



ST. BENEDICT'S CATHOLIC HIGH SCHOOL

**DEVELOPING LEADING EDGE PRACTICE IN
ENGINEERING BASED STUDY SUPPORT ACTIVITIES**

May 2009

For case studies linked to QiSS recognition please indicate at which level:

Advanced

And related to which theme(s) of the Code of Practice

Section 1.5, 2.8, 2.9, and 2.11

Introduction to the school

St Benedict's is a successful 11-19 Voluntary Aided Catholic co-educational secondary school built on the south-east edge of Whitehaven within the Cumbria Local Authority and under the trusteeship of the Diocese of Lancaster. It is a specialist Engineering College in its 2nd phase of designation. The Georgian port of Whitehaven is situated on the Irish Sea coast a few miles away from the western boundary of the Lake District National Park. The School is in the Hensingham area of Whitehaven which is the principal town of Copeland with a population of approximately 25,500.

St. Benedict's is recognised both locally and nationally as a particularly successful faith school which serves a diverse community. Learners come from a wide range of socio-economic backgrounds. CAT data shows that attainment on entry is lower than average in all years and significantly below average in some years. This is supported by Yellis data at Year 10.

Target Group / Key Stage:	FSM /SEN/ EAL:
Key Stages 4 and 5 for our pupils and Key Stages 2 to 3 for our partner work	10.3 % FSM 20 % SEN 1.3 % EAL
Local Authority : Cumbria LA	School /Centre: St. Benedict's Catholic High School

What was it like before?

Study Support activities have taken place at St. Benedict's for a number of years – well before the school started the QISS process. The programme has become much more formalised and the school was awarded 'Established Study Centre' status in February 2006 through the national Quality in Study Support programme. In 2006, Ofsted praised our 'extensive and impressive range of out of hour's activities' and this has grown further since that date.

Since 2002 we have operated as a Specialist College for Engineering and one of our study support strengths and elements of uniqueness are the range of activities, partnerships and community work we do around this area. This case study will be based around elements of leading edge practice that makes St. Benedict's unique.

The main area we will look at is the training of Science, Technology, Engineering and Mathematics Ambassadors (STEM Ambassadors) – an activity which involves our pupils, industry partners such as Sellafield Ltd, United Utilities, Capita Resourcing, Atkins and STEMNET as well as community stakeholders including our 5 feeder primary schools.

Science, Technology, Engineering and Mathematics Ambassadors (STEM Ambassadors):

- Deliver activities such as Science and Engineering clubs
- Help with school competitions, events and awards
- Offer mentoring to peers and younger pupils
- Act as role models to young learners

What are the benefits to our partner schools and pupils:

- Science, maths, design and technology, and engineering become relevant to the everyday experience of pupils
- Better motivation, more confidence and enthusiasm in school
- Opportunities to improve key skills as well as increase understanding in science, maths, design and technology, and engineering (STEM subjects)
- Better understanding of the opportunities that a career in science, technology, engineering and maths
- can offer

Why did we set up this particular programme?

To give primary school pupils an insight into engineering at an early age and encourage them to think about the role engineers play in life. The project work involves designing, manufacturing body parts and an electrical breaking light system for the pedal power go-karts. This covers a variety of engineering activities and we wanted young learners to take up STEM based subjects later in their education and explore careers in this area.

The project work helps increase pupil understanding of STEM based subjects and how they link together. This is achieved through a variety of fun projects that pupils at Key Stage 1 and 2 become involved in. Primary school teachers also benefit from the projects as they receive CPD through the activities in these areas. This enhances their own practice.

Key Stage 2 SAT's results have increased above predictions over the 5 year period since inception showing that the impact the programme has on raising attainment and achievement. This has also impacted upon the development of the Year 7 Design Technology curriculum offered in school to further raise attainment and achievement levels.

Why were certain pupils targeted?

The STEM Ambassadors are Year 12 and Year 13 students studying AS / A2 Engineering. In the current academic year (2008/09) there are approximately 10 students fully trained to deliver the knowledge and skills through the project work. They were targeted in the hope that they would be able to build skills and develop the understanding of others in the STEM subjects. They also develop as role models to others and undertake these activities in their own time as an enrichment activity outside the normal curriculum.

What was planned?

The project was initially thought of and planned by the school's Director of Engineering and snowballed from gaining Engineering specialist status. This programme was fast tracked due to additional funding from the 'Grow Your Future Workforce' scheme supported by United Utilities for over 5 years in order to deliver project work in the 5 feeder primary schools.

Did you involve partners?

Our industrial partners, Sellafield Ltd, Capita Resourcing, United Utilities and Atkins provide 2 engineers per feeder primary school to deliver Junior Young Engineers Clubs where the STEM Ambassadors assist.

STEMNET (Science Technology Engineering and Mathematics Network) aims to ensure that more young people in the UK make a choice to enter science, technology, engineering and mathematics (STEM) related careers at all levels, and future generations are properly informed about the science and technology that surrounds them.

With the support of its partners, STEMNET achieves this in two ways:

By bringing science, technology, engineering and mathematics activities, experiences and excitement into classrooms throughout the UK, enhancing and enriching the national STEM curriculum.

By linking those companies and other organisations that employ STEM educated people, and schools, in such a way that young people can get a clear idea of the diverse and exciting range of careers available to them.

STEMNET has received funding from the Department of Trade and Industry since 1996 and now continues to enjoy support from the DIUS (Department of Innovation, Universities and Skills) and DCSF (Department of Children, Schools and Families) since then. As a national organisation, it works hard to ensure that no region of the country is disadvantaged, by comparison with any other, with respect to STEM opportunities. STEMNET train our students to become STEM Ambassadors.

STEMNET's vision

A society where young people, regardless of background, recognise the

contribution of Science, Technology, Engineering and Maths (STEM) to their lives and more are choosing to pursue STEM qualifications and careers.

Through Ambassadors, teachers have opportunities:

- To set up, expand and have extra support for extra-curricular activities
- To develop more varied teaching and learning styles
- To update their knowledge of contemporary science, technology and research processes
- To learn more about local companies and linking opportunities

By encouraging business partners to assist in the Science and Engineering Ambassadors programme, employers enjoy the following benefits:

- Career development of staff
- Increased profile in the community
- Raised interest among future generations as potential employees in the sector
- better understanding of the education system

What happened?

As a STEM Ambassador, students must be involved in at least one project either in school or with the primary schools. To date, there has been no student who has withdrawn from the scheme.

Were there unexpected funding problems?

Grow Your Future Workforce funding ended in 2008 so the school has funded the programme through the specialist engineering fund at an approximate cost of £3000 per year.

Describe a typical session for the 'fun' element

The STEM Ambassadors meet once a week with their nominated primary school in the workshops at St. Benedict's from 3.15pm to 4.30pm from January to July each year. The primary school pupils make the parts to attach to the pedal powered go-karts ready for judging in July where they have a 'RACE DAY' where they compete against the other 4 primary schools at Rowrah Race Track. They are judged on their folder work, the actual design of the go-kart and the breaking light system where they have to tell the judges exactly how they made the parts and how the breaking light system works. All participants receive a goody bag, certificates and medals. The overall winners receive a trophy each.

Why did it work? Not work?

As the programme has been running a few years they project is fairly refined and has a growing level of pupil involvement. Initially there was a commitment both in terms of finance and time from our business partners the only main issue was transportation due to staffing by the primary schools but this tended to be overcome with careful planning. Over time however, funding has reduced and the activities are currently funded out of the school budget and through sponsorship.

What has been the impact and how was it verified?

Key stage 2 SAT's results have increased above predictions over the 5 year period since inception.

When the pupils from our feeder primary schools come to St Benedict's Catholic

High School, they come with increased confidence as the project work improves the transition process with staff being known to them and the school buildings being familiar (for example one of the primary schools only has 5 or 6 pupils coming to a secondary school of 1410)

The STEM Ambassadors gain confidence in communication, team work and leadership skills which are transferable into their future career pathways be it higher education or employment. The programme is aimed at Post 16 students and is unique as STEM Ambassadors are usually graduates. It is therefore useful for CV's and during the interview process

STEM Ambassadors have also been used at activities held in school such as a Year 9 Smallpiece event in school where they acted as peer mentors and helped in the delivery of the programme.

Of our current Year 13 STEM Ambassadors, 100% of the cohort have applied for STEM related university courses to study courses such as Mechanical Engineering, Aeronautical Engineering and Civil Engineering or have gained work with leading companies in the Engineering fields.

What have you learnt and what are the next steps?

We have learnt that students involved in practical learning make good progress and are well behaved and motivated. They also need to part of the development of the programme and its activities so we provide opportunities for student voice.

To raise appropriate funding for this project work so that it can continue for years to come and to raise awareness of STEM initiatives. Also, to persuade more business partners to become involved so that the programme can grow further e.g. to use the West Cumbria Business Cluster to help develop and have an input in projects. We also want to increase the number of STEM Ambassadors so that they can participate in more Smallpiece activities and other events such as recruitment of Post 16 students; teaching and learning assistance in classes for practical activities and primary school projects.

Case Study Reference:

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