

## Engineering the Curriculum.

(Fintan Donnelly - Principal, St Patrick's Academy)

Saint Patrick's is a large co-educational school we have one thousand three hundred and sixty pupils here. What the school here has always tried to do is have a curriculum that meets the needs in so far as possible of every pupil. There's been a great of curriculum development not only in the current year but running right back to the nineteen seventies. We currently have about twenty-six subjects offered at GCSE and ah about thirty-two at post-sixteen. So that's far and in excess of the entitlement framework but the reason why it's there is because there's a need for it and there's a demand for it from the pupils. There's been a great tradition of linking out with local industry and trying to develop a curriculum programme that in some ways at least tried to meet the needs of local industry.

(Maria Curran – Project Director MEGA)

I'm project director of "MEGA" which stands for, Manufacturing and Engineering Growth and Advancement project. It's a project that's completely funded by Invest NI and Mid-Ulster Council and it comes out of the hard work of the Mid-Ulster Schools Forum and the main purpose behind "MEGA" is to alleviate the skills shortages faced by local manufacturing and engineering companies in Mid-Ulster of which there are five hundred and twenty-three in the Mid-Ulster alone.

"MEGA" has eight companies on its' steering group, Edge Innovate, Northern Hydraulics, Steelweld, Nugent's, Axon Power, Specdrum, Strickland Ireland and Mallaghan. It's progressed now that's there's twenty-six companies on the "MEGA" network. One of "MEGA's" aims and objectives is to insure that schools are aware of the vast array of careers available within manufacturing.

(Fintan)

We offer a curriculum also that isn't supply led. That is that it, it responds to the changing needs of the economy. We would always say that a school is not there solely to serve the labour force but it does have to keep in mind the needs of the economy. We offer through our partnership with South-West College, BTEC in Engineering at post-sixteen. We also brought engineering on because we felt that it brought a new skill-set for the pupils and it also allowed... allowed pupils to get access to that kind of skill-set at an earlier age so they're making their choices at age fourteen and starting to look at career paths that may flow out from a GCSE in engineering.

(Maria)

Apprenticeships develop the technical skills once our young people enter into apprenticeships they train on the job. They develop the technical skills so it's really important that at post-sixteen level schools that all of our young people know about the various pathways available to them. "MEGA" at the moment are working with one of our local universities to try and create the very first degree level apprenticeship in manufacturing and mechanical engineering.

(Fintan)

We did find in the past that many strong scientists and mathematicians would not necessarily go down an engineering route and even though we knew that in the labour market there were significant shortages there and particularly we know we have a very, very strong and vibrant engineering sector locally. So we did look at that and we wanted to understand why so many students even though they did have their mathematics didn't necessarily go towards engineering so bringing in the engineering into the school was part of that strategy. Bringing some of the local businesses into the school was also part of that strategy to try to open up young people's minds to see what is actually out there. Sometimes there are very, very ah... successful very large, even globally successful engineering firms on the doorstep but young people may not have heard of them so raising awareness has been part of that.

(Maria)

Twenty-nine percent of employee jobs in Mid-Ulster are made up within the manufacturing sector. It's predicted that then the industry will need seven hundred and forty-nine new jobs before two thousand and twenty-three. Nearly a half of the world's mobile and crushing and recycling and material handling industry is based in the Mid-Ulster region. These companies are major competitors with each other yet they all face the same skill shortages. Last year we saw I think around thirty of our school leavers going into engineering courses of one type or another so we do see a payoff starting to come through. We've also been fortunate to have people from the engineering sector on our Governors. We've had the former president of Engineers Ireland and he's been able to bring a wealth of experience and indeed context to the school and that has been a great help and those links out into industry always are invaluable in informing staff and informing pupils about the direction that we need to go in as a school. When I meet employers I say what are the major skills that you need? and they say we can teach skills as well when they're in industry but we need young people with a positive attitude. We need them to have a "can do" attitude and that they always want to learn, continuously learning is really, really important that we embed that skill in our young people.

(Fintan)

We made a number of changes to student options over the past number of years and as part of that change we obviously had to engage in consultation with some of the key stakeholders and not least which would be the pupils. Ordinarily we would put out preliminary choices allow the pupils to select what they felt they would like to do and then try to design the curriculum options around what they wanted and that has worked quite well.

We've surveyed pupils periodically over the years and also parents to try to get a sense of whether or not they felt curriculum provision was appropriate and suitable. Generally the feedback and that has been very strong and then most recently we introduced complete open choice for students at GCSE and ah... we started to do that in 2016 and it did require a consultation with Governors, with Parents and with Pupils. It raised concerns because obviously as I said earlier we wanted to be more demand lead than supply lead and therefore when you make that kind of change you introduce the possibility that numbers might drop in some subjects and some subjects that indeed are very cherished in the school so we had a job to make sure that we would protect

and encourage and make sure that children still took an interest in those because they have such broad educational value but at the same time try to encourage children to take... pathways that embraced more of the new subjects along with the older more traditional. We think that that is working very well.

(Maria)

We're delighted that with females going into STEM subjects that we do see more females going into engineering but there's huge amount of work done by industry and schools to encourage more females into the sector. These are well paid, high quality jobs and there is a vast array of them right here at home on our doorstep.

(Fintan)

Pupils who find that their needs are not quite met by one or other of the traditional sciences or by mathematics alone and they need something slightly different so some of these new courses are very exciting in a way that they have been designed to meet specific industry need.

(Maria)

It's predicted that 65% of pupils in primary schools will do jobs that haven't even been created. So it's really important that our young people learn transferable skills and that they are able to adapt to the ever changing world of work.

(Fintan)

We were interested in finding out not just what the primary schools were teaching but also how. So that we could borrow some of the "How" and bring it in so that the children would transition much more much easier I suppose between primary seven and year eight.

(Maria)

Digital skills are going to become really really important. Especially for manufacturing. With the advancements in "Industry 4.0" and robotics and artificial intelligence and virtual and augmented reality these digital skills are going to help industry progress to the next level and we need this talent pool of young people coming through with these digital skills. Industry have to get products to market, schools have the skills. Schools have to help the young people achieve their exams but we need time invested in you know all of our young people can achieve GCSE and all of them can choose A-Levels but unless they have exposure to the world of work how do they know what they want to do. Work experience is vitally important but we've got to have work experience in Key Stage 4. Even exposure at Key Stage 3 to the world of work through project based learning activities so that they can link what they learn in the classroom to the world of work in the future.

(Fintan)

One of the changes of course that was necessitated by bringing in open choice was that the process of choice then made it an awful lot more consideration and time so there is a clear programme for all Year 10 students taking them through a very well designed... series of exercises bring them towards understanding and knowing themselves and understanding and knowing the possible career pathways and trying to lead them towards matching those. We

also introduced a careers advice day for Year 10 where we bring in, interview each pupil with their parents and we found that very successful. The feedback that we get from it tends to be universally positive and we also, one of the things that we found from it was that the responses of the young students at age fourteen their awareness and their interest and their engagement was remarkably high and many of them are remarkably well informed.

(Maria)

We're looking at how we can link industry with education and what we can do to empower our young people about careers in manufacturing. We are looking at, you know, high quality work experience, how can we improve it. How can we develop summer internships for our young ones. We're looking at, we're working with "Sentinus" on developing their R&D team activities that young people will Local industries and hopefully they will be the young person then that will choose a career where there are jobs available right here on our doorstep in manufacturing and engineering. There's so much can be done for careers there needs to be investment in careers education. Career teachers need time allocated on their timetable for, for individual guidance and advice. We've got to develop career management skills within our young people. They need to be able to adapt to changing careers as we know that young people will not do the one job for the rest of their life. So they need these management skills to be able to, to change as they go through their life. We're looking at the development of maybe ambassadors how will go out to schools and tell the young people about what life is like working within manufacturing and engineering. They will become mentors to the young people. They will help them gain work experience and some are internships. It's really important that we collaborate with schools and industry collaborates with schools in that we ensure that what is developed in the curriculum meets industry needs.

(Fintan)

One of the things that we have pioneered here has been collaborative learning at post-sixteen. Because what we do know when we learn from employers is that the majority of young people when they go out into work places in the future that will be working in teams.

(Maria)

Research has shown that industry really requires soft skills. They want that, you know, young person who are creative thinkers. That young person who has a really good work ethic that really wants to learn.

(Fintan)

Preparing young people to work together to solve problems together to learn from each other and we have a great culture of that. We've developed it through a peer teaching programme from when they're very young right down in the junior school and into collaborative learning in the senior school.

(Maria)

Young people need to learn for a purpose and they need to be able to establish the links between what they learn in future life, whether it be work or whether it be just life in general, but they need to understand... you know, sometimes we deliver a curriculum to suit an exam

and we need to be broader than that. Now post extra-curricular activities are fantastic opportunities for young people and they really develop a lot of our soft skills as will work experience, as will part-time jobs. But we have got to... we can't just you know steer our young people down the academic, you know skills and not broaden their soft skills, cos that's what's gonna help them in industry.

(Fintan)

We can't be completely responsible for training a work force but what we do hope to do is provide a work force that has the basic skills the basic dispositions so that they can be trained and that they're willing to learn and willing to work hard.

(MUSIC)