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Technology Insight: Virtual Visits to Industry using the Web

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Technology Insight is being developed to improve the understanding that pupils have of industry and how products are developed.

Biographical notes

The three authors all work in the Manchester area in the area of technology education and professional development.

Melanie Fasciato is a senior lecturer in design and technology at the Manchester MU. She teaches on both primary PGCE and BEd courses. He major publishing output has been at KS3 & 4 but her current research interests lie in primary D&T.

Martin Coleman is co-director of the Technology Education Development Unit, University of Salford. A consultant for a number of national agencies and companies, he supports the development of both science and technology in schools and provides in-service training for ICT in D&T and science.

John Martin is co-director of the Technology Education Development Unit, University of Salford. He has been involved with in-service training, publications on primary and secondary D&T and with Design and Technology Times. He has extensive expertise in software and hardware development.

Abstract

The paper describes the philosophy and structure of a new Web service for technology education that is being developed by the authors. The fundamental concept is that the site allows pupils and teachers to 'visit' industry and to learn how products are designed and made.

Each 'visit' focuses on a particular product and tells its story through the people involved in its production. The 'visit' is complemented by ideas for follow-up activities in schools and hotlinks to other relevant resources on the Web.

The aims for the programme



Figure 1.

The aim of Technology Insight is to provide an Internet service, accessible through the World Wide Web, which is designed to promote and support:

- the development of high quality work through design and technology, science and business education in primary and secondary schools
- the provision of relevant and useful information from, and links to successful and innovative industries

There are three phases of development. The first two – the research and strategy development and the pilot development have now been completed. During summer 1999 the third phase had been started. This will evaluate, extend and refine the work done in the pilot phase in the period up to summer 2000. This third phase involves:

- providing information about a wider range to industries than those currently available
- extending the scope of the current on-line materials which focus on the needs in the UK secondary schools to include a primary school aspect

- refining the current on-line materials to include a greater variety of multimedia and opportunity for greater interaction by the user

'Visiting' industry

Over a number of years in the UK there has been an increasing emphasis on the need for young people in schools to learn about the world beyond the classroom. This has resulted in schools making visits to industry and becoming more closely associated with them, in some cases as partners. For many schools however, access to industry is very limited and in some cases none existent. This can be for a variety of reasons. The geography of the school is highly influential, as is also the proximity of industries that can offer some support.

The aim of Technology Insight is to provide all schools with the opportunity to visit industries in a virtual sense. This is being done by using the multimedia environment available on the web and by connecting with industries that develop products which are familiar to young people. As one of the main audiences for Technology Insight is the design and technology community in schools, the product orientation of the company is vital. To this extent Technology Insight has certain key features:

- each 'visit' focuses on a specific product that young people are familiar with and which is broadly similar to the kinds of product they themselves might design and make in school technology project work
- the 'visit' starts with an overview by a senior manager in the company involved
- hot links from this overview go into greater depth and tell the story of the contribution of various individuals or teams who have been involved in an aspect of the product, such as: specifying the brief, research, design, production, quality, safety, finance, promotion
- each of these personal accounts has a follow up activity that young people can do in school, or as a homework exercise pupils and teachers are able to ask questions via e-mail of the people involved in industry and the responses are posted on a bulletin board as the materials become used.
- case studies are to be included to show how this resource has been used to provide ideas from teachers on approaches and other relevant resources.

Current position

At the time of writing this paper (December 1999) the service has two 'visits' available – one to a food company and the other to a textiles industry. A number of other 'visits' are being developed. The pilot materials were launched at the annual conference of the Design and Technology Association (DATA) in late June and were made available then to a restricted audience from whom we invited views and comment on its potential to enhance the curriculum in schools.

We have also presented the pilot service at the International Design and Technology Education Research conference (IDATER) at Loughborough in August 1999 where an audience from home and overseas were able to review and pass comment on the principles and practice we are developing. The response and interest at both DATA and IDATER were very promising, as has been the response from a variety of other educationalists with whom we have been in contact at various times over the summer and autumn. The service was launched publicly on 19 November 1999 as a freely accessible site under the URL (www.technology.org.uk).

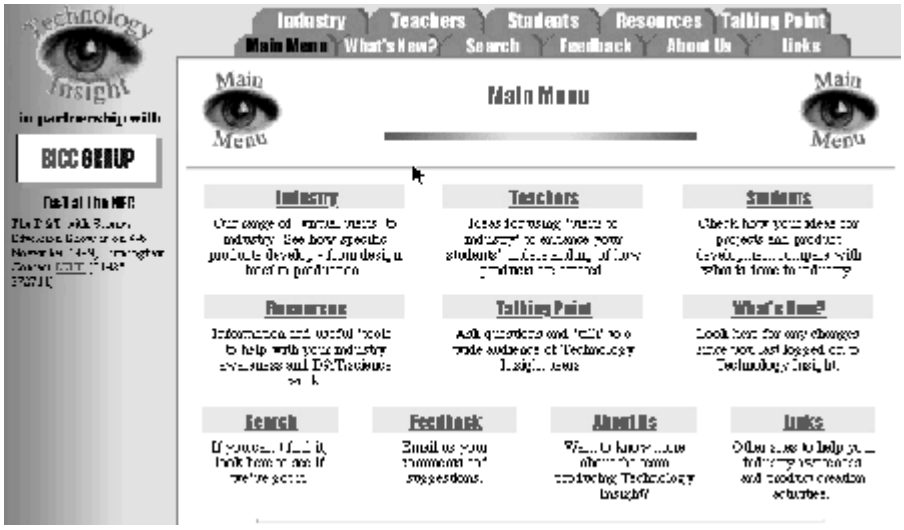


Figure 2.

The future development of information that becomes part of the service is dependent also on the management team finding efficient and productive ways in which it can be developed. To facilitate this we are now working with practising school teachers who are being provided with funding to cover supply teachers whilst they are on placement in industries. By working with teachers in this way we can ensure that we keep the resources relevant and accessible to

children in schools. The placement also offers the opportunity for the professional development for teachers so that they can improve teaching and learning in their own schools. The additional value of web publication can be attractive to sponsors of such placements.

Strategy for phase 3
Phase 3 Strategy was to enable successful development from the pilot phase we created, and have been implementing, a strategy which involves a further partnership between ourselves, the Training and Enterprise Council (TEC) and the more localised Education Business Partnerships (EBP). These exist as part of the TECs. Their particular remit is to foster and promote work experience for school and college students and work placements for teachers to assist professional development.

Our scheme is now formally supported by the Manchester TEC and has reached out to the Stockport and High Peak TEC as well as the south-east Lancashire TEC. In consultation with the EBPs in these areas we now have commitments to fund teacher placements during the current financial year and into the year 2000 and 2001. We expect to be able to develop a further five virtual 'visits' during this current year. We are also starting to assess how we can enhance current and future resources in the Industry section of the service. By using animation and compressed video, schools will be able to download these to experience a more direct feel with the people and industrial processes which are highlighted. We will however continue to make sure that there is always a level of access that requires unsophisticated browser technology for those schools whose connections will have restricted download speeds.

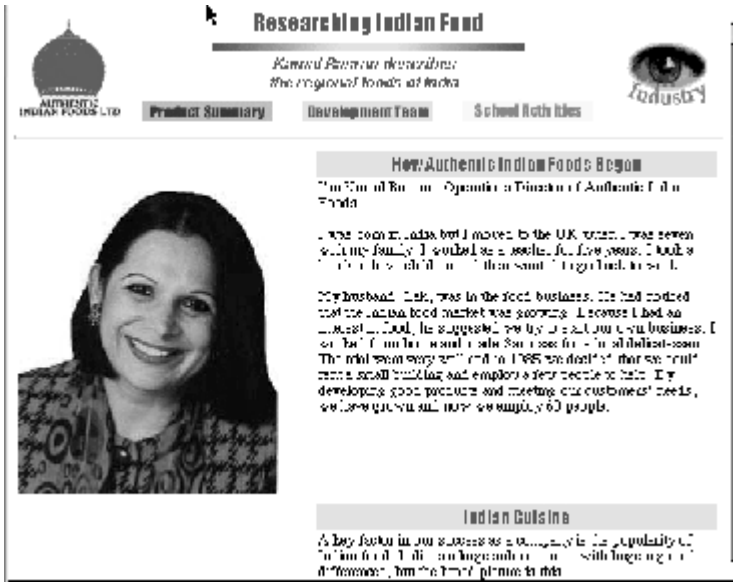


Figure 3.

Dissemination
In addition to presenting the service at professional conferences, we have also had publicity through the DATA journal, the Design and Technology Exhibition at the NEC in Birmingham and through articles written for the University of Salford newsletters. We intend to build on these with other briefing articles in the TES and other educational journals and dissemination systems during the coming year in order to develop an active user base in schools and initial teacher training establishments. The levels of access to the service and the types and location of the user base will be monitored and analysed during the current year. In addition to the technology-related curriculum in schools we will be targeting science and business studies departments.

Links with other agencies
We expect to develop further the links with TECs and their replacement agencies in the region but have set in motion links with other parts of the country. We expect further development of the service to be supported through links into industry at a national as well as a regional level.

We have also established a connection with a new agency, which has close connection with the Lowry Centre at Salford Quays. As part of this development a commercial/educational aspect is being developed as a shop window for new communications technology. This national development is called the Digital World Centre (DWC) and the Unit here at the University has a place on the Education Group that advises it. There is a strong indication that the DWC will make bids for development funding which extend and develop the ideas and practices which we have been working on for Technology Insight. We expect this development to start during 2000.



Figure 4.

The way it works – secondary schools

The assumption is made that the user will either be a teacher or a pupil. From a science or business studies point-of-view the materials can be used in a variety of ways. The structure seen to be most beneficial to design and technology departments in schools is best described by reference to the diagram shown below.

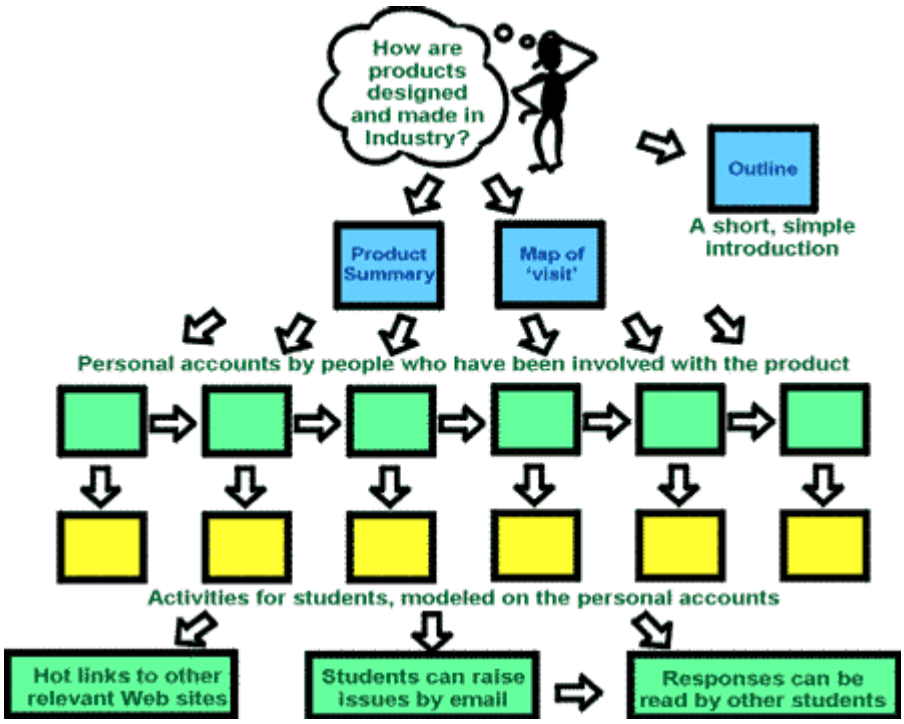


Figure 5.

The resource would be used when a student or teacher is involved with a product development. To relate what happens in industry in terms of a similar product development so that the process and practicalities might be compared, the user first selects from the main menu which visit might be suited to their needs. A resume is given so that choices can be made more effectively.

After selection, the user is presented with a personal account from a senior manager in the company about the way the product is developed. This summarises, in first person style, the background to the product and the processes of development and manufacture through which it has passed. As part of this account, the key elements of development are referred to and these are hot-linked to further presentations by those people who contribute to the process. The user can get further detail of what each team or individual does and how they do it.

Further hot links from each of these accounts lead the user to activities that emulate the tasks performed by each specialist group or individual. This enables the user to recreate what actually happens in industry to enhance learning and skill acquisition.

The primary school dimension
The notion of a Key Stage 2 virtual visit came about following the realisation that the interactive nature of the Technology Insight virtual visits, would provide an excellent medium through which to explain to younger children how products are designed and made. In order to capture the interest of the children it was decided to choose popular and familiar products and the first such product was Swizzells sweets. For those who have forgotten these products, the names Parma Violets and Foam Shrimps should jog a few memories. The product also had the advantage that the manufacturing process is relatively simple; it involves mixing four ingredients and then 'cooking' them, a process that can be replicated in school.

Our intention is that the primary visits should be cross-curricular in nature and may be used by teachers to deliver foundation subjects. Classroom activities will be provided which link into literacy and numeracy objectives.

As with the Key Stage 3 and 4 virtual visits, an industrial placement has been undertaken in the form of several day and half day visits, funded by Stockport Education Business Partnership. Key members of the company's management team were interviewed and the manufacturing process tracked through the factory and beyond, including packaging, advertising and distribution. Once the information had been checked for accuracy, the format for the virtual visit was decided. The researchers then developed this specifically for the purpose, as this is a new initiative in primary education. The structure for the primary materials will differ from that of secondary and will be accessed for trial purposes through the following model.

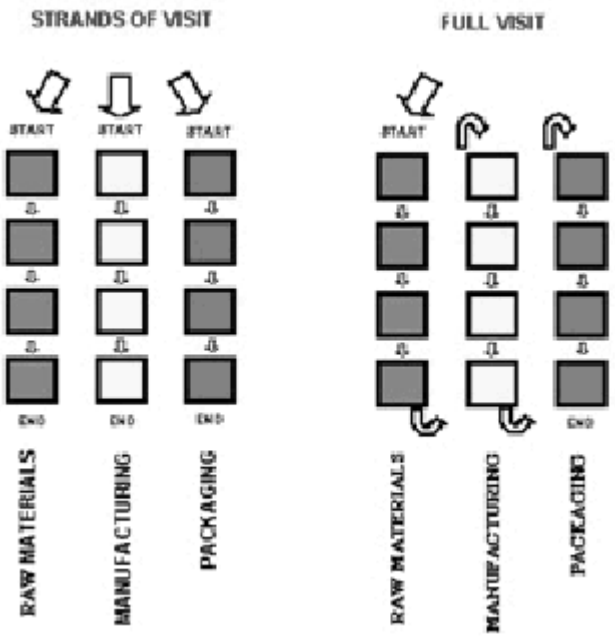


Figure 6.

Pupils making a 'visit' may choose between a single strand representing an aspect of the product manufacture and a full visit to all the strands consecutively.

The virtual visit is linked to a research project, the focus of which is to assess how pupils' perceptions of industry and the process of creating consumer products change following their use of the virtual visit web pages. In carrying out this enquiry, it is hoped to ascertain both the effectiveness of the virtual visit in teaching about manufacturing and to gather information about children's perceptions of industry. The first step is to ask children to draw and annotate their ideas about where sweets come from and how they are made. This is orchestrated through the use of open questions that prompt but do not guide. Following children's use of the virtual visit, a second annotated drawing will be made and a comparison made of the two, using pre-determined criteria.

A pilot of the initial drawing and annotation exercise has been carried out to determine its effectiveness. A similar research instrument was used to study pupils' perceptions of scientists (Jannikos, 1995[1]).

Finance for the management
Finance is being provided by our main industrial partners; BICC, Railtrack and BT. This will assist the programme up to the summer of 2000. We are looking for additional partners beyond this time so that we can expand the service to include a wide range of products and industries for schools to link into and learn about. In due course and as part of the

web site, we hope to channel questions from schools through to these industries and to set up conferences to enable issues to be discussed and knowledge to be shared.

Ideas and interaction
We welcome the opportunity to communicate with those associated with the Millennium Conference and who are interested in this type of development and its potential for improving teaching and learning in schools. Our contact details are available on the web site and are also detailed below.

Oral presentation
The presentation will:

- Describe the background to and the nature of, the site
- Show examples of the current information resources for secondary education
- Provide a preview of the primary curriculum materials
- Provide details of recent/current site usage
- Describe brief case studies of use in schools
- Show outcome for the first phase of pilot research on primary school impact

References
[1] Jannikos, M. (1995) 'Are the Stereotyped Views of Scientists being Brought into the 90s?', *Primary Science Review*, 37