SCHOOL EDUCATION IN THE INFORMATION SOCIETY
Communication matters: learning at school in a wired world:

Abstract

The Socrates MAILBOX project has been examining the various ways in which the use of electronic mail, the Internet and other new communications technologies has impacted on schools. This paper explores in depth one underpinning issue - the pedagogic case for wiring school.

*It first demonstrates how information and communications technology can become part of a child's learning experience at school, through recounting a typical day in the life of a child in a wired school. This experience forms the basis for analysis showing how the full integration of technology in school can lead to more efficient and effective curriculum delivery. Further it shows how school learning using communications technology is an essentially social activity, extending the scope of the curriculum to include the interpersonal skills of team work as well as personal development. Most importantly, it provides a means to help children to **learn how to learn**.*

MAILBOX research is showing that these developments are not a necessary outcome of the use of new technology in school. Certain supporting conditions apply, including changes relations between teachers and children and changed school organisation - a new approach to teaching and learning in school. Such change requires time, commitment, training of staff and leadership.

In conclusion, the use of new communications technology in school can be a catalyst for the transformation of the environment and content of learning. But full integration of the new approach requires sustained effort supported by a strategy for sustainable development.

Daniel's day

Glasgow, Scotland. The school day has just begun. Daniel, Jemma and Ahmed, all aged 11, and their teacher are seated at a computer connected to the Internet.

T: Right, Daniel, check today's mail.

D logs on, teacher puts in password.

J: I haven't got a letter from Louise!

T: Maybe tomorrow. Oh we've got one from Australia..

A letter from a student teacher in Australia. She wants to know about children aged 8 and under using Internet

T: Do children in this school aged 8 and under use the Internet?

J: No

T: Why not?

J: Because they are too young

T: What do we do if we get information about a competition?

J: We print it, then photocopy it

T: And..?

J: We take it to the class, and they do the competition

T So what do we say in our letter?

D: They are not using it but older children are downloading the information and giving to them.

T: And what if they want some information

D: We find it and bookmark it for the teachers.

The children prepare and send their reply:

> Thank you for your letter. We are primary 7 children age 11 from Richmond Park School in Scotland. Our children age 8 and under take part in competitions which have been downloaded from the Internet.

The Socrates Mailbox Project

Children using the Internet - is it important? Why? Isn't it a luxury? A chance to play games? A gimmick? And email - an expensive way to chat? Does it have a serious role in school? Does it really contribute to learning? Or is it just an add on?.

Daniel is a pupil at Richmond Park School, Glasgow, one of the primary schools I visited as part of Mailbox, an EU Socrates project which aims to find the answers to questions such as these. As one of the class email group he takes a turn at dealing with the post several times a week. Already we see how with the teacher's help email can help to generate new thinking. But this is only one of several communications events in his school day. Let us follow him to the next event, after mid morning break.

Launching a magazine - two schools collaborate

They call it the Alligator project. Daniel explains why:

> "We started our alligator project when we were learning to use video conferencing because we said "See you later alligator" whenever we finished speaking to the other schools on the computer. We found out all about alligators from books, the Internet and from television programmes. We learned lots and it was all very interesting."

Richmond Park now has regular video conferences with the secondary school which takes most of its pupils. At present the two schools are planning a joint magazine. Today the conference is between 5 children - 3 girls and 2 boys including Daniel - from the top class at Richmond Park and perhaps a group of 30 at the secondary school. The teacher helps with advice, sometimes adjusts camera direction, otherwise the children control everything. Lynette on controls.

Both groups of children have separately been brainstorming and identifying key words for editorial guidance for the magazine. They exchange and discuss words, ending up with 19 key words.
Then the primary children have a video to show the others - a 13 year old girl interviewing a government Minister. This will help them prepare for interviews as "journalists" for their magazine. All listen and watch carefully. They will prepare comments and questions for discussion next time.

Filing the mail: Daniel tidies up

The video conference over, lunch time approaches. Daniel is back at the computer working alone. He puts his floppy disk in the drive. He then starts moving documents into folders. He makes a new folder and puts some letters in it. There is one unlabelled letter - he checks the email index and labels it appropriately and files it. I ask why he's doing this.
D: It takes less space.
He gets down to 12 items, arranges the icons, and reduces the size of box round them. Some items have been placed in the waste bin. He deletes the contents.
D: I'm not supposed to do that but I know I've got it.
A final tidy.
D: That's better!
He takes out his disk.

Daniel's morning was typical of what I saw every day at the school - several occasions where he used communications technology. This primary school is unusual in its degree of integration of technology. Communications technologies have only recently been introduced, but are already central to school activity. There is constant interaction between non-technological activities, computers in class and - for older children - inter-active communications technologies.

Learning by using technology

Using the technology is fun, but it is not there for fun. In school, the use of technology is always explicitly related to aspects of the curriculum. Much curriculum content is delivered through use of educational software on computers in class. Equally, communications technologies are used for curriculum enhancement - the video conference, for example, focused on concept development. The extract below from the teaching plan for the Alligator project mentioned by Daniel shows how the school systematically designs curriculum delivery.

> *Alligator Project Week 1*
> Knowledge and understanding: develop understanding of main distinguishing features of vertebrates i.e. reptiles - alligators. Also look at pupils' own distinguishing features and characteristics. Interaction of living things with their environment e.g. farming and climate
>
> Planning: Propose simple categories within which information found can be organised e.g. reptiles - alligators/crocodiles. Use pupil profile to decide which information to gather on selves
>
> Collecting evidence: Extract specific information from reference books, TV programmes, from Internet search. Measure each other to find height/weight etc.
>
> Recording and presenting: record collected evidence in a variety of ways - enter information under headings/ make drawings. Contribute to class & wall display. Database of personal information.
>
> Interpreting and evaluating: Distinguish between fact/opinion e.g. about "myths" about alligators. Discuss how interaction between humans and environment is very different in some parts of the world to others.
>
> Developing informed attitudes: Develop positive attitudes towards endangered species. Raise awareness of the individuality and identity of each person, and the contribution that each person can make to their immediate world.

The plan goes on to describe cross curricular extensions - links to language development, mathematics, expressive arts, music. The impact of this meticulous design is evident both in the confidence, competence and high standards achieved by the children, and also recorded in their personal records. I read the following in the personal file of one child:

> “Work on email/Internet has certainly developed all language skills as well as social/collaboration. It motivates him. The collaborative work to develop self confidence is a good strategy.
>
> Reading: use of Internet as a valuable source for locating up-to-date information - questions the usefulness of information/ relevance/ how to select etc.
>
> Alligator project/video conferencing: K excelled himself in this topic."

Learning more through technology - extending the curriculum
The curriculum of the twenty first century will need to help children to develop the capabilities and skills they need for life in the information age - such things as knowing yourself, knowing how to work with others, knowing how to cope with change. Watching Daniel, I saw a child working well with his peers - activity like checking and replying to the mail was done collaboratively. Sharing tasks put all the children on an equal basis, but at the same time the use of technology gave each individual a chance to shine. A child in control of a mouse is in control of their learning. Daniel's short spontaneous session tidying up seemed symbolic of the quiet but solid confidence and self-esteem possessed by every child in the school. Confidence empowered these children to learn to learn.

Learning to use technology
Daniel and his classmates have reached the stage where information technology is a natural part of their learning environment, like books and teachers. How was this point reached? The school head is firm: it takes years. Now, every child spends time at a computer at least once a day, even the youngest starting to learn keyboard skills through games. Each individual's progress in IT competence is monitored alongside

all other aspects of learning. The children enjoy their learning tremendously. Public presentation of achievement - web pages, the magazine, email communications - are highly stimulating. The ease with which children transfer competence from one application to another is striking.

The result is not just integration of technology in learning but integration between learning technologies.

Changing relations...

The seamlessness of the learning experience is not by chance. The teachers have made it so. But what is the secret of their success? How have they developed the skills to manage the complex organisation of teaching and learning which comes with the integration of information and communications technology? Watching a teacher learn to use new software gave me some insight.

> **Learning to use new software - children and teacher together**
> The school IT adviser is showing a teacher and three children - Lynette, Edwin, Daniel - how to use new software. The children learn by doing, the teacher learns by watching. The software - called Webwhacker - allows you to download layered web pages onto a hard disk. This means you can explore a chosen set of web pages at leisure. The demonstration has already begun:
>
> A: We want to take Robbie's pages down so we can find them without searching
> *D has mouse and finds the Home Page*
> A: What's that?
> E. This is Robbie
> *Robbie is a former pupil of the school who now has his own web page*
> A This software will take all the pages down and save them on disk so we can look at them later. Now Daniel, get the launcher window, Bring up the Web Whacker - a nice programme, it helps you take down several pages at once.
> *She gives D step-by-step instructions. The other children watch carefully, L is very quick to spot the icons and point to where D should take the cursor.*
> A: Now we're going to set up a new group... Every new group has .www in its name. What would be a good name?
> L: R S (She types R.S)
> A: Get the URL (*D. grabs it with mouse*), click once on the title, choose options, choose all levels - normally it just takes one page, we want it to take all levels down, we are going to do a whack - Oh! It's telling us to do something. Where should we go?
> L: Preferences
> A: So where do we go?
> L: Where you go... *(silence)*
> A: If you're not sure what do you do?
> *D answers by scanning the tool bar with the mouse and checking the lists till they find preferences under OPTIONS. The Preference box asks them to enter their email address.*
> A: Do you have your email address? Do you know where to find it?
> All: Yes
> *They point to the card pinned to the wall above the computer which has the address on it. L reads it, correctly letter by letter, then types it. Now they are ready to try the Whack. D sets it off.*
> L: What's it doing?
> A: It's sending a message then it's coming back with all the words and pictures
> L: What pictures?
> A: Pictures of Robbie
> L: Has he got a computer?
> A: Yes, he's had one for quite a long time.
> L: I've got one as well.
> A: Can I leave you to finish? Then have a look at the pages and perhaps send Robbie a message

Teacher and children are here learning together - more than that, the teacher, although silent, is learning from the children. I noticed that even those teachers most experienced with technology found new applications challenging. But they have come to realise that children pick up the skills quicker. This they accept, and they have the confidence to allow themselves to learn from their pupils.

This confidence derives from regular teacher development over the long-term. The head teacher tells me staff development is one of the cornerstones of effectiveness in her school. Her indispensable lieutenant is the teacher who co-ordinates IT in the school - a post the Head understands well as it was formerly hers. These two provide formidable leadership, but with a light touch. Of the various committees that moderate teaching and learning in the school, the most influential, the one that everyone wants to be on, is the Microtechnology Committee - commonly known as "Chips with everything".

The teachers in the school work as a team. The atmosphere is one of shared, and enjoyed, endeavour. On my last day in the school, the pupils were absent - it was a day for staff development. The IT adviser had set up a staff cybercafe, open all day for the teachers to familiarise themselves with new applications. All the school support staff turned up. The school dinner ladies learnt to surf the net and find the school web pages.

But for the last glimpse of the school, let us return to Daniel’s day. About to leave the school, I am drawn to the music room where I find Daniel and his class at their singing lesson. They are singing their technology song:

> Send a message
> Send a message
> Send a very, very, very urgent message.
> Hoist the flags up on a boat
> Send a letter, send a note
> Use the post box at the corner of the street.
> **But with our communication**
> **We have friends across the nation**
> **Exchanging information every day.**

Creating a new school environment
Richmond Park School has taken 10 years to get to this point. Today, later starters must move faster. What are the conditions for change? How can schools make decisions about technology and its use? And how can they implement change successfully? A recent independent inquiry into information and communications technology (ICT) in UK schools, the Stevenson report, provides a framework for analysis.[1] Published in March 1997, it is both a status report and prescription for progress. It concludes that if progress is to be made, ICT must figure strongly amongst Government-led strategic initiatives for education. There is no quick fix; progress will result from a "coherently managed set of initiatives". The report sets out three requirements for the successful integration of ICT into schools: single minded vision, commitment, stamina. These are all evident at Richmond Park school, and in other MAILBOX schools.

Towards integration - elements of a strategy
The report proposes three elements of a strategy: teacher training, software, connection. These three elements have indeed been vital elements influencing the achievement at Richmond Park.

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[1] The independent ICT in schools commission <u>Information and Communications Technology in UK Schools: an Independent Inquiry</u> March 1997

Teacher training: At the top of the Head's list of key factors was teacher training - the importance of training to help teachers accommodate to the new approach to teaching and learning.

Software: access to an extensive range of software underpins all learning at Richmond Park. The children now turn first to the Internet or their CD ROM encyclopaedia for information and reference material. The school head has accumulated software by directing her spending budget at software in preference to books - a startling idea, but why not? Is the future of text digital or ink?

The Head is particularly keen on "content free" software, which enables the children to write, draw, create. Perhaps such software needs more attention - the power to create motivates children so strongly.

Connection: connection affects the quality of a child's learning experience in a number of ways. It links children with the world of work and adults, enriches the content of learning, gives value to individual achievement, allows children to display their achievements, brings new capabilities for learning into class.

In Richmond Park School, connection has had a catalytic effect. I asked the children in Daniel's class about their use of the Internet. We talk first about email. They started using it when they moved to the top class. “Internet is easy.” They describe the process of logging on and searching - they know it backwards! They like email. Why?

> L: It’s easy;
> A: It’s fun - it’s not so much fun just writing a letter - the letter takes longer to go
> *Do they reply to all their letters? No. Some are letters for teachers - they print them out and pass them on; some don’t need a reply. Some are for other classes - the teacher of those classes usually deals with the reply. Sometimes they initiate mail. Usually they get a reply.*
> L: I like showing other people how to do it.
> J: I like meeting other people and helping them. *She is teaching her brother and sister to use a computer*
> K: It’s exciting sending letters all over the world. But I like working on the website best.
> *J wants her own web site.*
> *The Internet? Frustrating! K says he has no patience with it!*
> *They have a sense of pride, of achievement: “Some people haven’t even got a computer”.*
> *They like working together on the Internet. They can talk to people beside them. Sometimes they can’t do that in class.*
> *They compare video conferencing and email, and list the differences. They really like video conferences. They would like to have video conferences with more places, perhaps link up with London. They would like to visit the schools they video with - just for a day.*

The case for connectedness continued

Robbie, now 17, was once a pupil at Richmond Park. Ten years ago he helped to start the school revolution, when he and his teacher - the present head - took the very first school computer out of its brown cardboard box. The Head describes how her initial terror of this machine changed the moment she realised what the computer could offer, and turned to hope when she saw how fast the children mastered the technology - she could learn with and from them.

Robbie will now soon go to university. We have already heard he has web pages - the children downloaded them earlier. What does the Internet mean to him? "It's my life". He uses it for school work, to back up class work. He also uses it to earn the money for his web connection - he designs web pages for others. He sees the Internet as reducing the danger of isolation when you learn alone. It gets people together, communicating with each other: "Wouldn't it be great to pick up a phone and talk to 15 people? That's what the Internet offers. People don't want the computer to be a solitary thing.”

Robbie is very proud of his web page. It has been tremendously successful, with several hundred "hits" and comments in its first three weeks of existence. It's called the Ramp Ahead, and is a web site for people with disability.

For Robbie has cerebral palsy. "I can't write. I had to use a computer." For him, computers first put him on equal terms with other children, and now he is able to communicate freely across the world.

Robbie is not alone in his disability. The school I have described is Glasgow's primary school for physically disabled children. Its successful integration of technology is a powerful demonstration of ICT as not only a force for learning but also a force for social cohesion. A great equaliser, a great opportunity. As Maggie Pollard, the Head, and Mari Wallace, the IT co-ordinator, expressed it recently:

> "Information Technology is the medium by which children in one primary school have achieved more than they or we, as their teachers, believed to be possible."[2]

Learning to learn, learning to change

Richmond Park School offers a vision of the future - a school environment where information and communications technologies open access to the whole world of learning, and where children learn to manage their own learning. Teachers too have had to learn to manage learning differently in this new open environment. The school has changed, it continues to change and - a truly learning organisation - is ready to change further in response to each new opportunity offered by the information age.

The vision, commitment and stamina of the people involved has transformed learning, while information and communications technologies have provided both inspiration and means for that transformation. Information technology first opened the door on a new era; now communications technologies have flung wide the windows.

Janet Jenkins
June 1997

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[2] Breaking through the glass ceiling**,** Scottish network for able pupils (SNAP), 1997, Mari Wallace and Maggie Pollard