The knowledge-producing school: moving away from the work of finding educational problems for which computers are solutions

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This paper has two parts, an argument or rationale for doing what is described later in the paper. As an academic, I am interested in the ideas and the practices and how they mutually inform each other. The first section maps something of the logic of the notion of having schools as sites of serious knowledge production, research sites. The second part briefly outlines some of the work that has been taking place at two Queensland primary schools. For me, this work draws together a large number of ideas and threads that relate to the issues and problems of using the new computing and communication technologies in schools.

**Schools & CCTs**

One of the enduring features of the use of computing and communication technologies (CCTs) in schools is the unerring capacity of schools and school systems to reproduce the patterns of use, including the mistakes, of the past twenty years. How to respond to the developments and use of CCTs outside schools has become more complex than it was in the early 1980s when this all began, even though for many schools it appears that the game has not changed much at all. In effect, it remains a matter of finding educational things to do with whatever CCTs are vogue. Broadly, I will argue that the use of CCTs in schools remains in this immature state. Largely, this situation derives from a loss of institutional memory which prevents lessons from the past informing contemporary policy and practice and that leads to not much more than a reactive response to each release of new CCT products.

Some examples will illustrate the point. Unlike the 1980s when schools were a key site for access to CCTs they are now, for many students, relatively speaking, computer poor sites. Student computer ratios in schools while much lower than the 1980s can’t compete with homes in which there may be one or two computers and one or three children. Many schools however, continue to operate as if they are the significant source of access to CCTs.

There is a persistent, teacher-centred notion about how CCTs fit into classrooms that is well illustrated by the use of crossword generating software in the early 1980’s. Many teachers saw it as a wonderful opportunity to generate tailored puzzle sheets for their students in keeping with time honoured classroom practices. Not all teachers though reacted that way. Some, conscious of the learning that took place for them when they constructed a crossword puzzle reasoned that this learning would be good for students and thus relinquished the task of construction of such puzzles to their students. A simple enough idea but one that is easily forgotten as each new technology is taken up in the classroom. One of a number of current instances of teacher-centred thinking is the fad of Webquests. In this approach to using the Internet, teachers construct a problem or task that can be tackled by students using information available on Internet sites. The teacher typically provides a selected set of online resources that students need to use in order to solve the problem. This kind of digital busy work has characterised two decades of classroom computer use. What is valued in such activity is that students are using computers which, because of the status of the technology outside of schools must, in and of itself, be a good thing for students to do.

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1 I prefer this acronym to those that impute informational attributes to these technologies.
2 They are, of course, for students who have no access outside school.
The immaturity of thinking about CCTs in education generally is maintained by a broadly held perception that CCTs and their use in education is now well understood. The only real problem, it seems that persists, is mastering the intricacies of each new technology as it appears. Such an approach amounts to the never ending work of finding educationally useful things to do with each new wave of high tech product. In effect, a crude form of technological determinism. What underpins this logic is a belief that CCTs are in and of themselves, a kind of educational good, that is, the more CCTs that can be deployed the better off things will be educationally. Michael Schrage (1998: np) posits:

My personal experience is that the overwhelming majority of people who want to bring technology and the Internet and interactivity to the schools believe that they are inherently doing a good thing, that they are doing God's work for education, K-12 or beyond. And I think that's a hypothesis to be tested, not a proven fact. I think there are ideologues and idealists in the worst meaning of the phrase and I am afraid it is that bias - the bias that better technology or more technology is an inevitably good thing rather than something to be self-critical and self-skeptical about - that is provoking a backlash against technology in education.

This view, which would be bizarre in other contexts, has persisted in education and only now, in this current era of evidence-based policy making is there a possibility that this orthodoxy might be challenged. To illustrate the point it is useful to compare, in broad terms, the persistence of the bias of CCTs as educational good with a similar bias in business.

In the early 1980s, in the enthusiasm associated with the appearance of relatively affordable computers, business, like education, acted as if CCTs were in and of themselves a “business good”, that is, more of them would guarantee greater efficiencies and support the generation of higher profits. Only recently has the relationship between business outcomes and expenditure on CCTs been challenged. For instance, Paul Strassman’s (1997) work illustrates the complexity of the relationship. As he puts it,

Despite much talk about the cyber economy, information age, or knowledge-based enterprise, as yet there are no generally accepted economic or financial principles to guide executives in spending money on computers. Decision makers find it difficult to reconcile the claims of computer advocates with their staff's ability to prove IT investments are profitable. (Strassman, 1997: xv)

What Strassman’s work clearly shows is the importance of employing CCTs to address specific targets and goals rather than simply pursuing a policy of acquiring more and more CCTs in the belief that an increased volume will somehow improve things. In education, there have been countless studies that have demonstrated either little, no or, on some occasions, a negative effect on learning when CCTs were deployed. In effect, much the same outcome as Strassman’s work that is, no correlation between expenditure on CCTs and educational outcomes. Unlike business however, there is little acknowledgement of this. The consumption of CCTs by schools and school system continues apace. Each new CCT product requires an educational response. Educational problems need to be identified for each new, high tech solution.

At this point it is clear that the circumstances I have outlined might continue indefinitely. Schools may never be able to step back from taking advantage of the symbolic importance that CCTs afford them. They have to be seen, at the very least,
to continue to acquire, to be seen to be up to date. And, it is relatively easy to point to the silliness of much of what has happened and continues to happen. What is outlined in this little paper is one approach around the impasse. To begin, we need to step back a little and look at the basis of the significance of CCTs in the world beyond schooling.

There is no doubt that if we were to remove all CCTs from the planet that what we now colloquially refer to as globalisation would no longer be an issue. The deployment of these technologies has reshaped much of the social, economic and political landscape in ways that were difficult to imagine even a decade ago when these technologies were over a decade into relatively widespread usage. How we think about this phenomenon is, in my view, the key to moving out of the dilemma I have described.

**Relationships rather than information**

It is fashionable when talking about CCTs and their deployment in many aspects of human activity to talk in terms of information, even an information revolution. This is, in effect, a bias, a way of thinking about what is happening and schools have responded in terms of curriculum initiatives like information literacy\(^3\), teaching students about the Internet, and designing curriculum activities to exploit the ready availability of online digital data. It may seem odd to talk about the emphasis on information as a bias but by relying on this framing of the use of CCTs beyond schools, we are blinkered from seeing another, perhaps more significant way of thinking about what is happening as CCTs are used in a wide range of human activity. Schrage (2000) puts it bluntly:

> To say that the Internet is about "information" is a bit like saying that "cooking" is about oven temperatures; it's technically accurate but fundamentally untrue.

The biggest impact that CCTs are having and will continue to have, he argues, are on the relationships between people and between people and organisations. These new relationships derive from the new modalities of communication. This is not a new idea that CCTs or indeed any technology can be seen in terms of the relationships they affect or mediate, the new relationships they support and the relationships they terminate (Sproull and Kiesler, 1991). What is important here is the emphasis or bias that is placed on relationships rather than on information.

In this respect we can ask what does such a bias or framing mean for schools? What relationships might be affected? What new possibilities might be explored? Thinking about CCTs in schools in terms of relationships shifts the focus from the technology per se and problems of how best to integrate CCTs into the curriculum towards schools as social organisations, their internal relationships and those with the local community, government, and other schools. In effect, the focus shifts from the question ‘What on earth do we do with this new technology?’ to ‘What kinds of relationships do we want to have with the world beyond our boundaries?’ In other words, the key questions to be considered are to do with new articulations beyond school.

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\(^3\) There is no space to explore the flawed nature of these responses except to note they reflect the immature thinking to alluded to earlier. They represent rapid closure on a complex epistemological issue that is far from resolved (See for instance, Lankshear and Knobel, 2003).
This is not to suggest that the existing relationships many schools currently have with their local communities and beyond are not significant nor that they need to be re-appraised. Rather, it is both possible and valuable to think about new, additional relationships for schools which means, in effect, examining the possibility of some new purposes or roles for schools. This is not a simple matter and, yes, it is partly encouraged by increasing evidence from many school systems around the world that existing systems cater for a relatively small proportion of students.

At this point I need to develop another part of the argument and make a point about information, its so-called abundance and what this might mean for a school’s local community.

Paul Saffo argues that in an era in which information or content is made increasingly available via an expanding number of delivery mechanisms, the scarce resource will be an ability to make sense of the plethora of material at hand. In other words, what will matter is expertise, point of view, a place to stand from which to make sense of information. Saffo (1994: 74) puts it this way:

“Point of view” is that quintessentially human solution to information overload, an intuitive process of reducing things to an essential relevant and manageable minimum. Point of view is what successful media have trafficked in for centuries. Books are merely the congealed point of view of their authors, and we buy newspapers for the editorial point of view that shapes their content. We watch particular TV anchors for their point of view, and we take or ignore movie advice from our friends based on their point of view.

Schools offer experiences designed to teach students particular points of view. We call them subjects. Despite the loyalty most school systems show to maintaining allegiances to particular disciplines, there is growing uncertainty that neither the disciplines as they appear in schools, nor relevance approaches to curriculum address the needs of the young (see, for example, Moore and Young, 2001).

If we accept the point of view argument for the moment and apply it to a school’s local community, What might having expertise for a community mean? Clearly, we can think of community expertise as a kind of aggregate of that of the individuals who comprise it. We also know there are more collective ways of knowing too, that is things like local gossip networks through to more formal collections like local histories or neighbourhood surveys. But, in a world in which, so-called fast money or capital can move employment from one part of the planet to another with the press of a key, a case can be made that the one thing a community can and will need to be expert in is more and better knowledge about itself. In a world which appears destined to be increasingly shaped by financial and information forces which operate globally, having a rich source of knowledge about itself will provide a local community with a strong basis from which to read and act on the global influences that it encounters. In other words, the production, accumulation and dissemination of local knowledge will become more important to communities as the impacts of global forces develop further.

At present, for most communities, national or where they exist, state governments determine what information is collected and why. When data is collected it tends to be part of a larger, often national issue, which may not have a lot of significance for local interests. This paper is about making the case that schools have a unique

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4 Crude indicators like retention rates from year 7 to 12 are a measure of this.
opportunity to play an important and possibly central role in providing local communities with a new, locally responsive knowledge production capacity.

**From consumers to producers**

Schools have always acted largely as consumers of knowledge and information. From textbooks, to material available on the Internet, information flows into schools far outweigh the information that flows out. The relationships that schools have with the world outside is therefore largely framed by their consumption of information and knowledge. Students, as we know spend a good deal of their time learning how to make good use of sources of information and knowledge both inside school and out. While developing such skills is one important aspect of living in a part of the world characterised by relatively easy access to such resources, learning how to produce knowledge and information is perhaps even more important. To make the point in the context of film making, do we want our students to be movie makers or movie goers?

Many would claim that producing knowledge is also commonplace in schools. Students write essays, do projects and collect and analyse information. Some would argue that this kind of work prepares students to live and work in what some describe as a knowledge or information economy. I am unpersuaded by such argument. Schools, as I have argued earlier, have continued to do what they have always done. CCTs have been domesticated. The work students do often involves CCT use but it is learning how to use CCTs that have been schooled. It is limited and limiting and often in stark contrast to the use students make of these technologies outside school.

I have been working with a small number of schools in Queensland who have been exploring the notion of schools as producers of knowledge. In doing so, they have moved beyond what I have called a “fridge door” mindset for student work and have begun to develop new and interesting relationships with groups in their local communities. Knowledge production for these schools always ends up producing a product or a performance. An important part of negotiating the production of such knowledge is that the product or performance is something that students see as being valued by the consumer or audience of their work. Their work is taken seriously and the students know it. Consequently, the level of engagement, the quality of work and student learnings are impressive. These are not teacher projects with peripheral student involvement. They are projects which are given to students as problems to solve or, as has been the case in a number of instances, problems the students have raised with a view to solving them.

When the Principal of one of the schools was invited to talk about developments at the school to a state conference of primary school principals, she commissioned a group of year seven students to document the use of CCTs in the school on video and to produce a CD. The students planned the shoot, collected the footage using a digital camera, did the editing, voice overs, supplied music and credits and burned a

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5 A shorthand to indicate the normal pattern of knowledge production in schools, that is student completes an assignment, a teacher assesses it, the assignment is taken home by the student and published on the fridge door for a few days before parents discretely discard it.
The students then presented the product to an audience of over two hundred principals at the conference.

In response to a class incident, a group of year seven students designed and produced a PowerPoint-based CD to offer advice to students about bullying. They scripted, filmed and edited six scenarios each with three alternative outcomes to illustrate the consequences of what they labelled ‘weak’, ‘aggressive’, and ‘cool’ responses to a bully. They launched the interactive CD at a public meeting at the school and have marketed the CD to other schools. In another case, one school is negotiating with a local community organisation to research the level of understanding the community has of the organisations services and capacities.

Other examples include year six students working with the local cattle sale yards to produce a documentary of the history of the sale yards for a beef expo in 2003. The product CD is being used at an international beef festival and by the local council to promote the region. In another instance, year four students made movies as a part of their study of the local community, a fairly typical activity for students of this age. They filmed and edited a video of the community and local services copied it to a CD. The CD is now being considered by local council as a promotional device for potential new employees of a large industrial development.

In another project, a group of students interviewed local "characters" and filmed them at tourist sites in an old mining town which has high unemployment and which is trying to establish itself as a tourist site. The students shot the film, edited it, and burned the product to CD. The data will be available at various sites around the town on touch screen computers so visitors can get a sense of what the town has to offer.

None of these projects are in themselves remarkable. Many schools could recount various projects like this that different groups of students have worked on over the years. What is different about these schools is a broad commitment, a mindset that recognises the significance of knowledge production in supporting student learning and engagement. It means both schools devoting a good deal of ‘school time’ to this kind of work and this is no simple matter.

Producing knowledge in a primary school would have been much more difficult if students had to rely on producing written words. Both schools have invested in CCTs to support the recording of digital visual images, both still and video. They have a modest amount of CCTs by school standards, two to three per class, with a small central facility that supports editing of video and still images. What is interesting is the routine way in which students at both schools currently employ digital cameras to do their work. For some work, students often opt to make a claymation movie.

The move to use CCTs to support writing with cameras is relatively recent for both schools. In less than a year, a broad base of expertise has been developed among the staff and students that allowed preparation of audiovisual presentations typically stored on CD-ROM or VHS tape. What is important here is that CCTs are not the focus of any of the work. They serve useful roles to support the work of students.

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6 A simple slogan captures much of the approach of the -school agenda: when in doubt, have the students do it.
7 Claymation or clay animation is the process by which animated film can be produced by taking a sequence of digital still pictures of clay figures which are slightly altered from frame to frame to give the appearance of animation when assembled into a movie. See for example, http://library.thinkquest.org/22316/home.html?qskip=1
which has value to an outside group or audience. Their role in providing students with another means of expression has proven pivotal to the success of most of the projects. There are of course projects which have made no use of CCTs. What is important here is a clear sense of purpose for both schools. CCTs are used to support the work of engaging with local community, producing knowledge about the community that has value and supporting other schools and students in doing similar work.

The other important element in this work is that community engagement occurs in two ways. Not only has community become a source of problems on which to work but also students access specialist communities for support in working on some of their projects. As Moore and Young (2001: 459) recently suggest, there are now strong grounds for 'reorienting debates about standards and knowledge in the curriculum from attempts to specify learning outcomes and extend testing to the role of specialist communities, networks and codes of practice.'

Recruiting
None of this is particularly new. What is new is that all of these elements are drawn together under a new logic, that of schools as producers of knowledge as sites where serious knowledge production and research can occur. Rethinking the role of schools as producers of useful and valuable knowledge opens up many important questions. Equally, it positions schools as an important new resource for community and provides students with valuable experience in serious knowledge work.

I wrote this little paper to share what I think is a significant way around the problem of CCT use in schools, and more importantly, one that takes seriously the changed nature of the world and the preparation of students for it. I am interested in hearing from any schools or teachers who may be doing similar work or who are interested in the notion of knowledge production.

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8 A similar argument is made by Gee, Hull and Lankshear (1996).
9 There is an embryonic website concerned with this project: http://www.deakin.edu.au/education/lit/kps
   There is also an email list that supports this work.
10 Instead of thinking of a school as a place where 300 young people attend to be provided with an education, try thinking about a school as a research site, populated with 300 small sized researchers.
11 My email address is: cbigum@deakin.edu.au
References