The Big Bridge – engaging tomorrow's structural engineers

Inspiring children to pursue a career in structural engineering can be a tough gig, especially when other STEM careers in robotics or artificial intelligence are constantly in the news. Helena Russell finds out how hands-on engagement in Ireland is helping to redress the balance.

At an age when they are preparing to make decisions that could dictate their future careers, few children know what structural engineers do for a living, let alone how they might become one.

That's not the only barrier to recruiting the next generation of engineers, says Amy Dillon, Project Director of the Think | Design | Engineer Foundation, a not-for-profit community interest company based in Northern Ireland. Many schools these days do not have the luxury of dedicated careers advisers, so this role is often filled by teachers alongside their daily work.

The most successful way to overcome these obstacles, Dillon suggests, is to give students hands-on experience of what structural engineering is all about – and what better way than getting them to build a bridge with their own hands, and walk across it?

Bringing STEM to life

The Think | Design | Engineer Foundation was set up in 2022 with the aim of making science, technology, engineering and maths (STEM) subjects accessible, inclusive and inspiring for all. Originally established as a delivery vehicle for the organisation's flagship outreach programme, the Big Bridge, it now offers a range of STEM workshops. In Big Bridge workshops, teams of students work from opposite ends to build a 13m long model of a cable-stayed bridge, bringing structural engineering to life through real-world learning. Once it is complete, they test it by walking across the model one at a time.

Dillon – whose role is a voluntary position alongside her day job as Principal Engineer at Design ID – is confident that the Big Bridge is a transformational way to get youngsters thinking about careers in engineering. The expert-led, hands-on workshops demonstrate that teamwork, innovative thinking and good communication are as central to becoming a successful structural engineer as maths and physics.



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↗ The Big Bridge initiative sees children learn about structural/civil engineering in a hands-on workshop in which they build and test a bridge

Meeting engineers in the flesh – especially when they are from groups that are under-represented in the industry – is just as important. 'We want to inspire kids to be curious about STEM, because we know that stereotypically it's got a bad rep; people think it's boring and a bit mathsy. We want them to know that engineers are approachable and interesting,' Dillon says.

These encounters can also be a gamechanger for the engineers who volunteer. 'We've had apprentices who are really quiet in work, but when they go out on the day it's blown us away how well they get on with the kids,' explains Dillon, 'and it has really helped in terms of their own development.'

'When younger members of staff help out at the workshops, the kids can relate to them more easily,' adds Laura Killeen, Senior Associate at Design ID, who organised a two-day programme of workshops earlier this year in her hometown of Carrickfergus.

Dillon agrees: 'It's good to have a range of people – someone like Laura who is well established and high profile, also someone who might have done an apprenticeship or is a technician, to show there are different routes into the industry. We know it's been successful when kids can identify with the staff, and see that it might achievable for them.'

Funds and sponsorship

Workshops can be tailored to any age group, right up to young adults who are not in employment, education or training (the so-called 'NEETs'), says Dillon, although those aged 8–14 get the most benefit.

She is pragmatic about the logistical challenges, such as the practicality and cost of hauling a 1.5t bridge model around the country, and the need to provide trained, specialist staff to safely host events.

With schools short of funds, this is where sponsors come in – private companies and professional institutions in the sector, or education authorities

that want to bring it to schools in a particular region. They cover the costs and provide venues and support staff if necessary. In return, they gain the opportunity to show leadership in education and community engagement, and offer meaningful STEM outreach that has real impact.

Killeen is chair of the IStructE regional hub in Northern Ireland and explains the very personal reasons for the way she decided to spend her discretionary budget. 'I went to school in Carrickfergus and it always felt like we were in the shadow of Belfast,' Killeen recalls. 'The schools there seemed to get all the opportunities, being closer to the big universities.' She wanted to give the students of her hometown a memorable experience, so she paid to bring the Big Bridge to Carrickfergus Town Hall for two days, holding four workshops each day, with a total of 165 school children aged 8–11 years old involved in the programme.

'The council provided the venue for free and we used STEM ambassadors to keep the cost low, stretching the funds as far as we could. I volunteered my time, and we just had to pay for the two members of staff who delivered the workshops,' she adds.

The central location of the venue meant most schools were able to walk or come by public bus; even the cost of coach hire can be a barrier to attendance for some schools, Dillon says.

Stepping into engineers' shoes

Killeen explains how the workshop is structured: 'First they get a briefing on civil/structural engineering, aimed at their level of understanding. We might focus on everyday things such as running a tap, flushing a toilet, or buildings they passed on the way to the event. We then brief them on what Big Bridge is and what we intend to do, but by this stage all they want to do is build the bridge! So, we split them into two teams, and they start building under close supervision. Once it's finished, all the kids cross it one by one – and although they are asked not to run, we get them skipping, Irish dancing, bear crawling and so on!

'It was so enjoyable seeing how excited the kids were about it – it made me stop and remember that what engineers do on a daily basis is a really fascinating job, with a problem-solving benefit,' she says.

Dillon adds: 'They feel really good because they have helped to build





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something, and they get to dismantle it as well – a key part of the learning.'

'With older age groups, we make it more difficult and we don't give them any help. It's more about project rules – they are all given specific roles, put in charge of health and safety, programme management, time and quality, and so on. If they find it too easy, we hide things, or send the project manager on holiday, or forbid them from touching anything so they have to work on effective communication.'

High demand

This year is expected to be the busiest yet for the foundation. In 2025, just over 3,000 students took part in Big Bridge workshops; by early September this year, a total of 2,883 pupils had already attended one of the 35 events. The model is available for use anywhere in Ireland, and in the first eight months of the year had already travelled 1,600km. It enables workshops to be brought to schools in remote communities which would not otherwise be able to benefit from them.

There's no doubt about the demand. 'We get about six enquiries every week from schools, which is fantastic,' Dillon says, 'but schools don't have funds to pay for it. So we very much rely on bodies like the IStructE to provide the people and cover the costs.'

Sometimes support comes from construction companies; contractor BAM, which is currently building the Narrow Water Bridge across the Irish border at Carlingford Lough, has sponsored Big Bridge workshops locally for the last two years. As well as the STEM aspect, the campaign was intended to strengthen links between children from the two communities that the bridge will connect.

Likewise, Lisburn & Castlereagh City Council funded two weeks of workshops for its schools, Dillon says. 'Originally it was going to be just a week; we invited every primary school in the area and were oversubscribed, so we had to do it twice – one week in February and a follow-up week in June. The council paid for it because they recognised the benefits.'

Dillon knows that the Big Bridge provides outstanding value and engagement, and wants others to consider whether they are gaining similar traction with their own STEM spending. 'You might be providing outreach to a certain number of school kids, but are you engaging with them, are you getting them excited about engineering, or are you just ticking a box to say you've done it?'

Inspiring the next generation

Tomorrow's Engineers Week 2026 is an opportunity for IStructE members to inspire young people to consider a future in structural engineering. Through member stories and school engagement, the Institution will showcase the creativity, innovation and global impact of the profession.

The stories will highlight how structural engineers are tackling climate challenges, collaborating across cultures and disciplines, and delivering everything from bridges and stadiums to renewable energy infrastructure and transport networks.

As part of the week, IStructE Fellow Roma Agrawal will visit a local school on 11 November, delivering a Dream Catchers assembly and her popular chocolate bridge experiment to introduce pupils to the possibilities of structural engineering.

Together, our members can play a vital role in shaping the next generation of structural engineering talent.

Find out more on the IStructE website.