10 Why can't teachers do IT? Cognitive dissonance

Problems teachers face with ICT

Teachers have four major problems with which to contend when attempting to master the application, content and concepts of Information and Communication Technology. These are the problems of ownership; time; access (and equality) and learning patterns unsuited to ICT.

Ownership

Surveys undertaken for this research showed fewer than 60% of teachers had access to a home computer. Of those who did, there was a variety of types and operating systems that reflected provision in their schools. Acorn computers were the dominant system for many schools in Leeds LEA, and this was reflected in patterns of teacher ownership. The prevalence of word processing as the main task to which teachers put computers means that there was not necessarily an imperative to upgrade machines regularly in order to accommodate the latest programs. Only in the last few years, with the advent of PC as consumer package, did 'PC' become synonymous with 'computer' for teachers.

   The net result of this was that in many cases teachers found that they had a make of machine and an operating system which was not the same as their students. The processes with which they as individuals were most comfortable were (and are) reflected in their classroom applications, which tend to be structured in curriculum terms. The readiness to treat computers as short-life

consumer items rather than consumer durables, and to constantly upgrade hardware and software, was not as apparent with teachers as with their students.

The cost of new machines as a percentage of teachers' disposable income was an additional disincentive for change.   Only with the introduction of the Computers for Teachers scheme, where teachers were able to claim a subsidy from the DfEE against the purchase of a computer, was there a financial incentive for teachers to purchase a high-specification machine with Internet access.

Time

One of the central issues confronting teachers is the amount of time which it takes to master new routines and programs before they feel a level of competence which enables their integration into classroom routines. In part there is a direct correlation between this problem and that of ownership. Unless teachers have direct access to the latest technology, and can use this in their daily routines, then they will be at a marked disadvantage compared with students who use machines in a variety of applications, for a variety of purposes, throughout the school day as well as at home.

There are very few teachers who are privileged to have a computer for their personal use at work: those who are in that fortunate position use it for a fraction of their working day. Few schools have been organised and resourced in such a way that ICT is integrated into the physical and curricular fabric of the school. As a result, the appreciation of the ways in which ICT can be used, and an understanding of the ways in which it can be learned, are of necessity limited. Workers in industries other than education who have this awareness pass it on to their children. Given these circumstances, it is not only difficult for teachers to bridge the gap, but difficult for many to perceive that the gap exists.

Access and equality

The introduction of a consumer technology that impacts on the educational process raises the issue of equality: those students who have access to a computer at home are often at an advantage over those who are reliant on machines at school. This is particularly the case for students who produce coursework for examination subjects. The amount of time which can be spent on work by students with computers at home, and the use of tools to remove surface errors, very often leads to higher examination grades than for those without. Teachers' views cited in the section 'What teachers think about IT' reflect that.

The unease which this generates leads many teachers to wonder about the disparity between schools: the provision which some schools can offer their students is considerably greater than others. When differentials are compounded by a perception of social inequality there is an understandable reluctance on the part of some to include within compulsory education a technology which embodies this. The charge of Luddism directed at such teachers may appear to be true: they are not, however, protecting their privileged position, but rather see themselves as defending the less privileged. If part of the curriculum can be maintained as an ICT-free zone, then many people feel that those with limited access to such resources are less likely to be disadvantaged.

How do teachers learn?

Teachers learn in ways that they know are successful. They have reached their position because they were successful at the type of learning which education demanded. In addition they bring to the task of learning a model of learning which they use in their work. Teachers have found that success within the education system is through listening; taking notes; practising and using reference books: these steps are repeated, until they feel that learning has taken place. They can then apply the learning to a specific task. The process is empirical: it involves the reduction of wholes to their constituent parts as the ultimate building blocks of knowledge.

Knowledge and truth are constructed from individual terms and propositions, which can then be fitted together as scaffolding, to support concepts. These

isolated terms and propositions can also be learned by the students, assessed by their teachers, verified by the education hierarchy and published in league tables.

Cultural capital

These four factors - ownership; time; access and equality and learning patterns unsuited to ICT - have inhibited the integration of ICT into classrooms. Teachers, unlike many of the families of young people in this survey, do not have access to a supply of surplus machines which they can purchase for a nominal cost. These factors contribute to teachers' failure to acquire the cultural capital which many of their students possess. A consequence of this is that issues such as plagiarism, copyright, ownership and attribution are not part of many teachers' concerns. Collaborative student work, on the other hand, is often seen in negative terms, since the school-based assessment demands the work of an individual. This is in stark contrast to the way in which learning and work is perceived in industry.

How do students learn?

Students who use computers at school and at home learn to use them by themselves. In order to do this they use a number of strategies. They watch – either what happens on the screen or other students at work. They learn how to utilize the machine because they have tasks to complete: without the machine they couldn't do the tasks. They learn because they can switch from one screen to another, one program to another, in the same way as they can zap from channel to channel on television with a remote control.

Students wander around whilst they are trying to work out a resolution to a problem, or the most appropriate way to accomplish a task. Things are left undone, half finished, whilst they use the ALT/TAB keys to switch between programs. They go for Best Fit in order to make applications work together, data integrate and meet their deadlines. The learning patterns they are developing are not those of their teachers, but they work..

The more they use these strategies with work they have to do, the more they are likely to apply them to situations in which their teachers have predicated the learning on more conventional patterns. Comments from students during the surveys indicated the ways in which this was the case, and the way in which many students felt that the site of learning (as well as production) was at home, in front of 'their' computer.

This is the fundamental problem, which must be addressed by both teachers and the education system. If school is not seen as the principal site of learning work for the majority of students, then what is it for?

A new paradigm for learning: bricoleurs in cyberspace

The new learning patterns that have developed as a result of students utilising computers incorporate ostensiveness, cyber-semiotics, a sense of making-do, allusion, reference and quotation. Their working methods are approximate: they tinker, tweak, learn from their mistakes and steer whatever path is necessary to reach their objective.

Conclusions?

The final survey carried out at Boston Spa Comprehensive School, in 1999, showed that 81% of students had access to a PC at home. Latest industry figures suggest that more than 70% of households in the United Kingdom with school-age children own a PC.

If these children were dependent upon institutionalised learning in order to use the computers, then they'd either be working out LOGO routines, trying to cheat their way through CAL or CALL programs, following sequenced exercises to practice Office routines, or sitting looking bored whilst somebody else sat at the keyboard and told them what was happening.

But they are not. They are using the things. And they learned how to do it. The challenge for teachers and educational institutions is to understand HOW they learned. Then accepted interpretations of learning patters and teaching routines can be mapped onto these.

The problem is that our conventional scales against which we can measure these are calibrated for the education system.

Surprises

During the course of this research my praxis, my understanding and concepts were changed. They were changed by what I discovered; by what I learned from the students; by using the technology. As a teacher, however, I often found myself looking in the wrong direction, for the wrong things. It was only later that I saw what had gone on.