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**Manufacturing motivation in schools**

[Global engineering company Renishaw](http://www.renishaw.com/en/renishaw-enhancing-efficiency-in-manufacturing-and-healthcare--1030) has opened its doors to [Radyr Comprehensive School](http://www.radyr.cardiff.sch.uk/page/default.asp?title=Home&pid=1), allowing pupils regular access to the company’s Fabrication Development Centre and Miskin manufacturing facility during product design lessons. This collaboration enables students to grasp the link between the school curriculum and industry, take part in engaging and motivating workshops to complement the exam specification and better understand the opportunities available for future careers.

**Background**

Radyr Comprehensive School is a coeducational school and Sixth Form College based in Radyr, near Cardiff, Wales. The school is located just 15 minutes drive from the Renishaw Miskin site and offers product design at GCSE and A Level.

The Fabrication Development Centre, located at Miskin, opened in May 2016 and is an educational resource for the hands-on learning of design, fabrication manufacturing and engineering for the young engineers of the future. The school had previously visited engineering open days at Renishaw with Year 9 students. but the new centre enables the school to run design and technology lessons at the manufacturing site.

During the development stages of the Fabrication Development Centre, Renishaw approached Richard Jenkins, Assistant Headteacher of Radyr Comprehensive School to consult on the design of the facility. During this consultation stage, the school saw the potential of the centre for its pupils.

“From the outset I was impressed with the vision that Renishaw had,” explained Jenkins. “The reasoning and rationale behind the Fabrication Development Centre, which is to promote engineering and industrial design at the grass roots level as a way to tackle the skills shortage is something we can stand behind. I was interested in the opportunities the facility could create for my students straight away.”

**Challenges**

According to [Engineering UK](http://www.engineeringuk.com/Research/Engineering-UK-Report-2016/), engineering companies need to recruit 2.56 million people by 2022. Worryingly, 44 per cent of engineering, science and hi-tech firms reported difficulty in finding recruits with the right science, technology engineering and maths (STEM) skills. An analysis by Paul McCombie at the University of Bath indicated that Design and Technology (D&T) A-Level is one of the top three factors underpinning graduate success.

Despite the significance of studying design for the engineering disciplines, numbers are dwindling. The year 2016 saw a 9.5 per cent decrease in the uptake of D&T at GCSE. With companies already struggling to recruit skilled candidates it is important to keep young people interested in taking STEM subjects at GCSE and A-Level, a matter influenced by their enjoyment of the subject itself. This means that creating engaging educational experiences for pupils at a young age can be essential to their selection of the subject later on.

As well as creating interest in STEM subjects through engaging learning projects, changing young people’s perceptions of engineering careers is an important battle in ensuring a pipeline of engineers and technicians. Companies can offer school engagement activities to promote the creativity of STEM careers and to debunk the myth that engineering is a dirty, dull career. At Radyr Comprehensive school the staff found it challenging to link the A-Level course material to industrial processes, a vital component in developing engineers of the future.

Radyr Comprehensive School aims to increase the uptake of design subjects in the school. The school has recently invested in a range of equipment including laser cutters and 3D printers. However, the purchase was just the first step in the school’s journey towards using technology more effectively in the classroom.

**Solution**

From September 2016, Radyr Comprehensive School timetabled regular visits to the Fabrication Development Centre in its product design lessons for three Year 9 GCSE classes and one Year 12 A-Level class. At the facility, the pupils develop their workshop and design and technology skills using the equipment.

“At Renishaw the classes cover materials in the syllabus but in much more depth,” explained Jenkins. “This is incredibly beneficial to the students learning as it complements the curriculum and enhances understanding.

“The pupils have worked on 3D printing projects using simple, free CAD software which has opened both the staff and the pupils’ eyes to how accessible 3D printing can be,” continued Jenkins. “We had access to 3D printers at the school but we did not understand the capabilities or potential of the technology before we were introduced to Renishaw. Today, we no longer find the technology daunting.”

“A visit to the Miskin facility can have a positive impact on pupils in two ways,” explained Simon Biggs, Education Liaison Officer for Wales at Renishaw. “Taking part in hands-on workshops that complement the school curriculum helps motivate pupils and develop their skill sets. The added benefit of visiting our site is the close link to the manufacturing facilities. The pupils are able to see the production, how clean the environment is and how creative and challenging an engineering career really is.”

The Year 12 Radyr students have been working on a project looking at the larger additive manufacturing machines run by industrial designers from Renishaw’s Gloucestershire site. The task is to redesign a part of the additive manufacturing machine; this type of project gives the students a clear industrial application of the skills they are learning in the classroom.

**Results**

“The students have learnt how the way they draw can impact the finished project,” explained Jenkins. “Using a 3D modelling package means that pupils must think critically about how the final product will be manufactured. This is different from the traditional design method in school, which is simply drawing a design by hand and then making the item manually. This has given pupils a better understanding of how design works and importantly has beaten the misconception among the students that being talented at drawing is essential for product design.

“We have only been using the facility for a few months, but we have already seen increased motivation among the pupils. They have made a clear link between the workshops at Renishaw and the curriculum. They have a wealth of real life experience that they can draw on in the intensive theory exam. We have had a lot of questions from them; including what qualifications they need to become engineers and how they could start a career in engineering?

“It has been amazing to work with professionals in using cutting edge technology. The access to the facilities and the support from Renishaw has been astounding,” explained Jenkins. “We’ve had incredible attendance to lessons – since September none of the Year 12 students have missed a lesson!”

Radyr Comprehensive School plans to extend the use of the facility across the three years in its GCSE program, in order to increase the interest and uptake of design subjects and improve the students’ practical skills, two steps closer to filling empty engineering positions and shortening the skills gap.

Ends 1,114

Notes to editors

UK-based Renishaw is a world leading engineering technologies company, supplying products used for applications as diverse as jet engine and wind turbine manufacture, through to dentistry and brain surgery. It has over 4,000 employees located in the 35 countries where it has wholly owned subsidiary operations.

For the year ended June 2016 Renishaw recorded sales of £436.6 million of which 95% was due to exports. The company’s largest markets are China, the USA, Japan and Germany.

Throughout its history Renishaw has made a significant commitment to research and development, with historically between 14 and 18% of annual sales invested in R&D and engineering. The majority of this R&D and manufacturing of the company’s products is carried out in the UK.

The Company’s success has been recognised with numerous international awards, including eighteen Queen’s Awards recognising achievements in technology, export and innovation.

Renishaw is listed on the London Stock Exchange (LSE:RSW) where it is a constituent of the FTSE 250, with a current valuation of around £1.8 billion.

Further information at [www.renishaw.com](http://www.renishaw.com)