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How do school children search the Internet? Teachers' perceptions

The volume of information available to the 21st Century learner continues to grow. The skills needed effectively to search for, retrieve and critically evaluate this information are, correspondingly, increasing in importance; and the promotion of these abilities is an important educational goal. Clearly, an information resource of rapidly increasing importance is the Internet.

This paper reports the findings of the first stage of an AHRB project being carried jointly by University of Sheffield, and The City School, Sheffield. The City School, which is the focus of the study, is a mixed community school in an economically deprived area of Sheffield. It is, however, well provided with ICT resources. School staff therefore, have an unusual breadth of experience in using the Internet and implementing it in their teaching.

One of the questions the project seeks to address is
"what tasks and activities do teachers require pupils to perform that (i) currently require or (ii) could potentially benefit from, effective Internet information seeking and critical evaluative skills?"

To address this question and as the first stage of the research project, the insights of staff were sought in a series of semi-structured interviews. Subject leaders and other key personnel were interviewed, and their observations are summarised in this paper. Issues arising from the interviews are as follows:

- Students, particularly younger children, need clear guidelines when searching the Internet.
- Students are more likely to learn of useful sites from their peer group than from searching the Internet.
- As an information resource, the Internet is used enthusiastically by students who are reluctant to use books.
- Many of the interviewees felt that their students were more skilled in using the Internet than they were. Those teachers who expressed such a view believed that the disparity had a positive impact on their teaching.
- The demands of the National Curriculum are preventing teachers from making best use of the Internet in their work.

In addition to providing valuable insights, the findings reported here will be essential in informing the later stages of the AHRB project.

Introduction

The continuing rapid development of ICT offers the 21st Century learner a growing range of information resources, many of which are accessible through the Internet. Unfortunately, the volume of resources available on the Internet, together with the variability in their quality, makes the Internet a very confusing place to search. Although a great deal has been written on Internet searching by adults however, surprisingly few studies have examined children's use of the Internet and of search engines.

An unresearched area

In 1998, Schacter *et al* observed that 'Children's information seeking and use of the Internet are virtually unexplored areas". This comment was echoed by Bilal two years later. Furthermore, it is hard to generalise from the few studies that there are. Hsieh-Lee, for example, summarises eight studies of children's web search behaviour that took place in North America between 1997 and 2000. The age groups investigated ranged from 6 to 15 years old, and the numbers of students in each study group varied considerably, with at least half of the studies involving fewer than ten students.

Although it may seem surprising that there has been so little research, given the extent to which the Internet affects modern life in the developed world, it should be remembered that the personal computer and the Internet have become a widely accepted part of Western Culture.

A recent phenomenon

The statistics in Table 1 show how rapidly access to computers and the Internet has grown in the last decade. Clearly, such access was necessary before students could begin to search the Internet. It was also necessary however, that the Internet should be available in a form that made it easy to search. Although it has been around for nearly forty years, it was not until the release of the World Wide Web in 1991, followed by that of Mosaic (the first graphical browser) in 1993, that use of the Internet became intuitive to anyone familiar with a Windows PC or Apple Mac (Berners-Lee, 1999).

The importance of the Internet in education is now indisputable, and large scale studies of the search habits of school children are now practical. In November 2001, a three year AHRB-funded project, "Education for evidence-based citizenship: improving pupils' information seeking skills" was begun at the University of Sheffield. One of the questions the project seeks to address is

> *"what tasks and activities do teachers require pupils to perform that (i) currently require or (ii) could potentially benefit from, effective Internet information seeking and critical evaluative skills?"*

It is a preliminary attempt to answer these questions that is presented here.

The focus of the project

The project is a collaboration between University of Sheffield Department of Information Studies, and the City School in Sheffield. The City School is an 11-16

mixed community school with around 1500 pupils. According to the last Ofsted report (2001),

> *The percentage of students known to be eligible for free school meals… is above the national average. Attainment on entry is below average… The present percentage of pupils identified as having special educational needs… is also above the national average*

Despite these disadvantages, the report states that the school provides a satisfactory level of education. Amongst the things for which the school is commended are education in ICT and use of ICT to enhance learning across the curriculum.

Not only does the school make good use of ICT however, it also provides excellent access to ICT facilities. This access is increased by the fact that the school is home to one of the five City Learning Centres in Sheffield. It is not intended to suggest that this level of provision is representative of schools throughout the UK. Rather, like Holloway et al (2000), because the intention of the project is to explore how children use ICT in the school setting, a school was chosen where student access is as free as possible.

Methods

In January and February 2002, a series of twenty semi-structured interviews was held in Sheffield. Eighteen of the interviewees were staff at City School, where interviews were held with

- two assistant head teachers
- the senior learning mentor
- Special Educational Needs teacher
- the library and learning centre manager
- co-ordinator of the scheme for gifted and talented students
- literacy co-ordinator
- ICT Key Stage 3 co-ordinator
- Work experience and careers co-ordinator
- the Network Manager
- subject leaders in English, Maths, Humanities, Science, Music, PE, ICT and Art.

Additional interviews were held with Head of Centres, Institute of Education at Manchester Metropolitan University, and with the Manager of Newfields City Learning Centre in Sheffield.

The intention is that the AHRB project be based on action research. The scarcity of research to date into Internet searching by children, makes the experiences and observations of the interviewees particularly valuable. The themes identified will inform subsequent stages of this project.

Results

The main purpose of these interviews was to learn, from the observations of people with relevant experience, how students search the Internet. Nevertheless, in the

course of the interviews, several other, related themes, emerged. These are discussed in the next few paragraphs.

Internet concerns

The interviewees were all positive in their view of the Internet as a pedagogic resource.   Some concerns were raised however. Three people explicitly expressed concerns about pornography; though others, more guardedly, referred to 'unsuitable', 'unsavoury' and 'undesirable' sites. In addition, two interviewees had worries about the risk of picking up viruses.

Other concerns related to aspects of accessibility:

> *It's a very valuable resource - when it works… We have problems with continuity of sites where we direct the kids to a site one day, go to the same site the following day and somebody's upgraded or something, it's unavailable…*

> *I'm reaching a point where I reach a firewall and I can't get onto bits that are supposed to extend out of the site, and that is very frustrating...*

Teaching with the Internet

None of the interviewees had received formal training in using the Internet. Mostly it had been "*picked up along the way*". Levels of experience varied considerably, from several years to a few months. One teacher claimed never to have used the Internet. All the interviewees had, however, supervised classes of students using the Internet. Many reported problems keeping the class "*on task*", but all felt in control:

> *More so than normal because it appeals so strongly to the pupils that you have less discipline problems in that situation than you have in the normal classroom situation...*

Some of those teachers who lacked confidence in their ability to use ICT were able to turn their lack of knowledge to an advantage

> *I always say at the beginning 'Look - I'm an old teacher - I don't know as much about computers as you - I know how they can be used, I know how they're useful, I know how important they are. You are part of a generation that is going through school and through life, etc.' We do that. And that works very well. I've got the confidence to do that, and the brazenness to do it, and to harness it in a way…*

> *…when I first got these computers, I thought I was going to be really embarrassed by my lack of knowledge, but the kids haven't really been bothered at all by that. They've understood completely, and helped me, and that's been really, really nice actually, because they don't seem to think any less of me. But they've been very helpful to show off their skills, and teach me things. It's a two way thing, so that's been good.*

Remarks from the teachers, and from the CLC manager interviewed, suggested that classroom management skills were of far greater importance than ICT skills.

It's very easy - if you're around a class of computers – [to see] *who is actually on task and who isn't on task, so classroom management sorts that out….*

I think it's a fantastic tool for the classroom - it brings everything in - but you have to be very, very careful. If you blink the kids can go and surf somewhere else, especially if the computers are turned away from you…

…there is a real development need for teachers in managing an ICT facility for a class….I've seen teachers say 'Go and search for this' *and I see kids who look like they're off task to be frank. It tended not to work. It tends to create classroom management problems, 'cause kids end up all over the place…*

A different resource for different students

One of the most positive themes to emerge was the extent to which the Internet is of value in complementing traditional information resources that might present difficulties to some students.

…some students appear to be able to read more effectively from a computer screen than from a book, and so have higher level computer reading skills than you would perhaps anticipate…

I think some kids actually find it easier to access information via computer than they do via say, maybe going to a book or going to the library…

Interestingly, gender was less of an issue than might have been expected from studies such as Holloway *et al* (2000). Where it was raised, it was in the context of learning styles:

I think the boys particularly - it's much easier to direct them to art history with the computers. The girls will do what you've asked them to, 'cause they're very conscientious here. The lads... with the computer, they're much happier, much more at ease, much more comfortable than wading through a book - particularly those who have a struggle with literacy…

Some kids, especially girls, are quite good at looking at a book and writing it all down neatly, and they seem to remember that: but boys don't have that. Boys need to do and find out, and somehow having a mixture can work quite well…

Factors limiting Internet use
Despite their positive experiences with the Internet, many of the teachers did not use it as extensively as they would have liked. The main problem they encountered was lack of time.

> *We don't actually have the time on the courses that we run in school to… put students onto the Internet, although we do use it for one of our projects…*

> *There is an issue about time to search for and prepare learning with on-line resources…*

This is being addressed in South Yorkshire however, by an e-learning project which is
> *providing time for teachers to produce materials and to seek resources and to develop those into learning packages.*

Another factor affecting usage appears to be the prescriptive nature of the National Curriculum.

> *…a lot of teachers come back to me and say… '"why should I use the Internet? – I.T.? I can get my kids through the examinations - get the A to C's they need, they never need to touch a computer.'*

> *…in the situation that I'm in, having taught so long, I've got most of the kind of resources and materials that they need to process them through an examination…*

Observations on Internet searching
ICT training was provided to all year 7 students, so none of the teachers encountered students who did not have the technical skills needed to search the Internet. More problematic was the lack of skills needed to cope with the large number of hits that a search generated. Most interviewees were concerned about the quality of material retrieved, and its appropriateness to the students' level of education.

> *The problem there is… actually sifting through what is relevant and what isn't relevant on the Internet. You can spend hours just looking for stuff and you will find complete nonsense…*

> *It's got some problems - we have problems with the level of language on the Internet. Sometimes the language is too high for the kids - it can be inappropriate totally…*

Several of the teachers noted that students seemed to be drawn to pages by their appearance rather than their content:

> *…they like the sites that are colourful - that have got interaction, and the actual quality of the information in them may not be so relevant…*

> *…they tend to go for things with animation and colour…*

The teachers interviewed generally found that the students needed to be directed.

> *I've learned from experience that they do need quite a lot of direction... and the ideal of allowing them freedom for independent research, doesn't always work as effectively. They need to possibly have more structure than I would have anticipated in the early days of using the Internet...*

The direction took one of two forms. Most commonly, students were provided with a list of appropriate URLs

> *...we direct them to certain sites...rather than just using a free search...*

More subtly, they were led by example:

> *I've also been on the Internet myself previously and checked out one or two sites. Then I'll say to the class 'How about we use Google as a search engine ... I'm always directing them to the sites I've already looked at. I'm not giving them pre-sites of say 'You must use this site'... I'm guiding them to those sites so they're not tempted to put anything else in... you check their words in their searches...so it looks as if we're working together. Very sly...*

Such direction tended to be aimed at younger students. There was a general perception that, as they got older, students became more discerning and could be given more freedom in their searching.

> *We talk about 'Are there any key indicators where the information's quality - particularly in Y10. Not in Y7 so much. It's difficult to introduce the concept of... what quality of information are you receiving. But in Y10 it's somewhat easier...*

> *... you change the use, so it becomes independent use when they're old and they can handle it - there's time, compared to directed use lower down the school...*

The Internet was, not surprisingly, a widely used source of information for Key Stage 4 students researching their individual GCSE projects. In such circumstances, student searches would not, in general, be directed by teachers.

One of the key factors identified was the interaction between students. Teachers frequently noted the extent to which children helped each other in classes:

> *There are students who find it difficult and haven't got computers at home, but there's always someone in the class willing to help them. They're very... very good at helping each other, and that's really nice...*

> *A couple of nights ago some youngsters... had to do some research on Emiline Pankhurst, so they just clicked on Google, typed in Emiline*

> *Pankhurst and… they came up with multiple references but they went for the first one that was what they wanted, and basically that's what they used for their source. But then someone else must have put something different in and they came up with just a slightly different one and they were all interested, because otherwise they were all getting the same reference… so they shared that information…*

Where there is an efficient communications network it seems, only one student needs to do a successful search in order for the class to benefit. Students were considered by their teachers to be unimaginative and undiscerning in their searches; but in a community where news of a useful, an interesting, or an entertaining website can spread rapidly, such qualities do not need to be common.

> *There's obviously currency in web sites, and they share information in that way…*

> *What tends to happen is someone discovers it and it goes round like wildfire…*

> *Word of mouth… is quicker than any tannoy system…*

Discussion

Summary of findings

All the interviewees clearly appreciated the Internet as a pedagogic tool, despite being well aware of its shortcomings. Its value in providing an alternative resource for students who struggled with traditional resources was widely recognized. Most teachers however, felt that they had too little time to incorporate Internet-based resources into their teaching, and that the narrowness of the National Curriculum acted as a disincentive.

Younger students it was felt, benefited from clear guidance when they searched the Internet, though students clearly helped one another; and details of useful or interesting sites circulated rapidly.

Issues arising

The findings summarised in the paragraph above prompt two questions about the teaching of Internet search skills in schools.

1.   Although research in the area is limited, some studies have been done in which school children were asked to carry out *finding tasks* and *searching tasks* on the Internet, and their levels of success were compared. According to Schacter *et al* (1998), children performing finding tasks, to glean specific information such as '*What are the three types of crime that happen most in California*' (Schacter et al, 1998) proved less successful than children carrying out *searching tasks*, where more general information is sought (e.g. '*Find at least three pieces of information that will help you develop a plan to reduce crime in California*). At City School, teachers noted that

Key Stage 3 students are less successful at searching than Key Stage 4 students. While student age may indeed be a factor, it may also be the case that the nature of the searches is different. Do teachers tend to set younger students the task of finding the answers to specific questions, while older children are engaged on more open searches of the type usually associated with project research? Although the findings of Bilal (2000, 2001) did not support the findings of Schacter *et al*, the question still has relevance.

2.   Usually, computer rooms follow traditional classroom design, with rows of computers on long benches, and all students facing the front. A common alternative is for 'islands' of tables, which seat 3 to 4 students:

> *…it means that the students are looking at each other and therefore there is an in-built tendency to talk to the person across from you: you can see their face…*

Given the extent to which students appear to be helping and informing each other, should such designs be encouraged?

Future stages of this project will focus on the students themselves. It is to be hoped that the findings will help to answer these and other, related questions.

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Year	UK	USA
1991-2	21% of households in Britain had a home computer.[1]	
1993-4	The average secondary school in England had one micro computer per 10 students. Fewer than a third of these were capable of supporting a graphical environment.[2]	22.7% of households in the US had a home computer.[3]
1994		3% of instructional rooms in state schools had access to the Internet.[4]
1998	Average of 8.7 students per computer in English schools. Two percent of school computers linked to the Internet.[5]	51% of instructional rooms in state schools had access to the Internet. One Internet computer to twelve students.[4]
1999	Average of 27 Internet computers per English secondary school	
2000		51% of households with a computer (41.5% with Internet access)[3]
2001	> 99% of English Secondary schools connected, with an average of 108 on-line computers per school.[5] > 75% of adults accessed the Internet from their own home.[6]	

Table 1: Statistics indicating the levels of access to ICT and the Internet in England and the USA

[1]Office for National Statistics (2000)   [4] National Center for Educational Statistics (2001)
[2] Department for Education (1995)   [5] Department for Education and Skills (2001)
[3] US Census Bureau (2000)   [6] National Statistics StatBase (2002)