TSNews

Can we learn from the US?

When we began in June 1994, the TSN was modelled upon the Science and Health Education Partnerships that began in San Francisco seven years earlier. Information from this project helped guide us through the initial development of TSN and into what became a partnership scheme adapted to our own local conditions.

Two years later, and conditions had changed; a number of issues arose that suggested the TSN might need to expand its activities and styles of partnership, e.g. the provision of training for scientists and teachers, the involvement of other institutions and industry, and the possibility of increasing communication amongst its members by, for example, electronic mail. It seemed sensible once more to tap into the experience of our American colleagues, this time by a small and representative team visiting the US. Prof. Bruce Alberts, President of the National Academy of Sciences, kindly offered his offices to arrange an effective itinerary, and The Gatsby Foundation agreed to fund the 10-day visit. A full report is being produced which lists and describes the many projects seen and the general outcomes and lessons learned by those operating them. Most of this TSNews reproduces shortened sections from the full report.

The purpose of the visit, which took place in the Spring, was to gather useful information about partnership schemes involving the science community and teachers—what sort of partnership schemes there are in the US, what they do, how they are funded, how they are managed and what works well and what doesn't.

The visiting team of four represented all sections of the TSN community—Carol Bennett from Lodge Lane First School, Frank Chennell as the TSN Co-ordinator, Keith Roberts for the scientists and Chris Webb from Stalham High School. The visit took place from 26 March to the 4 April 1996, with the whole team in Washington DC until 30 March. It then split up for individuals to see schemes in Baton Rouge, Madison, and San Francisco.

Annual Meeting 1996

Our Second Annual Meeting took place on 18 April 1996 with over 60 teachers and scientists attending. The main event at this year's meeting (and at the follow-up meeting on 6 June) was reporting upon what we found in the US partnership schemes and, in the light of this, discussing possible future directions and initiatives for TSN. These are the main points that were discussed:

1 Teacher professional development at all levels.
2 Education workshops for scientists.
3 Electronic networking for TSN schools via the Internet.
4 Mini-grants for partners who are developing a curriculum 'package' (see page 4).
5 'Quick response' twilight sessions for teachers on topical science issues (see page 4).
6 A teacher scientist residential week-end conference to produce classroom investigations.
7 Involvement of school science technicians.

The TSNews will keep you informed on developments.

Annual Meeting 1996

Teacher Scientist Partnerships - The American Experience

Why Partnerships?

The science and the education communities working together provide a powerful stimulus for a better science curriculum and unique support for its delivery in schools.

Science teaching and learning in the United States, particularly for younger children, has tended to be patchy, with little practical or investigative learning, with few materials and poor curriculum guidance. Many American partnership schemes arose from the drive for systemic reform of school science; for more practical, investigative science delivered in an appropriate context for all children.

The National Science Education Standards (1996), reviewed in the last newsletter, spells out the purpose of science for all school children and sets standards for its delivery and its support in schools. Many collaborative schemes relate to these standards, or local variants of them, and try to work within the Standards framework. Nevertheless, there is still plenty of scope for flexibility and the freedom to meet local needs and conditions in whatever contexts and programmes of delivery that suit. A project for 5-11 year-olds on the West Coast for example, exposes a whole school for a week of Marine Science that uses a range of practical science and a number of cross-curricular experiences all geared to the ocean. A curriculum project in Louisiana centres its science on experiences and investigations using the forestry resources there.

American partnerships of all types have generated imaginative, new and locally relevant investigative science for school children, together with–and this is important–the necessary support and inservice training for teachers.

Here in the UK we have the National Curriculum. And although it is possible to deliver national curriculum science within a variety of contexts, its prescriptive nature, its detailed content and its confined assessment demand can inhibit the range of experiences and contexts of delivery that many American teachers now enjoy. Although it is likely to be more difficult, British teachers trying to deliver science in similar contexts and styles that seize children's interest and imagination, can manage it providing they have the right support and resources.

Learning from the American experience, partnerships between our educational and science communities should be well-placed to help with such support and resources.

Main Features of American Partnerships

There are many forms of partnerships and networks ranging from individual teachers partnered with a single scientist, to partnerships between industry and national educational organisations. Often there is a network of multi-layered partnership activity; within a large partnership between institutions there are usually teams of scientists and teachers working together as well as individual partnerships. Partnerships between large organisations will have negotiated goals, last for an agreed minimum period and often involve funding agreements. Individual partnerships on the other hand tend to be informal, and range from one-off meetings to long standing relationships of many years.

At all levels, there are two common styles of partnership:

Top down–where one partner is the major benefactor in the sense that information and resources flows from the benefactor to the recipient. Usually, the information and resources offered are non-negotiable, and sometimes self-serving. Sometimes the cost of the project in terms of time and cash value of resources is not matched by its utility to the recipient, with the likelihood that neither partner gains.

Collaborative–where both partners work together towards an agreed common goal, and information and resources are exchanged between partners. Although the cash value involved is usually small, the service value of this two-way flow is likely to be high, with both partners gaining.

Lessons learned

In the past decade many styles of partnerships have arisen throughout the US. Some have blossomed, some have

Jan Tuomi, National Research Council Washington DC, shares a decade of experience in teacher-scientist parnerships. Left to right: Frank Chennell, Carol Bennett, Jan Tuomi, Chris Webb. (Keith Roberts behind the camera)

died, and a wealth of useful information has accumulated. There is considerable agreement by project operators over what is likely to be successful and what is likely to fail. Here are the more important of these.

Talks/lectures by scientists to schools. One-off talks and lectures to school children by scientists, however well-delivered, are usually the least effective of all possible activities, although they can be used effectively as an entry point into other partnership activity.

Laboratory fellowships for teachers. It is difficult to attract applicants. Teachers are often unwilling to lose holiday time, and they are sometimes inhibited by their own perceived ignorance. Fellowships are costly, the benefits are unclear and the teacher's experience is usually not transferable to his/her classroom situations.

Uncertainties and suspicions. Many teachers are initially suspicious and apprehensive of working with scientists; they are worried that scientists will make judgements about their competence level in science. High school science teachers feel particularly vulnerable because of the expectations of competence their science training carries. Equally, scientists are nervous about working with teachers, especially when in the classroom. They doubt their ability to cope with children, their ability to communicate appropriately, and their understanding of the school curriculum and the mores of classroom practice.

Personal empathy in partnerships. Really successful partnership activity takes place when the individuals involved are compatible at a personal level. By the same token uninspiring or failing partnerships are usually more to do with poor personal understanding and inadequate communication between individuals than with practical considerations such as locality or time commitment.

Induction. Good induction helps dispel fears and worries. Advice on surprisingly simple things like how and when to contact each other is also important. Most important is making sure that each side of a partnership understands and addresses the expectations of the other, and to ensure there is clear understanding and agreement of the purpose of the partnership and of each person's role within it.

Teachers' professional development Partnership activity at all levels is likely to be more successful when it includes, or is directed towards, involving scientists in teacher professional development. This is further enhanced when it is linked with teacher accreditation.

Scientist's training. Scientists appreciate help in coming to terms with the educational environment, usually through seminars or workshops sessions involving teachers.

Size of networks. Networks of individual partnerships should not be too big; they becom too difficult to support and manage. It is better to have several small networks than one or two large ones. Although nurturing partnerships and monitoring their activities are important, in practice they are difficult to do in large networks and many now no longer attempt to undertake them long-term. Because half-hearted partnership commitment is almost certain to fail, it is better to have a smaller, but selective entry into the network.

Titles. Descriptors such as 'mentor' or 'advisor' attached to scientist partners discourage genuinely collaborative work; partnerships work best when it is perceived as a partnership of equal, but different, expertise.

Partnership manuals Publishing 'How-to' manuals on individual partnerships is not a good idea, they tend to be slavishly followed and encourage stylised activity, and partnerships work better when they develop their own characteristics. However, booklets of ideas and representative case studies are useful starting points. Factual information on curriculum, school structures, educational terms and 'survival' hints are also useful.

Goals. Scientists find it more rewarding when working in a wider perspective than their normal narrow field (some schemes deliberately put scientists in partnerships that have a focus outside their immediate speciality). A good partnership focus is when the working context is beyond the expertise of both partners, (e.g. ensuring gender equity in the science programme, or developing a science unit that addresses a particular environmental or social issue). The goal should be achievable, relevant to the current curriculum and of personal interest to both partners.

Key points for successful partnerships:

- There needs to be a clear focus for activity with common goals.
- The activity should address the current curriculum.
- All partners need to gain, and should expect to gain (this may need articulating early on).
- More than one teacher per school should be involved (a whole team is best). But it is essential that one teacher is the main contact person and takes the initiative for keeping the contact alive.
- Practical as well as moral support is needed—it is best when there are rewards and recognition for both partners. This is often in the form of a stipend or grant, and sometimes by accreditation or positive recognition in career reviews and appraisals.
- Communication with other partnerships is most important; e.g. by e-mail, newsletters, meetings and conferences.
- Partnership activity is more effective when its focus includes a teacher's development. Scientists' activity with children that does not address teacher's needs is not efficient—when a cohort of children moves on, any benefits move with them; when teachers gain, the benefits remain in the classroom, and influences successive intakes of children.

Recommendations

The information gathered during the visit has clear implications for the UK, but there are three fundamental differences between the American and British scenarios that need to be taken into account. These differences render the present purpose of partnership activity in each of the two countries quite different.

1 A strong feature of American partnership activity is to lobby for successful systemic reform of science education. This is possible because

American schools have considerable freedom in designing science curricula and in developing suitable styles of delivery.

In British schools there is tight central control over curriculum and assessment. This, together with ever-mounting pressure for teachers to adopt formal teaching styles and practices, and the many enforced changes in education that they have endured in recent years, generates a climate that, for all the inadequacies of the present system, asks for a period of stability and support. With the present moratorium on the current national curriculum, the central purpose of UK partnership activity is therefore likely to be confined to supporting and enhancing what is already established.

Nonetheless, the present system will be revised sooner or later, and the current period of stability should not pass without deciding what changes will need to be made. It was suggested several times during the visit that the science community, through its many associations and establishment links, and with the collaboration of teachers, could at the right time act as a powerful lobby for science education reform in this country, and could become a political advocate for its teachers at local and at national levels.

2 Expectations of American science teachers are now very different, and American reformers realise they must not forget the need for adequate support and training when they ask for curriculum changes.

3 Funding levels for partnership programmes in the US are very much higher than in the UK.

In spite of these major differences, many of the lessons learned in the US over the last decade of partnerships should enable us to be more confident of success when plannning new activities and adapting what is already established. Acting cautiously upon this information should enable the TSN and others to avoid several years of trial and uncertainty.

Mini-Grants

As teacher research fellowships have not been taken up well, the cash used to fund them will go instead towards partnership 'mini-grants'. The idea is this: a partnership may apply for up to £200 to help it develop a successful classroom curriculum package. The money could buy equipment, or pay for duplicating costs, or used for other incidental expenses. The main condition attached to the grant is that it must be 'exportable' in the sense that duplicate packages produced by TSN would be available for other schools to use.

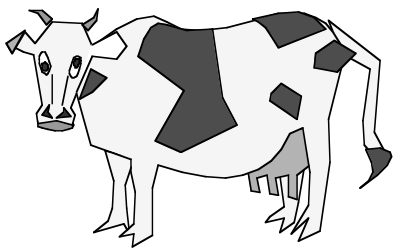
Further details from Frank Chennell.

Mad Cow problem for schools

The latest furore over BSE left some teachers in a quandary. Worried parents were saying that beef should not be available in the school dining room, others–especially the beef producers of Norfolk–that it should not be removed. Messages from UK sources have conflicted with European authorities, and even the scientists seemed not to be in agreement.

So that teachers would be in better position to make up their own minds, Microbiologist Dr. Allan Downie gave his views at The John Innes Centre on 4 July. He spoke of the history of the disease, and of the special nature of the infective agent along with an outline of the latest research on the subject.

This meeting was the first of the 'Rapid Response' sessions for teachers who want to know more about a current science topic. If you have a request for a talk on a current issue of interest, let Frank Chennell or any of the Steering group know.



New TSN Members

WELCOME

Mrs Dinah Holmes Science Coordinator Caister-on-Sea Middle School
Mrs Morag Kitchener Teacher Clackclose Primary School
Mrs Sue Smedley Teacher Hingham Primary School
Mr Tony Dear Science Coordinator Hingham Primary School
Mrs Anne Milner Biol, Env Educ Coordinator Sir John Leman High School
Mr Peter Matthews Physics/IT coordinator Sir John Leman High School
Mr Steven Ritches Dep Head of Science Sir John Leman High School
Miss Lisa Hubbard Scientific Officer Institute of Food Research
Rev Kevin Blogg Head of Science Fred Nicholson School
Mr John Clogan Packaging Operations Manager Rhône Poulenc Agriculture Ltd
Mrs Gail Gibbons Kenninghall Primary School
Mrs Elizabeth Hubbard Kenninghall Primary School
Mr Richard Boyce Teacher Caister-on-Sea Middle School
Mr Robert Ridout Head of Science Smithdon High School
Mr Martin Hampshire Physics teacher King Edward VI School
Mrs Pat Diggins Teacher Smithdon High School
Mr Neil Atkins Physics Teacher Smithdon High School
Mrs Heather Ryan Headteacher Shelton C Primary School
Mr Suresh Dalapathy Biotech Masters Student John Innes Centre
Dr Jean-Pierre Merle Process Chemistry Manager Rhône Poulenc Agriculture Ltd
Mr Mark Southgate Technical Manager Rhône Poulenc Agriculture Ltd
Mrs Sarah Woodworth (rejoins at new school) teacher Antingham & Southrepps Primary School
Mr R Barrett Headteacher Antingham & Southrepps Primary School
Ms Lucy Care Teacher Antingham & Southrepps Primary School

More equipment to give away

From the Institute of Food Research and John Innes Centre.

4 286 computers & monitors
1 Analogue (mechanical) single pan analytical balance (to 1mg)
Glassware:
test tubes and some quick-fit items
Plastic ware:
50 mL tubes with screw caps, 10 cm and 5 cm petri dishes

Contact Frank Chennell

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