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Design and Technology Curriculum Development in Initial Teacher Education through partnership with local industry

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Abstract
The paper discusses the development of a specialist subject study course in Design and Technology with Computer Studies through a partnership project funded by the Economic Awareness in Teacher Education Project at Goldsmiths'. The aim of the project was to build on the student teachers' experience of conducting personal research to expand their awareness of local industry in the context of information technology. The material presented shows the range of computer control applications explored by the students with support given by ourselves and the local Education Business Partnership Education Officer. Also addressed by the presentation are the implications for initial teacher education curriculum courses with regard to:

a) National Curriculum Technology and Curriculum Themes
b) Developments in Teacher Education.
c) Developing partnerships with the Community including industry and commerce.

This paper refers to the work of students second year on the BAEd Design and Technology with Computer Studies. During the autumn term the students were exploring mechanical toy manufacture and marketing as the context for their design project. The extension of this project was to control their toy prototype, using a computer, within the broader context of Computer Control. We also piloted enterprise and industrial awareness simulations. These were followed up by a visit to a local food retailer. In this way we have linked the two aspects of the students work - manufacture and control.

It is a requirement that for each design course project context there should be a written assignment. This assignment took the form of a case study or a report on the use of IT in local industry. The aim of the project was to build on the students' experience of conducting personal research to expand their awareness of local industry in the context of their projects. A further aim was to build this experience into the course design and planning. The outcomes of these reports could be made available in the CETEC for further dissemination and as a resource for future studies.

To support the production of these case studies/ report we engaged the services of Glenys Hughes-Jenkins, a local TEC development officer who assisted us in the planning, research and debriefing of this project.

After an introductory lecture on the use of computers in industry, held on November 20th 1991, the students were asked to select an area of industry they would like to research. The choice was very much left to individuals and their interests although it was suggested that 'interest groups' were identified so that students could support each other in their research. For the rest of the term tutorial support for these interest groups was available so that an assessment could be made of the contacts needed. The intention at this stage was for the students to find out as much as they could about their area of interest using their own contacts if available. Certainly, it was not our intention to rush into this work but rather that the students were clear about the area of IT that they were addressing before necessarily making contacts with the industries concerned (see Figure I).

At the end of November Dominic Clare and I had our first planning meeting with Glenys. We were all a little concerned as to how we might meet the needs of the students as the areas of study were not those we had originally envisaged. However, we arranged for Glenys to lead a seminar for the students on getting the most out of contacts with industry. To that seminar, held on January 13th 1992, was also invited Paul Gosling from London Electricity as a representative of our 'partners' in industry. At this session, which was extremely valuable, the students identified how they might benefit from links with local industries in general before considering their specific concerns.

As a follow-up to this seminar I took the students to the Coop Superstore in Croydon, which I had already visited on a staff development day. Mr. Jennings,

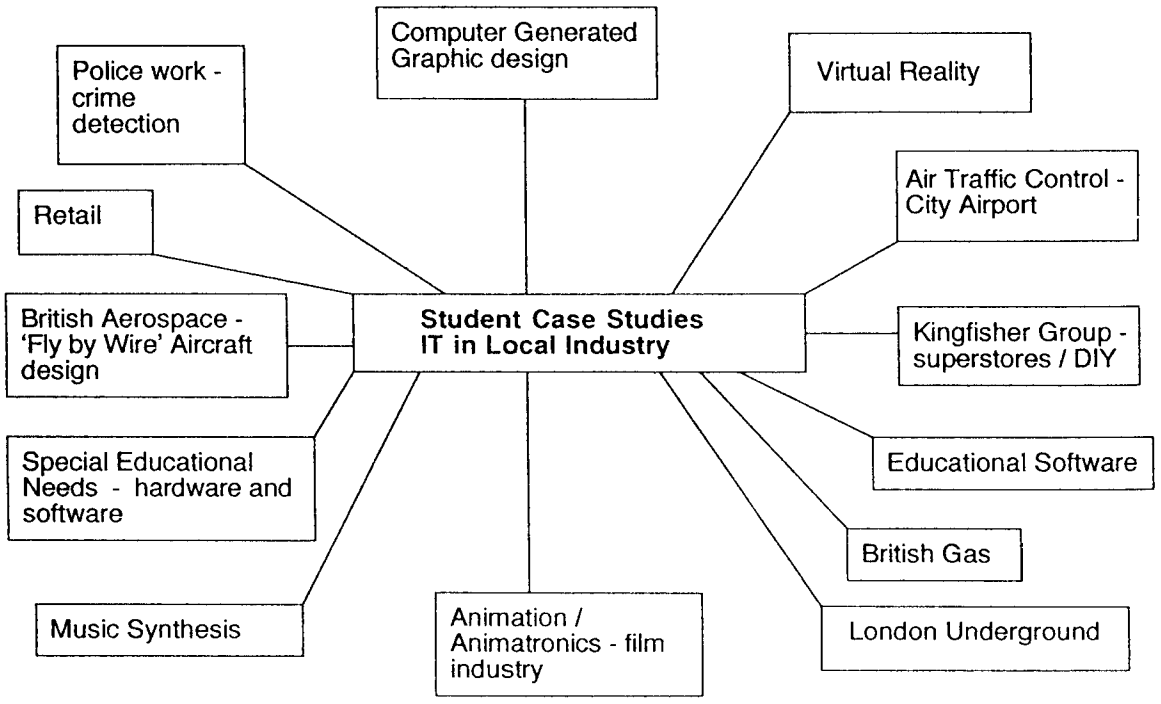

Figure1 Interest Groups for Student Case Studies

the assistant manager, took us through the whole process of food retailing from the delivery bay to the check-outs. Unlike the staff development day, when we were given a general tour of the store, we were able to focus on the use of computers and the visit was valuable in terms of the project brief. For the students who were focussing on retail, it was invaluable.

We gave the students two weeks to follow through with their contacts and those given by Glenys. By the 5th February the group were ready to make short presentations of their progress to Glenys. Further support was given through tutorial support with regular contact with Glenys to 'fill the gaps'. Special sessions were also arranged when we felt that a presentation for one particular interest area would be of benefit to the whole group. One of these sessions was David Houseman from Jim Hensons Workshop to talk about animatronics; another Jill Sissons, advisory teacher for Hammersmith and Fulham, to talk about IT for children with special needs. Both of these sessions led to further contacts and visits.

What was impressive at this stage was the initiative the students were showing in making contacts. They also used joint sessions with ourselves and with Glenys to network amongst themselves. I made a contact at the B.E.T.T. exhibition which I passed onto the students researching Virtual Reality which they followed up and developed further. Glenys' final input this term was on the 4th March when the group updated her on their research.

Outcomes and Developments

There are already several unexpected outcomes from the project despite the fact that the reports written by the students will not be handed in or disseminated until the beginning of next term. While our focus has been on developing the subject study course, developments in the curriculum courses are taking place. Not only is Glenys working with the students she is , in effect, working with us in our staff development.

The first unexpected outcome was apparent during the first seminar led by Glenys when she gave the students fictitious letters to answer to various industries, e.g. Insurance, Food Retail, General Stores, Trade Unions etc. The students were asked to discuss in groups how these different sections of the economic community could help them as teachers. This exercise was so successful that Glenys repeated the session with students on a 4th year Curriculum Option course, again very successfully.

The second was the opportunity for work experience with one of the contacts given by David Houseman. This was a animatronics workshop in Camberwell, the owners of which are keen to develop links with our department.

The brief was given to the students to research amongst the local community as well as further afield. Firms and businesses were found that were able to support the diverse nature of the students' interests nearby.

Experiences gained through the EATE IT project	Projected outcomes in relation to ITE
Generally People happy to talk about their roles and if not able to help have directed students to someone else.	More confidence in engaging in industry links in the classroom.
Students impressed with the respect their requests are treated with.	More awareness of the respect that education and industry have for each other.
Service industries generally more helpful than manufacturers.	More awareness of the idea of 'Partnership' with local industry.
Discovery that there are many different routes to gaining information.	More awareness of the personal commitment that individual contacts feel for their partners in education.
Encouraged not to give up in seeking information and making contacts.	A willingness and enthusiasm for developing links with industry on teaching practices in the third and fourth years of the B.A.(Ed) course.
More confident in making contacts e.g. speaking on the telephone.	
One contact often leads to another and in some areas, e.g. virtual reality, industry happy to share developments.	

Table 1 Feedback from the studets of experiences gained through the EATE project and projected outcomes in relation to ITE

How the students will benefit as teachers from this work in their subject study is yet to be monitored. However, the confidence that the students have displayed in conducting their research is very encouraging. The following table outlines some of the feedback already gained with some thoughts on possible outcomes in relation to the curriculum courses for the students' third and fourth years (see Table 1).

The scope to develop materials and strategies to address the local community context of National Curriculum Technology as well as the Economic and Industrial Understanding cross-curricular theme are perhaps the most obvious professional opportunities. We will seek to support the students in these and also look at other opportunities of supporting the taught curriculum, including other National Curriculum subjects and cross-curricular elements.

The work we have undertaken this year has been wide ranging in its influences. We feel we have been able to present a coherent and relevant course out of formerly distinct elements. This has been naturally derived from design work undertaken elsewhere in their course and has itself been a design activity with all the characteristics of such. Computing, or more correctly IT, has been explored in contexts chosen by students depending on individual preferences and they have been supported in taking some of the roles of systems analysts. The students have also had the opportunity to explore IT from wider social, psychological, economic and industrial, and political perspectives. We have incorporated the 'real world' of the local community in all of these and, we hope, presented all of these as an integrated whole. We have also addressed the implications for Education and professional courses in initial teacher education curriculum courses here, in terms of National Curriculum Technology and cross-curriculum elements, developments in Teacher Education and developing education partnerships with the Community including industry and commerce.

In addition to all of these outcomes we feel the students have gained tremendous confidence through positive responses from their relationships with the local community through the good offices of the EBP, particularly industry and commerce. We have also seen strong developments in research and critical use of information sources and the informal networks of help the students have been welcomed into. The establishment of a support network within the group has been a significant result of the course. This has worked at a number of levels, from the tutorial and expert visitor support we have provided to the wide, whole group discussion forum and then the small interest groups' work together.

We feel the course has been so successful that we have already incorporated many aspects described above into the next project: that is, the context of alternative technology. Here the students are researching and designing a solar-powered house for a local alternative environment centre. We plan to include much of the work described above in our courses for future students as well as in the course the students described here progress on to.