.8 (Q2)	7.3 (Q2)	8.1 (Q1)

The Journal Impact Factor (JIF) is published by Clarivate. It is the number of citations during 2024 to papers published in 2022 and 2023, divided by the total number of papers published in the same years. Citations are counted if they are from sources that themselves have a JIF*.

The CiteScore is published by Scopus. It is the number of citations received during 2021-2024, divided by the number of papers published in those four years. Citations are counted from sources that are themselves indexed in Scopus. Q1 refers to the top quartile of all journals in the category Education (containing over 1600 journals).

"Interdisciplinary Learning and Transformation of Engineering Education", with Karolina Doulougeri leading the guest editor team.

"Sustainability in Engineering Education – Integration and Transformation Approaches", guest edited by Anders Rosén, Ulrika Lundqvist, Ikateko Mathebula and Arjen Wals.

Furthering the field

Deputy Editor **Matheus de Andrade** is leading the initiative of the journal to support the quality of quantitative work in the field of engineering education research. During the academic year 24/25, two webinars have been given for authors, reviewers and editors. Recordings are available on SEFI's YouTube channel.

- Building Scholarship of Teaching and Learning with Exploratory Data Analysis, 6th Nov 2024
- Reporting Survey and Questionnaire Studies (Part 1), 24th June 2025

EJEE editors initiated and led two workshops at the SEFI conference in Lausanne. Documentation is available in the proceedings.

- Engineering Education Research: reviewing journal manuscripts fairly, constructively, and effectively (for reviewers), facilitated by a team of 12 editors representing five leading journals.
- Engineering Education Research: Writing for publication (for authors), facilitated by a team of 13 editors.

FJFF editors have also co-led and contributed to the Doctoral Symposium in Engineering Education at SEFI 2024 in Lausanne, and contributed to the SEFI Summer School 2025 for PhD Candidates of Engineering and Science Education Research organised by Eindhoven University of Technology (TU/e) and SEFI.

News in the editorial team

Associate Editors

Two Associate Editors have finished their assignments, and we sincerely thank them for her dedication over the years: Maartje van den Bogaard, The University of Texas at El Paso. USA Johannes Strobel. University of Texas at El Paso. USA

Following an open call, eleven new Associate Editors have been appointed: Ashish Agrawal, Rochester Institute of Technology, USA

Jon-Erik Dahlin. King's College London.

Sarah Dart. OUT. Australia Elinor Jones. UCL. UK

Lillian Luk. The University of Hong Kong. Hong Kong, China

Muhsin Menekse, Purdue University, USA Homero Murzi, Marquette University, USA Hugo Paris, ADEF, INSA Lyon, France Janne Roslöf, LAB University of Applied Sciences, Finland

Esther Ventura-Medina. Eindhoven University of Technology, Netherlands Ann-Kristin Winkens, RWTH Aachen University, Germany

Fditorial board

As part of the turnover in the Editorial Board, we extend heartfelt thanks to three members for their support and efforts in the past:

Esat Alpay, University of Surrey, UK Anne Gardner. University of Technology Sydney, Australia

A new member has been appointed: Emanuela Tilley, UCL, UK

Three longtime trusted advisors have been renamed from Associate Editors to members of the Editorial Board: Jennifer Case, Virginia Tech, USA

Anette Kolmos, Aalborg University, DK Bill Williams. Universidade de Lisboa. Lisbon. Portugal and TU Dublin. Ireland

Acknowledgements

On behalf of the journal, we sincerely thank the reviewers, who so generously contribute their expertise to help our decision-making and support the improvement of manuscripts. We thank the authors whose high calibre work is what makes the journal. We also gratefully acknowledge invaluable support from SEFI and Taylor & Francis.

FDITOR-IN-CHIFF

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Karin Wolff, Stellenbosch University, ZA

Contact: ejee.editor@gmail.com

The EJEE is gave a Best Paper award for those published in Volume 48 - that is in the 6 issues that we published during 2023.

European Society for Engineering Education Europäische Gesellschaft für Ingenieur-Ausbildung Société Européenne pour la Formation des Ingénieurs

The Best Paper in EJEE volume 48 is Sasha Nikolic. Scott Daniel. Rezwanul Haque, Marina Belkina, Ghulam M. Hassan, Sarah Grundy, Sarah Lyden, Peter Neal & Caz Sandison.

ChatGPT versus engineering education assessment: a multidisciplinary and multi-institutional benchmarking and analysis of this generative artificial intelligence tool to investigate assessment integrity.

This paper explores the potential impact of ChatGPT on engineering education assessment methods and its role in enhancing learning. It is written by a diverse team of authors from multiple universities and a number of disciplines. The study investigates the ability of ChatGPT to succeed in different assessment tasks. The authors use the findings to offer thoughtful and useful guidance on adapting assessment strategies to uphold academic integrity, while improving the authenticity and validity of assessment. This makes the paper a timely resource addressing a pressing issue for educators.

The paper has already made significant impact, as indicated by its impressive citation and download rates. Published in late May 2023, it has already had over 30 000 downloads, and counting. It is the 4th most-read EJEE paper of all time, still with a good chance to climb to the top.

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SEFI JOURNAL OF ENGINEERING EDUCATION ADVANCEMENT

The SEFI Journal of Engineering Education Advancement (SEFI-JEEA) entered its second year of publication in 2024–25, marking its first complete operational year, with the inaugural papers published in July 2024.

Established as a complementary publication to the European Journal of Engineering Education, SEFI-JEEA places a stronger emphasis on practice-based scholarship. It is a fully online, open-access journal aimed at educators and practitioners seeking to enhance frontline teaching, curricular innovation, and student support. The journal follows a continuous publication model, with articles released throughout the year and subsequently compiled into issues and annual volumes. The longterm objective is to publish approximately four issues per year, comprising 30–36 high-quality papers. In 2025, two issues are scheduled for publication.

As a newly established journal, SE-FI-JEEA's priorities for 2025–26 include increasing visibility, expanding its readership and reviewer community, and refining its mission and scope.

We are proud to have published several outstanding papers over the past year. We extend our sincere thanks to our dedicated authors for their valuable contributions and to our committed reviewers for their insightful guidance and support.

Statistics

Submissions Received	37 (23/year)
Submissions Accepted	19
Submissions Declined	2
- Desk Reject	1
- After Review	1
Submissions Published	18
Days to First Editorial Decision	5
Days to Accept	110
Days to Decline	322

Average Readership by Paper

Downloads of the full papers is promising with around 100 full pdf downloads on papers which have been available for at least 6 months. It is hoped that in time this will lead to further visibility and citations as word of the journal increases.

	abstract	full PDF
Mean number of downloads per paper*	274	119
Median number of downloads per paper*	189	90

* Data is shown for the 8 papers available or over 6 months (median 280 days)

Authorship and readership currently shows broad demographics with readers being recorded from 80 different nations.

Strategic Development Plans for 2025-26

- Further push journal visibility and position.
- New author template and guidance to more closely target practice and implementation.
- Registration with Directory of Open Access Journals (DOAJ) to enhance status, and visibility.
- Target 2-3 issues in volume 3 (2026) with an aim to build to 4 issues per annum.
- Expand editorial and review team.

Editorial team

The editorial team evolved over the past year and were crucial in helping support the growth and operations of the journal. The team expanded over the course of the year and in particular we are thrilled to welcome Sonia Gomez-Puente on board as Deputy Editor.

EDITOR-IN-CHIEF

Gareth Thomson, Aston University, UK g.a.thomson@aston.ac.uk

DEPUTY EDITOR

Sonia M. Gomez-Puente, Eindhoven University of Technology, NL

ASSOCIATE EDITORS

Kristina Edström, KTH Royal Institute of Technology, SE

Lead Author Institution Nationality



Svante Gunnarson, Linköping University, Linköping, SE

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Ann-Kristin Winkens, Aachen, DE **Aristides Carrillo-Fernandez,** Purdue University, USA

Ghazi Droubi, Robert Gordon University, UK **Saeed Shaeri**, Charles Sturt University, AU

Journal Readership (Top 20 nations)











Volume 3

Page 24 Page 25

THE ROUTLEDGE INTERNATIONAL HANDBOOK OF ENGINEERING ETHICS EDUCATION

One of the highlights of 2025 for SEFI has been the release of The Routledge International Handbook of Engineering Ethics Education. This landmark Open Access volume, published in January, has its roots in SEFI's long-standing commitment to advancing ethics as an essential dimension of engineering education.

The idea for the handbook was first conceived within SEFI's community, where members of the Ethics Special Interest Group (SIG) and other colleagues recognized the need for a comprehensive and authoritative resource to consolidate and extend work in this field. Many of the editors and contributors have been active in SEFI for years, drawing on networks, collaborations, and discussions initiated at SEFI conferences and within our SIG activities.

Spanning 698 pages and including contributions from more than 100 international experts, the handbook provides a unique map of themes, teaching approaches, accreditation frameworks, and interdisciplinary insights in engineering ethics education (EEE). It also addresses pressing issues such as artificial intelligence, biotechnology, GDPR, and generative AI tools like ChatGPT.

The handbook exemplifies SEFI's mission to foster collaboration across borders and



disciplines, and to share resources that enrich the work of engineering educators worldwide. It stands as a tangible outcome of the intellectual community SEFI has cultivated, and as a resource that will continue to support program leaders, curriculum designers, and researchers in embedding ethics meaningfully into engineering curricula.

Editorial team

Tom Boersen, Aalborg University, DK **Shannon Chance**, TU Dublin, IE **Diana Adela Martin**, University College London, UK

Roland Tormey, EPFL Lausanne, CH Gunter Bombaers, TU Eindhoven, NL Thomas Taro Lennerforts, Uppsala University, SE

NEW POSITION PAPER ON ENGINEERING SKILLS

Shifting Gears in Engineering Skills

Since the publication of SEFI's last position paper in 2016, the world has undergone significant transformations. We are now in the midst of a fourth industrial revolution, characterised by automation and cyber-physical systems, and an emerging fifth industrial revolution, driven by human-AI interaction, sustainability, and ethical considerations. These rapid advancements necessitate a fresh look at the skills engineers need to succeed. The 2025 edition of SEFI's position paper on skills addresses the challenges and opportunities presented by this uncertain future.

Union of Skills

In March 2025, the European Commission introduced the Union of Skills, an overarching strategy aimed at enhancing education, training, and lifelong learning across the EU to bolster competitiveness and address evolving labour market needs. SEFI's 2025 Position Paper on Engineering Skills aligns with the Union of Skills' objectives by emphasising the development of competencies that integrate knowledge, skills, and attitudes. By focusing on the 3Ts-Technical, Transferable, and Transdisciplinary skills—SEFI aims to prepare engineers who can navigate the complexities of the modern world and contribute effectively to society.

Key Themes of the 2025 Position Paper

The new position paper emphasises several key themes:

The VUCA World: Today's world is volatile, uncertain, complex, and ambiguous (VUCA). Engineers must be adaptable and able to thrive in rapidly changing environments.

Collaboration and Complexity: Engineering is a collaborative and complex activity. Engineers need to work effectively in interdisciplinary teams and consider socio-technical, societal, environmental, and economic perspectives.

Beyond Technical Skills: While technical skills remain essential, engineers also need strong transferable skills (e.g., communication, teamwork) and transdisciplinary skills (e.g., ethical decision-making, sustainability).

Lifelong Learning: Skill development is an ongoing process. Engineers must be committed to continuous learning and professional development throughout their careers.

Competencies, Not Just Skills: The paper highlights the importance of developing competencies, which integrate skills with knowledge and attitudes.

The 3Ts: Technical, Transferable, and Transdisciplinary Skills

The position paper focuses on the interplay between three key categories of skills:



Technical: The foundation and application of science, along with mathematical and computational skills.

Transferable: Cognitive, social, and emotional skills, such as communication, teamwork, and project management.

Transdisciplinary: Skills related to ethical decision-making, sustainability, and social responsibility.

A Call to Action: SEFI's 2025 position paper on engineering skills serves as a call to action for the engineering education community. It encourages educators to champion a holistic approach to education prioritising the development of contextual competencies incorporating knowledge, attitudes, and technical, transferable and transdisciplinary skills. >> full paper online

SEFI SPECIAL INTEREST GROUPS (SIGS)



DIVERSITY, EQUITY AND INCLUSION

In 2024-25, the SEFI Special Interest Group (SIG) on Diversity, Equity, and Inclusion (DEI) advanced its efforts to make SFFI conferences more accessible and inclusive. In collaboration with the organisers of the SEFI 2025 conference in Tampere, the SIG contributed to training for session chairs and developed guidelines for reviewers nominating papers for the Susanne Ihsen Award for Best Paper on Diversity and Inclusiveness. At SEFI 2025, the SIG will host a workshop ("Moving Beyond 'Breaking Ice' to 'Building Bonds' in Engineering Classrooms"),

hold its annual meeting, chair the Susanne Ihsen Award panel, collect data on inclusivity within the SEFI community, and provide two Acting Persons of Trust.

The SIG met twice during the year to discuss future directions, including initiatives to share good practice across the SEFI community and ways to support colleagues in contexts where DEI research is not widely valued. To promote evidence-informed initiatives, members submitted a paper to EJEE based on SEFI 2024 data and secured ethical approval

to extend the study across the next three conferences. The SIG's work has gained external recognition, being shortlisted for the ESAE SEI Award and presented at major events including the European Association Summit and ICCA Global Association Forum.

Co-Chairs

Fiona Truscott Chika Nweke University College London

Joelyn de Lima **FPFI** Lausanne

ATTRACTIVENESS OF ENGINEERING EDUCATION

The SIG on Attractiveness of Engineering Education advanced several key initiatives in 2024-25.

A systematic literature review on outreach activities is nearing completion, providing insights into research designs, measures, and the effectiveness of interventions.

A comparative study of engineering education pathways in Belgium, the Czech Republic, and the UK expanded to examine institutional barriers and enablers across Europe, with results to be refined at SEFI 2025.

A new Delphi study with secondary

teachers, engineering educators, and professionals is defining core engineering concepts for secondary education, with preliminary findings to be discussed in a SEFI 2025 workshop.

The SIG is also developing a framework to define "attractiveness" in engineering education by linking exploratory results with existing literature. Alongside this research, dissemination and community-building efforts have been a priority.

Two SEFI@Work sessions were highly successful:

• a roundtable on attracting girls to engineering through industry

-academia collaboration, and a joint session with the SIG on Engineering Education Research featuring James Huff and Monique Ross.

The SIG further strengthened partnerships through invited presentations in France and at the EU STEM Coalition General Assembly, where discussions began on a new action to map public attitudes toward technology and engineering.

Hanne Deprez Sofie Craps KU Leuven

ETHICS

In 2025, the Ethics SIG was one of SEFI's most active groups, advancing seven major projects and supporting three collaborations that strengthened research, practice, and policy in engineering ethics education.

- » A highlight was the Routledge International Handbook of Engineering Ethics Education, published in December 2024. .see on the p. 26
- » The sixth SEFI Ethics Spring Symposium took place from 24–26 March 2025 at the Royal Marine Hotel in Dun Laoghaire, Ireland, hosted by Shannon Chance, see on p.15.
- » The SIG also delivered an <u>editorial</u> <u>series</u> coordinated by **Diana Martin**, which produced eight pieces on the theme of interdisciplinarity.
- In the policy arena, a group led by Sarah Junaid (Aston University) contributed chapters to the Handbook on accreditation and submitted an abstract for a special issue of the

Journal of Engineering Education.

The capacity development in Eastern Europe project, initiated in 2022 by

Diana Bairaktarova (Virginia Tech), continued its efforts to consolidate the position of ethics education research in the region. It encourages greater participation from Eastern European scholars in SEFI conferences, the Spring School, and

collaborative publications.

The project on epistemic uncertainty and discomfort in engineering education, launched in 2024 under the leadership of Siara Isaac (EPFL), with a series of online seminars. These explored how students and educators engage with uncertainty, laying the foundation for future joint studies and possibly a dedicated EJEE special issue.

At the *Spring Symposium*, members proposed three new initiatives:

- » a project on truth-making (led by Paula Tomi, UPB, Romania),
- » a project on care (led by Mary Nolan, Atlantic Technological University, Ireland), and
- » a project on ethics and gender-sensitive design in civil engineering (led by Irene Josa, UCL).

Through publications, symposia, editorials, policy engagement, regional capacity building, and emerging research themes, the Ethics SIG continues to contribute to integration of ethics into engineering education. Its work is increasingly recognised not only within SEFI but also across the global engineering ethics community.

Co-Chairs

Mircea Tobosaru

University Politehnica of Bucharest

Diana Martin

University College London

CAPACITY BUILDING

The Capacity Building SIG continues to grow and build community around research and practice. The main activities this year are engaging in research and dissemination efforts within the group and across SEFI. We joined the Continuing Engineering Education & Lifelong Learning and Engineering Skills SIGs on a collaborative project exploring lifelong

learning, which will be presented at the 2025 Conference. We organized a SEFI@ work on Chapter 14 from the International Handbook of Engineering Education Research titled "The Overlooked Impact of Faculty on Engineering Education".

Looking to the future, we are interested in continuing and expanding our projects

on topics such as the role of sessional teachers and a cross-country view of practices and perspectives related to educator capacity building.

Co-Chairs

Jenny Griffiths
UCL London
Madeline Polmear
King's College London

by

ania), ing frameworks, policies and practices
y Mary Noical Universigender-sengineering (led in generating in STEM. Active
membership has grown slightly over the
last year, as have SIG activities that have
allowed a) sharing of practices between
members; b) growth in research and

scholarship; c) and development of both new and existing collaborations.

The SIG organised and supported two

The CEE/LLL SIG focuses on advanc-

SEFI@work sessions – the first in October 2024 was about sharing the key points from the SEFI2024 conference around Continuing Engineering Education and Lifelong Learning supported by SIG mem-

bers and joined by an international audience. The second webinar in May 2025 was an excellent session from Helen L. Chen (Stanford University) and Isabella Cardenas-Navia (WorkCred) around non-degree credentials in engineering, part of the series discussing chapters from the International Handbook of Engineering Education Research.

CONTINUING ENGINEERING EDUCATION & LIFELONG LEARNING

The SIG were well represented at the *IACEE Spring Symposium at Purdue* University in April 2025, reflecting the strong working relationship between the two organisations.

The collaborative research has grown

with particular focus on:

a) developing a taxonomy for CEE to allow better classification and easier exchange of ideas,

b) around the necessary staff development to support educators developing and delivering CEE courses and c) working with other SIGs (Engineering Skills; Capacity Building) around a shared interest in different aspects of lifelong learning.

Co-Chairs

Chris Smith

Glasgow University

Anikó Kalman

University of Nyíregyháza

MATHEMATICS

In 2024–2025, the SEFI Mathematics Special Interest Group (MSIG) concentrated on organisational activities for the MSIG Seminar 2025 (see on the p. 17), resource development, and research initiatives to support mathematics education for engineers.

Key initiatives included the creation and maintenance of a shared digital repository, which houses materials and resources contributed by MSIG members, and the continuous updating of the SIG's webpage on the SEFI site to ensure visibility and engagement within the community.

The Steering Committee held its annual

meeting in hybrid format at the Czech Technical University in Prague on 22–23 November 2024, co-organised by Dr Marie Demlová and MSIG Chair Professor Deolinda Rasteiro. Between January and June 2025, a series of online meetings coordinated with the Ostfalia organising team to support the logistics, academic planning, and strategic alignment of SIG activities.

The SIG continued to support several research projects, including MathDigger, GIRLS, and the CEEPUS project on active methods in teaching mathematics and informatics, as well as a working group

developing a first-year common entry mathematics syllabus for level 8 engineers at TU Dublin.

The SIG welcomed new members this year, bringing fresh perspectives and renewed energy to ongoing discussions and initiatives, reinforcing the group's commitment to inclusivity and collaboration across Europe.

Chair Ia Dias Rasteiro

Deolinda Dias RasteiroISEC Coimbra

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ENGINEERING EDUCATION RESEARCH

In the past year, the SIG on Engineering Education Research (EER) continued its mission to strengthen the field of engineering education research in Europe.

As in previous years, a core part of the SIG's activities centred around the Annual Conference in Switzerland. The SIG organised the 8th edition of the pre-conference Doctoral Symposium. see on the p. 10

In addition to the symposium, the SIG held an open meeting and launched a new webinar series linked to the *International Handbook of Engineering Education Research*. At a dedicated workshop, **Esther Ventura-Medina** and **Tinne De Laet** introduced the series and its first seminar on Chapter 7, "The

Role and Use of Theory in Engineering Education Research", led by Jennifer M. Case and Aditya Johri. This workshop marked the beginning of the SEFI@work Handbook webinar series, with monthly sessions hosted by different SIGs. The initiative fostered cross-SIG collaboration and ensuring regular engagement across the community.

The SIG also co-organiserd the third edition of the *SEFI PhD Summer School*, organised in collaboration with the 4TU Centre of Engineering Education, the Technical University of Eindhoven, and the Eindhoven School of Education. see on the p. 16

These activities—the Doctoral Symposium, the Handbook-based webinar

series, and the PhD Summer School—represent the SIG's strong and sustained commitment to capacity building in engineering education research.

Looking forward, the SIG will continue to build on these core activities. In particular, it aims to deepen engagement across the EER community, broaden participation to include more researchers at different career stages, and reinforce the connection between SEFI's research-focused initiatives and the broader engineering education landscape.

Co-Chairs

Tinne De Laet KU Leuven Esther Ventura-Medina TU Eindhoven

ENGINEERING SKILLS

The Engineering Skills SIG has had a productive year. The updated SEFI Position Paper on Engineering Skills, led by Helena Kovacs together and co-authored by many SIG members, has been successfully published. This new edition reflects contemporary challenges and priorities in engineering education.

Following the launch of the SEFI Handbook on Engineering Skills at SEFI 2024, over 100 expressions of interest were received. The editorial team, **Gillian** Saunders-Smits (TU Delft), Lynn Van den Broeck (KU Leuven), and Thies Johannsen (TU Berlin), is leading the volume's development, supported by Esther Perea Borobio, Neil Cooke, Jenny Griffiths, Abel Nyamapfene, Emanuela Tilley, Helena Kovacs, Kurt Coppens, and Matteo Di Benedetti. Chapters are due by 1 September 2025.

A collaborative project on lifelong learning, developed with other SIGs (Capacity Building and Continuing Engineering

Education & Lifelong Learning) will be presented at SEFI 2025 in Tampere.

Monthly SIG meetings and the European Engineering Educators podcast, hosted by Natalie Wint and Neil Cooke, continue to support community engagement and knowledge sharing.

Co-Chairs

Neil Cooke Birmingham University Lynn Van den Broeck KU Leuven

SUSTAINABILITY

In 2025, the Sustainability in Engineering Education SIG focused on strengthening its community by growing member engagement and defining its identity and values. Membership expanded significantly, from 43 members in 2023 to 117 in mid-2025, reflecting the growing interest in the group's activities. Looking ahead, the SIG aims not only to deliver on its action plan but also to encourage more members to actively propose and lead initiatives.

A key highlight was the launch of S.E.E.

Earth (Sustainability Engineering Education for One Earth), held on International Earth Day (22 April). This event brought together academics, students, and industry representatives from across continents to exchange good practices and resources for educating engineers in sustainability.

The SIG's strategic goals remain consistent: to build a broad network of stakeholders committed to advancing sustainability in engineering education, to stimulate discussion on the state of the art and future

directions, and to share practices, research, and lessons learned that can drive change. These priorities, together with the group's growing membership and signature initiatives, continue to shape the SIG's identity and contribution within SEFI.

Co-Chairs

Aida Guerra Univeristy of Aalborg

> André Baier TU Berlin

QUALITY ASSURANCE AND ACCREDITATION

The SIG on Accreditation and Quality Assurance aims to advance the international accreditation of engineering programmes and promote a global registry for engineering educators through practical tools and targeted strategies. By developing and sharing innovative resources, the SIG supports quality assurance efforts, helping educators meet and exceed international standards. In close collaboration with ENAEE, the SIG contributes to the refinement of accreditation processes to ensure they reflect current educational and technological developments.

A central priority is raising awareness of the EUR-ACE label, which enhances programme credibility and global recognition, and promoting the International Professional Engineering Educator Registry (iPEER), a globally recognised credential that ensures rigorous professional, scientific, and pedagogical standards. iPEER is the only professional body acknowledged to regulate the Engineering Educator occupation (ISCO 2311) under UN/ILO standards.

In 2025, the SIG will host a dedicated workshop at the SEFI Annual Conference in Tampere: "Independence of Accreditation Agencies: Challenges and Implications for Global Engineering Education Quality Assurance." This session will address the role of agency independence in maintaining trust and credibility, exploring potential risks and strategies for strengthening impartial, transparent, and autonomous accreditation systems.

Another highlight was EUR-ACE Connect 2025, held in Lisbon in May. This networking forum for EUR-ACE accredited programmes brought together leading institutions to share experiences, strengthen collaborations, and advance the visibility of the EUR-ACE label.

Led by José Carlos and Raja, the SIG continues to elevate the international standing of engineering programmes and foster a global community of skilled educators.

Co-Chairs

Raja Toqueer The University of Sheffield

> José Carlos Quadrado ENAEE President

SEFI Annual Report 2024-2025 SPECIAL INTEREST GROUPS

DIGITAL LEARNING

The Digital Learning SIG (DL SIG), initiated at the SEFI 2024 conference, continued discussions on the most important topics of the digital learning landscape. Included in these topics was artificial intelligence, especially generative artificial intelligence, the

effects of its use and abuse by both learners and teachers being very much a hot topic in research and practice. DL SIG aims to continue and expand on these discussions and the work we do to serve our members and the broader HEI community.

Co-Chairs

Mikko Nurminen Tampere University

Andrew Garrard
The University of Sheffield

PHYSICS

The SEFI Special Interest Group of physics assembles approximately 45 physicists who teach physics to engineering students. Physics teachers encounter similar challenges, irrespective of the country and the educational level. Developments in the field of physics education research and different solutions to and experiences from a variety of educational challenges (both

on lecturing as well as on lab work) are shared among the group members on a regular basis.

Our main activity is the organization of the bi-annual *Physics Teaching in Engineering Education Conference (PTEE)*. In 2024, this conference was organized by our members from TH Rosenheim, Germany. The next PTEE conference will be held from the 27th-29th of May 2026 in Warsaw and is organized by our group members from Warsaw University of Technology. More info on the special interest group, its members and activities can be found here.

Cha

Arjan Lock

The Hague University of Applied Sciences

CURRICULUM DEVELOPMENT

The curriculum development SIG has been developing a programme of SEFI@Work sessions for the coming year, with a first session planned to promote work from a group of institutions who have adopted an integrated engineering curriculum. This session will focus on a recent white paper written by **Emmanuela Tilley**. Further

sessions will be announced shortly and will focus on tools and approaches to curriculum development, both drawing on experiences in engineering but also more generic tools.

Although an active community is developing the SIG is keen to attract new members and to develop and engaged steering group. We look forward to seeing prospective members of the SIG at our session at the 2025 SEFI conference.

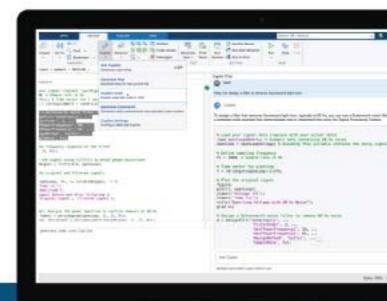
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SEFI AS A PARTNER IN **2024-2025**



ENHANCING ENGINEERING EDUCATION THROUGH COLLABORATIONS AND PARTNERSHIPS

In its mission to foster excellence in engineering education across Europe and beyond, SEFI continues to strengthen ties with partner organizations, networks, and global communities. These collaborations enable SEFI to remain at the forefront of innovation and advocacy in engineering education while building strong bridges between academia, students, and professional bodies.

SEFI has remained particularly committed to engaging with student organisations, supporting their activities and ensuring that students' voices are heard in shaping the future of engineering education. This year, SEFI was present at several major student-led events, including the **BEST** General Assembly in Tallinn, the **ESTIEM** Council Meetings in Sevilla and Calabria, and the BEST Symposia on Education in Madrid and Cluj-Napoca.

Our collaborations extend across Europe's higher education and engineering education communities. SEFI contributed to important discussions at the **STU**Learning and Teaching Forum in Bratislava, the CDEFI conference in Brussels ("Which and how many engineers for tomorrow?"), the E4E Skills Council in Berlin, and the ENAEE Connect Forum in Lisbon. SEFI also joined forces with Engineers Europe for the Engineers 4 Europe Closing Event in Brussels.

SEFI's international outlook remains strong through participation in global forums. This past year, SEFI actively engaged in the World Engineering Education Forum in Sydney, the IACEE Symposium at Purdue University (USA), the ASEE Annual Conference in Montreal, and the ICCA Global Associations Summit in Granada. These events highlighted SEFI's commitment to staying connected with the worldwide community of engineering education stakeholders.

In parallel, SEFI also maintains strong involvement in **European and EU-funded collaborations** that advance the quality and inclusiveness of engineering education. As an associate or cooperating partner, SEFI contributes to initiatives such as:

TRAINeng-PDP: Training engineers for lifelong learning through a personal development process. that has confuced this year and you maiy find the outputs here.

<u>In-4-STEM:</u> Developing innovative interventions to improve social and academic integration of STEM university students that will continue until 2027.

<u>ENHANCE</u> – European Universities of Technology Alliance.

<u>EuroTeQ Engineering Campus</u> – European Universities Initiative.

SEFI also greatly appreciates collaborations with its longstanding industrial partners: **Dassault Systemes, Ansys, Mathworks, Siemens, Bentley, AIRBUS**. In the past year, the SEFI SIG on Attractiveness worked with the representatives of Ansys and Bentley to stirr a discussion about attracting more women into engineering through in a format of an online roundtable.

In the past year, SEFI also reconnected with **CESAER, EUA** and **IGIP**, strong partners from the past and building towards reaching common goals in the near future.

Through these collaborations, SEFI continues to demonstrate its commitment to cooperation, excellence, and innovation in engineering education, while ensuring that the voices of students, educators, and professional stakeholders are part of shaping the future of the field.



SUSTAINABILITY STATEMENT

INSYSpart of SYNOPSYS°

As the global leader in engineering simulation, Ansys, part of Synopsys, empowers innovators across industries to design products that are safer, smarter, and more sustainable. While our technologies support a wide range of applications, a key focus of our Academic Program is preparing students to use simulation to tackle pressing sustainability challenges. Through the Ansys Academic Program, we provide free student downloads and affordable licensing to academic institutions to ensure that learners everywhere

can access the same industry-standard tools used by companies around the globe. This access enables students to experiment with solutions that help engineers design smarter, lighter, cleaner, and longer-lasting products. We also invest in open-access education through platforms like Ansys Education Resources, and the Ansys Learning Forum. These resources, available to students and educators worldwide, highlight fundamental concepts in areas such as fluid dynamics,

structural mechanics, heat transfer and material selection, while emphasizing their role in advancing sustainable technologies.

By collaborating with SEFI and universities across Europe, Ansys continues to champion sustainability in engineering education. Together, we are equipping the next generation of engineers with the knowledge, skills, and mindset to innovate responsibly and accelerate progress toward a more sustainable future.



BEING SCIENCE-DRIVEN



The current generations of young people form their worldviews in mental universes where realities appear as convincing computed visual representations. However, appearance and reality are distinct. Engineering is not the same as video gaming, and what you see, no matter how immersive, does not translate directly to the material world. Entertainment industries can impact our imagination. Industry has to comply with the laws of nature. So do engineers.

The material world is not just defined by the law of physics, material sciences, mechanical or electronic behaviours. When solving a socio-technical problem or just designing a pencil, engineers combine their knowledge and their creativity in a universe of data that also has to consider the emotional, social and commercial dimensions of the experience of those who will benefit from such solution, in the form of a product, a system, a service or any type of usage.

Employers expect newly hired engineers to deal with confidence with things and with people as well: Not just the people working with me but also the people who will use the result of my work.

The behaviours of things and of people must be modelled in conjunction with their appearance. This is the true purpose of a "virtual twin": a digital representation that integrates appearance, physics and the human and environmental impact



of things: an ocean of data. The "virtual twin" synthetizes this "ocean" in the form of a representation that is both visual and science based. And here comes AI: to discern within vast data sets, the relevant information for a given task and to assist in generating a new solution compatible with science and with patterns of human behaviour. Take the example of a car maker: data representing their knowledge from previous vehicles engineering, manufacturing and selling are available in their private "ocean". The actual physical life of previous model serves to validate their accumulated digital representations. The technical relevance -or the failures- and the economic relevance (sales success, logistics, competition...) can then be considered together with physical laws to generate new solutions. This cannot happen in the "dirty" ocean of the worldwide web. It can in the private data assets of a company.

The magnitude of these evolutions in the engineering profession impacts educators even more than the transformations of their own educational methods. This is why Dassault Systemes is actively translating the changes happening in industry into applicable educational methods. Results from these efforts can be discovered here.





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