

CREATIVITY AND THE COMPUTER EDUCATION INDUSTRY

DALE SPENDER

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INTRODUCTION

The biggest business of the future - according to Sir David Puttnam and a few other gurus -- will be the education industry. As we move into the information age and as the lines blur between teaching/learning, and work, and education and the media, the education industry will provide infinite possibilities for creative people from across the board. (Writers, artists, sound people, film makers, media researchers, graphics geniuses, animators -- and computer professionals.)

Never before has education as an enterprise been able to amass such a dazzling array of talent. Never again will it be said that those who can't do anything else can go into teaching. Education is the industry of the future and where the hottest people will want to be. Which is an extraordinarily exciting prospect. It's a mind boggling hike in status for education.

For too long education as a discipline, as an industry, as an issue - has been marginalised. But, in its broadest sense, education is now becoming central to our economic and cultural future. Let us just keep in mind that it is an INFORMATION REVOLUTION we are currently experiencing, which is why we should expect to find education as one of the key areas.

And it is the new technologies that are launching education. Not only are they putting education into the global context; they are bringing together the traditional practitioners, and the computer and media industries. New partnerships are being forged; new and huge markets are being found. And this is why education is the industry that everyone will wish they had shares in.

And what I want to do this morning is address some of the transformations - that are already underway. In this period of enormous change, when there will be some gains and some losses, I want to help frame an agenda that will be of use to teachers, (although this is a term that is fast outliving its usefulness), to educationalists, and computer professionals; I want to set out some of the issues for all of us as the information consumers or information processors, in the digital future.

1. REVOLUTION

One of the first points that I want to make is that we are in the throes of a revolution.

This means that most of what we know about teaching and learning - about what is to be taught, how it is to be taught, and how we know when it has been taught - is becoming increasingly inappropriate.

For the last five hundred years, teaching and learning has been based mainly on book information, and while we may have developed some pretty good theories and practices for doing education, and for studying it -- the print

insights and habits won't transfer to the digitised world. For teaching and learning "on line" is so transformed, that it is not even possible to make the old distinctions between teacher and learner.

And this is also exciting. As we move from book culture to digital culture, we are on the brink of being able to rethink the entire process of teaching and learning; we can start - to borrow a metaphor from an earlier age - with a clean slate. We are being presented with the unprecedented opportunity to ask - what sort of teaching /learning do we want in this new world? What sort of educational industry is desirable?

Over the years when I have objected to so much of our educational theory and practice, I have come up against tradition, against vested interests, against inertia, against the received wisdom which simply says - this is the way it has been done. And therefore will continue to be done. But these mindless obstacles to thoughtful teaching and learning do not apply any more. So fantastic are the changes that we are being called upon to make that there is little we have known which will "transfer. It really is a case of starting from scratch with - what do we want, and how do we do it?

And far from being frightening - this can be a liberating possibility.

2. CHANGES IN INFORMATION

One of the most dramatic shifts that we confront is the change in information itself. On many fronts. As we move from a print culture to a digitised culture, we move from stable information to moving information - and this in itself takes some comprehending.

Throughout print culture, information has been contained in books -- and this has helped to shape our notion of information. For the information in books stays the same - it endures.

And this has encouraged us to think of information as stable -as a body of knowledge which can be acquired, taught, passed on, memorised, and tested of course.

The very nature of print itself has fostered a sense of truth; truth too is something which stays the same, which endures. And there is no doubt that this stability, this orderliness, has been a major contributor to the huge successes of the industrial age and the scientific revolution. Where notions of truth, laws, objectivity and proof, have all been the reference points for our beliefs and culture.

But the digital revolution changes all this. Suddenly it is not the oldest information - the longest lasting information that is the most reliable and useful. It is the very latest information that we now put the most faith in - and which we will pay the most for.

And while some educationalists have not yet come to terms with the significance of this change in the nature of information itself, this will be at the core of the educational industry from now on.

(As an aside, I have to say here that many of the digitally homeless - the term that Nicholas Negroponte has given to the average 25-55 year olds who are computer ignorant -- there are the digitally homeless, who tend to think that the only difference will be that the words that were once contained in books, will now simply be transferred to the screen. Such an assumption

could not be further from "reality" as I will indicate.)

Education will be about participating in the production of the latest information. This is why education will have to be ongoing throughout life and work. Everyday there will be something new that we will all have to learn. To keep up. To be in the know. To do our jobs. To be members of the digital community. And far from teaching a body of knowledge that will last for life, the new generation of information professionals will be required to search out, add to, critique, "play with", and daily update information, and to make available the constant changes that are occurring.

And this shift in the nature of information from a "fixed" state (as in books) to a moving or recyclable state (as in digitised information) is not the only fundamental difference that is emerging: information is now a commodity. Just as other goods and services are. And this takes some getting used to.

There was of course a time when land and air and water were available to all. (In Australia we only have to look at the Indigenous culture to appreciate the significance of such an arrangement.) And although Karl Marx insisted that all property was theft it is now generally accepted that land can be individually owned - and that it is fair for members of a society to "pay" for clean air and water. And so too is this what is happening with information.

As an author, the idea that information should be paid for has a certain appeal, I assure you. And while there are many discussions to be had about the way information should be paid for - about how you provide for public access and what constitutes a fair rate -- the question of whether information has a cost is not much in dispute these days; except in some areas of cyberspace. (When I refer to those who think information should be free, I am certainly not referring to Bill Gates.)

So information has become a dynamic and changing process; no more learning a particular body of knowledge, or professional expertise, and then being qualified for life. For young people who are in educational institutions at the moment, their future work/learning scenario is one where just about every day there will be a need to take up some form of "education". To access a specific skills course, to work and learn on a simulator, to get credentialled for a certain task, to make contact with the world's experts on a particular topic.

In my own professional life I find I am in constant need of new skills, the latest information, communication with the experts in the field.

And the day that I can use credit points to take up a particular training course online, for hours or days -- or be able to "converse" with real or virtual intelligent agents who can help me find what I am looking for, is not too far in the future. It is an eventuality I can hardly wait for.

And that is when I am being what we have traditionally called a researcher or "a learner". There is now another side as well.

My current research focuses on the way brightness and ability get constructed in mixed sex classrooms (with boys getting more of it than girls). And not only do I think I am a world expert on this subject - I would also be prepared to "teach" it to others who are interested in the topic. Who want to know where I am up to. To participate in the global

production of the latest information in the area -- I would even be willing to sell my information to others who want it. Just as in the past, I have sold books.

Except that I no longer need a publisher. I could indeed set myself up as an online teacher and make my course on gender differences in intellectuality available to the students of the world. A course which I could update daily as I "learnt" more about the topic in interaction with other cyberusers and other cyber sources. And I could do all this from my own home; I don't need an institutional setting to become a world teacher. Though I do need considerable assistance from the computer specialists I assure you. (And I do need to find a satisfactory method of being paid for my services.)

But as I do research, learning and teaching on line, the internet allows me to be both teacher and student; at the same time, and on the same topic. Which is why the dividing line between teaching and learning ceases to be useful.

3. TEACHER/STUDENT

When information was stable, teachers could spend their time studying the sources, coming to terms with a body of knowledge.

Teachers could become the experts, do their training and get their qualifications, then enter the classrooms and pass on the information to the students. Who in turn would "master" the information and get their qualifications; and by this orderly process, the cycle could continue.

And this pattern is not being broken just because digitised information is constantly changing, and being updated; it is because students as well as teachers can interact with it, can do the changing. The most significant development that is taking place and which needs to be grasped at every level, is that information is now becoming interactive. Anyone who has access to it can make a contribution; can become an information producer.

Where once you had to be the published author to produce information, the way is now open to all. And this means there are no established authorities any more. Teachers and students are doing the same thing, are sharing the same status. Are participants in the same process. And the revolution doesn't stop here.

Even the old skills of writing and reading are becoming difficult to separate as we move to the screen where, through interaction, we can be both writer and reader.

The new terms are screeners, or questers, or crusers (from creative users) and these names are meant to indicate that everyone can play an active part in making information in the digitised world.

And for teachers who have worked within the print system, this represents a mind blowing transition.

What we must keep in mind is that print based education has been fundamentally hierarchical. We know that in the classroom, the teacher is the top of the pecking order; the teacher is the one who is in charge, who stands out the front, who knows it all, who passes on the information and decides which learners will pass or fail. But there are other hierarchies in the system as well.

From kindergarten to Grade 12, from Computer Science I, to a PhD., educational institutions have imposed a hierarchical order on information. Everyone has had to "pass" a particular level to move up to the next stage. It's all been very ordered and controlled. And it has to be said that it won't be this way for much longer.

When every teacher/student is online - and this is the educational environment we can look forward to -- there can be no convenient division into teacher and learner, expert and student. Everyone can have a go, and the hierarchy collapses when -- it all looks the same on the screen.

Even email makes no distinction. Cybereducation puts the teacher in the position of being just one of the participants. And because students - or users - can interact in their own way, and do their own thing, in their own time, and at their own pace, it simply isn't possible to impose the old control and order.

This is truly the end of teaching/learning, and of grading and examining, as we have known it. It is no wonder that traditional educationalists are shocked at the very prospect of digitised education. It deskills all teachers on a grand scale. It puts an end to the role of teacher.

And if this is not enough - to be forced to abandon your expertise, your skills, your knowledge, authority and identity -- just think how awesome it will be when educationalists give up their books for computer terminals. Where so many of the students are so much more proficient than their elders are ever likely to be.

And even this isn't the end of the changes.

4. HOW MANY TEACHERS DO WE NEED?

We all know that universities are competing with each other for students - in cyberspace. Open Learning started the trend, and distance learning is expanding. And as more and more courses are offered online, universities will be able to draw on the entire nation - or the world -- as potential students.

And if a particular university can provide the best resource internationally - it will soon get the numbers. Already "brand name" American universities are tempting Australian students with "degrees in the email" at very attractive prices. And an online MBA course from Harvard could become even more attractive as Australian tuition fees rise.

But even in Australia itself we can start to see the waste of duplication, of providing 37 English I courses, or Engineering II courses, ad infinitum. And the waste is even greater when so many of these courses are of such poor quality. (I could readily quote examples of lecturers who are dishing out the same notes they did years ago, who spend 50 minutes reading from the textbook and call it a lecture; whose teaching is boring, out of date, irrelevant or disgraceful.)

This is why it makes sense for a couple of universities to specialise, and to provide the best possible English I courses or Engineering II courses - which can then be taken up by other universities.

Which in turn can concentrate on dentistry or political science for example.

And reduce poor course offerings and duplication.

Now the implications of this must be obvious. A huge reduction in the number of "teachers" or lecturers presenting the courses. And a huge increase in computer support staff, media specialists etc. Many who are now doing the teaching could well be deployed as tutors or librarians to assist students whose courses are coming from other universities.

(Let us also be clear that at the moment the greatest cost in the educational budget is teaching staff; and that one way that governments and educational authorities will pay for the shift from books to computers will be by reducing the number of professionals in the classroom.)

And this trend of providing courses to those beyond the campus confines, which has begun in universities, will extend to TAFE colleges, and schools, in a very short space of time. Already MLC Melbourne offers its courses to students who aren't on the premises. This suggests that it won't just be the institutions competing with each other for students; but that teachers will have to compete with each other as well. And with independent writers, researchers, service providers, who also have information to sell to potential students.

This is of course a very new idea - in educational circles. Yet for people who have sold their information as artists, the prospect of competing for an audience- even on a global scale - is not a new one at all. And it is this perspective that I would like you to consider for a moment.

5. WRITER

Let me just state from the outset that while I have served my time in a number of academic institutions, there have been quite a few years when I have also earned my living - as a writer.

So I come to the electronic environment with considerable experience of having to sell myself, and my information, in the market place.

As a writer/editor I have always been obliged to convince publishers that people wanted to know about my work, that there was an audience, that the book would sell, and that I was the best person to edit or write it.

And I suspect that teachers will soon have to feel as confident and as enthusiastic about their ability to capture and interest an audience, and to deliver the information - as creative people have been in the past.

From local schools to universities much more emphasis is going to be placed upon the client or the customer. (It is obvious that when students can choose from global offerings, they can vote with their feet in a way that has not been possible with books, in the physical classroom. And teachers who face the prospect of having no students are likely to become much more sensitive to "client" needs and interests.)

While I don't think it will happen in the next year or so, it could be the case by the turn of the century, that there will be one rule for everyone in the education business. If, as a teacher, you haven't got any clients or customers, if there are no "users" who want to buy the information you are offering, then like artists and performers who can't find an audience, you probably won't have a job.

Now this is not the time or the place to get into the argument about whether this shift to information as a commodity, and to the education industry, is a good or bad thing. The stand I am taking is that this is the way the world works, and that as a creator of content - as writer or teacher -- I am going to get on with it.

Not for one minute does this mean that I am without my criticisms of the new medium. But there are parallels here with print. And while I have worked for decades within the print medium - and accepted the reality of books, publishers, libraries and copyright laws -- I have also been critical of many of the arrangements and have worked to change them. (The canon, the male control of publishing, etc.)

And it is much the same is the strategy that I now adopt in the digital context.

Of course I have my criticisms. (Some of them are wearily the same as those that applied to print -- the male control of the medium being one.) But I am also aware of the stunning new horizon that is now before us.

Because one thing the new technologies provide is the opportunity for all those in the business of education to become more creative. To see their potential students as the entire global village. To develop new and stimulating ways of involving users in the active production of information - rather than being the recipients of it. To work in teams in a multi media context. Whether writer, teacher, librarian, researcher, student, or computer professional -- we have now incredible opportunities for creating content. In the words of Tony Sarno who sees the potential of these new forms -- we are experiencing a digital renaissance and it is time to get excited about it. [1]

6. ACADEMIC QUALIFICATIONS

What we are talking about here is a shift in education from print culture to digital culture. And this means first and foremost that every student will have their own computer.

Last century every student had to have their own slate; this century every student had to have their own text books - and next century every student will need their own personal digital knowledge system- what ever form that comes in. Already at many of the private schools every student has their own laptop and if we want to continue to provide equal educational opportunity in this country, then every student in public educational institutions must be equally well equipped.

In his article, "Online classroom opens up a new world for students" Robert Wilson provides an overview of where our schools are up to. (In NSW all state schools will be connected to the internet by the end of the year; 400 Victorian schools will be connected by the year's end; all state schools in Queensland will be connected by 1998 - about one quarter of them are currently on line and internet education for teachers is a Queensland priority; in WA the estimate is that about 10% of schools are connected to the internet, and in Tasmania, 83 of the 240 schools have gone on line. every state school in SA is connected to Nexus, a precursor to the internet.[2])

But its not just the students who will need their own personal digital systems. A basic requirement now is that every teacher should be computer

competent; and this means much more than simply being able to use a word processor.

Just as it would not have been sufficient for educational professionals to be merely functionally literate in a print based system, so now will it be unacceptable for information professionals to be merely electronically functional in a digitised environment.

And if teachers at all levels have to be as adept with the computer as their teaching/ research resource, as they once were with print, and the use of the text book, then the retraining of existing staff across educational institutions is in itself, a mammoth and costly exercise. And the implications for "mature" or computer resistant staff, the digitally homeless -- are worth noting.

And retraining the staff is only the beginning. Think of the enormous task that is involved in transforming existing knowledge sources -- journals and "text books" etc - from print, to online interactive format. (The challenge to create interactive texts is one that I am currently enjoying. it's a bit like converting novels and textbooks into computer games.)

And the pressure to keep up with the changes in information will border on the extraordinary. Educational professions will never again be in a position to know what they are doing; when we recognise that

80% of the computer industry revenues now come from products that didn't even exist two years ago[3]

we can get some idea of the rate of information turnover.

But the list of new skills required by teachers, goes on and on. An educational community which has been primarily word oriented will have to become visually sophisticated; in the cyberage, layout is increasingly important. Graphics is a whole new area of educational expertise, a source of extensive information and meaning; it could be said that for the new-age information professionals, graphics is no less important than were the lesson notes in the print era.

And computer professionals and support staff will be as much - if not more -- a part of the teaching-learning process, as textbook writers and educational publishers have been integral to the print based system.

Teachers who could once be found in the library, the laboratory or their studies or staff rooms, preparing their lessons or writing textbooks, will soon be found creating scripts, or delivering performances in studios; or else developing sophisticated software, intelligent agents, or devising interactive "games" based on the old print texts and lessons.

And no doubt teachers will become increasingly specialised, "niche market" providers, who will be among the privileged few, supported by paraprofessional staff who will serve as tutors, navigator assistants, graphic artists and games' assessors and makers.

7. MEDIA

What becomes obvious is that no one person can be a fully effective teacher in the digitised environment. No more than any one person can make a contemporary film. And just as it takes teamwork to produce everything from

Open Learning TV programs, to a CDROM, so too are educational professionals going to find themselves increasingly working with a team of creative information people, in the very near future.

Yet as educational institutions become more like movie studios, there's nothing to stop television and cable providers from becoming more like educational institutions. It would even be very easy for Telstra for example, to start delivering educational content (particularly once privatised) - and to charge for it. And we should be thinking seriously about such possible developments.

For it's more likely to be Bill Gates, or America On Line, or Foxtel that will be the big producers of material for the educational industry. In a global marketplace there's no doubt that it's the USA - and to a lesser extent the UK - that would have all the resources and be selling their materials internationally. A small country like Australia could easily find itself swamped by overseas material to the point where little local content would make its appearance in the curriculum.

In much the same way as Hollywood values have dominated the TV-film global market, so too could there be a form of intellectual imperialism that ensures the primacy of US information values in the education system. And we have to ask if this is what we want; and if it isn't -- what are we going to do about it? And we don't have the luxury of time to think about our response; the window of opportunity to get into the digital educational industry -- is right this minute.

8. STUDENTS

So far I have concentrated on the teachers, and the implications that the digital world has for them - but what about the students? For if every student has their own laptop, and can access the internet from home, or from public terminals, would they have any need to attend college or school?

And if they do - what role does the teacher have in these circumstances?

I have sat in an Internet Cafe in the centre of Brisbane, which is right next to a university, and I have watched countless students (mostly male) pay their \$5 per half hour to access the internet in this highly social scene. Some of the students were even accessing university information, and I was puzzled as to why they would pay to do so in the cafe, when they could go online at the nearby university - for free.

But when I asked them about this, they thought I was the one who was behaving strangely.

"Why - they asked me - would you sit in the Library where you have to be quiet and still, when you can come down here and muck around. and have a good time with your friends? And still do your assignments?"

And as I watched them larking around, drinking their coffee - and eating while working on their machines -- sacrilege -- while music blared, and lights flashed, and people came and went, I knew I was watching the classroom of the future. Where students drop in to a social environment, and log on to and interact with their courses which are being delivered by "professionals" from any part of the globe.

The digital generation - unlike the print one - lives in a multimedia world.

And this more than anything else marks some of the changes that are occurring.

It's easy to see the links between print and the orderly classroom environment we have been accustomed to. Books have encouraged people to sit still, to be quiet, to engage in disciplined eye movements from left to right, across the page, and down - on to the end. Narratives have encouraged readers to suspend judgement, to follow someone else's story, to be patient until the information maker reveals all. But this is not how the digitally at-home operate.

Not for them the quiet study of someone else's material. No one - particularly not a young person -- sits at a screen and waits silently. It's instant gratification that the user wants. And almost everyone calls on the computer - out loud -- to hurry up, to go, go, go.

There's no disciplined eye movement. Rather the user has to decode the moving symbols. Eyes dart all over the place.

And far from waiting until the author reveals the outcome, the user interacts with the information - and changes it in the process.

But even here, our conventional educational theory and practice is behind the times. For if we want to know what the young are doing -we won't find the research coming from many established educational departments.

Some of the most useful educational information of the last decade has come from an advertising agency which was interested in understanding how Generation X processed information.

Apart from the finding that you would never sell anything to them if you relied on print, or made use of manuals,[4] there was the interesting result that even narrative text on a screen is accessed by the computer generation as a data base. Concepts of beginning and end, of "following an argument", and proceeding in an ordered and disciplined manner -- all fundamentals for decoding print -- were not valued by the cybergeneration.[5]

There are implications here for delivery, presentation and assessment of education, and for the new arts, which can study the transformation of reading and writing etc.

But if students can no longer be relied upon to attend classrooms and read all that is put before them in sequential order, neither can we keep the educational offerings of the future, confined to the student population.

When viewers who have no intention of enrolling in a course or even of doing any "learning", choose to watch Open Learning programs for interest and amusement, or to access online course materials for their own satisfaction, it is clear that authoritative information can be highly entertaining.

And of course there is much so called entertainment that has extraordinary information value. (Nature study programs; and television, radio, and sometimes newspapers, not to mention market research agencies and polling companies are now undertaking social science surveys and in depth investigations into homelessness, the effectiveness of training schemes - not to mention the way that the computer generation processes information.)

You only have to look at today's students in the internet cafe, to see MLC

girls engrossed in their computers, to know that we are in for a whole new world of exciting information resources. Digital education has to be lively, stimulating, infotaining and fun. Which is why the serious study - and refinement -- of computer games, could be recommended to all who want a future professional educational role.

9. NEW SUBJECTS

Just as print gave rise to range of new subjects -- from the novel to the humanities, from the study of charts and graphs to the codification of information, new "subjects" are now emerging as part of the digital renaissance.

New forms of language[6], writing, reading, study and criticism, are evolving from the digitised medium.[7]

Hypertext.

Novel and computer games;

Avatars; first person third person.

There is even a vast new area of "Englishes" study being opened up. Professor Higgins may have studied the accent and pronunciation (and significance thereof) of a language within national boundaries, but the opportunity now exists for studying the various strands of English -- American English, Chinese English, Indian English in the digital age.

As the language of cyberspace is primarily English (or more precisely American) the implications of the development of a world language (or of American dominance) is an area that just clamours for discussion and investigation.

CREDENTIALLING

Partly because of the transformation of the structure of knowledge, from stable to interactive, new means of assessment are going to be called for. "Content" no longer has the same importance, now that so much information can be stored, and so readily made accessible in digitised form. (Heads are no longer good places for keeping information in; memory is a dwindling asset.)

This means that more and more assessment will have to be based on process in a global environment. And more and more assessment will need to be undertaken, online; (from the open book examination to the interactive competency assessment).

The credentialling business.....

So what would a course look like?

ON LINE TEACHING; WHERE TO START?

As I have often been referred to as the handy hints person within certain universities (and I am sure that the description was not meant to be flattering) I wanted to conclude this address with reference to some of the practical issues that are going to confront educational professionals as they look to providing digitised or online courses. And the task I have set

myself is to formulate guidelines for best practice in a digital world.

One of the first things I would want to do would be to make such an outline available to my colleagues for discussions.

But let's just look at some of the other issues that arise for all those who might participate in online, multimedia productions.

What are the basic resources you need to offer online courses?

school/staff support

appropriately skilled teachers

computer support staff

adequate and sufficient technology (including provision for staff, and students, and infrastructure to maintain it)

students

appropriate (attractive) subject matter

intellectual property expertise and policies

financial resources

Requirements

Online subject outline; handbook, subject content and means of accessing it

Protocol in relation to copyright; netiquette

Virtual tour of school/college courses: introduction to relevant staff members, resources

Links to other services as well as online resources, learning centres - nationally and internationally.

Electronic resource/library (copyright clearance). See what is happening at ANL - World 1.

Electronic "notes" and text; interactive assignments etc. (You can't just take pages of print and simply place on a screen - needs repurposing so that it is medium specific and makes use of the potential of the new medium.)

Ongoing archive containing downloadable files on subject. and related subjects; assignment tips, time management strategies, subject checklist

On line message system - schedule meetings, appointments

CHARACTERISTICS ONLINE

1. Close personal communication

Paradoxically the machine evokes intimate and highly personal discussion.

In general, all work online is primarily undertaken in writing. But it is

different from the public forms that are usually associated with teaching and learning. Unlike the "traditional voice of authority" in educational texts - which is careful, considered, "public" - electronic writing can be dashed off: it can be impulsive, revealing, informal. And this must be taken into account.

2 OnLine "chat"

Online teaching provides an opportunity for teachers and students to "chat" and this informality needs to be addressed. Conventions governing such discussion should be worked out and made explicit. They must be decided upon and consciously set up by teachers, so there is no confusion about what is appropriate behaviour and what is not; "netiquette" between teacher and student. New classroom conventions and dynamic.

3. The authority of the teacher

As has already been noted, the online environment changes the authority of the teacher. Teachers in a face-to-face context (now being referred to as "offline") use visual cues and stage props to establish authority; (the teacher out the front, standing, so the teacher is "higher", holding the chalk, moving around while students stay still etc.). No such props are available to the teacher online. In the electronic form, all writing is of equal status - it all looks the same on the screen. All writing shares the same format.

Students' and teachers' contributions can become a seamless whole, and some ground rules for participation need to be devised. In the absence of social cues, and with the reported high incidence of sexual harassment and "flaming" , the focus must be on outlining the appropriate conventions.

(In his article on online classrooms, Robert Wilson reports the concerns of some of the educational authorities as schools go online. Wayne Starwick, electronic media services manager for Education and Children's Services in SA says that "The whole issue of censorship is a very vexed one and the internet is not in our control and never will be...". [8] Which is why there has to be a policy on the use of the internet that has the consensus of teachers, parents etc.)

4 Public nature of the educational environment

This also needs to be taken into account. Electronic material can be so easily copied with virtually no "cost" or effort. Online responses can become public fairly quickly and this raises issues of confidentiality. And of intellectual property.

In some subjects that have been undertaken in the USA particularly those associated with the software First Class, confidentiality became a big issue

Where it has been policy for example that no one should be allowed to post anonymously, the result has been that some students have typed comments or essays on paper, and handed them to teachers --because they are reluctant to post comments based on personal experience to such a large group. This rather defeats the purpose - and consequently, arrangements are now being made for anonymous postings in specific circumstances. This possibility would have to be looked at in subject design. It must be remembered that "email does not have an envelop" and that not only can the students' work very easily become public; it is also (ironically) extremely durable. It

cannot be ripped up, retracted, undone. It could even be said to "exist forever" in the ether.....

5. Nature of the teacher response

This should be made explicit. What are the reasonable expectations of teacher availability: when and how often should students expect a response?

Should students who post late at night expect responses early the next morning - or within 24 hours. (Note, teachers won't necessarily need to go to work to interact -- they too can telework from home, from study leave locations etc.)

Teachers are going to be much more accessible than they have been in offline teaching. What length of teacher response is desirable? Given the tendency for "text overload" the ground rules here are important. Students can overload teachers but the reverse is also obvious. "...Using distribution lists, a teacher can, with a keystroke or two, send multiple copies of an electronic response to an entire class. Students in online peer groups can also rapidly create a huge volume of text for one another.

(So there is a real) need to find ways of establishing limits for (teachers) and students, if the online world is to remain manageable and useful for... teaching and ...learning"[9]

And how many students will be a recognised class load online? One hundred? One thousand? And what about those whose role it is to provide support, to be navigators, to help students find the best sources to do their work? What is their status and work description?

6. Student Issues

Given all the conventions which need to be set out, what is the degree of formality that is required for student "work"? Will typos be tolerated? Will "imperfect" writing be allowed? Will a new form of communication emerge? What value will be attached to technical expertise - to graphics, animation, sound bytes?

What significance will be attached to electronic contributions - will they have to be printed out to "count"? Will there be a time limit on their responses - so many postings, of a specified length, and within a certain time frame? What about "collaboration" - so easy in this medium and so at odds with traditional educational notions of individual contribution. Will this necessitate the development of new educational theories and practice? What form will assessment take? What provision for feedback will the subject encompass?

9. Administrative Concerns

International students? Fees? (Global market) Credentialling? Class sizes? Staff Payment? Resources allocation etc. Policy on student and staff laptops?

GOALS FOR TEACHERS

As we move from a print based system to a computer based one - it is self evident that teachers will need to be able to teach within the new electronic environment. This has enormous implications for professional

development

Moving to a new educational environment (which this online teaching creates), there is a valuable opportunity to start from scratch: for teachers to rethink and reinvent the ways that teaching and learning can be undertaken. What was transparent and 'natural' offline, becomes online suddenly visible, and open to reflection. Teachers can examine choices, and make changes where desirable and useful.

OPPORTUNITIES FOR STUDENTS

Students must have equal and sufficient access to online facilities. (In conventional classrooms we assume equal access to paper, pencils, texts -- though not necessarily to teacher time.)

There are policy choices to be made here; private schools have made it mandatory for students [and staff] to provide own laptops while the school provides infrastructure, support, online capacity. (See Methodist Ladies' College, Melbourne)

Flexibility of the medium needs to be exploited, emphasising that students have the opportunity to "learn in own time frame" - after work, at weekends etc. And at own pace. In own home? On own laptop?

Students who might be reluctant to "talk in class" or who have "minority" views, could find the online environment (and "non-face to face" interaction) attractive. More equal access to teacher attention and time.

Possible advantages - geographic; national and international? Students who might be immobile or unable to attend campus?

Conclusion

In the USA at the moment, where there are many private, world class universities, which already function like corporations -- huge investment is going into the education business of providing global courses, at reasonable prices, and with quality guarantees; which even include provision for lifetime access to university resources and upgrading of credentials.

Also in the USA, service providers like AOL are looking to increase their market share by providing educational and credentialling services. While multinationals like Time Warner and Disney/ABC are blurring the distinctions between education and entertainment, and now expect to enter the genuine information market on a grand scale.

In the UK a liaison has been formed between the Open University and David Putnam's World Learning Network, which combines the resources of the OU, the British Film industry, the BBC World Service and the British Library and Museum. And all these new partnerships are based on the recognition that everyone, the world over, is going to want education/information, throughout their lifetime.

And its time Australians too recognised that we could participate in this vast and amazingly creative education industry. Australia has an impressive range of specific cultural content that is of enormous global interest.

We have the resources but not it seems the vision, or the ability to seize the moment. Except for the occasional event or presentation (such as this,

or SYTE) we don't even have a good record of bringing together the computer professionals the educationalists, and content contributors.

The response to the digital renaissance in some of our educational institutions (and arts and humanities departments), borders on the shameful, and is no less the behaviour of the Dark Ages than was that of the scribes who tried to destroy the corrupting influences of the printing press.

Everyone who is at this conference faces a personal and professional challenge -- as I do every day of my information life.

These are extraordinary times and call for extraordinary creative responses. There is nothing to stop us from being innovators in the new digital environment; and let me just say it is the only way we will have a legacy to pass on the next generation.

[1] Private communication, but see SYTE, the new section of the Weekend Australian, edited by Tony Sarno for an indication of these new arts and creative possibilities.

[2] See Robert Wilson, 1996 "Online classroom opens up a new world for students; the cane and the mortar board are gone from today's classrooms but can the blackboard survive in a computerised world?" SYTE., Weekend Australian, August 31-Sept 1, p8

[3] Pilita Clark, 1996, 'End of the dream', Sydney Morning Herald, July 27, pp 1-4

[4] See David McCaughan and Greg Wrobel, 1993, Out of the Real: Teens and Technology, McCann-Erickson, Sydney

[5] This study was undertaken by the educational publishers, McGraw Hill; see Peter Lyman, 1994, "Follet Lecture", October 4, Internet, directed by courtesy of Janine Schmidt and Colin Steele

[6] Anne A'Herran, 1996, "Language and the electronic environment; conversing with the lost boys", Macquarie University Style Council Conference, Adelaide, March 2

[7] See Ilana Snyder, 1996, Hypertext; the electronic labyrinth, Melbourne University Press

[8] Robert Wilson, 1996 "Online classroom opens up a new world for students; the cane and the mortar board are gone from today's classrooms but can the blackboard survive in a computerised world?" SYTE., Weekend Australian, August 31-Sept 1, p8

[9] Gail E. Hawisher, and Charles Moran, "Responding to Writing On-line" Writing and Response, Mary Dean and Peter Elbow, eds. San Francisco: Jossey-Bass, forthcoming 1996: email from Gail Hawisher, 15th March 1996

Creative education is when students are able to use imagination and critical thinking to create new and meaningful forms of ideas where they can take risks, be independent and flexible. Instead of being taught to reiterate what was learned, students learn to develop their ability to find various solutions to a problem. Coming up with various out-of-the box solutions is known as divergent thinking and there is no one way of cultivating this skill - largely due to the newness of the concept and the