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## Tomorrow's Engineers Live 2024

An incredible Tomorrow's Engineers Live 2024 took place on 5 February. Now in its third year, the event supports those delivering engineering and technology outreach activities to get the most out of their activities. There were practical sessions, collaborative discussions and opportunities to share ideas. More than 100 delegates heard from industry experts, STEM outreach providers and engineering role models. Together, we learnt more about how to inspire the next generation of engineers, reach underrepresented groups in engineering and technology, promote technical and other pathways into the sector... and more.

### Reflections on the day

- **Emphasis on creativity and inclusion** Yewande Akinola, the first keynote speaker, highlighted the importance of creativity and fresh thinking, along with the need to improve the perception of engineering to promote diversity within the field. This was echoed in sessions talking about relatable role models, looking at attributes and skills, not just the role. Diversity cropped up as a recurring theme throughout the day.
- **Equity, Diversity, and Inclusion (EDI) perspectives** There were lots of insights on supporting diverse role models, reaching girls, providing accommodations such as sign language interpreters with technical language and fostering inclusive environments for individuals from all backgrounds.
- **Using educational advancements and technology to broaden reach** Presentations from organisations such as Network Rail and the Met Office showcased innovative approaches to industrial placements, virtual work experiences, and curriculum mapping to engage students in STEM fields.
- **New and ongoing collaboration – learning within the engineering outreach community** Platforms such as [Neon](#) and [Code Connect](#) help share best practices and build collaboration. Funding and partnership sessions explored strategies to secure funding and gain senior buy-in, talking about the importance of building relationships with stakeholders, funders and future collaborators. Through collaboration, we can build on each other's resources, rather than creating from scratch. Learning from each other enables to scale up activities. This community is growing in openness and trust, let's build further to deliver activities together.
- **Personal pathways into engineering make a difference** James Dornor, and others, openly shared their personal journeys into engineering. Different, honest and unique stories help us become 'real models' revealing the power of connecting with young people on a human level to inspire interest in the field.
- **Resources and support** Joining [The Code](#), as well as using platforms like [Neon](#) and [Tomorrow's Engineers](#), are important and rich resources to support organisations, wherever they are on their outreach journey.
- **Evaluation** Several sessions talked about the challenge of evaluating individual activities, while noting how important it is. It's rarely possible to isolate the long-term impact of a single event, but we can learn how activities are enjoyed by young people and change their perceptions and aspirations.



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**The result:** We're building a brilliant, sharing community who come together to collaborate, discuss challenges and celebrate good practice. We continue to need impactful engagement that highlight the wealth and breadth of engineering and technology opportunities to appeal to all young people. And not doing these in isolation – building and delivering activities together.

## A full breakdown of the day

**Dr Hilary LeEVERS**, [EngineeringUK's](#) Chief Executive, and **Séan Harris** OBE, Director of Membership and Deputy Director General at the Institution of Civil Engineers, gave a warm welcome to a packed room and set the stage for a thought-provoking day ahead. Hilary introduced the first keynote speaker.

**Yewande Akinola**, Engineer and Innovator, spoke about **Innovation for Impact**. Yewande emphasised the importance of creativity and innovation in engineering. She celebrated the value of fresh thinking and highlighted the need to improve the perception of engineering, making it attractive and accessible to all. It's clear that there is both a need, and an appetite, for this approach. These traits aren't often celebrated so it was good to have a shift away from the focus on the academic or technical requirements. Improving the perception of engineering – and who can be an engineer – was a notable theme for Yewande, which was then echoed throughout the day during various sessions and personal stories.

The following panel session, **Opening doors – creating inclusive outreach** involved:

- **Alex Knight**, Chief Executive, STEMAZING
- **Kailey Firmin**, Trainee Engineer, VolkerStevin
- **Anna Preston**, Team Leader, Mabey Hire
- **Becky Patel**, Head of Education and Learning, Tech She Can

**Alex** told us about **STEMAZING's** mission to empower women in STEM to shine as visible role models who inspire our next generation of innovators and problem solvers. She highlighted the importance of relatable role models and empowering underrepresented groups. Her standout quote was 'You can't be what you can't see'. We heard from a deaf ambassador (**Kailey**) and an autistic ambassador (**Anna**). Kailey told us the difference it has made to her working life having a BSL interpreter with technical knowledge supporting her. Anna helped the audience understand her challenges. Through her desire to help others (as there aren't many autistic STEM ambassadors) she's overcoming issues with confidence and imposter syndrome by saying yes to opportunities. It was good to hear the positive impact Anna and Kailey had made to individual students Their personal stories resonated with the audience.

**Tech She Can** is a tech careers education charity focused on empowering women. They deliver cross-curricular free school resources for girls (and boys, noted in the shift from Tech *She* Can to Tech *We* Can, encouraging male allies of the future) connected to careers, with the aim of changing perceptions of tech roles and making pathways more visible. Echoing STEMAZING, **Becky** said that children can't aspire to be what they don't know exists. We need young people who want to be designers and creators of tech, not just users – by using their passion or hobby, seeing how it can turn into a career – and to start as early as possible. The computing curriculum and use of technology in schools, for instance, has made significant developments over the past few years but the world



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of work and technology is rapidly advancing – so we need to early adoption to prepare for careers that don't even exist yet. The charity has reached more than 63,000 children since March 2022.

Our key takeaway for **creating inclusive outreach**: be curious. Be curious about who and how we can help.

Before and after lunch, delegates had a choice of 2 out of 6 sessions to join, which ran concurrently. So, this will be a useful overview of the sessions you may have missed!

### **Pitch perfect - securing funding for your programmes**

- **Susan Flach-Lovesey**, Stakeholder Manager, Equinor
- **Katie Miller**, Head of Impact, Mission 44
- **Beth Bramley**, Head of Corporate Relationships, EngineeringUK

The session gave insights into how to secure funding for engineering and technology outreach initiatives. **Susan** and **Katie** shared valuable intel to secure funding, emphasising the importance of aligning your business case to your values and your brand as well as to social impact. Attendees gained practical tips on leaning into what you're good at, crafting compelling grant and/or bid applications using the diamond approach (ranking 9 ideas using a diamond formation to surface the top idea), doing your research, evidencing your application, building relationships with funders showing the fit, financial sustainability and demonstrate measurable impact. Interesting points to consider: have young people been involved in creating projects? Who has the power to approve? What makes you credible? Then, just add that 'sparkle factor', your USP, to really stand out and convince.

### **Getting buy-in from senior leadership**

- **Marieke Muller**, Senior Partnerships Executive, CIWEM
- **Becca Thurston**, Head of Academy and Skills, Wessex Water
- **Shaffra Gray-Read**, Senior Reputation Manager, KFC
- **Lydia Fairman**, STEM Early Engagement Lead, Network Rail
- **Moira Shaftoe**, Head of Professional Institutions and Partnerships, EngineeringUK

The key themes from the speakers included: knowing your audience to get buy in as early as possible. Your proposal must align with business objectives. Use data to support your case, as well as a cost-effective plan, will show you're thinking about (and measuring) ROI and the bottom line (these are often prioritised by senior leaders, with resourcing – another element that needs planning). Encouraging long-term thinking rather than short term benefits. What's the impact of doing nothing? Think building a skilled future workforce, fostering a positive public image – starting work in these areas *now* to feel a benefit and create a legacy. A partnership approach (internal and external) was really powerful – **Shaffra** talked about working with organisations in the third sector who share the same values. Finally, always communicate clearly: focus on purpose, benefits and outcomes.

There were lots of questions in this interactive session. Do senior leaders understand that investment is important from a sector perspective and not just a business need? How can you get SLT to invest now, to see the results in 'x' years' time? How often do you review strategies or consider outreach changes, and if so, how often? Answers revolved around social value and aligning as a sector.



Measuring progress builds the buy in. Engaging with local schools means tapping into your future workforce – and once senior leaders embrace this, progress begins. Revealing the impact of not doing anything can shift thinking.

### Engineering and tech solutions - inspiring the future

- **Peter Marshman**, Chief Executive, Digit<all>
- **Kathryn Denham-Maccioni**, Digital Engagement Manager, Institution of Civil Engineers
- **Suzanne Moroney**, Head of Member Engagement, Institution of Civil Engineers
- **Laura Fogg-Rogers**, Associate Professor for Engineering in Society, University of West England
- **Mike Hardisty**, Head of Environmental Sustainability, EngineeringUK

This session talked about the role engineering and technology play in solving societal and environmental issues. The speakers all emphasised the need to engage young people into 'green careers'. Initiatives like coding for climate action, sustainable computing and nature-focused projects were given as examples. Businesses partnering with schools, local authorities, and community organisations were emphasised to enhance outreach and engagement. The benefits of mapping projects to curricula, Gatsby Careers Benchmarks, and Skills Builder were discussed. We heard some compelling stories of young people genuinely shaping activities. The contributors felt we need to highlight to young people – and careers leads – the opportunities to tackle environmental problems through a broad range of careers in engineering and tech. **Laura** spoke about a play-based approach to engineering, supported for example by Minecraft. **Suzanne** and **Kathryn** talked about CityZen, a sustainability-focused game from ICE. The game's success shows that programmes demonstrating the positive impact of engineering can inspire the next gen of innovators and problem-solvers. There's clearly a lot of activity in this area, as shared by Digit<all> and CityZen (as well as the UK Electronics Skills Foundation, who spoke about this during one of the lightning talks) – linking climate and nature, and supporting young people develop passions to help the world around them.

### Engineering and tech on screen: virtual work experience

- **Lisa Tomkins**, Education Outreach Partner, Met Office
- **Jo Bishop**, Schools and Colleges Outreach Lead, Springpod

**Lisa** showed us how to design and implement effective virtual work experience, supported by **Jo**. Virtual work experience provides young people with practical insights into what a career in engineering and technology can look like. Moving online expanded the Met Office's reach and diversity of those taking part: from 32 ad hoc experiences the previous year (via connections to Met Office employees) to 547 work experiences – representing a wider reach and diversity of applicants. Virtual work experience still leads to 'in person' experiences and now plays a part as a route into working at the Met Office. **Lisa's** case studies showed us how the Springpod platform truly supports the experience for young people and those supporting work experience internally. Springpod provides a vast range of interactive and immersive experiences for career exploration. It does this with its different audiences in mind: there's content and programmes for young people, schools, businesses, universities and parents. Safeguarding measures and collaboration with schools are fundamental to building experiences online. **Lisa** said work experience at the Met Office is now an equalizer, not just open to those in the know.



### Getting technical - routes into engineering and technology

- **Ben Sutcliffe**, Strategic Workforce Planning Manager, Network Rail
- **Daniel Williams**, Asset Engineer, Network Rail
- **Sam Dillaway-Davies**, Education, Skills & Sustainability

This session covered how to make employers, young people and educators aware of the exciting, hands-on technical routes into careers into engineering and tech – particularly T Levels. **Ben** outlined the challenges facing the rail industry, including skills shortages, digitisation, training needs and an aging workforce. He introduced T Levels as a solution to attract motivated young people and address skills gaps, emphasising the importance of industry placements and practical learning experiences. Network Rail has clearly invested time and thought in developing their T Level offers. The first-hand insight revealed how important T Levels are, and that we need to fully get behind them and embed them properly. This pathway may be a faster route to bring young people into the workforce as they're able to make meaningful connections and contributions. As **Ben** revealed all the benefits to organisations, young people and the nation, it would be hard to disagree.

### Empowering future engineers through STEM role models

- **Carol Davenport**, Associate Professor and Director of NUSTEM, Northumbria University
- **Wendy Sadler**, Founding Director, Science Made Simple
- **Vienna McAndie**, Employer Engagement and Partnership Manager, STEM Learning

How can we effectively use inspiring STEM role models and STEM attributes to excite young people into engineering and technology careers? **Carol**, **Wendy** and **Vienna** each used their presentations to discuss the attributes of effective role models and the impact of long-term engagement on young people's career aspirations. They emphasised the need to portray role models as attainable and meaningful to students, focusing on non-technical employability skills and relatable success stories. We want our role models to be competent, successful and happy but not so extreme that success seems unachievable. There are common attributes that may be more relatable to young people – the interpersonal, softer skills such as teamwork, problem solving, creativity and self-management. **Wendy** talked about research that showed young people love STEM... but do they want to become a scientist, an engineer or a mathematician? Showing the types of people who work in these roles, rather than job titles, could help. **Vienna** rounded up the session talking about collaboration, calling out The Code and its mission, as well as the importance of well-designed resources to minimise efforts of teachers to embrace your programme.

All 6 breakout sessions gave attendees new ideas, knowledge and practical strategies to take away. Each highlighted the importance of collaboration, innovation, and inclusivity to inspire the next generation.

The audience reunited to hear 4 lightning talks from speakers across the sector, energising the audience with diverse perspectives. They addressed various aspects of promoting STEM education and engagement, including initiatives targeting underrepresented groups, integrating ethics into engineering education, and leveraging senior leadership support and community collaboration.



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**Stewart Edmondson**, Chief Executive, UK Electronics Skills Foundation

The charity is the only STEM organisation focused on electronics. **Stewart** showcased their highly successful Girls into Electronics initiative. It addresses the skills gap in electronics by encouraging more young people, especially girls, to study electronics. Through partnerships with universities, companies, and schools, UKESF organise events introducing students to electronics, engineering studies, and the career opportunities. There's significant participation and positive feedback, with a 54% of attendees considering a career in electronics afterwards. **Stewart** emphasised diversity and representation as crucial for innovation and creativity in the industry. The success is clear: 406 participants from 116 schools. 96% said the event was 'Good' or 'Excellent'. 83% felt more enthused about electronics.

**Grace Benham**, Channel Chair, Royal National Lifeboat Institution

Grace shared RNLI's journey of integrating STEM engagement, particularly engineering, across the organisation. RNLI have 450 engineers working for them. Historically, RNLI's STEM efforts were limited, but through strategic vision and collaboration with external partners like EngineeringUK, they've expanded their initiatives targeting schools and communities. These include Women in Engineering Day and participation in national STEM events such as The Big Bang Fair and Tomorrow's Engineers Week. Grace highlighted it's important to start small, engage stakeholders and use social media to enhance STEM engagement. The organisation uses forums for support such as STEM Learning and Careers Hub. Their journey has been significant – from one event a year in 2022, to several each quarter – which are evaluated and built on to carry on the conversations. They've got more involved with apprenticeships and are now targeting under-served areas.

**Role of Apprenticeships in Engineering and Technology, Beatrice Barleon**, Head of Public Affairs and Policy, EngineeringUK

**Beatrice** highlighted the importance of apprenticeships in addressing the growing demand for engineering and technology skills. Despite the increasing need, apprenticeship starts have declined – including the intake from lower socio-economic groups. Employers can play a huge role in offering entry-level opportunities and reaching out to young people to raise awareness about apprenticeships. She encouraged organisations to integrate resources and case studies into their outreach efforts to promote apprenticeships effectively. Collaboration and sharing of best practices are essential to make engineering apprenticeships successful. Lord Knight and Lord Willetts, in partnership with EngineeringUK, led an inquiry resulting in a 5-point plan to grow and sustain engineering and technology apprenticeships for young people. Beatrice gave a call to action for organisations to do more to appeal to young people – reaching in (getting young people involved pre-apprentice) and reaching out – through engagement activities. Everyone in the room can help – by sharing their experiences or launching your own initiatives.

**Engineering ethics and engagement with young people, Claire Donovan**, the Royal Academy of Engineering

The penultimate lightning talk, **Claire** discussed the importance of ethics in the engineering profession. The Royal Academy of Engineering has developed resources and guidelines to teach ethics at undergraduate levels and engage young people from Year 6 upwards. Ethics discussions



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can provide insights into morality, culture, technology, and global aspects of engineering. Claire highlighted the significance of organisations committing to ethical practice and fostering inclusivity and sustainability.

**The Code: Engaging Senior Leaders and Fostering Community, Sir Julian Young**, Chair of The Tomorrow's Engineers Code

**Sir Julian** highlighted the role that senior leaders play in engaging young people and supporting STEM initiatives – asking the audience ‘can you be doing more to engage young people? He introduced [The Code](#), a community of more than 300 like-minded organisations promoting collaboration and best practices. The Code offers resources, events and networking opportunities to support organisations in their STEM engagement efforts. Members are encouraged to join and contribute to shaping the future of STEM engagement through a commitment to [4 pledges](#), shared learnings and experiences as well as the exclusive [Code Connect](#) platform. He encouraged non-Code members in the audience to sign up immediately, citing we need a united front to help solve the planet’s problems.

The day’s final keynote speech was delivered by **James Dornor**, Founder, Driven By Us. **James** talked to us about **Driving impact**.

**Driven By Us** supports aspiring and future motorsport leaders through networking opportunities, careers advice and personal development support. James emphasised their focus on schools with high levels of deprivation and lower educational attainment. He openly shared his personal journey, detailing challenges he faced growing up including health struggles and the loss of his father at a young age. He believes that sharing personal experiences and failures makes STEM outreach more relatable. He developed a passion for design and technology at school and pursued further education in engineering. His work experiences were at prestigious companies McLaren and BMW Group, eventually earning a BEng degree. James talked about his motivation to set up Driven By Us. The audience were given top tips for effective STEM outreach which included encouraging volunteering, implementing mentoring programmes post-outreach, and sponsoring STEM events or organisations focused on increasing opportunities for disadvantaged groups. He advocated for interactive and practical activities aligned with the national curriculum and the UN's Sustainable Development Goals (SDGs) as well as the importance of ED&I. Inclusive environments should be supported by all employees, including senior management. **James** recommended measuring cultural change over time.

And that wrapped up a full-on, inspiration-packed, thought-provoking day!

## **Conclusion**

Tomorrow's Engineers Live 2024 proved to be a dynamic day of knowledge exchange and collaboration. Key themes emerged and, despite existing challenges, there’s collective optimism and determination among participants to overcome barriers and accelerate the shift towards a better equipped future generation.

The event demonstrated the strength of the engineering and tech outreach community and the potential for continued growth and collaboration in the future. Continued efforts are needed to sustain this momentum, drive impact, and ensure meaningful engagement with diverse communities to nurture a pipeline of talent for the future of engineering.



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### **Next steps**

The goal is to transition from simply sharing practices to actively practicing together, building and delivering activities collectively.

### **Thanks**

EngineeringUK are grateful to our British Sign Language interpreter, The Institution of Civil Engineers, Shell and Network Rail for their support to make Tomorrow's Engineers Live 2024 possible.

