

# BITC Member Company Education Case Study



**Sir John Rose, Chief Executive of Rolls-Royce plc, on  
Educational Activities:**

*“Our business benefits from the wide range of skills and experience  
that our people gain from taking part in these activities.”*

## Company Details

The name derives from the surnames of the company founders, Henry Royce and Charles Rolls. When they met in Manchester in 1904, they agreed to create a company that would later go on to manufacture the 'best car in the world'. In 1971, the company, and subsequently the brand, was split. Rolls-Royce plc retains the registrations for its trademarks for use in markets other than the motor industry. Its holding company, Rolls-Royce Group plc, is perceived as a contemporary, global engineering company operating in the aerospace, defence, marine and energy markets.

Rolls-Royce, a world-leading provider of power systems and services for use on land, at sea and in the air, operates in four global markets – civil aerospace, defence aerospace, marine and energy. It continues to invest in core technologies, products, people and capabilities with the objective of broadening and strengthening the product portfolio, improving efficiency and enhancing the environmental performance of its products. These investments create high barriers to entry.

The success of its products is demonstrated by rapid and substantial gains in market share. The company now has a total of 54,000 gas turbines in service worldwide and they generate a demand for high-value services throughout their operational lives.

Rolls-Royce has a broad customer base comprising 600 airlines, 4,000 corporate and utility aircraft and helicopter operators, 160 armed forces, more than 2,000 marine customers including 70 navies, and energy customers in 120 countries. Rolls-Royce is a technology leader, employing 38,000 people in offices, manufacturing and service facilities in 50 countries.

Annual sales total £7.4 billion, of which 53 per cent are services revenues. The firm and announced order book is £26.1 billion, of which aftermarket services represent 38 per cent, providing visibility of future levels of activity. Rolls-Royce has offices, manufacturing sites or service centres in 50 countries. As well as 21,000 employees in the UK, it has a major presence in Canada, Germany and the USA, and regional offices and joint ventures throughout the world.

Rolls-Royce has a long and successful history of community activity, and well-established programmes of activity around the globe. The company believes that by working with partners it makes positive impacts in its communities, and achieves tangible benefits for its business. Employees play a vital role in making a difference by getting involved in their community, and such involvement offers a broad spectrum of development opportunities.

There are four main themes in the company's community programme:

- Education;
- Arts and culture;
- Environment; and
- Regeneration.

## Educational Activities

Rolls-Royce is actively involved in and supportive of education activities as a crucial element in widening the pool of talent from which it recruits, and as a key part of its CR agenda. At the company's major sites around the world Rolls-Royce sponsors a range of education projects, and employees get involved with local schools to support young people and promote science, engineering and technology.

Because of the education support the company offers, Rolls-Royce's Chief Executive, Sir John Rose, was invited to join the National Council for Educational Excellence. This role helps the company to influence policy and strategy in education.

The Rolls-Royce Education and Skills Policy Board is chaired by the Executive Vice-President – HR Operations and Skills Capability.

This paper focuses on the activities that Rolls-Royce undertakes in the UK, and provides an overview of the company's education activities and support for careers guidance at the Derby and Bristol sites – the two largest Rolls-Royce sites in the UK.

Rolls-Royce invests in education in order:

- To help raise standards;
- To support future resourcing needs;
- To promote engineering, science and technology;
- To develop its employees;
- To influence government policy and strategy in education; and
- To raise the profile of the company.

The company's flagship education project, the *Rolls-Royce Science Prize*, encourages excellence in science teaching. Alongside the Science Prize there are a *range of local education activities* that schools near to its sites can engage in. Workshop-based activities offered to local schools include *Schools for Engineering, Science Alliance, Tracks, High Flyers and Vroom*. Around 200 Rolls-Royce employees are *Science and Engineering Ambassadors*.

On a smaller scale, a number of Rolls-Royce employees engage in *literacy, numeracy and science* projects with local schools; and in *student, teacher and headteacher mentoring* projects. The company is supportive of employees who

are *school governors*. The company sponsors an *education worker* at the national forest in South Derbyshire and supports the *Environmental Education Project* for schools run at Rosliston. A new engagement to provide a similar resource at Folly Farm in the Bristol area is planned.

Each year the company supports the UK's *National Science and Engineering Week* (March) and *Enterprise Week* (November). The Rolls-Royce [education webpages](http://www.Rolls-Royce.com/education) ([www.Rolls-Royce.com/education](http://www.Rolls-Royce.com/education)) offer an opportunity to provide resources, and to enthuse and inform students and teachers about engineering, science and technology. The *Cub Scout Scientist Badge* is reported to have attracted a huge demand.

Rolls-Royce has helped to *sponsor around 30 schools* that have achieved specialist status in science, technology and engineering. The company's education activities are aligned with the Rolls-Royce apprentice and graduate recruitment strategy and activities. It supports *careers fairs, school talks and career-focused workshop activities* in-school and at the Rolls-Royce sites. Rolls-Royce is engaging with the new *14-19 diplomas* and will offer placements for students studying the new Engineering Diploma, which will be introduced from September 2008. In addition, the company will continue to offer *work experience* placements, usually of one week. As part of their induction into the company, trainees participate in a community project during their first few days with Rolls-Royce.

### **The Rolls-Royce Science Prize**

Open to all schools and colleges in the UK and the Republic of Ireland, the Science Prize offers schools the chance to win up to £20,000 for science education. The programme has been developed in consultation with a team of teachers and advisers. It is supported by a dedicated website that gives detailed information on the programme. The site also includes a database of previous winners that encourages and supports sharing of good practice and provides ideas and inspiration for new proposals. Appearing on the database is a condition of entry if the proposal meets the qualifying requirements.

Teachers can enter in three age categories: 3–11, 11–16 and 16–19. They are asked to submit an idea for a science-teaching project that meets a need in their school or college. The project can be in any area of science. It can be a new idea or a development of something they have been working on for some time. The most important thing is to be innovative and come up with unusual ideas. The prize promotes teamwork by asking teams to submit their proposals. Teams can comprise head teachers, deputy head teachers, heads of science, science teachers, laboratory technicians, other subject teachers, class teachers, teaching assistants, school governors, parents, and representatives from industry, education and academia.

The Rolls-Royce Science Prize is a two year competition. During the first year, teams submit entries in the form of proposals. They are judged by a group of teachers and science education advisors, who recommend a shortlist of five finalists in each age category. Rolls-Royce then selects the three finalists from

each age category to receive £5,000 each, a digital video camera, and a specialist mentor who supports the finalists to implement their proposals. The fifty schools submitting proposals of a very high standard, but not reaching the finals, receive a Special Merit Award of £1,000 each. During year two, finalist schools work with a mentor to carry out their proposals over a 24-week period. They also document their work in an online diary and record their progress in a video using their cameras, which is assessed by judges. One submission is recommended as a winner and another as a runner-up. At the Rolls-Royce Science Prize awards dinner £15,000 is presented to the winner and £10,000 to the runner-up. All teams that submit an entry receive a Rolls-Royce Science Prize certificate.

The company invests £120,000 in prize money each year. By June 2008, £440,000 will have been awarded to 196 schools to improve science learning for over 160,000 pupils. The winning schools are announced in June at an annual awards dinner. The Nine finalist schools receive support from Science and Engineering Ambassadors (see below). In addition, a database of hundreds of freely available “bright ideas” for teaching science subjects in a creative way is being generated to showcase on the Rolls-Royce Science Prize website ([www.Rolls-Royce.com/scienceprize](http://www.Rolls-Royce.com/scienceprize)).

### **High Flyers (Derby and Bristol)**

The workshop (for ages seven to nine) comprises a series of interactive exercises and an element of performance. Each workshop runs for a half day with a whole class. The pupils are taken on a journey around an “Engineering World”. They learn key concepts about engineering and the jet engine through a variety of media, including discussions, small-group activities, design activities and puzzles. The activity is designed and managed by trainees.

### **Science Alliance (Derby)**

The concept of Science Alliance was introduced to the UK from Delaware, USA, by the Centre for Science Excellence at Sheffield Hallam University. It is a programme that links Rolls-Royce scientists and engineers to primary schools. Company personnel are directly involved in science lessons, helping to make the practical part of the National Science Curriculum more interesting and enjoyable for children aged between five and 11. Rolls-Royce personnel work both with teachers and students to support them to achieve their aims. Rolls-Royce acknowledges that the initiative is mutually beneficial, with employees gaining new skills and enhancing their professional and personal development while schools gain support to increase pupils’ attainment in science as a Science Alliance volunteer explains:

*“Working within the classroom and explaining basic concepts or ideas to children has greatly helped me to improve my communication skills both inside and outside work. Helping the children grasp new ideas and skills is very rewarding and makes you feel as if you are contributing towards their future.”*

## **Schools for Engineering Project (SEP) (Derby)**

Schools for Engineering is run in conjunction with the Industrial Trust for ages 11 to 16. The project takes the form of an interactive exhibition around the life cycle of the gas turbine aero-engine, from market analysis to after-sales service. The project culminates in a visit to a full-scale Trent engine in the Technology Exhibition, a trip around the Heritage Centre and a quiz. The activity is designed and managed by trainees, who host groups of Key Stage 3 or 4 students from local schools.

## **Vroom Power Challenge (Derby)**

The Vroom Power Challenge is a competition for Year-9 students aged 13 to 14. It encourages participants to work in teams while learning how to solve real engineering problems. Their challenge is to design, build and race a pedal-powered go-kart. In designing, building and racing their go-kart, teams are supported by Rolls-Royce employees, who help them learn new skills while producing a quality end product. It consists of three phases:

*Design:* Based in school, the teams consider how to steer, brake and transmit power, while bearing in mind that this must all be done using bicycle parts welded together.

*Build:* Based in Rolls-Royce workshops, under close supervision from Rolls-Royce staff, students work on Saturday mornings to fashion their machines from steel tubes and salvaged bicycle parts in preparation for race day.

*Race day (annually in July):* The teams race their karts. They compete in four categories judged by Rolls-Royce employees: Best Design Portfolio, Best Kart Design, Rolls-Royce Charity Cup, and Race Winner. Tactics are important: what line to take through the corners, when to change drive, how hard to push the karts. The initiative also aims to support local charities by raising funds for them. Each school is required to choose a charity to support by collecting sponsorship money; and the school that raises the most money for its charity wins the Rolls-Royce Charity Cup.

## **Tracks (Derby)**

*Tracks* is a workshop aimed at Year-9 students. The workshop introduces them to large, global companies, and informs them about jobs available and the skills needed to do them. Participants gain an increased awareness of careers in such companies, a chance to practise the skills needed in the world of work in a pleasant environment, and real-life role models.

## **Forces and Motion (Bristol)**

*Forces and Motion*, for primary pupils aged nine to 11, comprises two modules. The first contains presentations, discussion and pupil participation linked to the science curriculum. The second involves the pupils working in small teams to design, build and test a jet-powered aircraft.

## **ABLAZE (Bristol)**

ABLAZE (A Bristol Learning Action Zone for Education) is a partnership between business and education to support all schools in Bristol. It is an independent

charity founded by local businesses such as Rolls-Royce, Airbus, GE, HSBC and HBOS. It began life as the business support group for the Bristol Education Action Zone, and has the aim of improving attainment, attendance and achievement in Bristol schools. It is recognised by the Local Authority as the primary link between the authority and local business.

As one of the founders of ABLAZE, Rolls-Royce continues to support the charity by providing support to local primary and secondary schools.

### **Science and Engineering Ambassadors**

The Science and Engineering Ambassadors programme is a UK-wide initiative run through STEMNET. The Ambassadors are Rolls-Royce employees who receive STEMNET induction before they work to support teachers in schools and colleges and enthuse young people about science, engineering and technology. There are over 200 active Science and Engineering Ambassadors in Rolls-Royce who support science and engineering-based challenges and activities with local schools on a regular basis.

### **School Governors**

There are around 200 employees who are parent, community or Rolls-Royce sponsor governors of local primary and secondary schools. They apply their business expertise to an education context running a school at a strategic level.”. The governor community is supported through an annual conference, local site briefings and an electronic e-mail network. The governors are seen as a useful source of feedback and a direct channel into schools. Each year Rolls-Royce makes £25,000 available to governors who can apply for grants of up to £1,000 for projects to promote science, technology and engineering in their schools.

### **Working with Partners**

Rolls-Royce works closely with the government, academia and range of national and local organisations that promote Science, Technology, Engineering and Mathematics (STEM), such as the Engineering and Technology Board, the Royal Academy of Engineering and the professional institutions.

### **Impact**

The company undertakes a range of formal and informal impact assessments and works with key partners to evaluate its education outreach activities. The key aims behind the company’s education outreach support are to widen the pool of high quality talent from which it recruits and to enthuse and excite young people about engineering, science and technology (see section below on company benefits).

Key education programmes such as the Science Prize and Science Alliance gather evidence, anecdotal and where possible more formally, to assess their impact (see section on educational benefits below).

The company sets clear criteria about the objectives of its funding support for partners and participates in regular planning and review meetings to assess the impact of its support. For example, The Industrial Trust evaluates the impact of

the Schools Engineering Project on Rolls-Royce's behalf and the company is represented on the Steering Group of the Environmental Education Project at Rosliston Forestry Centre in South Derbyshire.

## Company Benefits

The Science Prize is central to the company's education programme. It is a long-term project that is already showing significant benefits. Entering schools and colleges have seen an increase in the numbers applying to science-related degrees. In the long term this will help to increase the pool of available science and engineering graduates in the UK.

John Leggott College in Scunthorpe has increased the number of students going on to study physical-science-related degrees by over 100 per cent. It has also seen considerable improvement in the retention rates from AS to A2 with 98 per cent of pupils completing courses.

Over 700 employees have been involved with the Science Prize in the last three years. Their involvement is a key driver for the competition. The programme helps employees to maintain links with the community and gain a range of skills from communication and relationship development to project management.

Graduate trainees are one key group of employees. Trainees are tasked with developing relationships with finalists to support projects. They talk to students about careers, develop press releases and help with video editing. Each project exposes trainees to a range of skills that they would not find in their day-to-day jobs.

The company sees major benefits to the recruitment, retention (the staff turnover rate is exceptionally low) and development of its staff. Working on local community projects forms a key part of development programmes for trainees and managers. Working on education activities, employees get the opportunity to develop a range of personal skills, including interpersonal savvy, learning on the fly, organisational agility, political savvy, understanding others and presentation skills. More generally, in a context in which the number of students studying physical science degrees has fallen by approximately half in the past 20 years, by supporting science teaching and learning through programmes such as the Science Prize, Rolls-Royce is ensuring that there are talented engineers and scientists in the UK and Ireland from which it can attract future employees.

It is important to note that the educational programme is deeply integrated into staff development. The term "volunteer" is not used, because the activity is not "voluntary", but part of essential CPD for employees.

## Educational Benefits

The Rolls-Royce Science Prize is unique in that teams can address any area of science teaching in a way that meets the needs of individual pupils rather than being told what to do. Schools are finding that the projects motivate staff and

pupils. This motivation leads to an increased desire to improve skills and knowledge.

“Last year was our best ever year for Advanced Physics results. Much of the motivation comes from our Science Prize project filtering through to mainstream lessons, assignments, enrichment opportunities etc.

More girls, especially, are engaging with physics/technology. The impact of the Rolls-Royce Science Prize project on the uptake of Physics courses at HE seems to have been significant – engineering applications are also very buoyant”. *Howard Darwin, John Leggott College.*

By helping teachers to improve the scientific skills of their pupils the company is helping society in two important ways (see box below).

We believe our future prosperity, crucially, depends on our ability to innovate, move up the value chain and compete by incorporating innovation in products and services that we can sell globally. This holds true for the whole of the British economy.

We need scientists. Clearly there has been a lot of concern about the decline of science in our schools and universities, but paradoxically, there’s never been a better time to be a scientist. We are interested in having a pipeline of the best of the best to enable us to be competitive in a growing market in a global opportunity.

If we look at the problems that surround us today that are associated with things like climate change, the implications for water availability etc, the way that we’re going to mitigate those is through large-scale, scientifically based, industrial solutions, which are going to require immense skill to implement on an industrial scale. And it is going to be engineers and scientists that are at the heart of that”. *Sir John Rose, taken from a speech given at last year’s Science Prize Awards Dinner.*

Professional development is an important requirement of each entry. Teachers must demonstrate how their skills and those of their pupils are improved by the projects. By supporting teachers’ development we are ensuring that a greater number of pupils will benefit from the Science Prize.

Comments on the Science Prize support the following benefits, among others:

- The combination of financial support, advice and mentoring leads to both a morale boost and a financial boost, thus ensuring a successful project and an enriched curriculum; and
- Pupils are encouraged to appreciate science in a fashion that is not covered by the way science is usually taught.

In the case of Science Alliance, there is evidence of improved Key Stage 2 SAT results. From the outset, the central aim of Science Alliance was to help

children's learning in science in order to raise their achievement. Ofsted inspection reports for the schools taking part in Science Alliance have included favourable comments from the inspection teams about the involvement of Rolls-Royce engineers in their science work.