



Royal Academy
of Engineering

Engineering Leaders
Scholarships

Alumni case studies



Foreword



The Engineering Leaders Scholarships (ELS) programme was established more than 25 years ago to support engineering undergraduates who demonstrate the potential to become leaders in engineering and to serve as inspiring role models for future engineers.

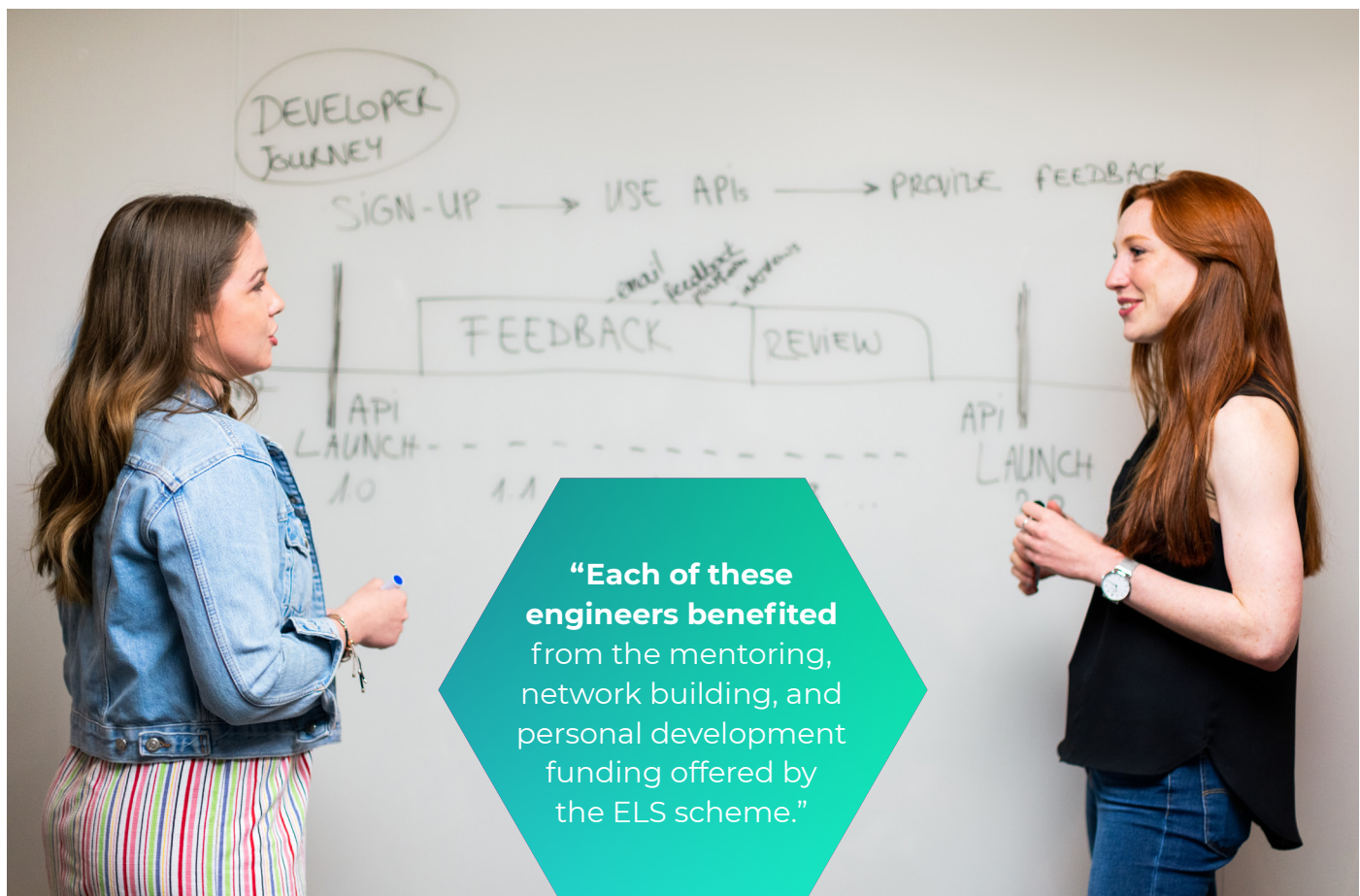
The collection of case studies in the pages that follow testify to the scheme's success in this goal, telling truly inspiring stories of exceptional engineers who have become leaders in sectors as varied as digital healthcare, international development and low-carbon aircraft.

Each of these engineers benefited from the mentoring, network building, and personal development funding offered by the ELS scheme, with many crediting the programme with setting their career off in the right direction, and giving them confidence in their ambitions. Many former scholars have kept in touch with one another, with their mentors, and with the Academy. We are thrilled to count them as part of our network and to continue to play a role in creating connections and

opportunities that advance their careers and the impact they have on the world.

Engineers are critical to addressing so many of our global challenges, be it climate change, healthcare, or cybersecurity, and to enabling improvements that benefit everyone. More than ever before, we need to nurture ambitious, well-connected engineering leaders, from all backgrounds, to advance our progress towards a sustainable society and an inclusive economy. The ELS programme set out to do just that all those years ago; here's to another 25 years, and to the future leaders we will meet along the way.

Dr Hayaatun Sillem CBE
CEO, Royal Academy of Engineering



“Each of these engineers benefited from the mentoring, network building, and personal development funding offered by the ELS scheme.”

Introduction

The Engineering Leaders Scholarships (ELS) programme provides support for undergraduates in UK higher education institutions who have the potential to become leaders in engineering and act as role models for future engineers.

This publication marks the ELS programme's 25th year. In that time, it has supported over 700 undergraduates from universities across the UK. It provides financial support to undertake accelerated personal development programmes, enabling aspiring leaders to acquire the skills needed to better fulfil their potential.

This publication showcases the career stories of 30 exceptional alumni who have leveraged the resources offered by the scholarship to take themselves to the next level in their development and fuel their passion for engineering as a tool for positive change.

These stories highlight the transformative power of the ELS programme and aim to inspire more young people to follow in the footsteps of ELS alumni to become engineering leaders of tomorrow.

Please share them with your wider networks and find out more by visiting www.raeng.org.uk/engineering-leaders-scholarship

Applications for the ELS programme usually open in early November and close in January. There are currently 38 awards available each year: 35 provide financial support to undertake personal development; and three additional enhanced awards, Sir Ralph Robins Scholarships.

Sir Ralph Robins Scholarship

The ELS programme offers three additional enhanced awards each year, aimed at supporting students from underrepresented backgrounds with tuition fees and the possibility of a paid internship at Rolls-Royce plc.

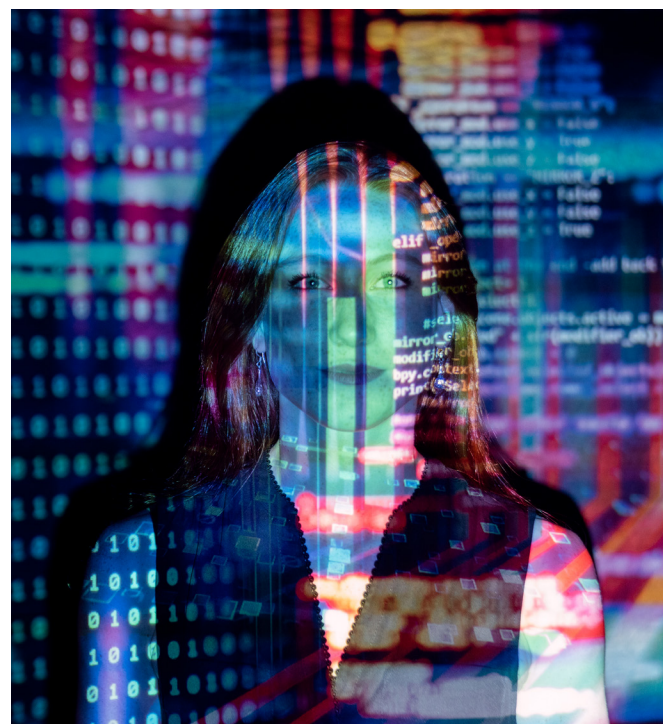
This scholarship was created in honour of Sir Ralph Robins FREng in recognition of his exceptional contribution to engineering and industry. Sir Ralph was Chairman of Rolls-Royce plc for many years and this scholarship was funded by Rolls-Royce plc and individual donors to mark the 30th anniversary of his momentous decision to launch the Rolls-Royce Trent engine.



Supporting the ELS programme

Over the years, the programme has been generously supported by organisations and individuals who ensure that we can continue to help ambitious and inspiring undergraduates to become engineering leadership role models. We are seeking to grow this programme to help more students to fulfil their potential and to become future leaders in engineering.

If you are interested in inspiring the next generation of engineering leaders, please contact the Royal Academy of Engineering at development.team@raeng.org.uk



Alice Chaplin

General Manager, New Zealand at Coffey



Fluid career steps led to leadership in engineering consulting

A change of mind

Alice planned on joining the Royal Engineers, but the ELS programme changed her mind. "It challenged me to think about my skills and encouraged me to come up with a 10-year career plan. I remember thinking, maybe the Army isn't for me."

She used her funding to do work experience at the Geotechnical Engineering Office in Hong Kong. The ELS also helped her build a professional network through the Academy's Sainsbury Management Fellows.

Business leader

Alice forged a career in business consultancy before joining an engineering graduate scheme. "I was a couple of years older than the other graduates and at the time it felt hard, but in

the long term, having business knowledge has given me a much wider skillset," she says.

Alice specialised in water and wastewater engineering, working on sites across the UK, before an opportunity to relocate to New Zealand arose, allowing her to work in hydropower, three waters and transportation.

"I sit in an engineering leadership position now, so the award has done what it was supposed to!"

She was AECOM project manager on the Auckland rail electrification project. "That work encapsulates why I wanted to be an engineer. Every day I see trains running on the system and I think to myself, I played a part in making that happen. It's pretty special," she says.

Alice spent 16 years at AECOM. "I had amazing opportunities – I didn't need to move from company to company," she says. But when she was offered the chance to run Coffey's New Zealand business, she couldn't resist. "I thought it was an incredible opportunity to bring

How the ELS

helped...

Funding: "As a student I didn't have a lot of spare money and there was no way I could have funded a work experience trip to Hong Kong myself."

A broader outlook: "Having had that international engineering work experience, it gave me the confidence to come to Australia and New Zealand when the opportunity came up."

Career planning: "Would my career have got to this point without the award? It's hard to say. But certainly, the planning early on and being encouraged to create a 10-year plan was a great thing."

all my different skillsets that I had learnt over 18 years together," she says.

Advice

You'll get some **great support** to really think through where you want your **engineering career to go** and what skills you need to get there.



Andy Bryant

Co-head and COO, bitFlyer Europe



A trip to Japan led to a career in crypto currency

An interest in robotics

Andy had wanted to pursue a career in robotics from a young age, but at university, he realised the industry was in its infancy. So, he spent most of his ELS funding studying robotics at the Tokyo Institute of Technology for a few months and a summer in the US working at a robotics spin-off.

“By the time I graduated, I'd already worked in the robotics industry in three different countries, so that was an amazing experience,” he says.

A change of scene

Andy spent his early career designing, building and selling

robots for the aerospace, medical, nuclear, and defence industries in the UK. Winning a Daiwa Scholarship – a programme of language study and work placement – enabled him to move back to Japan, where he decided to gain experience in investment banking, working in mergers and acquisitions for six years.

In 2012, Andy discovered Bitcoin, but like many people dismissed it as ‘magic internet money for nerds’. He came to realise that “blockchain was the missing piece in the internet revolution.” He was headhunted as general manager or COO in Europe for bitFlyer, which is the first bitcoin exchange in the world to be licensed in Japan, the US and Europe combined.

Advice

Andy believes everyone who takes part in the assessment day will **benefit from doing personal development planning exercises**. “Those types of processes really helped me think about **next steps** rather than jumping to the next job without thinking about where it might take me,” he says. ””

“Expect the unexpected when you apply. You can't plan everything... it's good to be open minded.”

“It feels good to be part of a world-changing movement that I'm truly passionate about. While on paper my career may seem quite colourful, it was a pretty natural progression,” he says.

How the ELS helped...

Ticket to travel: “Without the award, I wouldn't have had the money to go to Japan and if I hadn't, I probably wouldn't have received the Daiwa Scholarship. If I hadn't studied Japanese, I wouldn't have got the job I have now, so it was really a great start to my career.”

A broader outlook: “It made me realise that having a high impact as an engineer means going into other areas of management and business, but always being true to your roots.”

Lars Blackmore

Senior principal Mars landing engineer, SpaceX



Designing rockets for SpaceX

Reusable rockets are expected to change the economics of space travel, and one Engineering Leadership Scheme (ELS) programme alumnus is helping to make them a reality. Lars led the team that figured out how to make SpaceX's Falcon 9 rocket vertically land on a ship in the ocean, and the ELS programme put him on the right trajectory.

Dreaming of NASA

Seduced by space exploration and the search for life beyond our planet, Lars made it his mission to use creativity and innovation to overcome fundamental challenges. "In the words of JFK, 'dream of things that never were and say, why not?'," he says.

He studied engineering at Trinity College, Cambridge, where he took part in extracurricular activities such as the International Robot Design Competition in Japan. "To this day, I don't think anything has been more important for my

career than a solid basis in the fundamentals of engineering," he says. He also spent an exchange year at the Massachusetts Institute of Technology (MIT) where he worked on a satellite to test the effects of Mars gravity on mice. "The idea that students could work on an actual space mission blew my mind, and made me think that perhaps my dreams of working for NASA could become reality."

Making the dream a reality

Lars wanted to work on the cutting edge of space travel and the most exciting work was being done in the US. However, getting a paid internship at NASA was impossible in the aftermath of 9/11 as there was an almost total ban on non-US citizens working on space technology. Luckily, Lars was able to use his ELS funding to take part in the Planetary Science Summer School at NASA's Jet Propulsion Laboratory. "This was instrumental in letting me see NASA from the inside, and I formed some professional and personal relationships that have lasted to this day," he says.

Lars did a PhD at MIT's aeronautics and astronautics department, which enabled him to work at NASA's Jet Propulsion Laboratory where he split his time between working on a climate change satellite and developing new methods for precision landing on Mars. During that time he first heard about SpaceX's ambition to make a reusable rocket capable of

Advice

His advice to future applicants is to **be flexible and take advantage** of mentoring and networking opportunities. "There is so much to learn (good and bad) about the way industry, entrepreneurship and business work that you will not learn at university, but that **mentors can teach you informally**. Having someone that can answer your questions as you're deciding your path is **an invaluable resource**," he says.



© SpaceX



© SpaceX

precision landing. “I moved there with my sole focus being to work out how to land their Falcon 9 rocket,” Lars says.

“Engineering is for me using creativity and innovation to overcome fundamental challenges, and, in the words of JFK, to “dream of things that never were and say ‘why not?’.”

At the time, Falcon 9 was putting payloads into orbit, but it was not yet capable of return. “After four years and many failed attempts, we finally landed the first Falcon 9 rocket in December of 2015, and watching it from Mission

Control, I could not have been prouder of the team,” he says. Since then, SpaceX has landed 70 rockets making reusability “just another part of the business of space launch”.

Not content with making space history, for the past two years Lars has been working with the team developing the entry and landing of SpaceX’s newest space transportation system, Starship, which, if successful, will be completely reusable. “Starship is enormous and flies in a way that no vehicle ever has, belly-flopping straight down like a skydiver, before lighting its engines just before hitting the ground, to flip and land vertically. Getting this all to work is the next huge challenge,” Lars says.

How the ELS helped...

Professional route: Lars believes the ELS programme has contributed to his professional journey. “Giving students a merit-based chance to take part in extracurricular experiences that may be financially unattainable is extremely important and it definitely propelled my career at a critical time.”

Mini CV

1999 to 2002: Engineering at the University of Cambridge

2002 to 2003: Master’s degree in electrical and information sciences, University of Cambridge

2003 to 2007: PhD in estimation and control and research assistant at MIT

2007 to 2011: Staff engineer and senior technologist, NASA Jet Propulsion Laboratory

2011 to present: Various roles, now Senior Principal Mars Landing Engineer, SpaceX

Brittany Harris

CEO and co-founder, Qualis Flow



Striking the right note for sustainable construction

As a teenager, Brittany wanted to be on the stage. Now, she uses her performance skills to communicate big ideas in order to engage people in more sustainable engineering and construction practices.

The ELS gave her the first taste of interacting with different engineering disciplines, and she now has her own company to improve collaborative working and sustainability.

Building foundations

Volunteering in Uganda after her A levels helped Brittany appreciate the role of infrastructure in society. "It's why I ended up committing to civil engineering and slowly moved to look at alternative sanitation. My

career has spiralled from there," she says.

Brittany spent her ELS funding working in Hong Kong on placements with Arup and Laing O'Rourke, and after graduating, spent the remaining money learning Spanish in Madrid, before going to work with Engineers Without Borders in Peru.

"The ELS throws you into situations where you were meeting engineers from completely different parts of the industry, and you very quickly have to learn about and work with."

She then joined Buro Happold as a water engineer and did a secondment in geotechnics. "It was during that time that I realised the engineering industry often designs based on core fundamentals rather than data," she says. "So, we're not assessing whether what we

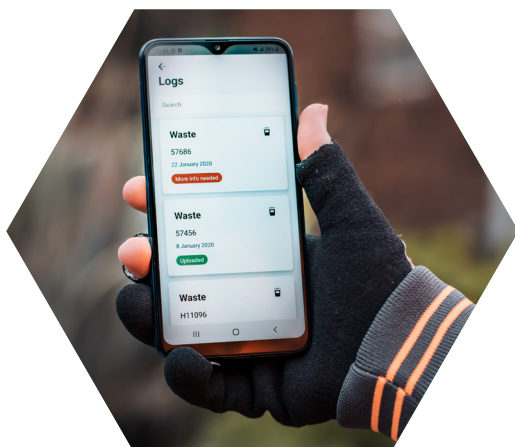
designed had the impact we expected and whether there are ways to improve that."

New horizons

While volunteering for World Merit, which works with the United Nations to achieve the Sustainable Development Goals, Brittany met Jade, who was working as an environmental advisor for Skanska on Crossrail, tracking materials into site as well as energy and water consumption.

Advice

As well as advocating the benefits of singing and acting, her top tip for any students debating whether to apply for the ELS scheme is simply to do it. **"If you don't play, you can't win,"** she says. "Make powerful choices. Don't let circumstance dictate what's happening."





They teamed up to start a new company, Qualis Flow, with the aim of improving sustainability in construction by taking a data-driven approach. The company has automated data capture tasks, such as quality checks, done on site so it can be fed back to engineering teams in a useful format and help them make informed decisions. "This means it can be instantly used on the construction site to make a project more sustainable," Brittany explains.

Using her voice for good

Brittany has helped organize a sustainability conference for

engineers and sits on steering committees looking at how the engineering and construction industries can achieve net zero carbon emissions. "I'm really trying to bring all the different institutions together to understand how we, together, can deliver on these terrifying and important global goals to achieve a more sustainable future," she says.

The ELS gave Brittany her first taste of interacting with different engineering disciplines, while her love of musical theatre has played a starring role in her career too.

"Although musical theatre can be incredibly silly, the communication skills that come with being able to tell a story and to really engage people in something that is bigger than them, are invaluable, particularly with what I'm doing now," she says.

Qualis Flow's quantitative approach to sustainability is new to much of the civil engineering community "so, that storytelling and being able to help them identify their role within that narrative is just so important. I'd love to see more engineers do musical theatre, because I think that communication is a bit that's missing in the curriculum."

How the ELS helped...

Develop communication skills:

"The ELS continually throws you into situations where you were meeting engineers from completely different parts of the industry, and you very quickly have to learn about and work with them in that space."

Cope with the unexpected:

"Being part of that programme, exposes you to challenging situations that force you to learn, as opposed to being taught in a structured way."

Fund experiences:

"The funding made a lot of future things so much easier and less stressful than they could have been."

Plan ahead but stay flexible:

"I always have somewhere where I'm trying to get to, but if I had been too wedded to my plan (of going to Buro Happold and getting chartered in four years) I would never have started Qualis Flow. I think it's great to have an idea of what you want, but realistically, when the opportunities present themselves, wherever an exciting move takes you, it's not necessarily a reason to say no to taking those opportunities because you have a plan."

Mini CV

2011 to 2015: Civil Engineering, Bristol University

2016 to 2018: Civil Engineer, Buro Happold

2016 to 2017: Delegate volunteer, World Merit

2016 to 2018: Co-founder, Washable International; an online platform concerned with water and sanitation

2018 to present: CEO and Co-founder, Qualis Flow

Emma Kent

Director of construction, Metropolitan Police



Breathing new life into old buildings

Year in industry

Emma spent a year in industry with Costain working on Kings Cross St Pancras station before embarking on her degree. "I thought, I want to shape the world," she says. While she was studying civil engineering at the University of Nottingham she attended a sustainable development conference in Dubai using her ELS funds. "It was a great opportunity to network and hear some of the latest thinking," she says. She then spent a month learning Mandarin visiting construction projects in China, including the Three Gorges Dam.

Building a career

Emma impressed a managing partner of Buro Happold at an ELS programme dinner, which led to a placement at the firm.



© Hawkins/Brown

She joined its graduate scheme and stayed with the company for eight years. "I worked on the 2012 Olympics, Battersea Power Station and some wonderful projects in Australia. That was where I got interested in creative reuse of old buildings," she says. Emma then joined Cundall, where she worked on listed buildings in Covent Garden.

"The ELS gave me a confidence in the soft skills and presenting at a senior level. I think that helped me accelerate my career."

She continues to breathe new life into old buildings in her current role, as director of construction at the Metropolitan Police. "I'm interested in reusing existing buildings, which is more sustainable than demolishing something and building something new," she says. In charge of capital projects, Emma is working on the refurbishment of 15 police stations across London, and has just opened a new driver training academy.

Advice

Emma believes the ELS brings great mentoring and networking opportunities. "You might meet someone who gives you your first

How the ELS helped...

A great network: "I still know now that I could call up someone on the ELS programme and ask for advice."

Confidence: "The ELS programme gave me a confidence in the soft skills and presenting at a senior level. I think that helped me accelerate my career."

A commitment to professional development: "It's played through my own career. I got chartered very quickly and I'm studying for my MBA. I think getting that boost early on fast-tracked my career and made me more focused."

job. I did," she says. "Plus, there's a network of people that you wouldn't otherwise meet. That's useful if you change course or are looking for jobs."

Tim Bushell

Infrastructure Adviser, UK Foreign Commonwealth and Development Office



Equipped for a career in infrastructure development

A global outlook

Having a strong interest in the built environment, Tim decided to build a career in structural engineering. To support his studies in civil and environmental engineering at Imperial College London, Tim used money from the ELS programme to undertake engineering-related work experience placements around the world. From an internship on the Lötschberg tunnel in Switzerland, to a bridge construction project in Bangladesh and fixing wind turbine pumps in Kenya, Tim's aim was to broaden his perspective and gain skills on the ground.

Seizing opportunities

Upon graduation Tim spent two years working at the



construction firm Sir Robert McAlpine, gaining formative site experience. He then became a chartered engineer while working at design consultancy WhitbyBird, getting a grounding in design, calculations and structural design. "They were the bedrock engineering experiences that I gained, which I chose to further in overseas work," he explains.

"The award really broadened my perspective and that's why I'd recommend it. If you make a good case then the support is available."

Next, he managed a small NGO's construction programme in Uganda, followed by doing a graduate diploma in economics. "It broadened my thinking into the underlying rationale for doing engineering projects – the economic justification, cost benefit analysis and international finances as well."

All these experiences paved the way to his present role as an infrastructure adviser in the UK Foreign Commonwealth and Development Office, where he oversees UK aid funding for infrastructure such as ports, rural roads and water projects

How the ELS helped...

The broader outlook of the ELS programme opened doors for Tim, because it gave him the opportunity to look at the big picture, which can be difficult when work demands your full attention.

"The initial ELS programme provided opportunities to do international work experience and planted a seed that was able to come to fruition later, once I had the practical engineering experience and professional grounding from working in UK companies," he says.

in developing countries. "I've broadened from my original engineering, construction and design training, and now use those skills in the development sector which is really interesting and impactful."

Fiona Howarth

CEO, Octopus Electric Vehicles



Protecting the environment one gadget at a time

“I always wanted to make the world a better place,” says Fiona. Winning a place on the ELS programme helped her see her ambitions in energy and transport were achievable. Having helped make central heating greener, she is now running Octopus Electric Vehicles, driving take-up of electric vehicles in the UK.

Getting into gear

Fiona’s ELS programme interview gave her the idea to investigate hydrogen-powered cars. She used part of her ELS funding to go on a German language course before her work placement on hydrogen fuel cells at BMW in Munich. She also spent the following summer attending the World Hydrogen Energy conference in Japan, with five other ELS members, visiting the world’s first hydrogen and petrol station in Singapore, and test driving a hydrogen fuel cell vehicle in California with Toyota.



Interested in how to commercialise cleantech, Fiona honed her business skills as a consultant. She worked on strategic projects for energy companies and utilities, advising on investment decisions in oil and gas. “It was fascinating, but I knew I wanted to be working to create a smarter energy system powered by renewables,” she says.

“The interviewers validated that my ambitions were achievable. Being given the award was confirmation of support. It was a great first boost and provided encouragement.”

Fiona did a secondment with the UK government, looking at the future of the energy sector, before joining a start-up developing products to remotely control home heating systems, which led to her helping to launch the Hive thermostat and brand with British Gas. There, she

How the ELS helped...

Funding: “The funding helped me develop skills and be able to do internships that I might not otherwise have been able to afford.”

Emotional support: “The interviewers validated that my ambitions were achievable. Being given the award was confirmation of support. It was a great first boost and provided encouragement.”

A big network: The ELS programme helped Fiona establish a network of contacts and find great colleagues, such as Octopus Electric Vehicles’s director of technology. “She’s brilliant and has been an inspiration to me,” Fiona says.

Fiona is still in touch with friends she met on the ELS programme trip around Asia. “I ended up living with one of them in London and actually met my husband via him,” she says.



Mini CV

2000 to 2004: Engineering, economics and management, University of Oxford

2005 to 2006: Internship, the Carbon Trust

2006 to 2011: Consultant, Bain & Company

2010 to 2011: Policy lead, Department of Energy and Climate Change (now BEIS)

2011 to 2012: Client services director, AlertMe.com

2012 to 2015: Head of product and commercial, Hive by British Gas

2015: Head of transformation, OVO Energy

2015 to 2017: Independent consultant

2017: Director of smart projects, Octopus Energy

2017 to present: CEO, Octopus Electric Vehicles

decided how Hive would be sold and what features it would have. "That was super exciting and it's now in nearly 2 million homes," she says.

Between two maternity breaks to have her daughters, Fiona worked with smart meter companies, and became fascinated by how electric cars could be charged overnight when there is little energy demand. Following a conversation with the CEO of Octopus Energy about electric cars and demand response, she joined the renewable energy supplier.

She runs a vehicle-to-grid (V2G) demonstration project, exploring how to optimise the energy system for drivers of electric vehicles. "It looks at allowing their car batteries to be used as energy storage to support the grid, charging up when there is abundant green energy and using a bi-directional charger to give back to the grid at peak times," she explains.

Alongside that, she is working on how to help customers swap to electric cars, so that they understand the technology, energy needs and cost involved.

Advice

"Back yourself," is Fiona's big tip. She says the ELS programme has 'turbocharged' the projects she has wanted to do and believes everyone should put their name forward. "The worst thing that can happen is that you meet some interesting people in the interview process. What's the best that can happen? Significantly more."

"So many pieces of the ELS programme have led me to where I am today."

A greener future

Fiona focuses on how smart charging kit could accelerate adoption of electric vehicles.

Joseph Corrigan

Head of intelligent healthcare, Cambridge Consultants



Using machine-learning to drive research forward

Developing skills

During university, Joseph used part of the ELS award to fund his master's project in digital signal processing for lean burn combustion in gas turbines. The combined programming and experimental skills from this project have informed much of his career.

Starting a company

Joseph joined PA Consulting, having become aware of the product engineering consultancy from an ELS placement with Thames Water. "I got exposed to lots of projects, which was part of the plan that the ELS programme helped me put together – to find a place that could help me find a good fit."

He came up with a way of using computational fluid

dynamics to model the flow of biomarkers through the cardiovascular system, which led to him founding a company called [PlaqueTec](#). He developed the liquid biopsy system, and associated machine learning tools, to demonstrate the first spatially correlated plaque biomarkers in the cardiovascular system, which are indicators of heart attack risk. "That was a big highlight for me," says Joseph.

"Having the Academy's name behind us allowed us to open conversations."

Having completed the R&D phase with PlaqueTec, he joined a startup called [Cazana](#), where he developed natural language processing and machine learning algorithms to read car advertisements and value cars. He negotiated the first deal for the platform, which he says was "hugely improved by the negotiation skills that were first taught to me on the ELS scheme". Cazana's technology is now used by insurers, dealers and finance providers in 40 countries.

Joseph then returned to his passion; medical devices. He specialises in developing AI and

How the ELS

helped...

Opening doors: "Despite being students, very senior people were willing to talk to us about how their companies worked."

Contacts: "I'm still friends with a lot of people from the ELS programme. It's nice to catch up with them and meet them around the world – and see the success they're having in their careers."

machine learning for medical applications at Cambridge Consultants, where he also manages internal investments in breakthrough technologies. "It's brilliant; I can help people to work on advanced technology that they have a passion for and bring these technologies to the medical market sooner" he says.

Advice

"Don't overthink it, just apply," says Joseph. He didn't think he would win a place because other applicants came from universities **"with much better reputations"**



Rowan Hewson

Head of operations and maintenance, Ecotricity



From margarine to wind farms

Learning the language

Rowan used ELS funding to learn Spanish in Ecuador, where he visited a renewable energy factory. "The ELS allowed me to travel, which was mind expanding and helped with my languages, and I learned a lot about industry and engineering too," he says.

Going green

After leaving university, he joined Unilever's leadership graduate programme, where he had early management opportunities.

After working in several different roles, he became responsible for leading half of one of Unilever's flagship factories making margarine. "I had 30 people

reporting to me and I was only 27," he says.

After becoming chartered, Rowan realised he wanted to change direction. "I took a step sideways and moved into renewable energy," he says. He joined RES as a turbine engineer managing contracts and specifications for new windfarms, and then worked for several different technical consultancies advising investors on windfarm transactions.

"The ELS programme gave me more sticking power and a network. It probably kept me in engineering."

Rowan then decided to branch out from the world of consulting, before joining green utilities company, Ecotricity as head of operations and maintenance. He now looks after a national portfolio of wind and solar generators as well as a team of people 'on the road' fixing turbines and providing technical support.

Advice

He urges candidates not to waste the opportunity and funding.

How the ELS

helped...

A big boost: "I wasn't particularly confident at university. When I joined the ELS programme it was a big leg up. I was given a chance to be launched ahead of where I was confidence-wise."

Validation: "I think the Academy gave me a sense of worth and was interested in the fact I'd chosen engineering."

Endurance: "The ELS programme probably kept me in engineering. It was a really positive thing for me."

"See it for what it can do for you rather than just a tick in the box and something for your CV. Make it your business to spend every last penny!"

Advice

Rowan's top tip is **not to be intimidated** by other candidates. "Put your hat in the ring. There will be some practiced gong collectors, and for them, it [the ELS] might be another one on the wall, but for people who haven't had so much fortune or investment in themselves, **it's a really good way of starting yourself along a path.**"



Felicity Milton

Director of Rapid Creation, Digital Brand 'Solutions', adidas



From competitive running to digital strategy at adidas

After a childhood dream of becoming a ski instructor, Felicity went off-piste to study mechanical engineering. An ELS-funded trip to a conference and competitive running led to a career-defining work placement. Entrepreneurial experience, another degree and injuries followed, but Felicity ran with it to secure a career at adidas.

Quick off the blocks

From a young age, Felicity knew she wanted to work in sport, but thanks to her talent for sciences, she decided to study mechanical engineering at Durham University, which had a strong biomedical module, "to keep the doors open".

At university, Felicity wanted to explore the world of sports engineering. Thanks to the ELS funding, she was able to attend a sports engineering conference in Biarritz, where she met adidas'

senior director of engineering. "I came away from that conference and introduction really inspired."

"It all started from that engineering conference."

At the same time, Felicity was running for Great Britain. She was sponsored by adidas and secured a work placement at the company's headquarters. "I met Tim Lucas – the same guy I met at the sports engineering conference – and we started talking about research projects," she says. "I felt that 'this is where I want to work', but I had a few things left to do first." After she graduated, she went to run for Oklahoma State University, which has a strong track and cross-country team.

Running with it

In order to benefit from this sporting opportunity, Felicity had to enrol on another course, and chose a

master's in entrepreneurship. "I ended up patenting my own product," Felicity says. Her scholarship ended after 18 months and she returned to the UK to study at Loughborough University and to be around UK Athletics.

Mini CV

2005 to 2009: Mechanical engineering, Durham University

2006 to 2008: Athlete, UK Athletics

2008: Intern, adidas

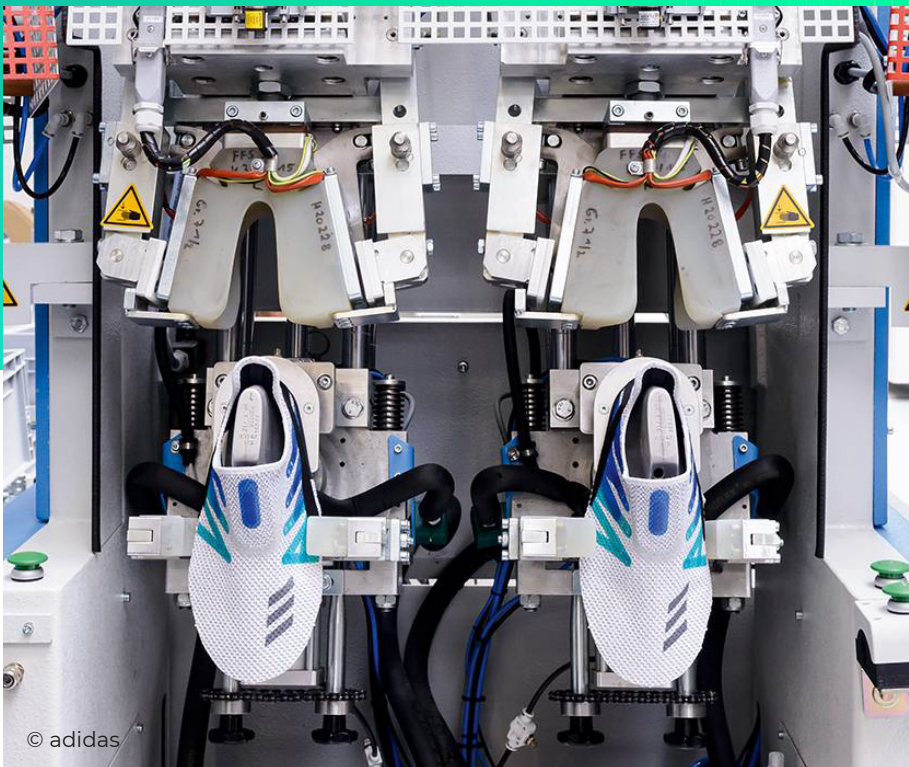
2010 to 2011: Entrepreneurship, Oklahoma State University

2010 to 2013: Founder, 1point6

2012 to 2013: Sports biomechanics, Loughborough University

2013 to present: Various roles, now Director of Rapid Creation, Digital Brand 'Solutions', adidas





She enrolled in another master's in biomechanical engineering and took advantage of the university's business incubator to develop an electroconductive compression product. She won UK's Young Entrepreneur of the Year award, but realised to would take a long time to get her healthcare device out into the world, as it would need to go through medical trials, which she saw as a "very lonely, hard route". So, Felicity applied for an internship at adidas.

If the shoe fits

Felicity thought she would be most interested in product innovation, but she went into 'creative direction', which used her engineering background to work on creating a 3D creation pipeline from design, development to production and marketing.

Advice

"You need to **find your own route**. Even if you don't really know exactly what you want, the **ELS is an opportunity** to help you get there."



A few years later, adidas launched its new five-year strategy "creating the new," and Felicity landed a place on the brand strategy team. "Almost immediately, I started working on a new business model, which was driven by our engineering team, based on automated manufacturing, local production and realtime consumer driven insights," she says.

Instead of sending goods to manufacture in Asia and having massive global supply chains, the idea was to create smaller ecosystems to better serve local markets; more sustainable, more culturally relevant and faster creation times.

"With all the automation, you'd be able to respond to individual needs and market trends, and it would be more sustainable. It's the future of where things are going," Felicity explains.

She worked on that project for three years and made "huge learnings". While she now works in the digital strategy and innovation team on business model innovation, building, testing and scaling new revenue development opportunities, her background enables her to take a systems-driven approach.

How the ELS helped...

A strong start: "You start to get these types of recognitions and that goes a long way. It's on your CV for life."

Support: "The ELS offered so much in terms of development, planning, focus, mentoring, and, obviously, better funding to go out and explore. It was a catalyst."

A network: "I'm still in touch with my mentor." Felicity is now in touch with his son too, who is a keen cyclist and physicist, so the helpful relationship has come full circle.

Advice

Felicity believes applicants should be themselves and play to their strengths in the competitive applications process. "I don't think you need to comply or copy," she says. "They [the panel] want to meet candidates who have the potential to be future leaders – that's the whole point. So, lead, don't follow."

Richard Farquhar

Vice president of propulsion, Rivian Automotive



Amping up the electric car industry

After starting his career with Lotus and having spent almost 15 years at McLaren Automotive engineering some of the world's best high-performance Propulsion systems, Richard joined a US based electric car company.

Despite a wealth of experience and success in the automotive industry, he credits the ELS programme with inspiring him to aim high and be the best at what he does.

Sparking a deep interest

Richard was sponsored through his Master's degree in Mechanical and Manufacturing Engineering at Queen's University of Belfast by Takata Corporation which designs, develops and manufactures Automotive safety systems.



During this sponsorship period, Richard spent time in Japan with the Central Japan Railway Company working on the Shinkansen bullet trains.

"I'm a product of this scheme. I've had a great career and am privileged to be doing some world class stuff. The ELS programme was one of the enablers for that."

He describes applying for the ELS programme as being a 'no brainer' and planned to use the funding to help him stand out.

He travelled to Detroit to attend the Society of Automotive Engineers World Congress and decided to learn German through an intensive language course in Germany, which he knew would be beneficial for a career in the automotive industry.

"It was really special as people were coming from all nations

to immerse themselves in the German language... it really increased my language adoption," he says. The remaining funds were used to buy technical publications and books, which he still has on his shelves.

Watt a career

Richard joined Lotus Cars' graduate engineering programme where he discovered what he loved doing, and what he didn't.

His interest was in propulsion systems, which eventually led

Advice

"There are many people who get degrees and have good experiences, **but to be the best, you need to stand out.** You can do that by doing something exceptional, special things and this [the ELS programme] is one of them," Richard says. ”



© Rivian Automotive

to a 15-year career at McLaren Automotive building and leading the powertrain team. “It was such a privilege for me to build up a powertrain team and design, develop and launch into production some of the world’s best high-performance propulsion systems for some of the world’s best cars,” he says.

Richard is now Vice President of Propulsion for Rivian Automotive – a new electric car company developing a new line up of premium electric

adventure vehicles and related products, plus a fleet of electric commercial vehicles for Amazon. “I’m leading the design and development of high voltage batteries, power electronics, electric motors, electric drive trains and thermal systems for all Rivian vehicles and charging & energy products,” he says.

Richard has over 200 engineers working across his teams. “I’m still deeply involved in technology and engineering and am energised by the challenge of continuing to be the best and aiming high. That really stems from the ELS programme all those years ago,” he says.

Mini CV

1995 to 2000: Mechanical and manufacturing engineering MEng, Queen’s University of Belfast

2000 to 2004: Joined Lotus’ graduate scheme, rising to assistant vehicle project manager

2004 to 2018: Various roles at McLaren Automotive, including powertrain and vehicle engineering director

2018 to present: Vice president of propulsion, Rivian Automotive

“I read hundreds of resumes and have been involved in graduate schemes & interviews, but for those who want to be the stars of tomorrow, they need to have something special. They need to have something extracurricular to set them apart and that for me is the biggest reason to do this.”

How the ELS helped...

A positive impression: “When I came to graduate, it was one of those jewels companies look for. And now, as an employer for the past 20 years, you look for those with something special on top.”

The annual event: “It was a highlight to go back every year and talk about how our careers were progressing and to exchange notes.”

Sparking potential: “At the time, the ELS programme highlighted to me that I had potential and I wanted to realise it. I’ve kept coming back to that. For example, I took on a big role at McLaren when I was relatively young and that was because I had potential. The ELS programme was a catalyst to take on new challenges.”

Tom Grundy

CEO, Hybrid Air Vehicles



Accelerating into an aerospace career

Tom embarked on an aeronautical engineering degree at the University of Bristol, and his career swiftly took off, thanks in part to the ELS programme. Tom has worked on fighter jets and jumbos. His latest venture is in low carbon aircraft.

Ready for take off

To complement his undergraduate degree, Tom joined a team competing in a university rocketry competition. "It led to standing in a wet field in Lincolnshire and launching this thing up into very low clouds. But having the joy of seeing it reappear and float back down on its parachute is a great memory" he says. He applied for the ELS programme to "open as many doors and opportunities as possible".

Among other things, the award enabled him to fly to Australia and work at the University of Sydney, where he helped build wind tunnel models and get flight simulator devices up and running. Tom also enjoyed the ELS programme residential weekends at the University of Cambridge. "That network building opportunity gave me academic insight into some of the challenges facing engineering and society, including the manufacturing sector. It was a really important part of the course," he says.

"To be free to be able to choose the best place to learn as much as you can and have the costs of that covered – that's an extraordinary set of opportunities."

Gaining altitude

Tom joined BAE Systems when he graduated. "I was extraordinarily fortunate to join SIGMA, its fast track scheme for accelerating engineers into positions of engineering accountability. I think the ELS programme was a big part of that because there was a high bar to entry," he says. SIGMA allowed him to move around the company, working on the Eurofighter Typhoon early on.

Tom then joined the Airbus team working on the Airbus A380 superjumbo. He then ran a programme developing big winglets, which gave him experience in systems engineering, rapid prototyping,

and flight test. He rose up the ranks to become an assistant chief engineer for BAE Systems unmanned aircraft business, developing and testing UAVs in the UK and overseas.

In his final three years at BAE Systems, Tom ran the business delivering engineering and maintenance support to the Royal Air Force Tornado fleet, wherever they were based. "I'm proud that we made a big difference there. We decreased the costs of doing that job and at the same time provided more service. So that was a big programme and a big deal," he says.

Advice

"Go for it. Meet people. The moment that door opens, there's a **great network**, new opportunities and a relationship with the Royal Academy of Engineering that carries on in one way or another."





© Hybrid Air Vehicles

How the ELS helped...

Breadth: “The ELS programme was a really good way for me to learn about different applications within aerospace and which directions I would like my career to go in.”

The network: “I still have contacts in my network [from the ELS programme] and keep up to date.”

Real-world experience: “I came out of those four university years, not only with academic experience but real currency in delivering in engineering and a strong network. It bridged that gap between academic learning and practical application.”

Good habits: “While I’ve been working, I’ve been awarded a second degree in advanced systems engineering and I’m now at Cambridge Judge Business School doing an Executive MBA alongside working. That’s a habit that the ELS programme drilled into me – learn and apply and carry on doing that.”

“My whole career has been based on that weaving in of academic learning and practical exercise that began with the ELS programme alongside my university studies.”

New destination

For the last seven years, Tom has been working for a smaller company – Hybrid Air Vehicles – as operations director and now CEO. The company is developing a new type of aircraft called Airlander, which is designed to deliver very low carbon emissions flight.

“We are pushing it towards being a zero emissions aircraft,” Tom explains. “Our next goal is to be able to fly 10 tonnes of equipment or 90 people with 10% of the carbon emission footprint of other aircraft. Reducing emissions is an imperative for aviation.”

Airlander shows how there are new ways to deliver more services from the air with less impact – and less cost”

Mini CV

1996 to 2000: Aerospace engineering MEng, University of Bristol

2000 to 2002: Engineer, BAE Systems

2003 to 2007: MSc in advanced systems engineering, Loughborough University

2006 to 2013: Assistant chief engineer, new business project manager, head of business management - Tornado ATTAC, BAE Systems

2013 to present: Various roles at Hybrid Air Vehicles, rising to CEO

2019 to present: Studying for an MBA at the University of Cambridge

Amy Peace

Innovation lead – circular economy, Innovate UK



Finding solutions to sustainability problems

Chemical engineer Amy is helping make the world a more sustainable place through engineering and systems thinking. The ELS programme gave her the confidence to move from a role in industry extracting chemicals out of biomass, to a very different one in the public sector; providing insights on how to transition manufacturing industries to a ‘circular economy’.

Interest in sustainability

Before studying chemical engineering at Imperial College London, Amy spent a year working for Imperial Chemical Industries (ICI), which, at the time was doing innovative things such as trying to extract high-value chemicals from plants for flavours and fragrances, which caught her attention. “I became interested in the sustainability aspect, which was a relatively new field and difficult to specialise in at university.”

Advice

“Look beyond the money. The mentoring is a great help to a lot of people. There are fewer multinational graduate schemes from employers, so the **ELS programme is a great way** to have some world-class guidance in your career.”



Amy’s tutor suggested she apply for the ELS programme and Amy used some of the funding to broaden her interest in sustainability through trips to Italy, which included language courses and industrial visits. “The ELS scheme helps you do interesting things. It was a licence to phone up people and ask to come and talk to them,” she says.

Working on a green solution

When Amy graduated, the ICI division she had been working with became part of INEOS. She helped develop technology for extracting chemicals out of plant material, including *Artemisia annua* from wormwood, as part of research to find a cure for malaria. “That was really motivating – looking at how you apply tech to something that has real global impact potential, but I was really drawn to how we could assess which technology was the most sustainable,” she says.

How the ELS helped...

An insider view: “It helped with confidence – it was an excuse to ask a few extra questions or attend conferences. It helped me infiltrate and find out how the system works to get into influential roles.”

Business courses: “You don’t always get to do those as an undergrad so you feel like you’re doing some really useful things – how to apply engineering in the real world, rather than more in-depth technical stuff.”

Learning to influence: “There were often opportunities for people on the scheme to go to the House of Lords, for example. The experience of talking to ministers and representatives of the House of Lords about things you’re working on is helpful, so when you go try and influence people, you’ve had a bit of a head start.”



Consequently, Amy began to work on sustainability projects including carbon footprinting and moved to the industry cluster organisation, Chemicals Northwest, to manage the sustainable development and innovation programme. “I liked trying to set up programmes to get industry enthused by the things they should be doing, like climate change mitigation and adaptation,” she says.

“ELS helps you do interesting things. It was a licence to phone up people and ask to come and talk to them.”

Following maternity leave, Amy worked for a not-for-profit company called Britest, which helps multi-disciplinary industry teams to work effectively on process design and troubleshooting. “I came in to see how to integrate sustainability into the tools and methodologies,” Amy explains. She enjoyed leading pan-European projects and teams to understand how sustainability should be evaluated across sectors, working for the benefit of the industry as a

whole, rather than individual companies.

Amy made her latest transition to the public sector when she became innovation lead on circular economy at Innovate UK. She investigates where industry support is needed to improve manufacturing and address net zero challenges.

“Climate change is such an urgent problem,” she says. “We have to do programmes that do not just save 5% here and there. We’ve got to be looking at the system level: how do we improve manufacturing, infrastructure and transport and how do all the pieces fit together? It’s a big challenge but I really like it.”

Advice

Amy says that while the ELS scheme supports people who have already demonstrated leadership potential, it can also be beneficial to young engineers with great ideas and a vision of what they want to do – and she should know, as she has been on the selection panel for several years. “We’re looking for people who have that spark and interest, far beyond whether they tick every last academic achievement box,” she says.

Mini CV

1997 to 1998: Year in industry sponsored placement, ICI

1998 to 2002: Chemical engineering MEng, Imperial College London

2003 to 2008: Process engineer, INEOS Fluor

2008 to 2011: Sustainable development and innovation manager, Chemicals Northwest

2011 to 2020: Freelance sustainability consultant

2012 to 2020: Senior innovation specialist, Britest

2020 to present: Innovation lead – circular economy, Innovate UK

Emil Hewage

Entrepreneur



Shaping a career in machine learning

Before attending university, Emil had more business experience than many graduates. However, he still credits the ELS scheme with giving him 'foundational' experiences that have helped him start successful machine learning companies.

Before attending university, Emil had more business experience than many graduates. However, he still credits the ELS scheme with giving him 'foundational' experiences that have helped him start successful machine learning companies.

The figure it out phase, before university

Emil wasn't sure if engineering was for him, so he chose to work before going to university "to figure it out". He joined a fuel cell startup as a technician. "I learnt a lot of skills, including software programming," he says.

Having lost his grandfather to a hospital-acquired infection, Emil joined another startup that developed microfluidic chips to measure infections in the blood. Working under the VP of engineering, he built the first prototypes of the medical device for clinical trials. "In the gap between school and university I had already experienced the high-tech science into

product translation skillset that engineering gives you," Emil says.

Sponsored studying

While studying engineering at the University of Cambridge, Emil kept working for startups. He became the leader of the solar-powered car team and used his connections to build relationships with corporate partners.

"The award funded a number of experiences that were foundational to me achieving what I've achieved."

While he was sponsored by Siemens and worked on their R&D projects each summer, he applied to the ELS programme to test out different career directions including the emerging field of machine learning. Emil used the funds and prestige to attend Intel's machine learning conference and visit autonomous

Mini CV

2006-7: R&D engineer, CMR Fuel Cells

2007: R&D engineer and programmer, Sphere Medical

2007 to 2011: Engineering at the University of Cambridge

2011 to 2014: PhD in computational neuroscience and machine learning, the University of Cambridge

2014 to present: Founder and MD, Cambridge Applied Research

2014 to present: Founder, Alchera Technologies

2015 to present: Board member and co-Founder, Cambridge Cancer Genomics

2015 to present: CEO and co-Founder, BIOS Health

How the ELS helped...

Understanding engineering:

"In the early days of my career, the immediate benefit of the ELS was the time, mentorship and input you require to understand the real and profound opportunities that exist as an engineer."

Contacts: Emil made friends through the ELS scheme including Sam Smith, who now works for Apple in California. "When I did my PhD, I used to crash on his sofa whenever I visited Silicon Valley" he says. "ELS contacts have been a huge part of my professional and personal development since."

Emotional intelligence:

"The ELS makes you think about your potential impact actively and I think it's the emotional intelligence you develop in that scheme that helps you ... you gain an understanding of how your actions can change the world. Without that, I don't think I would have the opportunities I had."

A kickstart: Emil founded his first startup in his 20s. "I don't think we would have started it if we hadn't been given that push at the ELS to understand that being an engineer is about your ability to work as a team and communicate well. Engineering's fundamentally more about that than individual technical brilliance."



car research centres in Silicon Valley. "I wouldn't have been able to do any of that without the award and pretty much every aspect of that trip became a core foundation of what I did next," he says. In fact, the researchers he met in California became collaborators and gave him the push to pursue a PhD in computational neuroscience and machine learning.

Machine learning entrepreneurship

While he was still completing his PhD at Cambridge, a trip to Stanford University inspired Emil to set up an open innovation lab – Cambridge Applied Research – for people to collaboratively develop new applications of machine learning in a range of advanced industries, ranging from new energy and climate technologies to solutions for health and transport systems. From 2013 to date, more than 50 projects have been incubated by Cambridge Applied Research and over 15 exist as independent companies today.

Based on his own research in machine learning systems, Emil founded Alchera Technologies in 2014, which provides real-time data about how people and vehicles use smart cities. A year later, he co-founded a startup which helps optimise cancer

treatments through genomics, cloud-based bioinformatics and machine learning.

Today, alongside these two active Director roles, he is the CEO of startup BIOS Health which is creating a neural interface between the human nervous system and artificial intelligence. "We have built underlying technology and the world's largest dataset for doing the equivalent of genome sequencing for neural data; now we're developing medical treatments," he says.

Advice

Emil believes the ELS programme offers opportunities both to students chasing a career that's "a bit different", as well as those who want to work for large engineering companies. "If you're keen to think about where engineering could take you, there are not many other opportunities that will directly affect you, your career and the capabilities you could end up with," he says.

Laura Steedman

Mechanical engineer, bp



Feeling empowered to tackle challenges in the gas industry

Engineer by accident

Laura loved art, but an opportunity linked to her Duke of Edinburgh Gold Award led her to studying engineering at university. "I didn't realise where creativity and science met, but it's solving engineering challenges," she says.

Laura joined the ELS programme while studying mechanical engineering at the Robert Gordon University in Aberdeen and used her funding to attend the Global Challenges Summit in Beijing, of which the Academy was a partner. "It really was crucial to my career," she says.

When Laura interned at bp she didn't shy away from the challenge of the energy transition. "The inspiration I got from that

summit gave me the confidence to influence the energy industry from the inside out," she says.

Award winning

Laura joined bp as a graduate and soon became a production support engineer in the offshore leadership team. She is now a mechanical engineer responsible for providing expertise and judgment in service of North Sea assets, and a carbon champion. "I'm finding ways to reduce greenhouse gas emissions and how to prioritise those projects within the business," she says.

"The network the ELS programme has given me is irreplaceable."

Laura won the SPE offshore achievement 'Young Professional of the Year' award in 2018 for working with a supplier to develop an upgraded turbine air filtration system for a North Sea platform and creating a business case to get stakeholder buy-in. "That resulted in large cost and time savings, but more importantly emission reductions too," she says, crediting the ELS programme with helping her develop business skills and match them with engineering knowledge to begin influencing.

How the ELS helped...

Skills: "I'm using the skills I learned during the ELS in my role now. It got me thinking, how do I influence stakeholders and take a great idea and make it valuable."

Network: Laura is still in touch with ELS programme alumni. "We brainstorm together. The network that it's given me is irreplaceable."

Early access to business ideas: "It's given me exposure to the Sainsbury Management Fellows completing MBAs, which is something I may not have considered had I not met these inspirational people during the process. It's definitely a goal of mine now."

Advice

"You can't lose. I didn't go to one of the most recognised universities and thought people from elsewhere would have had a better chance than me. But I went for it and it was the **best experience ever.** Even the application process will improve your skills."



Mike Hunting

Head of governance, risk and commercial, Atkins



Engineering a career at one company

Volunteer engineer

Mike originally chose his degree at Durham University to keep his options open. "If you have an engineering degree you can do all kinds of things," he says, but he decided to focus on civil engineering and hasn't looked back.

Initially the funding attracted him to the ELS programme. Mike knew he wanted to work on major projects abroad, so having spent his third year at university studying in Berlin he took a long summer in Peru where he volunteered with a charity and designed clean water and sanitation systems for rural locations. "I was aware getting this a scholarship would help in getting funding to work overseas and it helped both with a language course in Germany and

then my initial costs for travel and set up in Peru," he says. The ELS funding also covered the cost of volunteering in Sri Lanka, where Mike assumed responsibility for the construction of 110 houses, in response to the devastating tsunami in 2004.

Building a career

Upon graduating, Mike started at Atkins and has worked there ever since. In his 15 years, he has worked on highways, bridges, water schemes, high profile buildings, major infrastructure and energy projects. "I've had a really varied career in terms of market sectors, amazing projects, working with great people and have lived in the UK, Middle East and France."

"If you have an engineering degree you can do all kinds of things."

His highlights include working on the striking Supreme Education Headquarters in Qatar and the site for a new village, Coed Darcy, in Wales. "I was also delivery manager for infrastructure on Iter, which is a huge experimental fusion reactor in the south of France. It is one of the most exciting and complex projects on the planet and has

How the ELS

helped...

Preparation for work: "I think the award definitely opened my eyes and provided awareness and recognition of the different factors that make up engineering success."

Network: "I'm still in touch with people from my cohort and we catch up when we can. There's definitely a network that gives you a point of contact, particularly early on in your career. You can ask someone for help and learn from others' experiences."

the potential to change the future of energy" he says.

Advice

"Think of it as an opportunity to explore what you might want to do and the various opportunities in front of you – don't just explore a path that somebody else has taken."



Dmitro Khroma

Co-founder and CTO, Swytch Technology



Greasing the wheels of an eBike startup

The ELS programme is designed to help its participants dream big. One alumnus used his funding to help make his entrepreneurial ambitions a reality before graduating. Dmitro's aim of making electric transport accessible to everybody has been a success, with 20,000 people snapping up his company's eBike kit around the world.

Self-starter

Dmitro's entrepreneurial spirit first emerged in sixth form when he started a company selling waffles and bagels during lunchtime to other students. He then went on to study Engineering Design and the University of Bristol, where he established the EngDes society for his course. "I realised that not only did I enjoy building products, but organisations too," he says.

Before graduating, Dmitro spent a year interning at Cambridge



Consultants. "That's where I really found my feet as an engineer and put things I knew theoretically into practice," he says. Dmitro gained hands-on experience in robotics, software and electronics and met his future business partner in the process. "He was very interested in eBikes and sustainable products and I was very interested in building a company and manufacturing something."

"The ELS was a really good push and driver for me to think I could dream bigger than I did before. The scale of my ambitions went higher."

Dmitro joined the ELS scheme to build his network. At first, he wasn't sure how to make the best of the opportunity, but the scheme helped him 'dream bigger' and meet future collaborators. "Halfway through I started Swytch with Oliver Montague, which is the company

Mini CV

2013 to 2018: Engineering Design, University of Bristol

2015 to 2016: Mechanical design engineer, Cambridge Consultants

2017 to present: Co-founder and CTO, Swytch Technology

I'm now working at." Swytch Technology first product is an eBike conversion kit that turns any bike into an electric bike.

He originally planned to help with the initial crowdfunding video and assemble prototypes, but Dmitro found he could apply what he was learning in his degree to progress the 'rough idea' to manufacturing the first product.

Pedalling bike kits

"I used basically all the money to support myself really early on



before the company started to make any revenue,” he says. The funds paid for a trip to China where he was able to start a supply chain and figure out the manufacturing needed to make his eBike kit a reality. “We launched a product and part of the initial funding was through ELS,” he says.

The Indiegogo campaign was a success, raising more than £1 million. Swytch has now launched a new version of its eBike kit. “We have about 20,000 customers around the world in 40 different countries and over a million miles has been ridden on our kits.

We’re a fully fledged operational and profitable company and we’ve got around 20 employees

at this stage, and we’re growing fast,” Dmitro says.

He is now CTO and head of People and Talent at Swytch. His technical role involves overseeing all parts of the product development lifecycle from conceptual design to mass manufacture.

More recently he’s turned his design skills towards the company organisation, heading up the recruitment drive and developing the internal leadership team as Swytch grows.

“We launched a product and part of the initial funding was through ELS.”

Accelerating with the ELS

“I think there’s a good chance I wouldn’t have wound up starting Swytch if it wasn’t for the ELS programme,” Dmitro says. He credits the scheme with giving him confidence and a network.

“The thing that stays with me is that I’m part of a community that will always be able to support me in some way. I feel there’s always something to fall back on. It’s a very strong support.”

How the ELS helped...

Network: Dmitro met his head of manufacturing through the ELS programme. “It’s funny because you don’t really anticipate things might happen like that. He complements my skillset so much, in that I’m passionate about design whereas his expertise is manufacturing, so it’s been a really good turn of events.”

A new way of thinking: Dmitro says the weekends away, which form part of the programme – gave him an insight into the way he thinks and how he interacts with others. “I always think back to those days and, knowing what I know about myself now, question how I should act, change and approach a new challenge.”

Confidence: Dmitro says the ELS scheme gave him confidence as an engineer and leader. “It was a really good push and driver for me to think I could dream bigger than I did before. The scale of my ambitions went higher.”

Advice

Just like launching a new product, Dmitro thinks applying to the ELS scheme is all about **finding your USP**. “I think the competition is so fierce, it’s definitely worth thinking about how you stand out as an engineer and a leader. **Focus on things that make you different.**”



Sarah Surrall

CTO, Oxehealth



From instruments and energy to digital healthcare

Work experience at a local electronics company inspired Sarah to study engineering. But it was the ELS programme that showed her how varied the profession can be, and highlighted how much she enjoys problem-solving.

A healthy interest

Sarah decided to study engineering at university after taking a women in engineering course. She enrolled on the Academy's Year in Industry scheme, spending her 'gap year' working at Malvern Panalytical, a manufacturer of laboratory analytical instruments. "The Year in Industry scheme gave me a huge amount of freedom to try different things and own some projects," she says.


While there were times when she sat in meetings about scientific principles that she had not heard of, the experience came into its own at university. "When I was in maths lectures, I could see the applicability

because I could remember a conversation and see that's what was going on. It was really motivating during the course," she says.

"In my first role, the award added a lot of credibility and experience at a point when I was very early in my career."

At university, Sarah joined the ELS programme, using her funding together with assistance from Malvern to spend three months working in China, where she took a month-long language course, met customers and created training videos for the company. "The placement was more focused on the commercial side and that was really good exposure for me. It was a fantastic experience and I learned a huge amount from it," she says.

Advice

"The **network of peers** can give you inspire you to think about what you might be capable of." 

Mini CV

2003 to 2008: Assistant systems engineer, Malvern Instruments

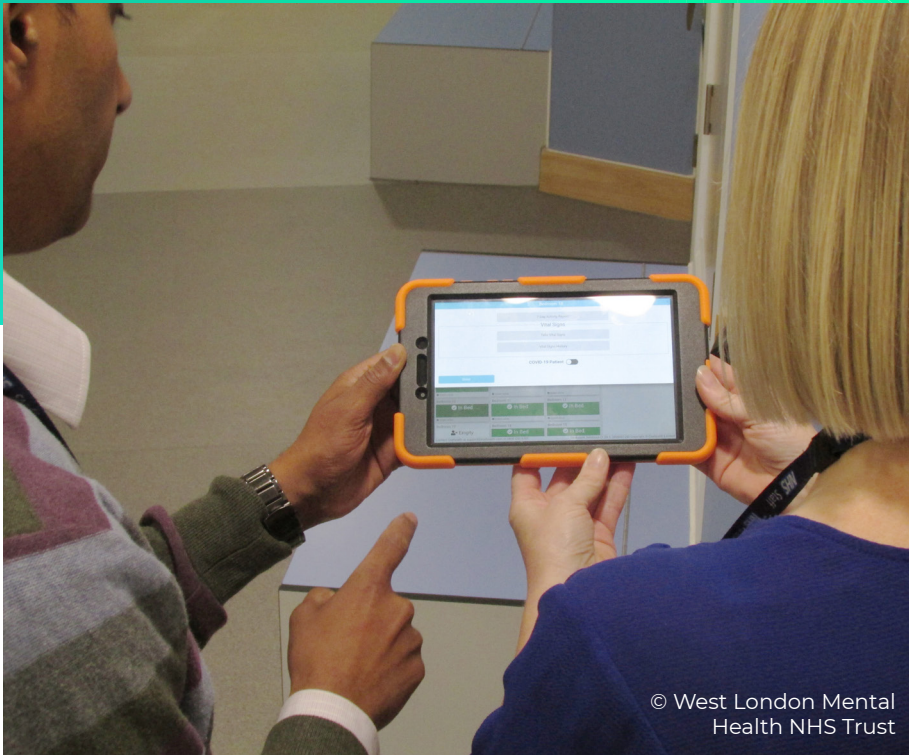
2004 to 2008: Engineering and computer science, University of Oxford

2009 to 2015: Senior research developer and project lead, Navetas Energy Management

2015 to present: Various positions at Oxehealth, rising to CTO

A move from instruments to digital healthcare

While Sarah gained valuable experience working for Malvern Panalytical before and during university, after graduating she decided to join a University of Oxford spin-out, Navetas Energy Management, which built smart meters to make itemised energy



© West London Mental Health NHS Trust

How the ELS helped...

Broader horizons: “The award gave me an insight about the broader opportunities for someone with an engineering background, which has influenced the direction of my career. Without it, I would probably have stayed on the technical side of engineering,” she says. “Part of what I discovered through the ELS programme is that I really enjoy solving problems – and those can be technical or organisational.”

Job prospects: I think that when I was interviewing at Oxehealth and in my first role, the ELS programme added a lot of credibility and experience when I was very early in my career. I don’t know whether project leadership roles would have been as fast to come without it.”

Lessons from workshops: “The exercises on running business were useful and helped me consider broader viewpoints of businesses while I’ve been working, which has helped me to progress in my career and take on wider roles at organisations.”

Friends: “I’ve built lasting friendships and we see each other regularly. In my last job I persuaded one ELS programme friend to come and work with me.”

bills. “I joined that company as a researcher and became a project lead. I ran a number of different projects with them, including a fun one that involved running different appliances in my house while charging an electric car.”

Unfortunately, the startup struggled financially because the route to itemised electric billing was unclear at the time, so Sarah decided to look for another role.

She joined Oxehealth, a startup working on vision-based patient monitoring and management. Its Oxevision platform helps clinicians deliver safer, higher quality and more efficient care.

“Part of what I discovered through the award is that I really enjoy solving problems – and those can be technical or organisational.”

Sarah joined Oxehealth when it had just started commercialising its technology. “I became the Solutions Lead and looked at the overall systems architecture.

We didn’t have a commercial team, so I also spent time going

out to meet potential customers so I could feed their needs back to the technical team for development.”

Returning from maternity leave, she was promoted to Vice President of Engineering, where she ran the systems engineering team, internal IT and infrastructure in the business, as well as the front-end developer team and the support platform.

She was recently promoted again to CTO to lead the business in scaling its Oxevision platform. “I’ve had a huge range of opportunities during my time at Oxehealth from developing algorithms to leading the company’s COVID-19 response. It has been deeply rewarding to grow my skills and experience alongside the business.” she says.

Advice

Sarah believes students should apply because the ELS programme offers opportunities they might not otherwise be able to take advantage of. “The network of peers can give you inspire you to think about what you might be capable of,” she says.

Chetan Kotur

Head of Products APAC, Polestar



Driving change in the auto industry

From a chance TV opportunity as a teenager to launching a new car brand, Chetan's career has been one highly charged adventure. The ELS programme helped him accelerate in the competitive field of car design, but now as Head of Products APAC at Polestar, he hasn't left his ELS roots behind: bringing fellow alumni and a young man he met on an ELS-funded trip along for the ride.

Turning an opportunity into more big breaks

Unsure whether to become a doctor or pursue his love of cars, Chetan got a lucky break when he was chosen to star in a TV programme about career dilemmas.

"It was surreal, but that show opened so many doors," he says. One of those doors held the key to strengthening his ambition to design cars, when he visited Jaguar Design and met the head of studio engineering. "I was

sold; that's when I knew what I wanted to do," he says.

Chetan studied automotive engineering at Loughborough University. "It was incredibly difficult but the challenge set me up for the future and I loved it," he says. He taught himself design and learned how to draw cars, but the ELS programme changed the direction of his ambitions. "I got to understand what industrial leadership is and the impact good engineers can have on society," he explains. "That motivated me to become the best engineer I could."

Moving up a gear

Chetan used his ELS funds to attend the biggest auto conference in the world and toured Ford's Innovation Centre in Detroit. But it was attending the Global Grand Challenges Summit in London that proved most inspirational. "The other delegates were megastars. It made me realise the impact I could have too. The conference

Mini CV

2007: Work experience, Jaguar Land Rover

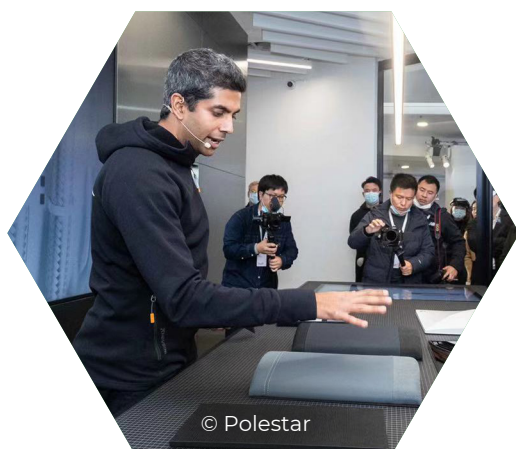
2008 to 2013: Automotive engineering, Loughborough University

2013 to 2015: Volvo Cars global graduate programme

2015 to 2017: Lead studio engineer, Polestar 2

2015 to 2021: CEO's Assistant, Polestar

2021 to present: Head of Products APAC, Polestar



was a turning point in my mindset."

A trip to Brazil also proved important. Chetan spent a month at a favela in Rio de Janeiro volunteering with children and learning Portuguese. One



teenage boy told him he wanted to design cars and Chetan decided to mentor him. As well as making regular video calls, he has helped the teenager through a car design course and is currently working out how to make his dream a reality. “That was the most rewarding thing I got out of the ELS programme – helping inspire the next generation and someone who has so much talent,” he says.

A career in the fast lane

It hadn't occurred to Chetan to apply for jobs abroad before he spoke to his ELS peers. Out of three job offers, he chose Volvo Car's graduate programme in Sweden. “I was born in Hong Kong, my parents are Indian and I grew up in the north east of England,” he says. “I was a bit of a chameleon fitting in everywhere and nowhere, but at Volvo, I was around other people like me.”

Chetan worked in the design studio like he planned. “My first day in the studio was the first day of the design of a brand-new car ... so I got to live my dream of seeing a car go from a clean sheet of paper to the final design.”

Then, Volvo launched Polestar – an electric performance car brand – and Chetan's career shifted up another gear when he was asked to become the CEO's assistant. “As a 27-year-old, I was freaked out,” he says. “My childhood dream was to design a car and here I was being presented with the opportunity to design a car company.”

“The Academy and the ELS ignited in me the determination to succeed at everything I try, be the best engineer I can be and do good for society. It's been invaluable.”

Chetan's team has launched two cars and he's even led the design and named a concept car called the Polestar Precept, which is going into production. “I've lived my dreams and back several times over.”

The ELS programme taught Chetan to seize opportunities. “You realise that all these CEOs and heroes – the people who are in the world-changing stuff – were like you are.”

How the ELS helped...

A mentor: “I'm still in touch with my mentor from the programme. Any time I have any thoughts or opportunities I call him and he's always keen to help.”

A global network: “I made friends who are now all over the globe and we meet up ... one of the alumni I mentored now works for my company.”

A new attitude towards risk: “I was brought up to be risk averse, but I learned through the ELS that I love taking risks and being out of my comfort zone. Any time I get into a dilemma, I end up taking the riskier opportunity. So far, so good.”

Marek Kubik

Managing Director, Fluence



Financial crisis led to a change of engineering direction

Every graduate dreads losing a dream job offer, but when this happened to Marek as the result of the worst financial crisis since the Great Depression, he pivoted and embraced a new engineering opportunity.

Marek completed an Engineering Doctorate (EngD) in renewable energy integration, which kickstarted a 'new' career. He is now a founding member of a rapidly growing technology company and advises the UN on energy storage.

Gearing up for big things

Marek decided to specialise in civil engineering: "I wanted to work for a Buro Happold or an Arup, and then potentially launch my own consultancy further down the line and do it for myself,"



© Fluence

he says. He applied for the ELS programme hoping to meet similarly motivated engineers from different disciplines.

In 2009, he organised a trip to Japan to explore his interests, including a trip to see Hitachi's robotics work and a nuclear power station where he donned a radiation suit and went into the reactor chamber. Marek also visited a sustainable housing community near Mount Fuji. "The Japan trip was one of the biggest and most unusual things I got to do as part of the scholarship, which otherwise I wouldn't have done," he says.

A big change

Marek was sponsored at university by the Happold Trust and did summer placements at Buro Happold. He had a job offer, but lost it before he started in the height of the 2009 recession. "This is when I pivoted and my career took me in a different direction," he says. Marek decided to do a doctorate in renewable energy integration, looking at

Mini CV

2005 to 2009: Civil engineering, Durham University

2009 to 2013: EngD in technologies for sustainable built environments while working as a research engineer, The AES Corporation

2013 to 2014: Renewable energy consultant, Electricity Association of Ireland

2013 to 2016: Business strategy consultant, then customer solutions and commercial projects manager at The AES Corporation

2016 to 2017: Market director, AES Energy Storage

2018 to 2020: Market director, Fluence

2019 to present: Energy storage expert, United Nations

2021 to present: Managing director, Fluence



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How the ELS helped...

A kickstart: “Having the award on my CV in the early days helped me get the opportunities I got. It helped my application to get into the doctorate and then the roles after that.”

Deep knowledge: “The trips and things I did helped round my knowledge.” Marek thought the best way to increase the use of renewable energy was by working inside a large fossil fuel energy company and changing it from the inside. He gained an understanding of the pros and cons of different types of energy generation at AES, except for nuclear. “But I’d seen that through the ELS programme so I could talk and argue either side of the fence for CCS and nuclear, for example. Having the ability to see all of those and debate all of them is helpful, because it gives you a lot of credibility” he says.

the challenges of renewable variability on grids. “I got an attractive salary and got to do PhD level research – working on a problem that really mattered – in industry,” he says.

Afterwards, he worked at a power station near Belfast, slowly moving into designing large-scale energy storage systems to help link to the grid, and before leading the development of Europe’s first commercial battery engineering project, which involved developing the project, raising investment, getting approval and seeing it built.

Next, Marek moved to Amsterdam to launch and scale

an energy storage technology company. “I’m a founding member of Fluence and we’ve grown very rapidly over two to three years,” he explains. He now leads the team for the UK and Ireland, two of the biggest markets for energy storage in the world. His role involves taking technology sales right through from origination to contract negotiation and signing. “Then I handover to an execution team that builds these megabatteries, and then there’s a service team that maintains their performance in the long-run,” he says.

“Having the award on my CV in the early days helped me get the opportunities I got.”

Advice

He says the funding is helpful for doing something you otherwise wouldn’t be able to do. “Think as big as you can and find a way to be able to justify it,” he advises. “Being able to blend something that’s memorable, fun and useful to my development was one of the key benefits of the ELS programme.”

Advice

“Don’t underestimate the benefits of knowing other people going through the same exams and experiences,” Marek says. He believes the network he gained from the ELS programme is invaluable, but **he made good friends as well as contacts** in different places “which is useful from a business perspective”.



Alex Lazell

COO at Hy5



Embracing change to ensure startup success

For many, the financial crash of 2008 was a disaster, but thanks to the ELS programme's international outlook, Alex turned it into a life-changing opportunity by moving sectors and country.

University days

Alex studied mechanical engineering at the University of Bath, which included a year in industry. He spent it at a robotics company OC Robotics, where he made a friend studying in the year above who encouraged him to apply for the ELS programme.

The award has had significant impact on Alex's career. He spent the funding on courses in energy and renewable energy, and spent a month in France studying the language, which is where he met his wife. "The award has affected my personal and professional life," he says.

Advice

"You always think that with these kinds of things that you have no chance because there are so many people, **but go for it.** Put your energy into it and **be confident.**"



Upon graduating, Alex returned to OC Robotics to work on projects in defence, nuclear and aerospace, as well as getting his first taste of project management. "I'd really recommend working at a startup to anyone" he adds. "The breadth of experience I got set me up for future jobs." By 2011, Alex's wife had completed her studies and Alex was keen to try something new and put his experience to use in a larger company in an international setting. However, the financial crisis had hit Europe hard and finding new roles for both was a challenge.

"The ELS programme introduced me to a group of motivated, international people and that made me keen to work abroad."

A new direction

The couple decided to move to Norway, which was largely

Mini CV

2004 to 2009: Mechanical engineering, University of Bath

2009 to 2011: Mechanical engineer, OC Robotics

2012 to 2016: Senior manager, Aker Solutions (oil and gas)

2016 to 2018: Project manager, Keep-it-Technologies (food packaging startup)

2018 to present: COO at Hy5 (prosthetics startup)

protected from the crisis, and Alex started a job in the oil and gas industry. "I hadn't specifically targeted a move into the oil and gas industry, but there were lots of interesting opportunities and the working language was English," he explains.

Alex progressed through Aker Solutions swiftly, taking on more managerial responsibilities.



“The ELS award gave me confidence to apply for leadership positions quite quickly; I was one of the youngest leaders where I worked,” he adds.

But once again, the volatile global economy was not on his side. This time, it was a crash in oil prices. “I had to make people redundant and it was a challenging experience,” he explains. Alex decided to pivot again, landing a job as a project manager at a startup developing smart sell-by-date labels.

The move was Alex’s first experience of working in manufacturing, but experiences from the ELS programme gave him the confidence to use his skills in a new way. His new role entailed scaling up production capabilities and installing a new production line so that the labels, which adjusted the sell-by-date of a product based on temperature in a bid to reduce food waste, could be made faster and more efficiently. With this accomplished, he took charge of a small team. “That was cool, helping to grow the company,” he says.

He is now helping prosthetics startup, Hy5, scale. He joined the Oslo-based startup as chief operating officer, at the point where it is starting to sell its affordable prosthetic hand. “It’s basically been my job to optimise everything and build production capacity,” he explains. “We’ve opened a new factory, built up a small team and can now sell the product internationally, so hopefully we’ll grow the company to something bigger”.

An international outlook

“The award introduced me to a group of motivated, international people and that made me keen to work abroad,” Alex says. Initially, it gave him the funds to live abroad and learn a language, but provided him with international contacts too.

Alex’s career has taken a number of different turns and led him to another country so it is no surprise that his advice to future ELS applicants is: “Go for it. You never know what’s going to happen. It could be the start of something good.”

How the ELS helped...

Global experiences: Meeting a group of motivated and international people on the scheme encouraged Alex to work abroad.

Leadership skills training: “It gives you the kickstart that might otherwise take years to achieve.”

Support network: Alex is still in touch with one member of the ELS but values its network. “You feel you can pick up the phone if you need to.”

Adrian Li

Software engineer, Everyday Robot Project

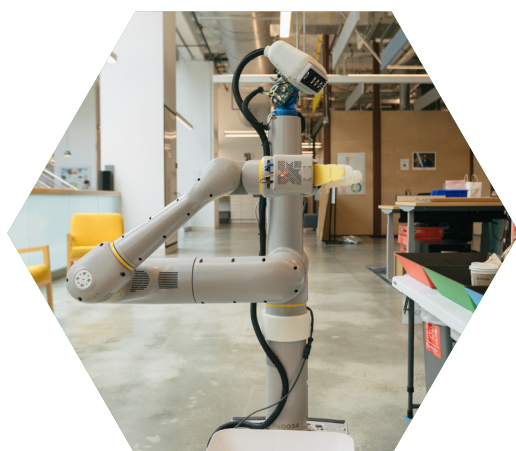


Making robots helpful

Exploring robotics

Adrian liked the idea of building things to improve people's lives and decided to study engineering at the University of Cambridge. However, he wasn't sure which branch of engineering to specialise in and applied for the ELS programme to gain exposure to the different sectors, as well as for the training and professional development opportunities.

Adrian spent his ELS funding on going to Robotics Science and Systems (RSS), which is one of the top robotics conferences in the world. "Attending RSS was a rare opportunity for me as an undergraduate to learn more about the state-of-the-art in other areas of robotics, and also participate in discussions with some of the leading roboticists from around the world," he says.



After graduating, Adrian joined Google as a software engineer working on the machine intelligence team. For a year, he applied machine learning to personalisation and recommendation products, before joining the robotics team, which has evolved into the Everyday Robot Project at X (formerly Google X).


"My team is working to make robots as helpful to people in the physical world as computers are now in the virtual world. I have been working on developing algorithms and infrastructure for deep reinforcement learning, so that we can create robots that can learn and do multiple tasks, rather than being painstakingly coded to do specific tasks," he explains.

"The ELS programme has been an important part of that journey leading me to where I am now."

Harnessing networks

Adrian credits the ELS programme with helping him break into the robotics industry but it is the contacts that he has made that have proved beneficial in the long term. "Being a part of the programme

Advice

Adrian believes that even students who do not know how they would spend the ELS funding should apply. "I think it is **always important to grow** with every opportunity, making the most of the journey, **without necessarily knowing** where it will lead you." 

has greatly expanded my professional network, and a few of the awardees from my cohort have become very close friends of mine," he says.

Advice

He encourages students from underrepresented groups to apply. "The lack of diversity in engineering is a very real problem that hurts everyone, and I hope that the ELS programme can be a force for change in promoting equity in the industry."

John Puddy

Engineering Capability Manager, Ultra Precision Control Systems



Helping an aerospace engineer land on his feet

Opening doors

John wanted to be an RAF pilot, but when it became clear his colour blindness meant that wasn't an option, he decided to become an engineer instead. He used his ELS funds on a tour of five US aerospace companies, which helped set his future course, noting, "it wouldn't have happened if I hadn't been on the scheme. The ELS programme opened doors".

Using new technologies

After graduating, John joined Westland Helicopters' research

and development team and then moved to join BAE Systems' Advanced Technology Centre to pursue his interest in robotics. He worked on a variety of autonomous systems programmes including looking at how driverless cars could be used by the military. John helped lead BAE Systems' MO-ATV project, designing a driverless robotic vehicle to carry soldiers' bags for them while on patrol. "Driverless cars have been a massive career highlight and it's been amazing to be at the cutting edge of this new technology" he says.

"The Academy's name and the ELS programme opened doors."

In 2005 John moved to the land vehicle part of the business to take on a technology programme manager role, looking at how to take the technology developed in the R&D programme and turn it into products. He was then promoted to head of technology for BAE Systems' land division in the UK where he was responsible for new technology for vehicles and munitions.

How the ELS helped...

Additional skills: "All of the training and development that we got through the programme added to my technical university skillset. I was able to deal with people, problems and projects that most degrees don't focus on."

Breadth: "Gaining an awareness of the breadth of engineering opportunities means that when you're starting work, you're more competent than if you just had a degree."

Advice

"Industry **doesn't need 1,000 people who are all the same,**" John says. "We need engineers diverse of thinking, background and experience. So rather than trying to second guess what people are looking for in you, **celebrate what makes you unique** and if that's the right fit, then you'll bring something incredible to which ever role you're pursuing."



John is now Engineering Capability Manager at Ultra Precision Control Systems, where he manages a team of 80, delivering everything from pneumatics systems to high integrity electronics for air and land systems.

Barbara Welch

Director, Mace UK



From building casinos to fixing up Buckingham Palace

Barbara Welch may have chosen to build a career in civil engineering after a career's advisor told her "construction isn't for women", but over the last 25 years she worked all over the world on some of the most recognisable and iconic buildings.

Building a future in international construction

Barbara studied at the University of Manchester Institute of Science and Technology (UMIST) and joined the university air squadron, flying in her spare time. "My degree was quite full on but I managed to juggle the two," she says. While joining the RAF had always been on her radar, she recognised that an engineering degree could be an excellent foundation for all sorts of opportunities and decided to

explore them further by applying for the ELS programme.

Barbara used the award money to fund international work experience placements. "I learnt I could use my engineering degree in construction to work anywhere in the world. I've done that to the max," she says. Her first stop was Sydney to see the construction of the Olympic Stadium, before taking in Hong Kong's new airport. Barbara also completed a leg of the tall ship circuit, which she says was a good lesson in teamwork and leadership.

claims-orientated projects.

"I thought we [engineers] should be working more collaboratively to build better value for clients and not wasting money on legal disputes and claims," she says. So, when she was offered three jobs, she chose Mace – a company she has now been with for 23 years – because her philosophy, values and ethos aligned with the company's vision for the industry.

Barbara first worked on a rail project in Buckinghamshire, before working on redevelopment projects in the centre of Manchester. These included the redevelopment of the famous Hacienda nightclub, although she concedes that "it



"I learnt I could use my engineering degree in construction to work anywhere in the world. I've done that to the max."

The work experience gave Barbara an insight into what she liked and didn't like in the construction industry, including

Advice

"Even if you're unsuccessful, **you're better than you were**, and if you're successful, the award can be **life changing.**"





was sad to demolish a building I used to party in at university". After seven years of project and construction management in the UK, Barbara moved to Asia where she worked on casinos in Hong Kong and Macau, as well as projects in the Philippines, the Maldives and Singapore.

"I probably wouldn't have stayed in engineering if I hadn't had the opportunities the award afforded me. It was life changing."

She then moved to Russia and worked throughout Eastern Europe, before returning to London to run Mace's business in western Europe. "If you work in construction you can work anywhere," she says – and that now includes HM The Queen's London residence.

A palace fit for future generations

Barbara is currently seconded to the Royal Household as Programme Director leading Buckingham Palace's £369million reservicing programme.

The project has 100 miles of cabling, 30 miles of pipework, 6,500 sockets, 2,500 radiators and 5,000 light fittings to check and update, some of which have not been upgraded since the Second World War. The ambitious programme will be delivered in phases over 10 years, while maintaining business as usual in the palace.

Advice

"No experience is bad experience," Barbara says. She believes applicants learn a lot about themselves simply by completing the application form and will meet some amazing people during the election process. "Even if you're unsuccessful, you're better than you were, and if you're successful, the award can be life changing."

"Speak to people. Get advice. Get lots of it," she says. "Listen, but then be selective which advice you follow, because only you know what is best for you and what you are truly capable of."

Barbara urges young engineers to dream big and set goals and objectives. "Dreams are just reality waiting to happen," she adds.

How the ELS helped...

Industry knowledge: "It made such a profound difference to my understanding of the wider industry that the career could afford me. I probably wouldn't have stayed in engineering if I hadn't had the opportunities the award afforded me. It was life changing."

Lessons in communication: "Being able to change your communication style to align with the audience is important. The agility and flexibility to do that and manage a range of stakeholders are skills I got through the ELS programme."

Adam Lorimer

Head of North America, Glue



A greener future with virtual reality

Adam began his career as a project engineer trying to make the operations of an oil giant a little greener. However, the ELS programme, helped him realise an entrepreneurial path could better help him affect change. Going from big business to startups via business school, Adam is now exploring how virtual reality (VR) could make work more sustainable.

Big ambitions

Adam became interested in the marketing and business of new technologies when he was studying mechanical engineering at the University of Sheffield. "I really I wanted to be in a leadership position in a large company," he says. "The world I saw as a kid and the people I saw as successful, worked for big companies." He was drawn to the ELS programme to develop leadership skills that could help him fulfil his ambitions.

In addition to attending the leadership workshops, Adam wanted to boost his language skills so he could enjoy a global career, and spent his ELS funding

on learning Spanish on an immersive language course in Spain. "That was eye opening because I was totally out of my depth," he says. But it was meeting other members of the cohort with entrepreneurial ambitions that really broadened his horizons.

Career in energy

After graduating, Adam worked for bp for seven years, but as an environmentalist with an interest in cleantech, he decided to change direction and attend the Haas School of Business at the University of California, Berkeley. "This was partly to round out my education, but also to loiter around the labs and see what new tech was coming out," he says.

Instead of working for another big business, Adam set his sights on building a startup, having been inspired by others on the ELS programme.

He co-founded Alphabet Energy, a company specialising

Mini CV

1998 to 2002: Mechanical engineering, University of Sheffield

2002 to 2008: Various roles at bp, from pipeline engineer to topsides mechanical and interface engineer

2008 to 2010: MBA at Haas School of Business, University of California, Berkeley

2009 to 2017: Co-Founder and vice-president, Alphabet Energy

2018 to 2020: Founder, TeleportVR

2020 to present: Head of North America, Glue

in heat recovery and nanotechnology that spun out from the Lawrence Berkeley National Laboratory. "We built the biggest thermoelectric generator and had the first crack at a commercially viable

Advice

"The ELS is a good way of **connecting with people in different disciplines**"





© Glue

product in thermoelectric power generation,” Adam says. But commercialising advanced materials is a slow business. “It would take too long to scale and deploy and have a meaningfully impact on climate change,” Adam adds, explaining his decision to move on.

“Meeting people with different experiences through the ELS programme helped. If I hadn’t have done that, I may not have had the motivation to start a company myself.”

It was while sitting in a traffic jam that Adam wondered whether VR could be used to eradicate commuting.

He bought an Oculus developer kit to investigate remote collaboration in VR, such as how you can make someone feel like they are in the same place as another person. “The more I dug into this, the more it seemed the ultimate dematerialisation technology,” he says.

Adam now heads up business in North America for a Finnish startup. Glue is a VR collaboration platform that helps remote teams bond, create, solve problems and connect with customers, so they can work remotely effectively without contributing to carbon emissions by commuting or travelling for business.

“Remote collaboration has been a hot topic during the pandemic. If there’s a silver lining, we’ve seen it’s possible to run business without office buildings,” he says. “We now have to take the best bits of what we’ve learnt and apply them.”

Advice

Adam thinks students should apply to the ELS programme to broaden their outlook and meet people. “The ELS is a good way of connecting with people in different disciplines,” he says. “You might get a snapshot of an area that gets into your brain and you can stay in touch with that person. Then, when you hit a problem you can’t address with your area of expertise, there are contacts and other ways of thinking about it.”

How the ELS helped...

A fresh perspective: “I met people at the events who were working at startups. At the time I thought big business created the change, but meeting people following an entrepreneurial path from a young age planted a seed in my brain that it’s possible – you can decide just to do something and you don’t need the backing of a big company.”

A strong reputation: “Having the Royal Academy of Engineering brand on my CV helped with applying for jobs and business school.”

Network: “Now people are in their 40s, it’s a useful spread out set of contacts. There’s a couple I still call to bounce ideas off.”

Daniel Meredith

Vice president – global manufacturing engineering capability, GKN Aerospace



Helping careers take off

Studying aeronautical engineering at university wasn't what Daniel expected, but the multidisciplinary course, together with the leadership focus of the ELS programme, took him in a business-orientated direction. Having joined GKN Aerospace as a graduate, he is now a high-flying executive at the company and says the ELS programme helped his career take off.

Preparing for take off

Daniel studied aeronautical engineering design at the University of Bristol. "I was expecting it to be more industrial design and a bit more creative, whereas it was quite rigorously academic in terms of applied physics and maths," he explains. "But as I went through it and learned more, my understanding of what it takes to design an aircraft deepened."

He is grateful that the course gave him a broad understanding of engineering principles, and because it was multidisciplinary, he learned other skills too, such as management and finance. "In addition to the engineering, those modules enabled me to get to the position I'm in today, where I have an understanding of engineering principles and applying them at a business level," he says.

To get experience of the working world, Daniel spent a summer at Renishaw and a year with Airbus, where he was inspired by

a manager, who was in his mid-30s and leading a research group. "Before that, I was naïve to the scale of what could be achieved and was looking at it purely from an engineering perspective, rather than an engineering organisation perspective," he says.

"I couldn't have done what I've done without having the foundation in place through the award and the internships that I did."

Thanks to ELS funding, he also spent a summer working for Siemens in Orlando, Florida, and another on a language course in Spain, as well as doing some 'industrial tourism' touring factories in China and Japan, with some other members of his ELS cohort. "It was fantastic and met all the hopes I could have had for it," he says. "It was really beneficial."

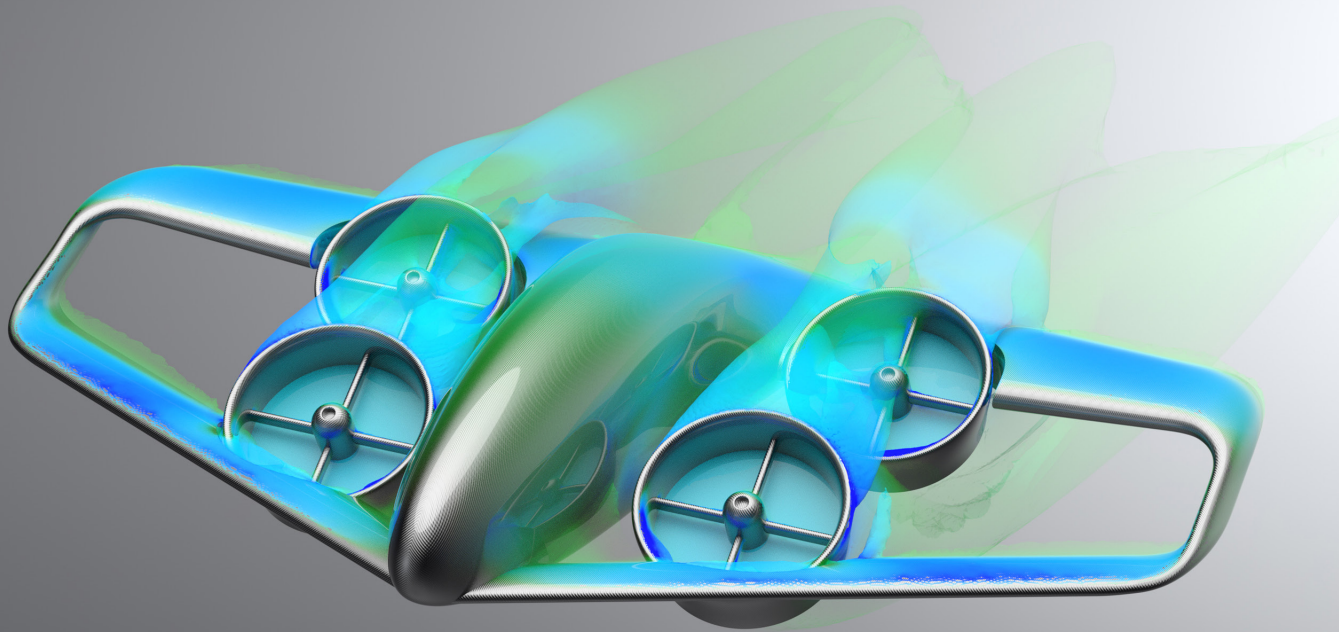
Flying commercial

Upon graduation, Daniel joined GKN's International Leadership Development Programme, which involved moving countries for short placements.

Having already worked in the US, partly funded by the ELS, he could show he appreciated the challenges. "What I believe GKN was looking for was a level of emotional intelligence in leaders. Maybe if I hadn't have done those placements and received the award, I wouldn't have had those experiences," he adds.

Initially, he worked as a project developer in the Isle of Wight, where his experience in factories around the world through the ELS programme stood him in good stead. His second placement was in Spain, where his language course came in handy.

Following a permanent move to the Aerospace division of GKN in 2008, Daniel enjoyed his first management experience of



leading a team, working for the general manager of the Cowes factory.

An opportunity then came up at another GKN Aerospace site, in Portsmouth. It was there that Daniel gained 'significant' management experience leading a work cell and "really focused on the operations, product development and sales side."

Daniel moved to the US to manage a facility in Alabama for two years, then moved back to the UK to also manage the larger Portsmouth factory.

"I had 300 people and £30 million of revenue, so within three to four years I took quite a few leaps up."

He then left factories behind to lead other leaders in a global functional group, before moving to his current leadership role in manufacturing engineering. "I've gone full circle and have a responsibility to develop the

processes and capabilities of our entire manufacturing engineering organisation for thousands of people," he says. "To have got back to engineering and working at a level where I can understand the principles and define how people do their jobs at such a significant scale is really rewarding."

Advice

Daniel believes engineering students should apply for the award as it's good practice. "The application process is similar to applying for a job, so it gives you an understanding of what's to come and it's a great accomplishment to put on a CV when you're applying for early career jobs."

How the ELS helped...

Securing a first job: "The experience I had from the award definitely contributed to my personal awareness, which enabled me to be successful in getting the job."

Contacts: "I learnt the importance of building personal relationships and a network so you can get something done ... My network within GKN is very strong and I think the scholarship taught me that benefit early."

Soft skills: "The softer skills, like communication, that you gain though the scholarship are unbelievably powerful when you're in a role and working through a graduate scheme."

Rebecca Wooding

Project manager, Arcadis



Supporting remote community development

With her sights set on becoming a rollercoaster designer, but no mathematics A level, university initially proved a bumpy ride for Rebecca. But the ELS programme funded a trip to Uganda, which led to a successful career in international development.

An uphill battle

"I always wanted to be a rollercoaster designer," says Rebecca. But despite being good at physics, nobody told her she needed to study mathematics to be an engineer, which restricted her choice of university. She chose the University of Warwick, which offered an equivalent to A Level mathematics as a module, but it was tough. "I think getting through my first year of university is my greatest life achievement," she says.



Back on track to Africa

Rebecca realised rollercoaster engineering wasn't for her and developed an interest in international development. She set up the University of Warwick branch of Engineers Without Borders, along with two other students.

"The ELS programme trip completely defined my career trajectory."

Her lecturer travelled to Uganda every summer to teach and she decided to use her ELS programme funding to join the trip, having spoken to a local hydropower turbine manufacturer in the Midlands that donated some turbines.

The small team worked with the community to build a small hydropower scheme for a school in the mountains. "The ELS programme funding enabled me to get there and to sustain myself while working on the

project. I learned how to weld, design, build, construct and project manage in really difficult circumstances."

While she spent the rest of the ELS funds a return trip to Uganda and a tour of China to look at

Mini CV

2008 to 2012: Mechanical engineering with appropriate technology, University of Warwick

2012 to 2013: Graduate sustainability master planning engineer, Mott MacDonald

2013 to 2017: Mechanical hydropower engineer, Mott MacDonald

2018 to 2020: Infrastructure adviser in the DRC, Foreign and Commonwealth Development Office (FCDO)

2020 to present: Project manager, Arcadis



water structures, her first visit to Uganda was her stand-out experience. “That trip completely defined my career trajectory.”

Around the world in infrastructure projects

Rebecca started working at Mott MacDonald as a sustainability masterplanning engineer, but found that it wasn’t the right fit. She took a sabbatical and worked in Mexico with Engineers Without Borders, where she designed a filter for a biogas system with farmers.

When she returned, she joined Mott MacDonald’s hydropower team in Brighton as a Mechanical hydropower engineer. “That really kicked the international career off,” Rebecca says. She worked on projects in Georgia, Pakistan, Slovakia and Uganda, before moving to Albania for a year to work on a large-scale hydro power construction. It led to her becoming chartered and

“really defined my career and my skillset,” she says.

After six years, she left Mott MacDonald for the Department of International Development and worked as an infrastructure advisor at the Foreign and Commonwealth Development Office (FCDO), where she was the advisor in the Democratic Republic of the Congo (DRC) for water infrastructure and was focused on doubling the capacity of water networks in two cities in the east of the country. “The project I was the technical lead for is the largest urban water project in the DRC and the first project to bring the water private sector into the country. It was completely pioneering as well as being then DIFD’s largest urban water project at that point in time.”

“The ELS programme was incredibly empowering, because it was something from the profession that says, ‘yes, you can, and yes, you belong’. It really gives you motivation.”

Rebecca has just joined Arcadis design and consultancy firm as a project manager. She will oversee a major water infrastructure project in the UK. “I’ve gone from being told I don’t belong, to feeling like I belong nowhere else and the engineering sector

How the ELS helped...

Big concepts: Rebecca still applies lessons about teamwork and communication that she learned on ELS programme weekends away. “It has been really vital,” she says. She believes the scheme opened up new opportunities and career paths by allowing her to explore the wider profession and move into the civil service, for example

Confidence: “I think it was empowering, because it was something from the profession that says, ‘yes, you can, and yes, you belong’, which I hadn’t had,” she says. “It’s an incredible experience, and it really gives you motivation.”

is kind of like an extended family,” she says.

“The ELS programme was incredibly empowering, because it was something from the profession that says, ‘yes, you can, and yes, you belong’. It really gives you motivation.”

Advice

Be creative with how you spend the funds. Contacts are really important, but actually **investing in yourself** as an individual and the kind of skill set that you want to build, I think is much more **powerful**.



Philip Sibson

CTO, KETS Quantum Security




Unlocking a career in quantum security

Unlocking all the options

"I felt like there were lots of options open to an engineer," Philip says. He joined the ELS programme to explore them. "I was getting lots of academic training at that point in my degree and I wanted to flesh that out with some additional skills," he adds.

Philip spent some of this ELS funding on a language course. "One of the options I was looking at the time was working abroad so I thought language skills could unlock those routes," he says. Philip also attended conferences to gain knowledge of outside his engineering science degree, including nuclear fusion, and quantum technologies, which was another new and emerging field. "It gave me more exposure to the area and that ended up fuelling the direction of my academic career after my undergrad."

Advice

"The ELS programme can **broaden your horizons and give you exposure** to areas you may not have thought about before." 

Quantum leap

Philip decided to do a PhD in quantum-secured communications at the University of Bristol, using quantum technologies to try and improve the security currently used in telecommunication networks, which is of huge importance when it comes to critical infrastructure. "The focus was to use integrated chips – the same sort of devices we use in our mobiles or computers – for this security purpose," he explains. A year-long programme at the Quantum Technology Enterprise Centre after his PhD allowed him to flesh out the business case for a commercial venture.

"The ELS programme can broaden your horizons and give you exposure to areas you may not have thought about before."

From that research, he co-founded a company called KETS Quantum Security and raised seed funding. The company now has 14 staff working towards its first prototype and demonstrator and is in the process of raising more funds to scale.

How the ELS helped...

Business skills: "During training sessions, there were lots of activities centred around leadership and examples of other people's personal career paths – like MBA courses and businesses – it gave me exposure to ideas."

Ambition: "The ELS programme gave me some insights and the motivation to go out and try what I'd seen for myself. It's been pretty crucial in getting me into that arena."

Advice

Philip says he thinks it is useful for students wanting to cement a career they have in mind, or help them explore new avenues in engineering. "There is also the benefit of the funding so you're able to broaden your horizons," he adds.

Aleksi Tukiainen

Entrepreneur



Helping to fuel entrepreneurial ambitions

Getting started on startups

Aleksi studied engineering at the University of Cambridge, specialising in control systems, machine learning and robotics. He joined the university's solar-powered car team, where a friend told him about the ELS programme.

Aleksi spent some of the funding on "getting up and going" as an entrepreneur. "This was themed around building some contacts, going to events and getting exposure." He also visited Stanford University and Massachusetts Institute of Technology to look at their startup ecosystems and visit their solar car teams.

Advice

"Part of the process, which involves writing down your interests and core strengths, forces you to think about what you want to be, and that's good. Even if you don't get in, you get many of those benefits from the interview process"



Thinking about a sustainable future

After graduating, Aleksi co-founded Secondmind (formerly Prowler.io), a technology startup that uses machine learning for decision making, with applications in automotive, logistics and finance. He led the development of the finance application and helped grow the startup to 100 employees, before deciding to found another company.

"The cohort that you're in becomes a peer group you keep for life."

Aleksi has a strategic role in another startup, Alchera Technologies, as well as heading up product and technology strategy at BIOS Health, which is building a neural interface designed to decode and encode signals from the brain to the body in a bid to treat chronic health conditions.

He has more entrepreneurial ambitions too. "I want to start a company in sustainability, but because of the coronavirus situation I'll try to stay in healthcare for a bit."

How the ELS

helped...

Training: "The fact that you have to think about what you want is super valuable," Aleksi says. He made a 10-year career plan, which proved remarkably accurate. "It was helpful to look at how you want to build your skillset, network and abilities so that you can travel in the direction you want to go," he says.

Network: Aleksi says it was amazing to spend time with people with similar interests and ambitions. "The ELS programme network is a really powerful tool to understand where you are and where you want to go to in your career."

Funding: "The cash allows you to do the things you might otherwise not be able to. It goes remarkably far."

Rebecca Wray

Associate Director, digital health oncology R&D, AstraZeneca



On the fast-track in pharma

A route into healthcare

Rebecca's career in digital health was kickstarted when she won a placement at GlaxoSmithKline (GSK) while studying at Queen's University Belfast. Her lecturer encouraged her to apply for the ELS programme. "It was a combination of feeling inspired by people I met and also getting the idea that I could achieve something that gave me the courage to apply," she says. Rebecca spent the award money on an immersive language course in France. "A few years later and I can speak to my clients and colleagues in French. It's something that really has made an impact," she says.

Focused on strategy

Rebecca spent time on international assignment in Japan with GSK, and upon returning to university, realised

she wanted to specialise in healthcare. She decided to forgo non-healthcare related jobs with Procter & Gamble and Volvo Cars and did a placement at TTP – a tech consultancy – before she graduated.

"The ELA programme really jumpstarted my career and accelerated my learning even before I graduated."

Rebecca joined TTP after university and rose to the position of a leading digital health strategist in Pharma, managing a wide range of areas, from defining strategy to business development. "It was across the whole spectrum, which was amazing to get so early on in my career," she says.

Rebecca has started a new role at AstraZeneca where she is Associate Director of Digital Health Oncology R&D. She is focused on identifying strategic digital health opportunities to support and augment clinical trials. Rebecca is passionate about using digital health and patient insight, to revolutionise healthcare.

Advice

Rebecca believes that simply applying for the ELS programme is valuable and

How the ELS helped...

At GSK Rebecca was given responsibilities beyond an industrial placement student. "The ELS programme really did jumpstart my career. I think it accelerated me so quickly, even before I graduated," she says.

Over the course of the scheme Rebecca also built a network. "If I look at my LinkedIn page, I can see them all achieving incredible things, which is motivating in itself."

She also credits the ELS programme with giving her confidence plus communication skills. "I think it really has changed me."

that it is important for young engineers to get used to feeling uncomfortable. "The process pushes you outside of your comfort zone, but, if you want to be an engineering leader you have to learn to be uncomfortable and push yourself," she says.







Royal Academy of Engineering

The Royal Academy of Engineering is harnessing the power of engineering to build a sustainable society and an inclusive economy that works for everyone.

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Together we're working to tackle the greatest challenges of our age.

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Note: All the information included in this document was accurate at the time of publication.

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