Enriching the primary curriculum via education – industry liaison

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This article describes:

- collaboration between a primary school, a manufacturing firm and a teacher training institution
- enrichment of the primary curriculum via education-industry liaison to improve mutual understanding between industrialists and those involved in education.

Introduction

Visits by secondary school students to industry, often on work experience in Years 10 or 11, are commonplace; visits by primary school pupils to industry less so. This paper records the experiences which resulted from a partnership between three institutions: a primary school (Coton Primary School, Coton, Cambridgeshire), a manufacturing firm (Ciba-Geigy Plastics, Duxford, Cambridgeshire) and a teacher training college (Homerton College, Cambridge). In their separate ways all three institutions already had experience of education-industry liaison prior to the project that is described here. Coton Primary School had undertaken topic work involving horticulture and the marketing of plants, whilst Ciba-Geigy and Homerton College had collaborated on industry-based problem-solving projects for primary teachers and trainees with chemistry or physics as their main B.Ed. degree subject.

The aims of the project

Informal discussions between the then Head of Coton Primary School, Ciba-Geigy training staff and myself revealed a common wish to promote cooperation between the three institutions. The aims of such cooperation were seen to be fourfold:

- to improve mutual understanding between industrialists and those involved in education
- to help teachers (at primary and tertiary levels) to acquire a better understanding of industrial enterprise
- to enable children to develop a fuller appreciation of industry
- to help children's learning in technology and other subjects through industry-related activities.

Putting the aims into practice

Having agreed on these common aims, we then decided on the following sequence of visits to help realise our aims:

- a visit by Coton Primary School teachers to Ciba-Geigy
- a visit by Coton Primary School pupils to Ciba-Geigy
- a visit by Ciba-Geigy personnel and trainee primary teachers at Homerton College to Coton Primary School.

(I went on each visit too.)

Each visit, whilst conceived with the overall project aims in mind, was planned with different objectives and with activities tailored to the different groups. For example, the first visit – that of Coton Primary School teachers to Ciba-Geigy – had two objectives:

- to provide primary school teachers with opportunities to gain some first-hand experience of manufacturing industry
- to give the teachers the opportunity to reflect on this experience with a view to preparing a programme of events geared to realising the project aims with their own pupils.

In fact, both these objectives were met and, in addition, a noteworthy gain was the establishment of a good rapport between the teachers and their industrial hosts. This was an important feature that was to develop progressively throughout the duration of the project.

Pupils' expectations of industry

Before the visit by the pupils and their teachers to Ciba-Geigy, the teachers held class discussions with their pupils about industry in general and Ciba-Geigy in particular. Pupils aged 6 to 9 were asked to write down what they thought a firm like Ciba-Geigy would be like. Their views make for very interesting reading. Here are three examples.

"I think the factory will have lots of tubes all over it and lots of little rooms with little windows and silvere wall and humming noises. I think it will be fun to see a real factory. I think all the people will be wereing white clothes."
Beccy (8 years)

"I have never been in a factory. But this is what I think it will be like: noisy, busy, shouting, messy. Lots of people. I reacon there will be files everywhere. And signs saying private. Lots of doors, clicks, metal box, cardboard. Lots of people wearing uniform. Lots of structures and dustbins."
Rebecca (8 years)

"I think Ciba-Geigy would have parts of planes not painted all around the aerospace department and machines that punched holes in the light metal. A machine powered by electricity, a thing like a photocopier, pieces of metal on a conveyer belt with a very strong piece of metal coming down on the other pieces of metal. I think that there'd be a man planning aeroplanes on a computer and people working on computers seeing plans of aeroplanes and computers answering difficult questions."
Christopher (9 years)

Pupils' experiences of industry

As one might expect, the post-visit comments by the pupils showed that some of their pre-visit expectations were borne out and others changed considerably. For example, one pupil wrote:

"Ciba-Geigy was much bigger than I thought it would be. The whole system was much more complex than I had put in my description before I went to Ciba-Geigy. I was right about it having tanks full of chemicals outside the factory for making Araldite and plastics. I was also right about the hard hats but not about the white coats. I found it amazing to think that the fire-proof honeycomb was used in the construction of aircraft. It was very interesting to see that video about what Ciba-Geigy did and made. It was very interesting to know that the bodies of Lotus Elite cars were stick together with Araldite. I think I learnt a lot from the visit to Ciba-Geigy."
Nicholas (9 years)

Of particular interest are the collective views of the pupils about Ciba-Geigy. These were recorded under four headings as follows.

What we learned from the visit

- The ways in which the workers cooperated
- Safety regulations
- How to make honeycomb – ways of trapping air for light strong materials
- How important accuracy is
- Some jobs are very tedious
- Uses for Araldite
- How storage is organised
- How our maths is applied in industry
- Honeycombing (Aeroweb) is used in propeller blades and aircraft wings.

What surprised us about Ciba-Geigy

- Everyone had to wear safety glasses
- Ways Araldite is used for mouldings and sticking (car etc.). How 'good' the safety door was
- How vast Ciba-Geigy is
- No waste from trees because everything can be used for chipboard
- How little air pollution (smell) there was
- There was no obvious production line
- Unhurried pace.

What we enjoyed

- Finding out about Ciba-Geigy
- Wearing the glasses
- The refreshments.

Changes we'd like to make

- Design of buildings, more landscaping
- Make inside of buildings more colourful for the workers

Follow-up work to industrial visit: making bridges (Coton School Year 3)

- Not store canisters of chemicals so high
- Use higher shelves for smaller items or those which wouldn't cause damage if they fell
- Camouflage tanks
- People with boring jobs should be paid more.

Industrialists' experiences of primary education

In the final phase of the collaboration, industrialists from Ciba-Geigy and trainee teachers from Homerton College visited Coton Primary School and saw the results of the follow-up project work on bridges and flight which pupils had done as a result of their visit to Ciba-Geigy. Some of the comments made by the industrialists as a result of their visit to Coton Primary School are particularly interesting:

"I am enthused about what exciting things are happening in some schools – pleased that efforts are being made to help children become more questioning and adaptable."

"I found it surprising that the children had learned so many lessons from what was to us a comparatively simple visit. They obviously noticed far more that we do, for example, on how well we cooperate with one another. A fresh view, uncluttered by too many preconceived ideas can see the obvious when those closer cannot. They were also astute enough to realise that, for example, although some jobs were boring, others were much more interesting. This is a major step forward from the common idea that factory = production line."

"I have personally learned that today's teachers of very young children play an important part in the formulation of the youngsters formative years. This way of teaching prepares the child to stand on his/her own feet when going onto the secondary stage of education."

"The tour of the site and the visit to Coton turned out to be a very worthwhile exercise. At the start of this it was quite difficult to envisage such young children taking an interest in 'our world'. The outcome has been both enlightening and encouraging."

"Industry should pay greater attention to primary school education."

Was it worth the effort?

A lot of time and energy on the part of all those involved – teachers, industrialists, pupils and the College tutor and his students – was invested in the pupils' visit to

Presentation of class work to visiting industrialists in school assembly

the factory, in the follow-up work, and in the industrialists' return visit to the school. Was it worth the effort? The response is a convincing 'yes'.

- The project provided an opportunity for the school to meet the requirements of the National Curriculum in terms of introducing young people, in a meaningful way, to the world of work outside school. The visit was a powerful and long-lasting reference point that gave relevance and a greater significance to subsequent classroom activities. It helped pupils to begin to see that school is not a self-contained world-of-its-own which exists apart from the rest of life but that the skills that are learned are similar to the skills used by adults in the work place. At a more mundane level, the pupils encountered structures and materials in context (like the honeycomb structures which seemed to have had a strong impact) - something that is simply not possible in the classroom.
- The visits created opportunities for pupils to develop their social skills through talking and asking questions on their visit and, later, through the chance to present their follow-up work and explain it to when their hosts returned the visit and came to their school. The 'feedback loop' provided by the follow-up visit was a very important aspect of the overall project. There were also, of course, benefits to the student-teachers who saw the value to children's learning of linking classroom work with 'real' structures and purposes in the world outside school.
- There are benefits for teachers that should not be overlooked – especially at a time when teachers feel that they are getting a bad press! Those involved acknowledged their pleasure and pride in having their work appreciated and respected by industrialists on their follow-up visit to the school. It was another justification for the extra effort they had made.

Overall, pupils, industrialists, teachers and student teachers thought that the project had been stimulating, informative and worthwhile at many levels. What we learned from this venture was that where visits are well planned, where pupils are well-prepared to make the most of the opportunity for learning, and where visits are well integrated with work done subsequently back in school, their potential for supporting routine learning and for influencing pupils' attitudes to school work and work outside school is tremendous. We should not underestimate young pupils' capacity to understand quite complex ideas, structures and processes, nor their capacity to apply their new insights in subsequent classroom work.

LIZ DONWORTH
Colleagues will be saddened to hear of the untimely death of Liz Donworth. Liz served as a staunch member of DATA's first primary working group and was a member of the Primary DATA editorial board. She brought to the group a wealth of classroom experience as well as a keen and active involvement in all its activities. Her contribution to the success of the first DATA annual conference was truly significant.