

STEAM AHEAD!

STEAM EDUCATION IS PAIRING ENGINEERING AND CONSTRUCTION COMPANY STAFF WITH PRIMARY SCHOOL CLASSROOMS TO INSPIRE CHILDREN TO CONSIDER CAREERS IN THE INDUSTRY

There were days when building blocks, cereal boxes, plasticine, toilet roll holders and a length of Sellotape had the potential to build the "world's tallest tower". In the fast-moving and ever-changing worlds of education and construction, the current theory is that young people need to have 21st century learning skills like critical thinking, problem solving and teamwork, or fear being left behind. However, there are many skills in the traditional construction sector that cross over with 21st century learning skills, while still making space for cereal boxes and Sellotape. The traditional skills of building and mechanical knowledge, maths and language literacy, coordination skills, logistics management, critical reasoning and organisation skills have had the benefit of linking to a fast-moving educational environment where learning in design, graphics, mathematical studies, project management and contemporary management skills have enhanced the industry.

Despite the expanding number of routes to entry into the construction sector, graduate and apprenticeship numbers are failing to meet the current demand and the same historic obstacles exist for women entering and remaining in the industry. So, what can be done to change this mindset and create a new generation of construction industry professionals?

HARD HATS FOR GROWING BRAINS

Research indicates that the optimum age for engagement with STEAM (science, technology, engineering, arts and maths) subjects is between 9 and 13 years of age. This is when a child's curiosity about the world they live in is most active. There is a natural fascination with what makes their world turn and how everyday things work. This, coupled with a limitless imagination, can lead them into an exciting world of discovery and learning. Research also shows that the younger the child, the smarter the investment in education and that the effective introduction of STEAM subjects at the right stage produces beneficial outcomes for STEAM related industries, which can have a major impact on the socio-economic performance of nation states.

But why, you might ask, should the construction sector care about STEAM subjects? Engaging with kids on a broader horizon than "construction = building" is critical to enticing young people into the field. Our "STEAM-in-a-Box" programmes are fun, hands-on-programmes designed both to engage children of multiple skill sets and aptitudes and to develop those skill sets and aptitudes in children who may



not have previously considered themselves capable. Most children will never have met an engineer, construction project manager, materials scientist, 3D modeller or the whole myriad of other professionals working in the sector. Equally, they will have little or no idea about the vast array of potential careers in the sector. STEM, Arts and design subjects are fundamental to many of these careers, as are the aforementioned 21st century skills.

Around Ireland, the US and Europe there are laudable programmes attempting to introduce STEM and Arts subjects to engender enthusiasm in children for science, technology, engineering, arts and mathematics. Mainly these initiatives are aimed at second level, yet research is increasingly showing this as being too late along the child's decision timeline. A child's imagination is captured in primary school.

Engaging with primary school children, in the structured co-teaching Continuing Professional Development (CPD) relevant framework provided by STEAM Education, provides an opportunity for companies in the construction sector to adopt primary schools and send in their STEM professionals with STEAM-designed programmes to work with the teachers and inspire the children.

A CLASSROOM APPRENTICESHIP

Over the past few years, STEAM Education has been working with construction firms and companies from all sectors of engineering in Cork, Dublin, Kildare, Limerick, Westmeath, Belfast and beyond. Companies including Sisk, ARUP, John Paul Construction, Jones, MEP, Dornan, Stewart, Collen, Jacobs and Sirus Engineering all engage with STEAM and with primary schools in their locality to inspire young people.

STEAM programmes are designed to complement, enhance and stretch beyond the school curricula. As the courses are further supported by class teachers who reinforce the subject matter and carry it through into their broader teaching, the benefits are multiplied. STEAM

Education is working to address the long-term needs of the industry and provide a sustainable solution to the problems currently being encountered, while supporting the over-stretched education system.

A SOCIAL RESPONSIBILITY

STEAM's popular "Engineering-in-a-Box" model is the most popular programme within the construction sector. It provides primary school children with the concepts and theory, mixed with the practical application of their new knowledge which they can apply to interesting and relatable projects. The context of the programme is that humans continue to address challenges in our lives such as the need to create better forms of shelter for our families, designing more efficient and sustainable energy and heating systems, creating the infrastructure for services, communication, water and imagining better facilities and futures for our communities. What does this look like in the classroom? For instance, the children work on projects where they construct lollipop stick structures using triangulation, discover load distribution with paper towers and plan and design a production line process within a sweet factory. Although these may seem like complex problems for 10 year olds the schoolkids are learning instinctively, through playful collaboration and problem solving, not to mention the guidance of a professional from the industry. The programme also incorporates team building and self-directed learning projects, giving the kids an opportunity to devise solutions to challenges, build them, test them, learn from any mistakes and rectify their models or designs.

TAILORING OUTREACH TO MATCH YOUR AREA OF EXPERTISE

While the "Engineering-in-a-Box" programme is structured with resources and content provided, it is also very adaptable to engaging in a more in-depth way in different sectors. For example, it includes a two week project-based element which can be focused entirely on construction, or even more specifically on one aspect of construction such as



electrical engineering, depending on the company involved and the expertise of the volunteer co-teacher involved. The opportunity can also be taken throughout the delivery of each lesson to customise the examples to that of the work of the programme sponsor, delivered by your company professionals. Your volunteers might want to share how they got into their specific sector of construction, but also to discuss other opportunities in the sector. STEAM also provides and supports positive PR opportunities for the company if desired.

The STEAM Education strategic approach to the delivery of its programmes to primary schools is to roll it out through a strategic Corporate Social Responsibility (CSR) framework, utilising established STEM and Arts companies and the expertise of their employees to support the education system, as well as the longer term requirements of the company for creative, innovative, interested and skilled employees. In this way, the STEM and Arts companies cover the cost of the programme while benefitting from the exposure of their brand, business and the continuous professional development goals of their staff, investing in their own community. The school, teacher and student beneficiaries receive the programme, irrespective of how well resourced the school is, whether it's in a socially or economically disadvantaged area, or whether or not it's a school known for its career path links to STEAM careers.



FUTURE PROOF

The best testimonials for the "Engineering-In-A-Box" programme come from the participants themselves. Colm Walsh, a Site Engineer with BAM Ireland, said: "I really enjoyed teaching STEAM's Engineering-in-a-Box to the 6th-class students of Scoil Chill Ruadháin, Brooklodge, Cork. The way in which the children used engineering principles that they had learned in the classes to solve the tasks that were set to them was brilliant. Every day when I came to class, it was clear that the children couldn't wait to begin the next project. Their enthusiasm was inspiring and I hope I get to continue delivering EIAB on behalf of BAM Ireland for years to come. I would recommend that all companies get involved in the programme as it's an enjoyable and rewarding experience."

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