

# The use of a web site and associated published materials to support the development of a community of practice for primary design and technology teachers

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## Abstract

This paper will describe the development of a design and technology web site specifically for primary teachers. The web site has been developed in the context of the Nuffield Primary Design and Technology Project over a period of time when the government has pursued strategies which promoted literacy and numeracy (at the expense of the more practical and creative elements of the curriculum) and provided resources to enable teachers to become proficient in the use of information communication technology. The paper describes the following:

- the development of an initial web site
- the use made of this web site (through web site statistics)
- the development of resources in association with DATA (the Design and Technology Association) to provide innovative curriculum materials for teachers at a time when commercial publishers were not willing to do this
- the revision of this web site to accommodate provision of teacher materials and professional support
- the use made of the revised web site in the first six months of its life i.e. October 2001–March 2002 (through web site statistics)
- the use made of the materials and the web site in continuing professional development activities carried out by the Nuffield Primary Design and Technology Project and its impact on practice.

Finally the paper identifies areas for further research.

## Background

In 1996 the Nuffield Foundation awarded a major grant for the development of materials to support the development of good practice in primary design and technology. A short time afterwards the government introduced the national literacy strategy (Department for Education and Employment, 1998) and a year later the national numeracy strategy (Department for Education and Employment, 1999). The experience of the Nuffield Primary Design and Technology Project has been that the combined effect of these initiatives diverted schools' attention from the practical and creative elements of the curriculum including design and technology. The government has also introduced training in the use of ICT for all teachers via New Opportunities Funding (<http://www.nof.org.uk>). The Nuffield Primary Design and

Technology Project responded to these events in the following ways:

1. Developing trial design and technology printed materials that were primarily for teachers.
2. Evaluating the effectiveness of these materials through their use at over 60 trial schools by means of questionnaire plus two in depth scrutinies by an independent Open University research team led by Patricia Murphy.
3. Developing a web site to support teachers using the materials.
4. Working with Learning and Teaching Scotland (formerly Scottish Consultative Council on the Curriculum) to develop materials for the Scottish primary technology curriculum incorporating the pedagogy developed and validated by the Nuffield Primary Design and Technology Project (Learning and Teaching Scotland, 2000).
5. Co-operating with DATA to produce a revised, version of the trial materials taking into account the findings of the evaluation – the *primary solutions* in design and technology pack (Barlex, 2001).
6. Developing a dissemination programme for primary solutions involving in-service, the support of teacher advocates and promotion of the web site.

## The initial web site

The initial web site [www.nuffieldfoundation.org/primaryDandT](http://www.nuffieldfoundation.org/primaryDandT) went on line in February 1998 (Barlex, D. and Mitra, J. 1999; Barlex, D. 2001). An important feature was the ability to download trial materials. This was logged during the last four months of 1999 and all of 2000 (see Table 1). The results indicated that this could be an effective and inexpensive way to make materials available to teachers.

## The primary solutions pack

The Project was unable to find a commercial publisher willing to publish the materials. This was not because the publishers found the materials wanting. They came to the conclusion that it did not make commercial sense to publish the materials as the considerable emphasis on literacy, numeracy and to a lesser extent science and ICT, had led to a low 'spend' on design and technology in primary schools. This situation was resolved by a partnership between the Nuffield Foundation and DATA through which DATA became the marketing agency for the materials. This is an interesting example of a partnership between an educational charity

Unit title	Number of units downloaded in 1999 (4 months only)	Number of units downloaded in 2000
What sort of light will work for you? (Year 6)	177	929
How will your roly poly move? (Year 2)	157	842
Which fruits would be good in your salad? (Year 1)	142	849
How could a carrier make the job easier? (Year 5)	143	731
Make your own bread (Year 6)	95	605
Fabulous Flowers (Year 4)	97	582
Should your software talk? (Year 2)	91	393
How do you like your toast? (Year 2)	79	394
Apple tasting (Year 2)	76	336
Soft drinks (Year 4)	91	303
How cool is your drink? (Year 3)	61	311
What shape should your pastry be? (Year 4)	64	268
How do you take your tea? (Year 5)	29	150
<b>Total number of units downloaded</b>	<b>1302</b>	<b>6543</b>

(which does not need to make a profit) and a professional association (which from a small investment might actually make a profit). The partnership enables the provision of curriculum materials and professional support at a time when commercial publishers are unable to do so. The materials were called *primary solutions* in design and technology (see Figure 1) and the contents of the pack are as follows:

- a short teacher's handbook explaining the Nuffield approach to primary design and technology and how to use it to good effect in different ways

- a sample printed unit and a CD-ROM giving a guide to the Nuffield approach
- a tour of the new web site and 24 units of work which can be downloaded and printed in either full colour or grey scale.

The pack sells for £9.60 and sales since publication in September 2001 have been encouraging – 871 packs to date (25 March 2002).

**The current web site**

The web site was restructured and went online in October 2001 as [www.primarydandt.org](http://www.primarydandt.org). The forum area of the original site was unsuccessful and has been removed. It has

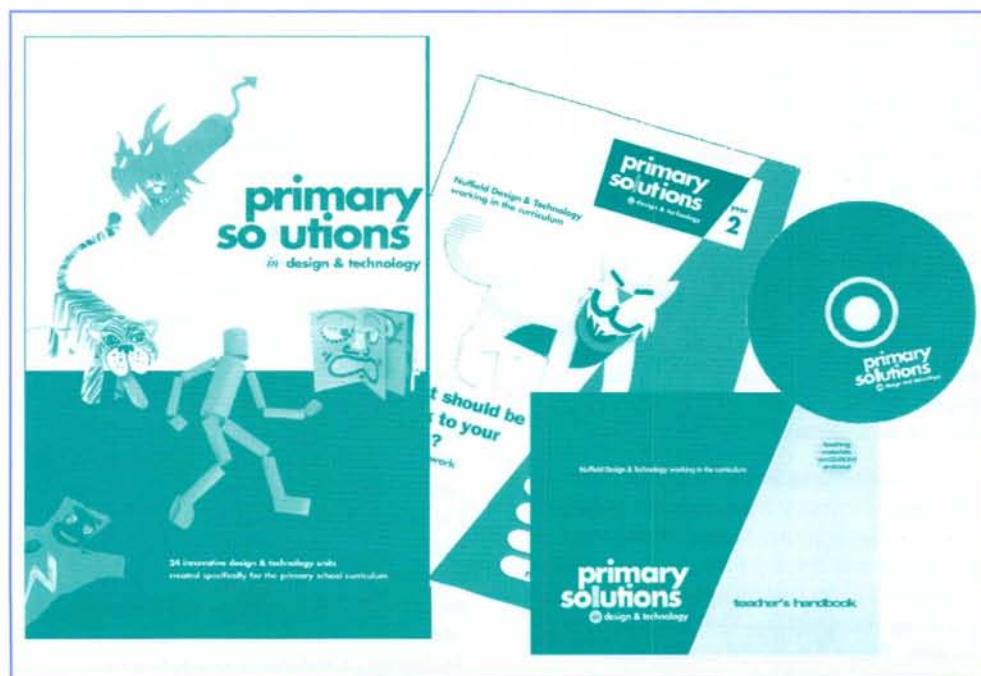


Table 1: Nuffield Primary Design and Technology trial units downloaded 1999 and 2000.

Figure 1 The primary solutions in design & technology pack.

	October	November	December	January	February	March	Totals
Colour units	1632	2541	1451	1713	1841	1022	10,200
Grey scale units	956	2024	947	1503	1062	757	7,249
<b>Total</b>	<b>2588</b>	<b>4565</b>	<b>2398</b>	<b>3216</b>	<b>2903</b>	<b>1779</b>	<b>17,449</b>

	October	November	December	January	February	March	Total
Colour units	183	565	425	653	697	341	2032

Table 2: Nuffield Primary Design and Technology primary solution units downloaded from 15 October 2001 to 16 March 2002.

Table 3: Nuffield Primary Design and Technology primary solution units available in the archive downloaded from 15 October 2001 to 16 March 2002.

been replaced by an area called resources, which is dedicated to downloading the revised materials. Areas of the site that were concerned with the curriculum development project nature of the site and no longer relevant, were also removed. The site retains the following features – a showcase featuring work from a wide range of primary schools, a learn here section featuring tutorials for each of the units, expert tutorials on key issues in design and technology and an animated glossary, a regular news section and a reference section listing consultants, suppliers and useful television programmes. The use of the web site for downloading units of work has been impressive. In the six months since it was launched almost 20,000 units of work have been downloaded. (See Table 2 and Table 3)

Table 4 shows the units downloaded in order of popularity. A particular unit's popularity will be governed by several factors. For example, if it occurs in the QCA Scheme of Work and is a unit with which teachers are familiar and may have built into their scheme of work, it is likely to be popular. This is the case for 'which parts of your picture move?' and 'what music would you like to make?'. Two of the least popular are those concerned with using software for multimedia design. This may reflect teachers' lack of confidence in this area of ICT (information and communication technology).

The downloading of such a large number of units however encouraging, does not indicate a change or improvement in the practice of design and technology teaching in primary classrooms. So a key question is: 'To what effect is the web site influencing practice?'. This will be addressed in the next section.

#### Dissemination and impact on practice

The Nuffield Primary Design and Technology Project is now in its third phase. Phase 1 was the research and development phase in which the structure of the materials and the underlying pedagogy was identified and validated. Phase 2 involved turning these findings into materials that could be used by a

wide range of teachers in teaching primary design and technology. Phase 3 involves the dissemination of the materials and approach to as many teachers as possible as part of the wider strategy of creating a self-sustaining community of practice, dedicated to teaching design and technology in primary schools. The Project sees the web site as an essential ingredient of this phase but one that requires other activities to enable it to become effective in the longer term.

If a web site is to be used by teachers as a means of professional development, it is essential that those teachers have easy and regular access to online computers. At five recent in-service events held by the Project to disseminate *primary solutions*, a show of hands indicated that over 90% of the primary teachers attending had access to the web both at school and at home. This encourages the Project to believe that professional development through a web site is definitely feasible.

Attracting teachers to the web site is then the next step. The Project's view is that this will require several simultaneous approaches. Firstly, the availability of the *primary solutions* pack complete with CD-ROM that allows printing of the 24 units of work and presents an introduction to the web site, plus a sample printed unit of work and a teacher's handbook. These are concrete artefacts leading teachers towards a virtual world of professional development. Short presentations, in which the pack and its contents are described in conjunction with a description of the web site as part of in-service training events, are an important way of introducing teachers to the pack and the web site. The Project has carried out several of these since the pack was published and the revised web site was launched. In all cases the impact of the combined pack plus web site approach was strong, with teachers purchasing the pack at the training session. As Ian Punter, an LEA advisor for design and technology, commented after the Primary Design and Technology Conference in East Sussex in

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Unit title	The Big Task	Overall total
Which parts of your picture should move?	Design and make a moving picture that tells a nursery rhyme or a simple story	2023
What music would you like to make?	Design and make a simple musical instrument and use it to play a part in a piece for four players.	1605
Will this story surprise you?	Design and make a pop-up book that will intrigue, amuse and inform a particular reader.	1142
How will your beast open its mouth?	Design and make a model animal with a moving mouth.	1041
How fast should your buggy?	Design and make a controllable, battery-powered toy vehicle for an identified user.	1006
How cool is your drink?	Design and make a healthy cold drink that meets the preferences of another class member.	976
How will you store your favourite things?	Design and make a container to act as a treasure chest for favourite small items.	925
What sort of light will work for you?	Design and make a lighting device to be used in a particular situation – reading under the bedclothes, signalling, lighting a tent.	835
Which fruits would be good in your salad?	Design and make a bowl of fruit salad that has the look, smell and taste required by a particular user.	752
How will your roly poly move?	Design and make a simple push-along toy (a roly poly) that provides amusement in both its appearance and the way it moves.	705
How should your puppets tell their story?	Design and make puppets and a theatre and put on a performance that tells a story with a message..	689
Will your party hat be funny or fantastic?	Design and make a decorated paper party hat.	645
What can you learn from a textile tree?	Design and make a class 'tree' using card tubes and textile wrappings. The tree then becomes a classroom teaching resource.	632
What display will your class share?	Design and make a display that will serve a particular purpose in the classroom.	625
How could a carrier make the job easier?	Design and make a carrier that meets the needs of a person who has to carry particular items..	564
Does this game stop you from being bored?	Design and make a toy or game that will amuse and intrigue a bed-ridden patient aged approximately 11 years and that can be played with on a bed tray.	500
How scary should a calendar be?	Design a monster for a particular month of the year to be part of a class Monster Calendar. The calendar can be used in the classroom, with a new picture each month.	477
What should be stuck to your fridge?	Design a fridge magnet that is made from layers and is part of a set that will appeal to young children.	451
What shape will your pastry be?	Design and make a pastry product for a special occasion based on their experience of the traditional jam tart.	435
Should your creature be fierce or friendly?	Design and make a creature to welcome visitors to, or deter intruders from, the classroom.	389
How do you like your toast?	Design and make a serving of toast that meets a particular person's preference for toast and spread..	266
Should your software speak?	Design and build interactive, multi-media software to convey information to an identified audience.	265
What would the scissors say on screen?	Design and build interactive, multi-media software to teach KS1 children about simple tools	258
How do you take your tea?	Design and make a serving of tea that meets a particular person's preference for hot drinks.	243
<b>TOTAL</b>	<b>All units</b>	<b>17449</b>

Table 4: Nuffield Primary Design and Technology primary solution units downloaded from 15 October 2001 to 16 March 2002 in order of popularity.

March 2002, 'In my experience it is not a common occurrence to have teachers coming at you waving £10 and £20 notes!'. Yet that is typically what happens. This is strong evidence that the teachers see the *primary solutions* pack as a highly accessible and useful means of developing the design and technology curriculum in their schools.

Longer in-service sessions, a whole day for example, provide an even better opportunity for teachers to engage in *primary solutions* and the web site. In such sessions, teachers have the opportunity to try out a unit for themselves and discuss with one another the conceptual and practical demands it makes on pupils, how it could be managed in their own schools and how it might need to be modified to meet their own circumstances. It would be a mistake to dismiss this activity as trivial. David Hargreaves, until recently the Chief Executive of the Qualification and Curriculum Authority in England, has argued that knowledge creation and dissemination in education must now involve teacher-centred knowledge creation through partnerships (Hargreaves, 1998). He argues that teachers involved in such knowledge creation will engage in four activities:

1. investigating the state of their intellectual capital
2. managing the process of creating new professional knowledge
3. validating the professional knowledge created
4. disseminating the created professional knowledge.

The Project argues that a day long in-service training session, as described above, is the beginning of a partnership with the Project and goes a long way in providing teachers with the opportunity to develop new professional knowledge and engaging with the four activities he cites. The use of the web site has a potentially powerful role in both validating and disseminating the new professional knowledge.

One of the difficulties associated with such one day in-service sessions is that afterwards participants are left isolated when they return to their school. Fullan and Stiegelbauer argue that collaborative support from other teachers greatly increases the likelihood that changes in practice will be sustained (Fullan and Stiegelbauer, 1990). The web site has the potential to provide this to a limited extent in following up the collaboration shared at the training session.

One of the features of both the short presentations and the longer in-service sessions is a description of how schools have used block time as a means of providing pupils with positive and effective design and technology teaching. These descriptions are compelling because they show how the use of *primary solutions* is transferable from schools where the materials were developed to other schools, which were not involved in the trials. Underlying this transfer is the activity of teacher advocates. These are teachers who have used *primary solutions* successfully then changed schools and introduced the approach to their new schools as a means of improving the teaching of design and technology. This take-up of *primary solutions* through teacher advocates is a powerful means of dissemination and one that can be further promoted through the web site.

At present, it is impossible to say whether the web site is having a significant impact on the practice of primary teachers. However, there is clear evidence that teachers find the approach to teaching design and technology embodied in the *primary solutions* pack very attractive. Acquiring and using the pack is a likely first step to using the web site.

One indication of the growth of good practice related to the use of *primary solutions* and supported by the web site, is the extent to which teachers will be able to provide examples of pupils' work for the showcase on the web site. A feature of in-service training sessions follow-up, will be to encourage teachers to submit examples to the showcase. Another indication will be the extent to which the use of *primary solutions* is reported (or can be inferred) in Ofsted inspections. At present it is too soon to report on either of these indicators.

#### Further developments and research possibilities

Both the Nuffield Curriculum Centre web site and the Nuffield Primary Design and Technology web site will soon be revised to include sections where visitors to the site can register interest and contact details. This will enable the Project to keep them in touch automatically with new features on the web site as they appear. The size of the database that this generates and the proportion of primary teachers in the database will give an indication of the extent to which teachers see the web site as useful. The database will also allow the Project to be more pro-active with these teachers, asking them for details of the units of work they are using and for examples of pupils' work for the web site showcase. This should lead to a growth in the showcase and the variety and quality of pupils' work

submitted will give some indication of impact on practice. The information will also be useful for putting teachers who have taught, or who are planning to teach, particular units in contact with one another so that they can share their experiences and provide mutual support and guidance. Monitoring these developments will provide more definite evidence as to the way *primary solutions* materials are being used and the impact that this, in conjunction with the use of the web site, is having on practice in the teaching of primary design and technology.

#### Summary

This paper has described briefly the work of the Nuffield Primary Design and Technology Project in producing materials for teachers (the *primary solutions* in design and technology pack) and a web site to provide continuing professional development for teachers using the materials. It has argued that a variety of approaches will be required to enable and encourage teachers to use the web site and that there are indications that this is happening. It has also argued that it is too early to see whether the use of the web site, in combination with the *primary solutions* materials, is having any significant impact on practice. The paper has suggested where evidence for any such impact may be found in the future.

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- 'ICT Training for Teachers, School Librarians, and Public Librarians  
£250 million available  
The Programme  
There is £230 million available to fund ICT (Information and Communications Technology) training for teachers and school librarians throughout the UK. This training will ensure that teachers and school librarians are equipped with the necessary knowledge, understanding and skills to make sound decisions about when and how to use ICT effectively in teaching. There is also £20 million available to train public librarians in ICT skills. We have approved providers for this training which are listed in our ICT Training catalogues. The teachers and school librarians section of this programme is run separately from the public librarian strand.'
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