Bill Cope, Mary Kalantzis and Colin Lankshear. A Contemporary Project: an interview

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ABSTRACT The first two issues of *E-Learning* featured monographs by Bill Cope and Mary Kalantzis, which they generously made available for publication. Both of these works, *Designs for Learning* and *Text-Made Text,* are artifacts grounded in a larger shared project to which the two authors have been committed throughout more than two decades of sustained intensive activity as academics and public intellectuals. This interview by Colin Lankshear pursues an insider view of this larger project and how it relates to e-learning as an emerging theme of the present historical juncture.

Introduction

Colin: I am interested in your shared project around research, publishing, organizing international conferences, and other activities in relation to the idea of e-learning. How might the things you do, the ways you do them, and who you are in the doing of them be seen in relation to e-learning?

Mary: I suppose you could say there are three main things we are doing at the moment. The first is holding conferences, or knowledge forums which set out to create global dialogues around some key issues and cutting edge areas of thinking.

The other two parts of the project grow out of what happens when you have these kinds of conversations. What do they entail in terms of meaning, and the ways meaning has been produced and manufactured, how it is distributed and how it continues to change in terms of its production? What does that tell us about the changing patterns and structures of communication? What does that tell us about the changing nature of learning? What does that tell us about potential in each of those areas? This area of work conducts inquiry into *modes of production of meaning*, the information society and the knowledge society. This is the second part of our project.

The third part of the project arises out of the fact that we are educators who have always acknowledged that learning, and particularly schooling, is a compulsory site for all but the desperately poor in the developing world – hence, its paramount importance in society. People do all sorts of different things in their lives and have different educational aspirations and endpoints. But everyone goes to school, or should be going to school. School is not just about welfare and not just about child minding. It is a very important space for a society's 'big ideas' – where they are enacted and played out, whether it is in terms of curriculum or in terms of content, behavior, values, and social relations. Consequently, we believe that scholars and academics – the *best* scholars and academics – should be engaged in that space.

The Conferences

Mary: To take the first of these three areas, we have moved from being what I might call 'traditional' teachers and 'traditional' academics within formal institutions into a much larger landscape. I see this landscape as having three parts. One part is a series of conversations and engagements around something called a *conference*. Now, one can think of a conference in a fairly narrow way, but the kind of conferences that we are part of have a kind of snowball effect because they attract a core community that has an interest in a particular field – be that education, humanities or diversity. So it is not just about presenting and writing a paper to be published, although you have to set things up that way, pragmatically, so that the participants can come. It is about sitting down together to work out where is the world going, and how scholars come together and undertake reflective practice in a place that is safe – where the purpose for coming together is not about grandstanding, but is genuinely about engagement. The conferences are also places where it is possible to set new agendas. Once you say this is what we are going to talk about, then people who want to talk about that thing end up there.

Colin: What are the conferences you run?

Mary: We started with just the Learning Conference, which has now been running for fifteen years (www.LearningConference.com). This conference has a solid core of participants and people come from all over the world to join them. After 9/11, I thought we needed another one about the humanities (www.HumanitiesConference.com). That has now grown. We also have a conference on knowledge management and what that might mean (www.ManagementConference.com). There is also a conference cultural diversity and, in a more agenda setting spirit, the notion of 'productive diversity', which is one of the pressing issues of our times (www.Diversity-Conference.com), and one on the future of the book and traditional textual media (Book-Conference.com).

Bill: This is what we think of as the *outreach* aspect of our work.

Mary: The conferences are driven by engaged people – what you might like to call communities of practice. We started off doing it in Australia, we came to the conclusion that a national scope limits the discussion to localised, and often quite pettily narrow politics. The world is deeply inter-related and the scholars who are deeply interested in the themes of the conference come from far beyond the English-speaking world. This changes the level and tenor of the conversation. Each time we have a conference, we have a country partner who wants essentially global ideas grounded in their practice. So, whether it is Cuba or Greece or Spain or Malaysia, in each conference there is a partnership of peers that comes together around these issues.

We have discovered that this partnership of peers produces some difficult dialogues at a theoretical level, because participants are coming from different places, different politics, different ways of perceiving issues and problems. If you are serious about ideas you can't just stay within the group whose members are familiar to each other, which knows itself and which has a set of routines. For example, you come together, with a group of Chinese scholars in education, say, and a group of Australian scholars. The Chinese talk about e-learning and you talk about e-learning, and you think it's the same thing, then when they talk about dialectical materialism, it turns the conversation in directions you hadn't foreseen. You aren't just talking about *reflective practice*. They are talking about *dialectic*, which we are no longer talking about in the same way. That creates a genuine engagement, which makes the conversation both easier and harder. It is easier in the sense that it pulls at you emotionally, the conversation develops a life of its own. But it is harder intellectually because you have to suspend and transcend and negotiate. You have to test your ideas in a broader landscape, as they do too. From our point of view, the conferences are a very living, organic and very vibrant platform – for testing, exploring and pushing oneself.

Publishing: a contemporary approach

Colin: Perhaps we can pick up on the mode of production aspect you mentioned earlier and look at publishing in relation to your work as a whole.

Bill: In the case of the conferences, the mode of production concept is linked to the fact that, with every conference, we have built a journal to publish the contents of the conference that uses the technology platform we have developed. We have established five journals during the past two or three years. And we have built an approach to peer refereeing that we think is better than the approaches used by most journals.

Colin: Can you talk a little about that? First of all, what are the journals?

Bill: The journal in the education area focuses on learning and is called *The International Journal of Learning* – we've just given it a generic name (www.Learning-Journal.com). Similarly, in the area of the Humanities , we have established *The International Journal of the Humanities* (www.Humanities-Journal.com). Besides these there is a journal in the diversity area (www.Diversity-Journal), a journal in the knowledge management area (www.Management-Journal.com), and a journal about the future of texts (www.Book-Journal.com).

Across these five journals in 2004 we published around 1000 papers. The process is very open – we publish anything and everything that gets through the refereeing process, but the refereeing process is far more rigorous than is often the case. I generally have a dim view of refereeing processes. What gets published is often at the whim of editors. This is supported by a paragraph where a referee uses polite, and sometimes less than polite ways to say why they agree or disagree with the writer's politics or paradigm or perspective. By and large, it's not a terribly systematic or fair appraisal of what is going on in the text. Accordingly, we have built a more rigorous appraisal framework that we get people to use. Moreover, we build in an obligation for authors to referee. Part of the publishing agreement is that if you are publishing in one of these journals you agree to referee up to three other pieces. This creates a community of mutual obligation. The community is in fact the publisher, rather than the editor.

The entire framework has an organic life of its own. It is integrated into the publishing platform that we have been building (www.CGPublisher.com). This is the technology side of things. It is how the workplace side of the operation is managed. The journals range over four formats. The first is CD. This is the full text of the journal, and in the case of the biggest journal in 2004 there were 500-600 papers on CD. Those papers are also available separately as PDFs. These comprise the two electronic formats. In addition, there are two print formats. One is a monograph by monograph format – print on demand, and we have an online bookstore where you order one at a time. The final format is a bound volume that can go on a library shelf.

The idea is not to cut people out because they don't have computer access. We run multiple formats, and you don't have to access the whole journal. The reason why journals are not accessible is people can't afford the whole subscription, and three-quarters of what's in any journal is not what you're looking for or needing anyway.

Colin: So how does it work? What do I do if I want to access one of these journals?

Bill: You either buy what you want, paper by paper at a few dollars per paper, or you get a library subscription for which you receive either a CD containing all the papers, or a hard copy. What we haven't got yet, but will get, is an online subscription framework. In any event, everyone who attends the conference gets that conference's journal free on CD. In other words, if you are in the community, it is yours. It is actually a community building activity, but – to use an awful cliché – it's also a knowledge management activity, capturing the collective intellectual energies of the community. And it does this in a way that doesn't exclude people. If you get through the refereeing process – which is demanding, yet inclusive – then you are in.

Mary: So although the processes are more inclusive, they are rigorous, more rigorous we would argue, than much conventional publishing of specialised research, practice or academic knowledge.

There is no prescribed size to the community contributing ideas and published content. Instead of four issues per year times six articles, we can publish thirty articles or we can publish three hundred.

Colin: So it's a way of trying to have both quality and quantity?

Mary: Yes and that's what the new technologies allow.

Bill: And *apropos* of quality, we have 10 criteria about what a decent piece of thinking is. Some of these relate to conventional aspects: how well does the paper connect with the literature? How well is it communicated? Are these pertinent themes given the world we live in? Each of these 10 criteria carries a score out of 10, adding up to a total score out of 100. Where there is something about which a reviewer is not happy they have to provide a good explanation. Concerns have to be on the criterion in question, not about personal preferences, and the like. We do multiple blind refereeing.

Mary: People get their papers back, and they rewrite them as required. Authors are told the papers won't be accepted unless they are high quality.

Bill: We have gradually built this up, and I think it is a better system than most refereeing. In a way it illustrates something of the potential of the new technologies, which are low cost and easy. For instance, we ask authors to work in a Word template, which is a typesetting template. Word is an ugly program that is deeply flawed. But because it is universal we just struggle with it and make it work as far as it can.

Mary: And we are taking the technology seriously, trying to make it live up to the 'democratic plus quality' principles we believe in. We are trying to push them to their limits to achieve our goals.

Bill: And so far as the journals are concerned it's not just the conferences. We take continuous submissions, which are all refereed. The refereeing turnaround is meant to be tight, no more than six weeks. But the brute fact is that we disappoint ourselves, because we currently have a big backlog. We have ended up with a lot more material, and a lot more work, than we anticipated.

Mary: There is huge interest.

Bill: It is building into a very nice body of material, very interesting material. Some of it may seem a little arcane, a bit narrow, yet still very valuable. And other bits of it are really crazy, really good stuff.

Mary: Bill was the last Head of the Office of Multicultural Affairs and the last Head of the Bureau of Immigration Research, under the Keating government. These units did policy and research, and generated publications in Australia around issues of diversity. When John Howard became Prime Minister it fell to Bill to close both of those institutions. Soon every other university centre in our country that dealt with diversity closed. They were defunded. Bill thought: 'to hell with this'. We're not going to be able to do it within government and we are not going to be able to do it within the university system. If people want to keep the theory, research, publications alive they are going to have to do it on the outside. That is why one of the strands in our overall project is about diversity issues.

Bill: But with the goal of doing all of these things in an organic independent space. We have spent our lives writing submissions and getting grants, and quite successfully: lots of grants and doing lots of things. But always it has been a matter of doing things on the terms of the funding body. I have a not-too-cynical view that when you do that kind of research work the customer always has to be right. It has to be within their frame of reference, and usable within their frame of reference, otherwise you're not doing the right thing by them, you're not creating ideas or practices which mesh in a meaningful way with their perceived real-world agendas. All you are going to do is

disaffect them. The thing that's different about the journals and the conferences is that we've built advisory boards round each of them. Here, the agenda that has an organic life of its own. Collaboratively, you can build an agenda.

Mary: And the same applies to education as a profession and education systems. In Australia one state takes up a fashion, and another state copies it. Ideas spread through narrow lines of influence from bureaucracy to bureaucracy. Unless you are one of the two or three individuals who are influencing that government that week, you haven't got a chance of entering the dialogue. Yet there is so much happening out there in the world, particularly around technology, and around pedagogy and the knowledge society. Plus there is the diversity issue. For us these are central, yet and yet they are falling off the agenda, or being grossly simplified as issues, at both the global and the local levels. The learning conferences spun out like that, which is why they are grounded internationally. After all, whether it is China or Malaysia or wherever, we are all facing the same issues that we have to engage with: the same issues of globalisation, of ICT, of internal diversity; the same issues about the new role of knowledge in society. These are the same kinds of challenges, but different people are struggling with different bureaucracies to enunciate them. So, by bringing all these different people together in our Learning Conferences, and the Learning Journal that comes with it, we are able to help push the agenda in a different direction that isn't hamstrung by local bureaucracies.

Colin: Now all of this kind of work has to be economically viable.

Mary: Yes.

Colin: So how do you make it work? Remembering that we are talking here about an academic working in a university context, and an academic who has been in and out of universities.

Bill: My job description is 'lapsed academic'. We make it work. We still do get grants for various things, and we generate funds from the conference registrations. But it is very hard. Our overall objective is 'non-profit', to cover our costs.

Mary: The communities have to pay, in effect.

Bill: It is self supporting yet it also operates cross subsidies. So if we are taking conferences to countries where education is not so well resourced – recent examples here include China and Malaysia – then locals get in at very different rates. In the case of Cuba (Havana) in 2004 the locals attended effectively for nothing. So we are running a cross subsidy thing as well. The difficult thing is to simply make them pay their way and to do all that work.

Colin: In the past we have talked about public intellectuals and what that has often meant is people who are effectively subsidised by universities to think on behalf of democratic goals. You folk are to a significant extent breaking that mould, but also bearing a lot of personal responsibility for the economic side of it.

Mary: Yes. When we were young researchers at Wollongong University we went to the then Vice Chancellor, Ken McKinnon and said to him: 'We are university academics and you are expecting us to recoup our salary to survive here'. He said: 'Look you've got it wrong. You are academic entrepreneurs. That's what the new academic is'. But within the university context that's a very funny – very odd – kind of idea. The university system doesn't have the mechanisms to deal with entrepreneurship of individuals. It tries to force people to be entrepreneurial, but just doesn't know how to enable it in a practical sense. It doesn't know how to turn around an invoice quickly. And in a sense we have had to become more entrepreneurial to create the conversations that we want to have through the publishing and the conferences. And then we hit the antipathy within the university towards entrepreneurship. It's very contradictory, dysfunctional even sometimes.

Bill: But also if you want to create independence as well; if you don't just want to be on someone else's page on a whole lot of issues. I can't tell you how many commissioned research reports we've done – and when we were in full swing we were doing a lot of them. Some of them were really useful and worth doing, but others were, frankly, busywork. This is why we have tried to build a level of economic independence and in so doing to build a community of thinkers that is in a way self-supporting.

Mary: The universities are suspicious of entrepreneurial initiatives, even though they talk that language. I suppose we are a kind of hybrid crossover. I stay within an institutional setting; Bill won't go within an institutional setting. We are intellectual partners. We are partners in an entrepreneurial sense. We are research partners, and we are linked with other people who work at that interface. We think this is the way things are going anyway, but we need better systems to be able to cope with it. So in a sense we think we are a bit ahead of where things are going to go anyway. It's an uncomfortable space to be in, but it's a more creative and freer space. Who knows where it will take us? We have ended up there in a sense because we are driven by wanting to have these conversations; driven by wanting to set the agenda; and driven by wanting to make a difference. And knowing that making a difference within existing institutional structures is very slow.

Bill: In a way these communities develop a life of their own. You see people periodically, which is very affirming. You communicate between the meetings, and after a while they generate a momentum and life of their own.

Mary: But to come back to something we were saying before, what is it about the electronic world that assists this community building? It's not just that we have chosen to do this. I think that something has happened in the material conditions in which we meet and communicate that allows us to do this. Now it might be e-learning, it might be the knowledge economy, it might be the knowledge society. It has something to do with the way those words describe the material conditions, whether it is the ability to fly somewhere and be together, and the ways in which today's communications systems make it possible for people to be in Mexico and Cairns, or Greece and Melbourne, to work together. We are doing that, as you are doing that. Email that keeps us connected twenty-four hours a day, seven days a week. So it's possible. Plus all of the other new technologies that are available – it means that our relationships are becoming broader and more immediate at the same time. We couldn't do this before, that's why we only did conferences in Australia. The need to publish a book still costs a fortune if you do it conventionally. So how could you possibly do it before? But now with the new e-capacities for multiple formats, you can do this.

Bill: With intellectual work of the recent past, there was a manufacturing cost – producing books and producing brochures and putting them in the mail. With our conferences when we first started we did mail outs and put brochures in the mail. This year for the first time ever we haven't produced a single piece of paper. We have simply built a website and sent emails. And all the paper presentation proposals and registrations are online through a web interface. And so far as producing the journal is concerned, it costs very little to manufacture a journal that has 500 papers in it. And what does it cost to send somebody a PDF? Nothing. The means of production here and all the dynamics around that have changed. Meanwhile, in the world of academic journals take a look at the subscription rates. This is scandalous and tracks back to the fact that they are, with some very small exceptions, owned by four publishers, four companies. The academic publishing industry is massively profitable for those publishers, because it's a monopoly. But their costs are just crazy. But now it's possible to build these communities with no great economic costs. What remains are labour costs: time, people's time and energy to manage the whole process and to do the work. But there are no manufacturing costs, no mail costs, no brochures, no printing. When we *do* print stuff it's just print on demand. An order comes in and we'll just print one copy at a time.

Mary: At the same time it is high quality production. This is the other part of it, the capacity now to have high quality visuals, high quality layout, and high quality design. Initially the design was

clunky, you couldn't move around in it. But increasingly it's becoming easier and much more attractive. Plus there is the portability of the devices. You used to have huge computers, tiny little screens, heavy stuff stuck on your desk. All of that is changing and will continue to change, to the extent of refreshable paper that is now on the technological horizon, and a whole range of other innovations. The way in which text is manufactured and distributed, the way in which communication happens, these things have to be of vital interest to us as scholars and thinkers, as educators and people involved in the *logos* – to come back to the original Greek idea of faith and meaning and the spread of ideas. I think too many academics have seen the electronic thing as technical and commercial, or as so abstract that it doesn't have passion or a strong kind of immediacy. But it's not true. Potentially it always had that. While the engineers were designing the tools, we educators and scholars weren't engaging with the engineers. What Bill and I have done in recent years is to partner up with engineers. In fact, as linguists, we drive the technology. As historians and philosophers we say 'this is what we want it to do', and we work hand in hand with the software developers. We talk to them on a daily basis; and it is within this partnership that we are working on creating the new tools.

Bill: We have four people who are working more or less full time on the technology development aspect. They are highly talented software coders.

Mary: These four people have all worked in mainstream places and rebelled against that. They work in the office downstairs where we live because they want to be alternative, because they want to make a difference, and they want to work with people who want to do different things. So we have been attracted to work together.

Bill: They come from the 'open source' world, and the whole of the open source movement, which is now massive, is socially and politically motivated from beginning to end. This huge battle is going on between the world of proprietary software code and the open source movement. It is highly politicised, and if you go through and look at the weblogs of the luminaries of the open source movement, they are largely political. They're talking about the situation in Iraq, they're talking about inequality, they're talking about poverty. One of the most spectacular ones to look at is by one of the geniuses of computing – a man by the name of Richard Stallman, who invented some of the key concepts underlying what was to become Linux. Of course, it was a Finn (Linus Torvalds) who actually put Linux together, but some of Stallman's key concepts were building blocks for that work. Stallman's weblog is pretty much a political diatribe from beginning to end, a libertarian diatribe. So there is this huge battle going on, and my hunch is that sometime in the future, the proprietary side of the argument will lose.

Issues in the Digital Representation of Meaning

Bill: Speaking specifically about the technology aspect of our project, our reading of the digital dimension is in some ways non-conventional. The conventional reading of what is distinctive about the digital era involves things like concepts of the virtual, which we hear about incessantly, or concepts like the hypertextual, which is on about that texts are no longer linear – because you click here and you head off on a tangent. Most of the literature says that these are big shifts, and that these are fundamentally new phenomena. Our reading about both these things is that there's nothing new about them at all. What's new is something else.

We think the conventional reading is wrong because, if we take the line about the virtual for a start, the fact is that written texts – particularly since printing – were really designed to be about non-immediate experience. They describe Marco Polo's travels to China, or some aspects of the natural world that are not immediately obvious to commonsense experience. The whole experience of written text in modernity is the experience of the virtual. It is experience of stuff that is not in the immediately tangible oral/aural world that's around you. So in a way, then, there is nothing at all new about the virtual. The 'virtual' of the digital world is just another version of that same, modern thing.

With respect to the hypertextual, again that's something that begins with printing in the fifteenth century, and with the idea that texts have referents, including other texts. In this sense, modern texts never have beginnings and ends. The referents are either literal citations or bibliographical apparatuses or even literary allusions. Book covers are utterly deceptive. Where one text ends and the next one begins is entirely broken down by citation systems. Why do we have citation systems that allow for heading off in any direction beyond the text? Also, the linearity of a text is broken down by the table of contents and the index. Why would we need a table of contents except for non-linear readings? It is because we want to go straight to chapter 6. Why would we have an index for anything other than a non-linear reading? So in fact some of the most fundamental apparatuses in the information architecture of modern printed text are non-linear. Printed texts can point in a hypertextual kind of way to the universe of associated texts. These apparatuses are all built on the assumption that a singular reading of a text is the exception more than the rule. Novels are read in a relatively linear way, typically, but most other text is not.

All hypertext does is speed up modern reading practices. From an epistemological point of view, these points about written and digital texts acknowledge in a way that oral texts were not able to – and there's a point about subjectivity in this – that text is iterative. You actually build on other sources that need forms of acknowledgement explaining what is original – authorship and copyright and all that stuff – and what's not original in what an author is saying. So referencing is actually part of a certain kind of modern epistemology around private ownership of intellectual property, scientific reason and the like. These matters are, for better or for worse, deeply written into our culture. All that hypertext does is make it quicker. Rather than having to walk to the book and find a reference, all you have to do is press a button and you're there. The difference is that in a good library it will take you 15 minutes to locate and go get the book; now it happens in an instant.

These parts of the digital equation are *not* new in any fundamental sense.

So what *is* new? There are a number of things that are genuinely new, and that we think people thus far have not noticed quite well enough. I'll mention just three of the new things here.

The first is a big shift in fabrication practices, in manufacturing practices. One aspect of this is a shift away from mark up for a single visual rendering – the typographical tradition of Gutenberg – which is the information architecture around contents, and headings, and chapters. The nesting structure that produces the information architecture is marked visually around point sizes, fonts, page spacing and the like. The fascinating thing is that in the first moments of digitisation all that happens is the popularisation of the typesetter's craft around visual mark up. But that's still only for a single rendering. The big shift with digital publishing now is structural and semantic mark up. This has now become fundamental to the web, but it wasn't in the first instance.

The interesting thing is just as Bill Gates took the wrong lead with Word, Tim Berners-Lee also started by taking the wrong things from the legacy computing framework upon which he built HTML. He appropriated a hundred or so simple tags out of a huge mark up system that had been built for IBM in the 60s. Undoubted geniuses in IBM created this huge computing language called Standard Generalised Mark Up Language, which was meant initially for writing computer documentation. Berners-Lee, who was a smart researcher in the CERN physics lab in Switzerland, thought that SGML was practically unmanageable as a common protocol for computer-to-computer communication of text. So he took a hundred mark up tags out of SGML, and built a very simple mark up system, which has since become universal on the web. But from today's perspective he actually took a hodge-podge of tags.

He took things like bold and italics, but these were out of kilter with the rest of the SGML schema, which was actually about structural and semantic mark up and not a visual mark up. That has bedeviled the web since the outset, and it is an error which is finally being removed from the web. There is a new HTML that is becoming dominant very quickly, called XHTML, which is actually purely structural and semantic mark up. So instead of saying 'that is 24 point bold Helvetica', which indicates that it is a heading, you actually say 'it's a heading'. So you now have a whole grammar of text, if you like, where you mark up text grammatically, where you mark it up by its functions – its functional grammar – and you mark it up by its semantic values as well.

The important thing here is that it allows the same text to go to typesetting for print, it allows you to render this to a screen as HTML, it allows you to put it on a mobile phone or PDA, it also allows you to listen to it through voice synthesis. This is because what 'heading' means in oral language is a certain kind of emphasis and a pause before and after, and so on, and the fonts and

page layout used to indicate a heading will be different on a web page or a PDA to what they are on a printed page. The only way to allow multiple renderings is this kind of mark up. It's happened on the web already. And it's becoming the case rapidly with typesetting as well. That is a big shift.

I was re-reading recently Walter Ong's book *Ramus, Method and the Decay of Dialogue*. This pertains to an extraordinary moment in the fifteenth century when people came to conceive the world as a visual structure with words, such that they began to build taxonomies of the natural world, the conceptual world, the moral world. That involved putting words together visually in these sorts of structures and categories. That moment of Gutenberg was a huge moment in an epistemological sense. And this is another big moment right now. In the world of structural and semantic mark up, one needs to have a meta-level understanding of the design of what one is doing. With respect to this there is a wonderful moment in Jim Gee's book on games where he says that you are good at the games once you understand the design principles. Likewise, you can't be a practitioner of this new world of digitised text without understanding the design principles of language.

The programmers downstairs operate abstractly, they operate with the real world, and then the design principles become the real world. Often you find that they are focusing on the design principles behind the design principles. This is a way of allowing for a huge range of instantiations, and it constitutes a really big shift. This invites the question: 'Well, how are we going to teach kids to be operators in this world?' This shift is going on relatively unremarked, and relatively untheorised, partly because people in the literacy field haven't had the interest to get into the coding stuff and work out what's happening with the code.

The second main difference with the Gutenberg world is that what today's technologies do, and they've really only begun to do it successfully in the last ten or fifteen years, is reduce the elementary particle of composition of represented textual meaning from a character level to something below a character level. So it is actually reduced in the case of a screen-rendered text to pixels. This means that what you are dealing with is the possibility of rendering text and images on the same page and layering text into images in a way that was very hard to do in a physical sense before. In the old Gutenberg world – the letterpress book, for instance – there was a section with the plates and a section with the text. So we lived in a world for many hundreds of years where text and images were quite separated, for very pragmatic reasons. You don't have to become a technological determinist to conclude simply that it was hard to do, and this meant it was simply easier to keep the two separate. Moving in the first half of the twentieth century from letterpress and plate systems into photographic techniques meant that it was possible to bring image and text together a bit more. But it was still difficult. But now the elementary manufacturing unit has changed radically. The raw materials you work with are on a screen. So when you press a key it actually builds a visual representation out of pixels – the whole postscript format is just about manipulating these representations of pixels to create variations in fonts, point sizes and other aspects of the visual presentation of text. It's all a visual manipulation game.

Mary: You click for 'A' and you click for red. Text and image are made on the same plane.

Bill: And if you go back beyond pixels, the same compositional stuff produces sound as well. So you have got these basic things about human communication – namely, language, visuals and sound – which are all being manufactured in the same raw material on the same plane, on the same platform. Give human beings the capacity to communicate in any way and they'll take it up. As soon as it is there the capacity, it is taken up. Once again you don't have to be a technological determinist to think that's profoundly influential. So in terms of the multiliteracies stuff, we have Gunther Kress's idea of multimodality: even textual things are multimodal. Take a magazine, for example. There you find an extraordinary interplay of text and image. We are witnessing a huge turn away from the dominance of alphabetical language; a turn away from privileging isolated written language; and a turn towards the visual. This turn towards the visual can partly be understood in terms of the fact that in the current context of globalization, when languages are not mutually intelligible, you have to carry things visually. So a lot of text right now, like the instructional manual for a digital camera or the signs around an airport, involves the meaning being carried by icons. This is an attempt to reduce some aspects of language to visual schemas.

The third big thing that is happening involves the relative arbitrariness of different natural languages. Take, for example, a typical bank teller relationship in a conventional bank. It is hard to run it in more than one – or at most two or three natural languages. So you go there, you get your deposit form and you fill it out, and go to the window, and someone speaks your language. Now when you go to an ATM, the natural language in which it operates is relatively arbitrary because a discourse schema is built behind it that operates at a level of abstraction beyond natural language. Take, for example, the discourse schema of an ATM interaction. There are quite a few variations in it around 'I want my money', 'How much money have I got left?', 'OK you can have it. Here it is' – that sort of thing. This is what you would say in a face-to-face teller interaction. In the case of the ATM these things – and others like the account number, the person's name, the kind of currency – have all been built into semantic tags, and whether it comes out on the screen in English or Arabic is irrelevant. What grounds it is an underlying semantics, and the natural language surface is actually arbitrary.

The machine translation aspect to this is that the semantic and structural mark up is a precondition for effective machine translation. For example, my surname (Cope) needs to be marked up as surname if it is on the cover of a book (i.e., I am author). But my surname is also an emotional state, and it is also an old English name for a priest's cloak. Without semantic mark up there is ambiguity. Semantic mark up removes ambiguity. Machine translation will only get better and better, but semantic mark up is a precondition for it working.

Colin: So there are epistemological *and* semantic aspects?

Bill: And, moreover, new plays with semantics, new language plays. There is another side point to make here. This concerns the multilingual and visual aspects of Unicode. Unicode is a universal character set. You can even save Word documents in Unicode now. The technical side is that with the first computers you had to fit a character within 8 bits (1 byte). So ASCII, which uses one byte (8 bit) encoding, allows only 256 characters (of which only 94 characters are actually used – Roman upper + lower case, English punctuation and the odd French and German accent if you're lucky enough to have a special version of ASCII code). Now we have these 2 byte (16 bit) encoding systems, which allow for a huge number of combinations because it goes up in base 2. Unicode uses 2 byte encoding, which allows a 65,536 character set. Unicode actually pushes out to 112,000 characters, an even larger version of its character set, but there are 65,536 characters, the theoretical limit, at its 2 byte core. Unicode includes every piece of human symbology in every language. They have got Linear B in Unicode now, and archaic languages they can't even translate are in there. This development has gone on in one of these open source communities we were mentioning earlier; it is non-commercial, built around collaboration and consensus building. It is universal and it is becoming ubiquitous. Once again, the logic is one of *representing* these characters – the elementary unit is not the character but, rather, the group of pixels that build the particular character. This means that all human languages are on the same platform and are completely interchangeable within the one character set.

These are the three really significant things happening with the digitisation of text: the structural and semantic mark up issue, the multimodality issue about the visual and the textual, and the multilingual aspect. They are the really fundamental shifts, unlike the virtual and hypertext which are older modern ideas.

Technology in Education: the role of e-learning

Colin: I should think there are some interesting points of connection between these ideas and issues around e-learning.

Mary: Definitely. When people think of the term 'e-learning' they often struggle with the 'learning' bit, and don't focus on what the 'e' bit actually means. Typically, they think it is computers or they think it is software or they think it is some kind of tool, but largely it is the kind of epistemological shift that Bill described. This, however, raises a question. If you go to a non-'e' classroom, do teachers need to know about all this technical stuff that Bill has described?

Did teachers know the technical stuff about the book and its means of production in the ordinary classroom? Well in fact they did, *and* they reproduced it in the classroom. What did kids do? They wrote sentences and paragraphs; they wrote texts with beginnings, middles and ends. So teachers knew, over decades, the production values and the technical issues related to traditional written texts. And books were read to a class or read silently. And what they do when they go to the e-learning environment is just transpose the traditional world of text onto the electronic. What we are trying to say is 'No, this new way of making meaning allows for other things, you might as well not use it at all if you are just going to transfer what happens with books and writing and alphabetical literacy into this new space'. In fact, in some respects it doesn't do traditional literacy as well. The tools it has are often so clumsy, that you might as well stick with the media you know.

So what do you use it for? How do you use it? And does it enable you to prepare kids for this other world that is pervaded by the epistemology, technology and social relationships produced by the shifts we have been describing? This is why we write about the modes of production of meaning, try to understand them and join in projects which attempt to address these issues. And then we ask: 'If the classroom is bursting open, what tools do teachers have to capture what happens in those different spaces, to record it, to share it and to reflect upon it?' The tools are not there at the moment, and here, our Learning by Design framework is trying to find ways to use the new technologies to provide teachers with a professional learning tool by means of which they can observe and reflect on their choices, but also take them one step further into a collaborative space that the technology allows.

Bill: Going back to the simple materiality of this technology, what does it mean for schools? The first of the three points means that we have to work on new forms of abstraction. This is a conceptual space where you have to operate at meta levels of understanding design principles – to use Jim Gee's concept – not just immersion in things, but understanding design principles 'underlying' the real world and design principles behind the design principles. That's the first point.

The second point is multimodality. We can forget about doing phonics in isolation. It is a matter of bringing the visual and the textual together. In fact, children come to school uniquely synaesthetic, and school knocks that out of them. You have got to *build on* that synaesthetic capacity rather than knock it out.

And the third thing is that this is a global environment which is deeply multilingual, deeply about crossing discourses, deeply about dealing with difference. All that is happening in this third space is about working in a way where you can communicate across language, cultural, human differences. Arguably schools weren't very well engaged with the world ever, but this ups the ante in terms of the kinds of engagement and the kinds of human beings, sensibilities and dispositions you have to build in a classroom.

Mary: But imagine continuing to do all this when our Prime Minister [John Howard] in a political speech prior to the 2004 election said that the ongoing debate about our national identity is over. That flows down to what happens in schools. Bush, Blair and Howard similarly said globally that there is freedom of choice to *be like us*. You can be like us. That's why for us, it's not just the technology but what the technology allows you to do much easier than before that is *core* to the technology. So we haven't gone away from any of those things that motivated us before we started to engage with the e-world. In fact, we have seen this as the next opportunity to *re-engage* with those issues in a way that is powerful and practical for teachers and for students. And we think that it is *in* it the technology if you engage with it in the sorts of ways that we are trying to engage with it.

The one fact you can't get away from is that we humans are social. Any other fact you can dispute. But that human beings become in and through other people is an indisputable fact. This means that compromises, sociality, knowing each other matters above all other things. So that has to remain core to what motivates you. So, for us, that hasn't shifted, although now it's a matter of trying to get into what the world is producing via the new technologies.

Colin: An interesting twist in all this is that often when teachers want to argue for maintaining the physical classroom and marginalizing the new technologies it is done precisely in the name of maintaining sociality.

Mary: Yes, the technology appears to be cold.

Bill: But it can be anything. It can be used in many ways, for good and for evil.

Mary: Take the book. When I was growing up in my Greek family I used to go and buy books from Woolworths and sit down and read them in my room. This used to infuriate my parents because it was antisocial. Why was I doing it? First, they didn't know what was in the book, and who knows where it was taking me? And it wasn't part of their oral culture and what they knew. Second, it was a very solitary thing that I was doing, they didn't know if I was daydreaming or fantasizing. It took me away from cooking, cleaning, talking, whatever. It did that too. A computer can do that too. It is no different.

Bill: Like all technology it just opens up human capacity to do things better and to do things worse. When we were in Malaysia early last year (2004) we went to this little Tamil school on the site of a former English rubber plantation. At the beginning of the twenty-first century the plantation is now owned by Chinese, the original Tamil workers are being displaced by Indonesian workers, and the land is now growing palm oil. These are major changes. In the area served by the Tamil school the people are mostly unemployed, or they get odd jobs in the nearest town. They are incredibly poor. In the school itself there is no glass in the windows. The room is very long – there were five classes in a room that was a hundred feet long with dividers all the way along to separate off the classes.

Now, as part of what we think of as the Mahatir technology agenda and also as part of the need to become part of the modern world, they've decided to run the entire Science and Mathematics curriculum in Malay and English. So how do you do that in a school where the teachers are not particularly good speakers of English? Well, you give them a data projector with a laptop computer that is on a box like a lectern, with big speakers on it, and you pay some academics in England who are connected with the British Council a small fortune to build an e-learning device. We happened to see one in operation. It went roughly like this.

'John has two books. Two books. T – W – O. Two'.

And the students repeated what was said. Then you press a button and the third book comes onto John's table. 'John has three books'.

It was all colour and movement. I sat there thinking 'I can't believe this'. The kids were fidgeting. They looked like smart kids. It was colourful, flash animation, patronizing cartoon stuff in reality. I thought: 'Give them a Dick and Jane reader'. Because you know what the *bad* kids would have done with a Dick and Jane reader – they would have turned over the page. They would have gone on to the next page too soon. And that would have been subversive. But you can't even do that. Here you have a pedagogy that is a version of the Dick and Jane reader, but even worse.

The thing about all these technologies is that any device which gives human beings another capacity to communicate increases their capacity to do good things and to do bad and silly things. Technology doesn't drive it. It just opens new possibilities, new depths and new shallownesses.

But for me the real potential around e-learning is often unrealized. E-learning is currently really centered around flash animations, not to put too fine a point upon it. What used to be on the page of the text book, and was probably in black and white, is now presented in colour and it moves. So instead of the diagram of the planets, where you have a sequence of diagrams that show movement – you can show movement on a page – you now press a button and the things move. And, of course, the other great thing it can do is that you can now have 'question and answer' at the end. So instead of the teacher having to mark 30 papers the machine adds up the answers and gives you a score out of 10.

Mary: And that is called 'efficiency'.

Bill: The terrible thing about it is that this is a travesty of the technology's potentials, such as the potential for developing knowledge producing communities at the school level.

Mary: For example, the kind of knowledge-producing schools concept that Chris Bigum and colleagues have been developing, that you [Colin] have written about.

Bill: Yes. Well the idea that you are a *receiver* of knowledge through the mass media, that idea so characteristic of the modern world. This logic *can* be reversed with these new technologies, because it is just as easy and just as inexpensive from the point of view of the material cost of production to produce texts locally that are relevant. The boy in the Malaysian story example was called Ben. I wondered if there was a child in the entire school called Ben. This is an aspect of relevance, albeit at the most simple, trivial level. But the more important thing is about subjectivity, which is about building things yourself with stuff that is around you, and about being an *agent,* a knowledge agent, rather than just being a knowledge recipient.

Mary: It's about being both. You have to be both.

Bill: Yes, of course. It's a dialectical thing. So the thing about the project in which we are currently involved is that at one level it is about building pedagogical supports. Teachers can write up what they are doing in the form of something that is more than a lesson plan, but that can be shared. It is like a curriculum development resource. The easy side of how we build the support mechanism is that we just build Word templates, because Word is universal and 'successful'. (The conceptual schema behind it is another story.) But also, possibly, a context where students collaborate in an online environment around a piece of work, publish it to each other, and thereby overcome the channeling of classroom discourse. Conventional classroom discourse involves one teacher and thirty students. The students' communication is question-answer with the teacher, or writing a piece for an audience of one, the teacher-assessor, rather than writing things for an audience of community, which is parents, other students, and the like. The point is to reconfigure all the relationships. Technologically speaking this is very easy to do. Our view of e-learning is a low tech view. You can do it with a web browser and Word. The real challenge is to reconfigure the social relationships of the classroom, and that's nowhere near so easy.

Mary: The key is not the technology, therefore. The key is the teacher. And our teachers need time to retrain, time to reflect, they need deep understanding. Yet, although all the evidence is now coming to the fore again that it is the depth and breadth of the expertise of the teacher that is the most important factor in performance, education systems haven't been able to invest in that teacher so that they can catch up with the potential of the moment. They haven't had a chance to come to grips with the new learning technologies. So they are scared.

How do you enable them, how do you assist them? Again, they need to be part of the conferences, they need to be part of publication, they need to be given access to low-cost publishing tools. All our conferences are attended by teachers as well as teacher-educators. We subsidise teachers to try and make sure that they can come. We make sure they can get published, and not just the academics. We mix teachers with academics. We have bureaucrats, teachers, and academics coming together, to discuss those questions because they require collaborative solutions.

Bill: So in Malaysia we have this group of ninety teachers who are struggling to teach Maths and English, and we are getting them to write small curriculum units that are based in the their everyday life experiences.

Mary: And, this is important, we have academics, principals and the schools coming together. It's not just 'here is a bit of technology, use it'.

Bill: It is not just individual teachers writing their individualised lesson plans. They are writing material that they are going to share among the group. To enable this we have built this platform we call CGPublisher. It is a collaborative platform that has a private collaborations space. You work on it in private when it is still in draft form, and then you move via a publication post and put it in a published work space, which is to all intents and purposes like an online bookstore. So it becomes something that can be shared. The idea is that something that is in a sense very private is actually designed for a lateral, public audience. And that this can then displace, or at least contextualise, all

these flash animations. In fact, why would you *need* that stuff if you had built materials organically from practice, that can be adapted and changed? Download the Word file and muck around with it yourself and change it for your local conditions, and if you have only got one computer in your school, print it out. It only costs a couple of cents to print it out, and just give it to the students.

So it is a funny kind of hybrid hi-tech/low-tech thing. The collaboration tool is in fact a sophisticated thing. It is a smart facility that our technical team has built. With every action around a collaborative work it keeps everyone informed about what is going on. So it has an email messaging service, which is replicated in a message spool. It helps keep work flow going and builds a bit of an audit trail around it – like who did what, when they did it, the contribution they made – and it also keeps a record of every version. So it's got a history of the whole thing. In effect, we have built a collaborative publishing platform that ends up in this kind of online bookstore arrangement (www.CGPublisher.com).

We have also built a mark up language where you can actually click on every operational concept and up comes a dictionary definition. This dictionary definition indicates the mark up tag that is being used for that concept underlying the text.

Mary: But getting user friendly, teacher friendly options is really hard. The technical part and the sharing part are actually easier than getting tools that make sense. Every teacher in every school has a set of routines that has come out of some kind of fashion. Moreover, many teachers are slavish in the way that they follow it and can't always see what the relationship is between what is expected of them in terms of a teaching plan, or a curriculum plan, or a set of accountabilities, and how it might fit in with something that might come from outside. And so while working outside of a particular system allows you to produce this more creative space, its take up within the system is much more fraught.

Bill: It's a very long march, I suspect.

Mary: Our view is that it is important for people like us to stay scholars and researchers. And we stay disseminators of ideas, which is also very important. And we try to be practitioners as well. I guess we have always tried to be all those things. It is what we could call praxis.

Bill: This is a very funny contradictory system we are in. I am daily bowled over by the multiple ironies. IBM has now pretty much given itself over to Linux, a software environment that is committed to transparency, and the re-usability of intellectual property. The IP is not privately owned. This confronts much of the proprietary stuff, where you can't see how it works, and it doesn't really work very well a lot of the time simply because of the opaqueness of the private space in which it has been built. It's not built collaboratively. It's built by a small team of people who are paid a lot of money, and that's not so powerful as a social learning environment.

There are other principles in the open source world, such as that the coding all has to be in natural language. It has to be readable. You can literally read this stuff. It's not like in the old days when it was all squiggles and 1s and 2s, etc. So, in other words, if you write a mark up tag that is not transparent in natural language then it is not acceptable.

Mary: Both at the level of ideas and at the level of technology we know that what we *are* doing here in Australia is at the forefront. This is a small country that doesn't really back its developers. It rarely even backs science, medicine, other things that return a lot of money in terms of commercialization. But the commercialization of the kind of things we are working on isn't fast or easy – you can't commercialise it quickly. So to get the investment to continue the work is very difficult. That's why, in a word, we are forced to become entrepreneurial – so we can keep on paying the techies downstairs. They continue to get paid from the conferences whenever we don't get any new grants.

Everyone says that knowledge is the engine of the new economy, but here in Australia in education we aren't investing in knowledge as though it is the engine of the new economy. They are now saying that biotechnology is the new engine of the new economy. This means that the new generation of biotechnologists and scientists are going to need the kind of things we are

talking about educationally in relation to e-learning, and that we are trying to help develop in and through projects.

For example, at the University of Melbourne the Faculty of Medicine got $12 million from the university and put in $12 million itself to get an e-learning centre for Medicine. That is $24 million. They have a small centre and are producing online training for medicine – whether it is a virtual dissection or how you do an online diagnosis. Then you go over to the Faculty of Education. $24 million to do e-learning in the Faculty of Education? Not possible. They might get $50 thousand from the Australian Research Council to do some testing here and there. They might even get $500,000. So here we have faculties of education who should be doing this kind of work but aren't. And can't. And that, I think, is where you get the drag around what e-learning might or might not be at the moment.

It's the *drag* that's critical. It's because those who understand the science of learning, and it *is* the *science* of learning, do not have the kind of resources to be able to do the kind of work that is required to be able to move into these new kinds of spaces, and not simply replicate the old learning electronically. Perhaps the Faculty of Medicine will do it before us. They are buying in their own expertise. But in faculties of education we *aren't* doing it. In fact our faculties of education are less wired and much more *old* technologies oriented. And while they *talk* about online learning and the like they don't really practice it in their teaching, or in their faculty communication, or in their wider practices.

Colin: It is like another turn of the wheel that Jim Gee mentions in various places. He talks about how you can go to business, or fast capitalist enterprises, or video games production enterprises, and find good learning principles being more manifest in the ways they run their operations and in the products they create than you can in the way we in education go about our business and in what we produce.

Mary: Yes, you can go to any university and you'll find faculties deploying the electronic environment for the purposes of their discipline and for the purposes of their engagement with their students. But look at how we in education run the practicum! Why do we still have academics in faculties of education, and teachers in schools training teachers? Doctors are in and out of hospitals and training doctors. Lawyers are in and out of courts and law faculties. Are we? No.

So, to sum it up, we are in our own personal worlds trying to live what we think is required to be able to generate the ideas, in the blurring of the boundaries and the crossing of the terrains. But it does put you out there on the margins. It does make your life a bit difficult at times, and people are often curious about why you are there.

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