Training in the age of digital abundance - technology or information?

by Nicky Ferguson and Lesly Huxley[1] ,
University of Bristol

Information. Technology. Networks. Training. Four words which are often thrown together and thrown around quite carelessly. Our view is that in whatever combination they occur, technology, to quote Janis Joplin, always seems to come out on the top. Our view is that the present and the future demand that we take training, and training in information skills in particular, very seriously. Only then can we deal with the challenges which the advances in networked technology presents. Only then can we begin to help others to come to grips with new possibilities and use existing skills and experience to avoid new versions of old mistakes.

Nicky Ferguson writes:
Let's start where everyone should start these days - on the Web. Often people have noticeboards in their kitchens - I find these quite compulsive reading. They are covered with the essential detritus of individual, or family, life. Business cards from the plumber and the piano teacher; appointment cards from the dentist, the clinic and the acupuncturist; receipts from the washing machine repair woman and the milkman; shopping lists, opening hours, bus timetables, parking tickets. Sometimes I learn something from these unauthorised perusals ("gosh the ante-natal clinic! congratulations") but mostly the charm resides in glimpsing the ordinariness, the minutiae of other people's lives. Nosiness, not to put too fine a point on it. I'm not sure that trawling through most Web pages is very different. A superficial fascination but often no new information, no new ideas. This is actually fine - we don't advise people to keep their noticeboards covered with a black cloth in case someone else wastes their precious time reading personal trivia. It is up to me to discipline myself not to spend all day browsing the appointment cards. We should be explaining this to children, students, trainees, users call them what you will. It is not the Web's fault that people find it useful for collecting and collating their personal and work trivia and signposts, and sharing that information with their friends. It is up to the browsers, and here I mean the people not the software, to recognise quality when they see it and when they don't, and to develop strategies to make their work time more productive: and of course it is up to the professional providers of quality information to point people to worthwhile sources and to run quality services.

So what are these quality services? How will our students recognise them? Equally important how will they recognise those that aren't worth spending their time on? Moreover, since the line between information consumers and information providers will become increasingly blurred, how can we encourage them to make their information available in a neighbourly, useful, socially responsible, creative, even fun way? Let's look at some sites and see what we think of them.

Let's say I'm interested in goldfish - someone's told me that I should look at **"Sharon's home page"**, OK, let's explore.

H'mm- it seems Sharon likes goldfish too but there's not really much more about goldfish than that. There seems to be a Jane Austen archive and there are other things which may or may not interest us, but no real material about fish; still there is a list of other places to look for fishy stuff including Dave's page - **"really interesting"** it says - so we'll go and look there.

Dave's page is strong on hyperbole but again it lacks content. Still it does have a list of fish sources (which look similar to the ones on Sharon's page, now you come to mention it). There seems to be a heavy metal music archive and there are other things which may or may not interest us, but no real material about fish; still there is a link to the **"SOFA home page"** (I know you've all heard of the Small Orange Fish Association) so we'll go and have a look there.

Well this isn't quite what I expected - this seems to be the home page for my kinswoman Finlay Ferguson, rabid Scot and fish fan, as well as chairwoman of SOFA. It does have a list of fish sources (which look similar to the ones on Sharon's page, now you come to mention it). There seems to be a clans and tartans archive and there are other things which may or may not interest us, but no real material about fish; still there is a link which reads **"Goldfish lovers click <u>Here</u> "**- now that sounds exactly what we're after, so we'll go and have a look there.

Oh dear... **"Sharon's home page"** ... back where we started.

One could argue that the act of classification itself ("Some fish pages I have gathered together") adds value to the web; but in fact a classification which only points at further pointers obfuscates rather than clarifies. Which is all a roundabout way of saying that many web pages seem to be a part of a self-referential, charmed (but not charming) circle,

merely pointing to each other without adding much to the sum of human knowledge or even networked information. Of course a classification which also describes, not a mere listing but a descriptive record, meta-data in the jargon, is a different matter. Depending of course on its own provenance and reliability, such meta-data does add value to the web and to the resources it describes and it can be amply justified. Care should also be taken to point either to resources themselves or, in some cases, to further, fuller or more specialised descriptive lists, but not to bare lists of titles, whether or not they are long or have hyperbolic introductions.

What implications does this have for us when we attempt to train others to construct worthwhile web-based resources? What should the resources do?

1. **Value**
They should add value in some way, probably providing descriptions of the resources they point to, preferably doing more.

2. **Classification**
They should systematically categorise and take advantage of the uniquely "virtual" nature of their medium to cross-classify, so that users can get used to knowing where to look and can find things where *they* expect to not where *we* think they should.

3. **Maintenance**
Resources should be continuously maintained to give currency in addition to reliability; networked information changes so fast that unmaintained lists go off quicker than milk on the doorstep.

4. **Quality**
They should not just uncritically dump everything that might be relevant into a huge list. Quality judgements should be made and continue to be made so that resources which are set up in a burst of enthusiasm and left to wither and become irrelevant are spotted and deleted.

5. **Variety of access**
Users should be offered a variety of access methods or interfaces - they should have the choice of searching or browsing and preferably have different browsing options.

And what are the implications for the searchers, the users (and those who seek to teach them)? There will probably be no "one way" of doing things and no one source or megastore which will satisfy all your information needs. You may expect to call at three or more locations and use different techniques before arriving at your goal. You should take care that you are narrowing the field along the way, not skipping from one unordered list to another. Reward the productive search paths by taking a few moments to retrace your steps and add bookmarks, penalise the not-so-charming

circles by making a mental note to avoid them in the future. So the Tao of webbing will be that there are many paths to enlightenment, you will browse and then search, search and then browse. In searching, how to search? In my experience the information strategies of the average user are limited. Many if not most of the postgraduate students I come into contact with have managed to get good degrees without knowing what the three letter word "and" means when it is used as a Boolean operator. They will search for "Marx and Engels" (or often "Marx and Spencer" but here is not the place to consider the quality of secondary education, spelling or the commodification of culture) and expect, very reasonably if no-one has told them otherwise, that they will find every resource which mentions "Marx" AND also everything containing "Engels". Yet many sites providing search facilities on the Web will offer far more sophisticated options which go largely unnoticed or unused. There are two approaches to this problem. The first is the one that the technologists adopt. What we need to do, they tell us, is to make the search engines, the software, the facilities, so clever that users don't need to know about search strategies, they can just type in their queries in natural language. I'm a big fan of natural language searching, at least I will be when I find a system that works, but I doubt if most users have given sufficient thought to what they are seeking, even to phrase their quest in natural language. Perhaps I will be convinced by someone here today who has designed a natural language search engine with artificial intelligence, in-built dictionary/thesaurus and pre-search feedback mechanisms so that when a user enters on the search form the word "aids", before searching the database or sending the robot off to examine the web, our intelligent engine will ask the user "Do you mean handy gadgets for disabled people to allow them to operate machinery, pick things up, hear better and things like that, or do you mean the disease or do you mean home helps or do you mean something else I haven't mentioned here?". Even in that unlikely event I will still maintain that a sophisticated approach to searching will encourage sophisticated thought and that surely sophisticated thought is needed for sophisticated analysis. Of course I do not think we should discourage the development of excellent search mechanisms - I am in fact involved in a project in which we spend a lot of time discussing exactly what such a mechanism should and should not do for the user - but alongside the technological development, we should be encouraging and promoting amongst so-called "ordinary users" an understanding of strategies for finding, retrieving and using information.

Which brings us to training. You will have guessed by now that I think training should encompass more than the latest technological buzz, more than which buttons to press in version *x* of software *y* which will be replaced by software *z* in a few years, months or weeks. We are after some more general appreciation of ways to use these technologies for real work, even real life. I used to think that it was important to make Internet training a totally pleasant and stress free

experience, newcomers tend to bring quite enough stress and anxiety with them when attending a course on such a daunting and overhyped subject. I now think that it is somewhat mischievous and misleading to prepare and engineer such things to gloss over the difficulties and make everything too smooth and easy. Training, when related to preparing yourself for other activities such as running a marathon, swimming the channel or even a walking holiday, implies a certain amount of effort, dedication, commitment and practise. You make yourself, or your trainer makes you, do unpleasant things, push yourself, stretch, extend your capacity - you will be subjected to nauseating exhortations such as "no pain, no gain". Perhaps we should be taking the "make 'em sweat" approach a bit more in this area too. Of course it is necessary to present beginners with step by step practical exercises outlining every key press, what are known as hand-holding exercises. But if that is **all** we do, however impressive our evaluation sheets at the end of the day, we are not giving them the confidence to go further on their own. Better to suffer a few adverse comments at the end of the training day but produce trainees who, when the hand is taken away will wobble off on their own bicycles and disappear round the corner, not collapse in a heap. So let's make our poor trainees answer questions, don't just let them follow the instructions, or wander off on their own. We should, of course, provide reference materials and the equivalent of reading lists, citations catalogues and bookshelves, but as many university lecturers have found, it's not always best to dole out photocopies as it can encourage the belief common amongst students that the act of clipping a photocopy into a ring binder osmotically transfers information and comprehension of it to the brain. Often better to force the unwilling student to search for and actually read the article before deciding whether it is worth copying and archiving in empty cornflake boxes. Similarly with exploring the networks - next time they will be able to cope better if this time they had to work it out from a sketch map rather than being led by the nose.

In summary, I would like to beg, plead and cajole you, as information professionals to share your skills with the horde naive users like myself who are blundering and about to blunder into this huge global virtual library that is creating itself. I am asking you to consider, going **OUT** of your institutions and talking to the people who are and will be using the Internet. Get involved with training initiatives and patiently explain that people have thought about information issues before Netscape was installed on their PC. Go to the places where they are beginning to use this stuff - the school classrooms, the undergraduate Internet clubs, the cyber-cafes and worse (yes it's a dirty job but someone's got to do it). Spread the word about information handling skills, information seeking skills and user-friendly information provision. Don't let the code-writers monopolise the new image of international networked information - they will reinvent the wheel if you let them and it will be triangular (but with retractable spokes and flashing lights). What's

more, as the provision and use of networked information explodes, the technology will change at least every couple of years. But information skills will become more relevant, more important, more marketable. Be there, or be triangular.

Lesly Huxley writes:
The task, when I was appointed SOSIG Documentation and Training Officer in mid-1995 was twofold: to produce SOSIG promotional, publicity and reference materials drawing attention to a service which had done 'some of the hard work' in searching for quality and relevant social science resources; most academics who tried the Web when it first emerged from their University computer experts' clutches found it a significant time-waster and severely wanting. We wanted to bring them back into the fold, bringing the newcomers with them, to show them that there were ways of locating useful networked information quickly. Secondly I was to provide Internet workshops at UK universities and colleges of Higher Education, supported by training materials tailored for social scientists and the particular needs of the site concerned. The target audience comprised mainly newcomers to networking in the Social Science field and those tasked with training and supporting them. The workshops and materials were not to be set entirely in the 'press that button' mould - although newcomers would need some precise instruction, the aim was to provide a forum for learning both the tools and techniques *and* an attitude of enquiry which would allow them to cope with and extract the best and most relevant information for their work not only on the day of the workshop but well into the Net future - a future with little discernible shape. One difficulty was in reconciling participants' time constraints and potential technophobia (or Netphobia) with the ever-changing, ever-challenging Internet environment to which I was trying to introduce them. Another was to satisfy the needs of on-site trainers and support staff for materials which could be adopted, adapted and cascaded to others beyond the dozen or so attending the workshops each time. The route from task specification to task completion (not that it will ever really be complete - that's not the way of the networks nor the way of training!) was a challenge to ideas about teaching (training) and learning.

Initially there was a period of stock-taking, using paper and on-line materials developed during SOSIG's formative years. An on-line welcome page was loaded in a browser and bookmarked before participants entered the room and greeted them when they arrived. They were invited to browse through it to gain some WWW and Netscape background, something which seemed to challenge their ideas of what a workshop should be: they expected to be welcomed, introduced, led gently into the topic with a talk or perhaps a demonstration, not allowed to explore on their own. Some had dabbled before, thought they knew a lot and were expecting something a lot more sophisticated. Others felt lost: how could they get on and experiment when no-one

had taught them what to do? Many simply sat and stared at the text on screen and then, as time went by, at the screen saver. Others browsed through the comforting pieces of paper they had been given, hoping for guidance from there, but still reluctant to put fingers to keyboard or mouse. The know-it-alls clicked off into a bravado show of hypertext highjumps which did little to reassure their colleagues. A few of the newcomers caught on and read, understood and followed links, started exploration.

The aim had been to avoid giving them SOSIG "on a plate" but to provide a menu of ingredients with which they could experiment to find the most appropriate mix to prepare themselves for future learning, future exploration, with some guidance, some structure. In the main the challenge presented by this slightly unconventional learning experience failed them. Instead of prompting reflection, questioning, experimentation, it engendered resentment amongst the knowing, misunderstandings and misconceptions amongst the beginners: some thought the welcome page was SOSIG, some were unaware of what they were using - a browser- to view this information: was it a word processor? a text reader? How had it appeared on their screens? Worse still, their ability to come to grips with paper exercises later on and their confidence to proceed further were seriously affected. The unconventional start which should have set a positive note of enquiry for the rest of the workshop instead proved a barrier to learning.

The pattern of the workshops and the materials evolved gradually for a time as I tried to improve them with small adjustments, but eventually changed dramatically to take on a more conventional look which could still incorporate prompts for reflection, areas of challenge. A very traditional start of welcome speech, presentation with slides about the Internet and demonstration of how to load the browser and the on-line tutorial (a several page and quite complex development on the one-page welcome page) now leads participants gently into the recipe, but the emphasis is placed early on on self-paced learning, exploration, challenge within a structured framework. The on-line 'slides' provide more flexibility than their Powerpoint predecessors:- the levels of experience of each audience varies enormously, from one university to another, department to department and within the same workshop. The hypertext links in the slides provide for a longer, detailed 'talk' for newcomers, with the ability to bypass the basics and/or offer off-the-cuff demonstrations for a more experienced set. The presentation can be expanded in almost any direction dictated by the experience and interests of the audience. Within the traditional framework of talk and presentations and step-by-step exercises implying apprenticeship, acceptance of information learnt from the expert, lie semi-Socratic interventions which stop short of destroying all former knowledge in order to clear the way for future learning: at all stages participants are questioned and challenged, either to think further about what they are doing, to seek information and provide an 'answer' and prompted to

develop their own questions, their own enquiry.

Once the expected presentation is over, participants load a browser, enter the URL for the on-line tutorial and start exploring. Some are hesitant and follow slavishly what is on screen, but for most, the flexibility of the tutorial structure encourages them to set their own agenda, their own pattern for learning. After these initial explorations via the tutorial and a talk about and demonstration of SOSIG, participants are finally given the comforting pieces of paper many of them still crave. There is generally a collective sigh of relief at this stage: they have had a taste of freedom but they do not yet feel ready for total liberation. The pilot step-by-step exercises have been developed into a workbook and are interspersed with questions demanding reflection and further questioning in turn and to try to interrupt slavish adherence to instructions without understanding. Quizzes are provided to reinforce and test the newcomers' learning and to engage the more experienced. In both cases they are designed to illustrate how SOSIG and the resources it points to can be used to support teaching and research, to prompt lateral thinking, provoke consideration of searching and browsing strategies. Emphasis throughout is on consideration and development of the latter, on the different tools and techniques available, the different thinking that may be required depending on the design and content of the resource. This is followed through in further exercises involving other UK national services and international WWW search engines such as Alta Vista, Excite etc. Participants are encouraged throughout to use their own search terms or subject areas for browsing rather than sticking rigidly to the examples in the exercises. After the initial, traditional 'presentation' introducing the workshop and enough background to get them going, the rest of the day - and these are full-day sessions - is given over largely to participants' explorations. There is no requirement to use all of the workbook or to follow the sections in any particular order. Most are delighted to be able to set their own pace, to follow up their own lines of enquiry within the framework the workbook provides. During the second two thirds of the workshop my role is to respond to questions, interrupt occasionally with comments and demonstrations on issues which arise and offer collective or individual guidance if asked.

Requirements and the materials to meet them are constantly changing. Materials are frequently updated with screen shots and instructions, URLs and comment. I have to address participants' increasing levels of Net experience arising from extensions to campus networks and the increasing availability of graphical browsers on academics' office machines. Few sites now want coverage of using telnet to access WWW resources via Lynx, more want an introduction to HTML authoring. Web-based evaluation forms and questions and comments during workshops provide useful feedback in tailoring workshops and materials. Information is also collected at the workshops on participants' previous usage of the Internet and World Wide Web as part of the evaluation of

the effectiveness and usefulness of the Gateway and subject-based services in general, as well as of the training. Follow-up questionnaires and, in some cases, telephone interviews, seek to provide comparative data for usage after the workshops, to be analysed by a consultant employed under a related project. The most common comment on the workshop forms has been the usefulness of 'protected time' to explore, of not being forced through at a particular pace and of being allowed to follow up own lines of enquiry. Early on in the workshop participants are exposed to ways of recording and saving information found on the Web, through bookmarks, saving and copying and, in some cases, using electronic mail. Fewer now reach for the pen to write down URLs of useful sources they have found. Many copy bookmarks to disks to take away as a new starting point. If participants have not started following links or searching for information themselves by the middle of the second session I feel that the workshop has failed. The most successful sessions - from my own and from participants' points of view passed on through evaluation forms - are those where questions come thick and fast, where the text and graphics appearing on screens as I roam around the room are those I have never seen before, where participants call colleagues' attention to resources they have found, sometimes scampering excitedly around the room like children. Their enthusiasm for exploration, the discovery that amongst the abundance of networked information sources there are some which could prove really useful, that there are ways of finding and handling information which are not trivial or a waste of time, is a great joy. Even more so when they begin to think out loud, follow lines of thought on how they might incorporate some of the resources in their teaching, how they might introduce students to them. From then on the SOSIG has jumped off the plate, each participant leaves with a handful (or mindful) of ingredients which they can fashion into their own individual recipes for locating, using and perhaps in the future building networked information resources.

1. This paper has been presented at the CSS96/IASSIST conference at Minneapolis, University of Minnesota, May 12 - 19, 1996.

Nicky Ferguson and Lesly Huxley, Centre for Computing in the Social Sciences, University of Bristol 8, Woodland Rd BRISTOL BS8 1TN

E-MAIL:nicky.ferguson@bristol.ac.uk

CCSS home page at: http://sosig.ac.uk/ccss/

SOSIG at: http://sosig.ac.uk/