

Case study
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16-year-old Krystyna's ideas turn into reality

As UCLan's new Engineering Innovation Centre opens its doors to students for the first time, a teenager from Lancashire has already seen first-hand the way it will help to turn life changing ideas into reality.

Taking part in a competition to find the next generation of young engineers, Krystyna Marshall, 16, from Burnley invented a cost-effective way to support a young family member with a life-altering spinal condition.

The invention allows children like her cousin, who is living with Spinal Muscular Atrophy (SMA), to live a more conventional life by wearing an engineered jacket which supports their skeleton and gives extra strength to their back muscles and spine.

Turning her design into a proof-of-concept was problematic however, as the amount of metal needed to create the exoskeleton would make the design too expensive and heavy.

With the help of UCLan's School of Engineering, a 3D exoskeleton was printed, drastically reducing both the cost and weight of the final prototype. Additionally, by 3D printing the prototype, repairs to the exoskeleton can be completed much quicker and at a fraction of the cost of a metal structure.

Krystyna said: "By making this design a reality, a new world can be opened up to children with spinal conditions. The invention allows them to carry out simple tasks that were previously impossible, such as sitting up in bed or tying their shoelaces. For children with SMA, this is life changing."

Dr Matthew Dickinson, Senior Lecturer at UCLan's School of Engineering, added: "This SMA exoskeleton is a perfect example of the way that engineering can have a direct impact on people's lives. The solutions that we will be able to develop at the new EIC will have real world benefits to thousands of people in Lancashire and around the world, not just in healthcare but across the entire business sector too."

The competition was part of the Leadership Award, run by Primary Engineers, which asked young people between the ages of three and 19 what they would do if they were an engineer.

Dr Susan Scurlock MBE, Founder and CEO of Primary Engineer, said: “Waiting in the wings of Primary Engineer has always been the thought that one day one of those involved in the programme will achieve our vision of making the world a better place to be. That has been achieved, to staggering effect, by Krystyna Marshall and Dr Matt Dickinson at UCLan who, through the Leaders Award, have changed the way suffers of SMA will be treated – without doubt making their world a significantly better place to be. We are very proud to have played a part in this amazing story.”

Identified as a signature project within Lancashire’s Strategic Economic Plan, the EIC has secured £10.5 million via the Lancashire Enterprise Partnerships’ Growth Deal with the Government. The new facility has also received £5.8 million from the European Regional Development Fund (ERDF) and £5 million from HEFCE’s STEM Capital Fund.

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The University of Central Lancashire (UCLan) is a leading modern university with thriving campuses in Preston, Burnley, Westlakes (Cumbria) and Cyprus.

Founded in 1828 as the Institution for the Diffusion of Knowledge, UCLan now has a staff and student community approaching 38,000 and an employment-focused course portfolio containing over 350 undergraduate programmes and nearly 250 postgraduate courses.

As well as being a national leader in the number of student and graduate start-up businesses it supports, UCLan is also Lancashire’s largest provider of graduate level qualifications, supplying highly skilled graduates into the workforce. The University also has established links with global businesses, police constabularies, NHS trusts and more than 1,000 regional enterprises across a variety of sectors.

Internationally the University now enrolls students from more than 100 countries and has partnerships with 125 institutions from across the globe.

The University has an established research reputation with world-leading or internationally excellent work taking place within the areas of Business, Health, Humanities and Science. UCLan is also ranked in the top six percent of universities worldwide in the 2019-20 Centre for World University Rankings, as well as holding the maximum 5 QS stars for the quality of its teaching.

With a strong focus on continually improving the student experience, UCLan is currently undertaking a £200 million project to redevelop its Preston Campus. The vision is to create an attractive and inviting, world-class environment helping to create jobs, kick-start regeneration and attract inward investment into the city and North West region.

University of Central Lancashire (UCLan) website: <https://www.uclan.ac.uk/>

About Lancashire’s Growth Deal Programme

In the last three years the Lancashire Enterprise Partnership (LEP) has successfully secured £320m of Growth Deal investment from the Government's Local Growth Fund.

This funding, one of the largest Growth Deal settlements to be allocated to a LEP, is designed to help improve and upgrade existing commercial infrastructure, kickstart new economic initiatives, and unlock additional private investment to drive further growth across the county.

Over 40 projects have directly benefitted from the LEP's Growth Deal Programme. These include:

- New and improved transport connections including the Blackburn-Bolton Rail Corridor; the Broughton Bypass; the Centenary Way Viaduct; and the Hyndburn-Burnley-Pendle Growth Corridor;
- World-class higher education, research and vocational skills provision and facilities including UCLan's flagship Engineering and Innovation Centre; the national Energy HQ in Blackpool; Lancaster's Health Innovation Campus; and Myerscough College's Food & Farming Innovation Centre;
- A wide-ranging package of regeneration programmes specifically for Blackpool including a new international conference centre at the Winter Gardens complex; the development of Blackpool town centre 'Green Corridors'; traffic management, bridge and road improvements and an extension of Blackpool's tram network.

The Growth Deal programme will help to generate up to 11,000 new jobs, create 3,900 new homes and attract £1.2 billion of additional public and private investment for Lancashire.

Lancashire's Growth Deal programme is also fully aligned to other major economic initiatives such as the £450m Preston, South Ribble and Lancashire City Deal, the £20m Growing Places Investment Fund, and the Lancashire Advanced Manufacturing and Energy Enterprise Zone Cluster.

For more information visit www.lancashirelep.co.uk

European Regional Development Fund

The project has received £5.8m of funding from the England European Regional Development Fund as part of the European Structural and Investment Funds Growth Programme 2014-2020. The Ministry of Housing, Communities and Local Government is the Managing Authority for European Regional Development Fund. Established by the European Union, the European Regional Development Fund helps local areas stimulate their economic development by investing in projects which will support innovation, businesses, create jobs and local community regenerations.

For more information visit <https://www.gov.uk/european-growth-funding>