To what extent are the new technologies implicated in profound educational change, and how are they implicated? What is the nature of the relationship between the text of educational computing and the context of curriculum more generally, and between curriculum and the social formation? These are important questions which cannot simply be taken for granted, or glossed over; rather, the research agenda needs to be rejigged and rethought, as does the way education itself as well as computing are conceptualised.

INTRODUCTION

There is a growing and urgent interest in the use of the new information and communication technologies in classrooms, and in educational practice as a whole. This has come about through the operation of influences that have been apparent since the early 1980s being coupled more recently to a growing anxiety about schools, schooling and education generally. The mood of contemporary concerns and debates was, in large measure, captured in a publication last year in the Washington Post. (See following articles—Eds.) The three contributors, Neil Postman, Lewis J. Perelman and Hugh Kenner, rehearse arguments that accompanied computers when they first came into classrooms. What distinguishes them from early commentators is the extent to which they draw in contemporary and broader educational, political and economic discourses. The move is important because it shifts the focus of debates about computers in education from the local site, where it has more or less remained for the past fifteen or more years, to a broader, global focus. The move also reflects a 'globalising mindset' that has begun to characterise many education debates. In part it derives from the global perspective promoted by environmentalists over many decades, something that more recently has been energised by the fact of global interconnectivity courtesy of the new information and communication technologies. In computing terms, the move is from the 'stand-alone' microcomputer to the 'networked' personal computer.

Thus Postman (1992) clothes his main concern, that schools may no longer have any significance because 'we' do not have a culture worth preserving, in an old argument succinctly put by Tony Adams recently:

If we look back on the thirty years or so of educational computing then we must surely come to the view that there is little in educational computing that is vital to education as it is practised in schools. I would venture as far as to say that if every computer were to disappear from the classroom we would notice very little difference.

(Adams 1992, p. 165)

Postman dismisses technology as 'means to an end', asserting that it 'is a billion-dollar American delusion that the application of new technologies will make a significant difference in the long run, to what happens in the classroom'. Postman's concern about the decline of culture derives from a broader educational discourse which might be described as coming from a new mutation of the 'old right'. It
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embraces a concern for old values, for 'good books', for 'the basics' in education. In general terms it might be described as the conservative end of liberal educational thought.

Perelman (1992), on the other hand, rehearses a contrary but equally old argument. He asserts that computing does make a difference to learning, something that has been claimed since computers were used for instructional purposes. The contemporary discourse in this brings to this claim is of an entirely different kind to Postman's. His concern is with the 'languishing economy' of America. He makes the usual implicit link between schooling and the economy so fashionable today, but goes in the opposite direction to most economically-driven positions:

More education is not the cure to economic doldrums. Rather, it's one of the major causes of the malaise. Education has become a lethal saviour. Like a solid-gold life jacket, it's outrageously expensive, and the longer we cling to it, the deeper it will sink us.

The reason is that schooling—as a technology, as an economic sector, as a way of life—has become terminally unhinged from the real world of living and working.

This is a new, economically-rationalist deschooling position. The arguments are not new; proponents of the new information and communication technologies as wide apart as Seymour Papert and Michael Scriven have argued this case, as has, it might be argued, Ivan Illich.

Perelman bases his argument upon the post-industrial catch-cry that learning is now a lifelong enterprise, with the emphasis upon 'enterprise'. He sees schools as inefficient State-run knowledge industries that can no more be upgraded with new technology than the horse could be re-trained or even genetically re-bred to become a car. In an enthusiastic call to capitalist arms, he asserts:

It means commercializing, not just privatizing, America's collective farms of the mind—public schools and colleges—to unleash the power of free enterprise to deliver, better, faster learning opportunities at ever-declining cost to everyone.

He advocates a 'high tech' voucher system for the distribution of these new knowledge resources and suggests that the economic spin-off would be huge, creating a market for high technology products greater than the current world market for computers.

The third article by Hugh Kenner, an English scholar, takes a third position, based upon what has been described as 'on' education (Barrett, 1992; Harasim, 1990)—others here too. While his argument reflects promotional positions that have always been found with computer use in classrooms, he speculates on the interaction of two technologies, the printed book and the computer screen, and the implications for reading and writing. In doing so he gestures towards the concept of 'emergent literacies' (Spencer 1986) and is concerned to emphasise the pedagogic implications of new forms of knowledge, and new ways of participating in the construction and reconstruction of knowledge. The example Kenner makes much of is a 'wired' classroom in which students come to the same room but communicate via terminals! However bizarre this may appear as pedagogy, the article underlines the emergence of new kinds of classrooms, ones 'without walls' as McLuhan presciently described them:

The telephone: speech without walls.
The phonograph: music without walls.
The photograph: museum without walls.
The electric light space without walls.
The movie, radio, and TV: classroom without walls.

Man the food-gatherer reappears incongruously as information gatherer. In this role, electronic man is no less a nomad than his paleolithic ancestors.

(McLuhan 1964, p. 283)

In these accounts there is little of the excitement and glamour that has traditionally accompanied each new high technology product into the classroom. Computers first came into schools during what might be regarded as a mildly contracting period in education (i.e. governments were spending a little less, but nothing like the kinds of reductions currently being experienced around the world). Yet there can be little doubt that things have changed. More precisely, there has been decisive change in terms of what over a decade ago Meighan and Reid (1982, p. 354) in a pioneering account of curriculum and the new technologies described as 'the environment of schooling', and what more recently Lemke (1993) has called the 'ecosocial' conditions of educational practice. Meighan and Reid (1982) point to two such factors: 'the abrupt transition of education systems from expansion to steady state or even contraction', so that [economically, it has become harder to support expanding but labour-intensive activities such as conventional schooling' (Meighan & Reid 1982, p. 35); and 'the move from an energy-rich to an information-rich economy' (Meighan & Reid 1982, p. 356). Lemke's concern is more broadly with 'ecosocial change', that is, with 'changes in the practices and institutions we call education in the context of changes in the practice and institutions we call information technologies', with the observation that 'both these foci must be embedded in larger and more complex systems, if we are to truly imagine the nature of likely and possible changes' (Lemke 1993). To what extent are the new technologies implicated in profound educational change, and how are they implicated? What is the nature of the relationship between the text of educational computing and the context of curriculum more generally, and between curriculum and the social formation? These are important questions which cannot simply be taken for granted, or glossed over; rather, the research agenda needs to be rejigged
and rethought, as does the way education itself as well as computing are conceptualised.

Elsewhere, we have argued for a reconceptualisation of educational computing (Green & Bigum 1990), drawing upon the work of Bowers (1988) and others. In that paper we assert the priority of educational issues over computing-technological issues, suggesting that there needs to be more engagement than has tended hitherto to be the case with contemporary debates and developments in curriculum studies and curriculum theorising, particularly that concerned with notions of critical pedagogy, the politics of representation, and the social production of meaning and subjectivity (Donald 1985; Giroux 1988; Giroux 1990; Lather 1991). In this paper, we want once again to look critically and rather sceptically at current attempts at ‘re-framing’ educational computing, conveniently represented by the three contributions to the Washington Post last year, briefly outlined above, and then propose an alternative perspective of our own. Our focus is firmly on the curriculum and cultural questions that, as we see it, must be asked if the project of educational computing is to be turned more towards the interests of progressive education, social justice and critical democracy, and for these New Times.

THE MODERN CLASSROOM SYSTEM: A BRIEF ESSAY IN CURRICULUM HISTORY

As Perelman (1992) confidently asserts: ‘In the knowledge-age economy that will endure from now right through to the 21st century, learning is in and school is out’. This is a familiar prognosis now. It is, however, far from unproblematical; indeed, it is in urgent need of scrutiny expressly from the point of view of curriculum inquiry, since on the face of it this is a claim to go beyond curriculum itself, at least as classically understood. This is because, traditionally, curriculum and schooling have been seen as closely and even inextricably related. Furthermore, it is a claim for the radical de-institutionalisation of learning: the dissociation of learning from curriculum, on the one hand, and from schooling, on the other. Here we want to focus on the concept of the classroom. This is because this concept can be seen as intimately related to curriculum and schooling alike. Is it possible to imagine technological transformations of education without some attendant notion of changing classrooms? What functions have classrooms served, then, within the social-institutional economy of curriculum and schooling? How are these changing? And relatedly, how is the concept of the classroom itself changing?

This is to take the concept of the classroom as fundamentally problematic, both from the point of view of curriculum change (‘how does the curriculum change?’) and that of curriculum stability (‘what has made the curriculum so stable?’) (Meighan & Reid 1982, p. 354). It is also to consider the classroom as a crucial focus for technological change (Aronowitz & Giroux 1991), whether as something to be demonised and transcended as something to be reclaimed and transformed. As Reid (1990, p. 210) observes, classrooms as ‘living [inventions]’ set constraints upon our imaginings of educational possibility, ‘dulling [our] imaginations with their excessive familiarity’. He further argues that classrooms are inventions of their time and that a study of their history can ‘remove the assumption of the immortality’ of inventions like the classroom. Hence we can find important lessons to be learnt from history, in seeking to understand the impact of new technologies on educational practice and the possibilities and problems of change, and it is to this matter that we now turn.

David Hamilton (1980, p. 282) has argued that ‘educational practice lies at the intersection of economic history and the history of ideas’ and that ‘the pedagogical practices of an epoch are expressions of both material and ideological resources.’ His thesis is important for grasping the proposal that popular schooling, as a specific apparatus of social discipline and government, is deeply implicated in what can be called the project of modernity. He links what he describes as the ‘moral economy’ of the classroom system to the emergence of a new historical, intellectual and existential sensibility, grounded in decisive social and material changes. The key to this sensibility, which he presents as a ‘general philosophical transformation’, is the newly-emergent notion of ‘system’, as a centrally organising concept-metaphor for the ‘mechanistic world view’ associated with Newton, Locke and Bacon, for whom above all else ‘nature was accessible, knowable and controllable’ (Hamilton 1980, p. 283). These principles of inquiry were readily extended into the social and cultural field, including political economy, as in most notably the work of Adam Smith. Hamilton indicates how such ‘power-laden ideas about reason, nature and law-like behaviour’ entered into educational theory ad practice, specifically via the introduction and consolidation of ‘simultaneous instruction’ and the modern classroom system. Significantly, these developments are linked to the emergence of a ‘modernising climate’ (Hamilton 1980, p. 287) directly associated with the increasing influence of Smith and others of like mind (Hamilton 1990). This can be readily related to what Doll (1989) presents as ‘the foundational model for the social sciences, including education’, that is, scientific modernism, best and most succinctly expressed in Newtonian mechanics. For Doll, ‘Newtonian thought is one of the foundations on which the present-day curriculum is based’ (Doll 1989, p. 244), and he goes on to trace its influence in the work of such influential figures as Ralph Tyler, Madeline Hunter, B. F. Skinner and James Popham, and in the pervasiveness of a discourse on curriculum which emphasises and prioritises order, harmony, quantification, measurement, linearity, aggregation, and predictability. Above all else, what characterises the educational field and especially the modern classroom system is a particular view of rationality, which can be linked more generally to the
project of Enlightenment, organised as it is by a governing idea of 'reason', as an exemplary meta-concept, a universalising category par excellence (Giroux 1990). The normative concept of the classroom, as a system of social relations and surveillance, needs to be seen in this light, as a particular expression of the will to power and the power of reason.

Hence it becomes possible to see in the development of the modern classroom system, across its various transformations from an 'engine of instruction' (a machinery of instruction for teaching the greatest possible number of pupils at the lowest possible cost) to a 'space of moral training' (Jones & Williamson 1979, pp. 72-3, 87), a strong expression of the investments and impulses of modernism, and as participating in a general process of modernisation. Indeed, there are important connections to be made between the emergence of modern educational science, as exemplified for instance in traditional forms of reading pedagogy and the associated technologies of textbook and basal reader (Luke 1988), and the complex of the classroom, bringing together an entirely new personage—the social figure of the modern teacher—and a unique organisation of social-architectural meaning (Donald 1985; Green 1989; Hunter 1987; McHoul 1989). As one commentator puts it: 'Classrooms arrived on the scene with their own macro-cosmic resonances centreing around collectivist sentiments of sympathy and emulation which were to be unlocked by the new teacher professionalism' (Reid 1990, p. 209).

This, then, is how the modern, normative concept of the classroom is to be understood, and against which new initiatives and proposals for educational practice can be measured. Importantly, what such an argument enables is the suggestion that at the very heart of the politics of educational change, and specifically of representing and imagin(ing) classrooms in contemporary public and educational debate, is a conflict between the logic and imperatives of modernism, on the one hand, and those of postmodernism, on the other. There is now an increasing body of specifically educational discussion on the implications of postmodern(ist) social and cultural theory for curriculum and schooling (Doll 1989; Giroux 1990; Lather 1988; Murphy 1988), which is usefully drawn into this present discussion. Specifically, we want to argue that contemporary movements towards process-developmental curriculum and the open classroom are usefully considered in this way, that is, within the shifting dynamics of modernism and postmodernism. In particular, the challenge that these movements present to the normative concept of the modern classroom involves engaging with the radical implications for curriculum of what can be called the emergent culture of postmodernity. This is a matter not just of coming to terms with the pedagogic implications of new forms of knowledge and popular culture and the challenge of 'emergent literacies' (Spencer 1986), although that is most important. It also involves grasping the profound changes associated with the necessary re-framing of modernist projects, which certainly includes schooling and hence the modern classroom system. This does not mean that classrooms as such will simply disappear, although that is something which might well be contemplated; it does mean that, in the conventional, normative form that has lasted now for almost two centuries, classrooms can at least begin to be imagined otherwise, and in the meantime specific changes, modifications and innovations realistically introduced.

THE VOICE OF REASON

Visions about technological-inspired educational transformations have longed characterised the field of debate. In a wide-ranging discussion some years ago now, Michael Scriven (1986/1989) has argued for a radical reformulation of the field of educational computing, and specifically for the need to re-think and reconceptualise the role and use of microcomputers in the school. There was an urgent need, as he saw it, for 'a broader vision of their potential uses, based on a different conception of their nature as an educational force' (p. 29). Hence he proposed a new metaphor for understanding computing: rather than seeing it as an 'appliance' or a 'device'—that is, in material-technological and narrowly utilitarian terms—it should be understood as energy. That is, 'computers are better conceptualized as a source of energy' (p. 28). This metaphor has both a popular and a more precise, scientific designation. On the one hand, it refers to the 'energy' that drives a person, that keeps teachers and students going: active, inspired, enthusiastic, engaged etc. As he observed, 'there are times when most teachers, myself included, would welcome a new supply of energy' (p. 50), caught up in the fray and heat of the pedagogical moment. On the other, it was likened to electricity and the way it is used in schools: 'to light the classroom, to drive audio-visual devices ranging from an overhead / film projector to a tape recorder, to power the copiers, to supply air conditioning and local heat, to run the telephones, to keep the luncheon food cold, and to illuminate a microscope stage'. He presented the following thesis:

The uses of electricity do not just contribute convenience or enjoyability; they contribute the very possibility of the modern school. It is possible that computer energy will be the distinguishing feature of the postmodern school. Certainly the presence and the usual use of computers does not mark the arrival of a new age in schooling, but perhaps a new vision of what they can do, coupled with a new generation of computers that can implement that version [sic], can bring about a quantum leap in the school's ability to meet the needs of the students and society.

(p. 28)

A similar vision of computing in general is offered by Hills, 'Computation should be like electricity. You plug into the wall and use as much of it as you need whenever you need it' (quoted in Brand 1987, p. 191).

A number of observations can be made here. Firstly, this is paradigmatically a technologically-driven or technocentric vision of educational computing. It avoids the deterministic position that material-technological objects in themselves, and of themselves, decisively shape human action. However, it rests upon what is presented as an informed sense of the possibilities in computing, plus a faith in technological progress an development; by definition, the new generation of computers will be better. Secondly, and relatedly, the analogy between electricity and computing is particularly striking, as are the terms in which the connection between them is forged. That electricity is seen as central to 'the very possibility of the modern school', rather than for instance the invention of print, the codex book1 or the cultural technology of the classroom itself, is noteworthy, and indeed would be an interesting idea to explore. It is certainly not beyond

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disputation, however, and there are consequences of some importance in making such a proposal.

Significantly, Scriven notes that 'what characterises a form of energy is its ubiquity—the way in which it can be put to work to do jobs and solve problems that do not share any common elements' (Scriven 1986/1989, p. 28). Could it be that, alongside and linked to this catholic usefulness, there is an attractive and alluring element of flexibility in energy sources such as electricity and computing, and perhaps even more importantly a perceived neutrality? Electricity certainly would seem to have these qualities, at least from a certain perspective. It operates according to a digital logic, too, as does computing (Bowers 1988). Can it be said, though, with anywhere near the same degree of knee-jerk assurance, that computing exhibits such qualities?

Is it serviceable and 'user-friendly' in the same way that electricity arguably is? Might there not be something rather disturbing in the thought that, at some stage, computing in its various forms will be as 'ubiquitous' as electricity is for us now? We would not want to be seen here as simply evincing a naive luddism. Science fiction has provided us with enough convincing and powerful scenarios, of a positive kind, to make the prospect of electronic culture not only intriguing but also exciting. All the same, such a prospect needs at all times to be considered critically, with a proper regard for human priorities and political consequences.

What, then, is the vision of educational change that is being offered here? What we have is a series of truly radical proposals for reformulating curriculum, pedagogy, learning and schooling, from the point of view of computing technology and its possibilities. They are presented, moreover, in the exemplary voice of reason: they are, from this perspective, eminently rational and entirely consistent with informed educational commonsense. The following observation is made:

What we are seeking is the result of the infusion of a new source of energy into the curriculum. Like the energy of a river in flood, it is not always possible to predict exactly what its effects will be, but it is good planning to look ahead to ways in which we can usefully employ that energy, and form defences against trouble.

(Scriven 1986/1989, p. 35)

In other words, the perspective offered here links up readily with mainstream forms of educational-administrative logic; it is all about trouble-shooting and problem-solving, within the social economy of the school or the school-system. It operates on the basis of an administrative rationality, and is concerned above all else with getting the business of education done more economically and efficiently. In this view, essentially the school works like a machine—or, more particularly, like a computer. Hence, when Scriven comes to considering 'the educational functions of the computer', as distinct from its 'sociological functions', the discussion is organised in terms of

additions, enrichments, deletions or replacements. What is most pertinent here is how schooling of the future is imagined, with regard to how it currently operates and is understood. What emerges is a truly apocalyptic vision, a scenario of 'the end of civilisation as we have known it'. In a series of moves, an argument is mounted to do away, firstly, with what are often erroneously regarded as the 'basics': the so-called basic operations of literacy and computation. That is to say, what are presented as traditional, time-honoured sections of the mathematics curriculum and the language arts or English curriculum are swept away. Where once 'we spent a great deal of time...dealing with long multiplication, long division, logarithms, numerical approximation methods and the use of the slide rule', now there is 'the small calculator or computer' and soon 'computerscrath-pads' and the like. In a similar fashion, handwriting and its related pedagogy will become less important in the classroom of the future, as keyboarding moves into prominence. The implication is that the various transcription aspects of writing will be less foregrounded and significant—which of course, in theory at least, allows more emphasis to be given to composing activity (Smith 1982). Similarly, 'reading is also, courtesy of the computers, close to becoming a redundant skill, again ignoring economic considerations' (Scriven 1986/1989, p. 33). Further:

It is by no means too early for us to be planning exactly how we propose to handle this assault on that [which] is naively thought by many to be an essential element in education. However, reading, writing, and arithmetic are simply a means to an end, the end of learning, enjoying, and functioning, both in society and in private. What the computer already does to some extent and will increasingly do, is to make clear that these are merely means and uncommonly difficult ones to master.

What is missed entirely here, what is completely glossed over, is the point made with great force in contemporary curriculum scholarship, that schools are not simply instructional sites, the aim of which is to promote and further student learning; rather, they are also, and arguably more importantly, cultural sites, wherein the ongoing work of social management and cultural transmission is conducted. In Reid's (1990, p. 208) terms:

'educational settings are more than arenas for the deployment of technologies of teaching and learning, more even than functional constellations of socio-cultural relationships: they are cultural institutions which derive meaning from the macroscopic institutions of adult endeavour.'

The point is, so-called basic skills training in literacy and computation has been from the very outset of the modern classroom system a central feature in a larger project of social discipline, and hence must be understood as entirely functional within its logic. Scriven (1986/1989) goes on to propose that the opportunity is there to do away with the privileged status of reading, and hence reading pedagogy, with regard to school learning generally: 'The fact is that we could teach science, for example, well into secondary school without any need of reading, manual or electronic...[Many years of serious science education can be provided to students who are unable to read, if we don't make it impossible]' (p. 34). What
he envisages, in fact, is a move away from text-based pedagogy altogether, in the sense that has been fundamental to schooling from the very beginning. A radical move, indeed, especially given the social-disciplinary ramifications of the normative form of school pedagogy. It is worth noting at this point that in Donald's (1985) account of the social history of popular schooling, basic training in literacy and computation was linked to a similarly basic training in 'morality'. What, then, are the forms of moral training associated with the electronic classroom of the future?

Scriven pushes his argument still further, however. First, he considers the proposal that computers might well replace teachers, and then, that they might be instrumental in the replacement of students; and finally, that computers might well do away with classrooms altogether, at least in the conventional sense. With regard to the first matter, he is careful not to be seen as denying the usefulness or the importance of teachers in the educational process ('Teachers of course have their own strength...'). However:

While it is quite true that computers will never be able to replace all teachers, it is simply false that computers cannot be used to replace some teachers. It is also false that they should not be used to replace teachers; in many important teaching situations they should be used to replace teachers.

He qualifies this assertion somewhat by saying that it is a matter only of 'computers replacing some teachers, or most teachers for some functions', which he describes disarmingly as 'this more modest possibility'. Yet it is clear that, for him, there is a particular attractiveness in the prospect of computers taking over large areas of teaching; the computer is potentially all that we, as mere humans, might want to be but cannot ever be, precisely because of our all-too-human limitations and failings; it is eminently student-friendly and student-centred, non-threatening, 'infinitely forgiving', and ultimately 'more knowledgeable and more accurate in assessing student responses' (p. 41). It's a matter of being realistic, of being reasonable: 'It may be the case that the old ways are better ways at the moment; then we should use them in the basis of serious evaluation. It is certainly not the case that the old ways are essential. They are getting in the way of progress in some cases' (p. 42).

The next move in this inexorable scenario is to replace students. Once again it is presented as an entirely reasonable proposal, a matter of calculating the curriculum 'savings' associated with the introduction of computers. What it means is that, in essence,

the same level of skill [in computation, for example] can be attained by a student with less seat hours, and that means we've replaced student-hours by computers. So, if we don't increase the educational objectives of school learning, there will be phantom classrooms, which means we have used computers to replace students.

(p. 47)

Even more radically, this scenario is extended to those situations 'when the student sitting in the classroom is replaced by a computer' (p. 47). An analogy is made to student use of tape-recorders on those occasions when they cannot be physically present in the classroom or the lecture-theatre; with the aid of this technology, they are able to participate in the work of the classroom, however mediated, without actually being present. The introduction of computing technology pushes this logic even further:

The computer can do more; it can turn in homework from a remote site; it can pass along questions to the teacher at appropriate points; it can make perfect instant copies of all illustrations and 'handouts'; it can record the correct answers when the teacher releases them in class (over the 'classroom LAN', a local area network that connects the computers in the seats with the one at the teacher's desk); and it can use them to correct the student's homework. (It can also do the homework and take the tests, if supervision isn't careful.)

(p. 48)

In short, what we arrive at is the 'studentless' classroom, the 'empty' classroom—the ultimate expression of the new curriculum logic of 'open learning', with its complex play of presence and absence. We are left simply with electronic spaces and spectres, 'phantom classrooms', themselves inhabited and endlessly traversed by ghosts. In other words, the classroom as such disappears, swallowed up in the inexorable march of progress—the classroom, that is, as a distinct social concept, grounded historically and institutionally in the social-architectural complex of the modern school. The resonances with Perelman's argument are clear and strong. The account of hyperlearning offered by Perelman is not much removed from Scriven's vision quoted above. Where Scriven has integrated the computer into classrooms to the point that classrooms hardly matter, Perelman sees no need for 'the box of the classroom'.

That there is a utopian, even apocalyptic impulse at work in this and Perelman's account that needs to be emphasised. It overstates the likelihood of radical educational and social change, and grossly underestimates the constraints built into the existing system. This is in part because it works with a celebratory, impossibly optimistic sense of the technological. But it is also because it lacks an informed sense of the social history of the modern classroom system, and more generally of curriculum history. At the same time, it is caught up in a logic and a rationality which itself sets limits on its capacity to imagine education otherwise, in a more realistic, socially-critical and informed way. In this, it is consistent with the mainstream culture of educational computing, locked as it is into a dream of scientifi city and the discourse of modernism.

DE-SCHOOLING AND THE LOGOCENTRIC CLASSROOM

One of the most compelling accounts that is currently available of educational computing remains that of Papert (1980). He presents what he describes as 'a new vision of education and education research very different from the traditional ones'. As he observes in his Introduction:

It is not true to say that the image of a child's relationship with the computer I shall develop here goes beyond what is common in today's schools. My image does not go beyond: it goes in the opposite direction.

(Papert 1980, p. 5)

Basing his argument on a particular understanding of what he calls 'Piagetian learning, which to me is learning without curriculum' (p. 31), he proposes what is in effect a new vision of the classroom, from the point of view of traditional forms not only of educational computing but also of mainstream education generally. This is one in which the student occupies the operational centre, in real terms; a view, that is, of the necessary priority of learners and learning, in and for educational practice. His account links up with a more general movement.
towards student-centred curriculum, particularly in the post-1960s period, and is a strong version of what can be called interpretation pedagogy (Barnes 1976). He envisages a new formulation of conditions for powerful learning, a new learning-environment, in which learners are perceived as active and a particular kind of relationship with the computer is promoted, a situation he presents 'very different from the kinds of access to computers that are now becoming established as the norm in schools' (p. 16). He describes this new, learning-focussed education in the following way:

...'teaching without curriculum' does not mean spontaneous, free-form classrooms or simply 'leaving the child alone'. It means supporting children as they build their own intellectual structures with materials drawn from the surrounding culture. In this model, educational intervention means changing the culture, planting new constructive elements in it and eliminating noxious ones. This is a more ambitious undertaking than introducing a curriculum change, but one which is feasible under conditions now emerging. (Papert 1980, pp. 31-2)

A number of points are worth making here. Firstly, he presents this account—the basis or prototype for what comes to be known as 'the Logo classroom'—deliberately in contradistinction to the conventional classroom situation, in which the dominant form is whole-class teaching, there is a regular, overdetermined pattern of discourse, interaction and exchange, and the recitation persists as the main feature of classroom practice. Secondly, his proposal can be seen as operating within a romantic form of the logic of de-schooling. Hence, with regard to the insistent normativity of current educational practice, it can be seen like Kenner's 1992 proposal as 'alternative' rather than, potentially at least, 'oppositional' in nature and implication, and in terms specifically and literally of 'deviance'. As such, it and Kenner's can be easily marginalised as a strategic proposal, within the larger politics of educational change. Unlike Kenner, his argument is geared to a de-schooling logic. At one point he evokes the apocalyptic vision of 'a world without schools' (Papert 1980, p. 178), having previously argued the following:

I see the classroom as an artificial and inefficient learning environment that society has been forced to invent because its informal environments fail in certain essential learning domains, such as writing or grammar or school math. I believe that the computer presence will enable us to transform the learning environment outside the classrooms that much if not all the knowledge schools presently try to teach with such pain and expense and such limited success will be learned, as the child learns to talk, painlessly, successfully, and without organised instruction. This obviously implies that schools as we know them today will have no place in the future.

Significantly, he concludes by observing that 'it is an open question whether they [i.e. schools] will adapt by transforming themselves into something new or wither away and be replaced' (Papert 1980, pp. 8-9).

DECOUPLING THE CLASSROOM AND CURRICULUM

Withering schools and fading classrooms have been a part of the discourse of educational computing since the coming of microcomputers to schools. The micro not only engendered the kinds of imaginings of classrooms and schooling, and more recently, practices that we have described, it also marked and masked the general availability of inexpensive microprocessor technology which, compared to the more visible microcomputer, has turned out to be far more significant in terms of shaping the day-to-day lives of those who live in the affluent West. Microprocessor technology supported a rapid growth in telecommunications which, coupled to the new information media also activated by microprocessor technology, gave rise to the communications revolution, something which continues apace to this day.

Schools have generally reacted to the communications revolution by attempting to take on board as much as they could in terms of hardware, software and even some of the promotional fantasies that come from vendors and enthusiasts. Focusing on the classroom and those aspects of the new information media that could be employed there has drawn attention from the broader, social manifestations of these technologies. It is as if most schools have assumed that little of significance has changed outside the school or, even if it has, that the way forward for schools is to become as 'hi-tech' as is fiscally possible and as quickly as possible. Raising concerns about the 'social' generally suggests consideration of the 'social effects' of the new information and communication technologies something that has been a focus of interest and scholarship for many years. Hinson (1990, p. 86) believes that while such studies may be useful they are essentially reductionist and rely upon familiar, old frameworks for analysis. His interest is in not seeing the new information media as external but as constitutive of new social relations.

The emergence of new social relations can be seen to arise from an intrinsic property of the new information media, their speed. It is a speed which distorts time and space in ways that we have yet to fully come to grips with. Paul Virilio, a philosopher of speed, offers some examples of the kinds of distortions that the new media bring about:

Point of view, the omnipresent centre of the ancient perspective design, gives way to the televised instantaneity of a prospective observation, of a glance that passes through the most of the greatest distances and the widest expanses. ...Suddenly we possess this ease of passing without transition or delay from the perception of the infinitely small to the perception of the infinitely large, from the immediate proximity of the visible to the visibility of all that lingers beyond our field of vision. Ad suddenly the ancient distinctions among the dimensions disappear. (Virilio 1991, pp. 31-2)

When it comes to influences that appear as esoteric as the effects on time and space of the new information and communication technologies, teachers have been right to emphasise the importance of establishing sound classroom practices using computers before becoming concerned about abstract ideas. We argue that an emphasis on the local and practical concerns of using computers in the classroom important as it is, is of little consequence without attention to the broader scale changes in which classrooms now operate; it is like caring for a tree but having no knowledge of or concern about the ecosystem in which it lives. It is only relatively recently that the changed economic circumstances outside of schools have begun to impinge directly on classrooms and teachers' lives. The changed economic circumstances are largely dependent upon a global economy which in turn is totally dependent upon the free and fast flow of capital around the globe which would be unthinkable without the new information and communication technologies. Menzies gives a sense of the scale of capital flow that the technology supports.
...the London Eurodollar market turns over $300 billion every working day, or $75 trillion dollars a year. That’s at least twenty-five times the volume of world trade in real, tangible goods.

(Menzies 1989, p. 19)

In Australia, the Sydney foreign exchange market buys and sells our international debt once a week (Yong 1989). The amount of money and the speed with which it circulates around the globe is a very different world to the one that inhabited by computer-users and their students. It is a world of ones and zeroes that takes on ‘real’ meaning to those who operate in it as Hills observes in a description of his stockbroker wife at work:

Her office was in the top of a skyscraper in Boston, and yet, in a very real sense, when she was at work she was in a world that could not be identified with any single physical location. Sitting at a computer screen, she lived in a world that consisted of offers and trades, a world in which she knew friends and enemies, safe and stormy weather. For a large part of each day, that was more real to her than her physical surroundings.

(Hills 1992, p. 13)

These new information spaces, created by the distortion of time and space by the new information and communication technologies are not as unfamiliar as they may seem. When we sit, ‘along with’ millions of other humans and watch events at an Olympic game, on the other side of the world, at the ‘wrong’ time of day, and yet still ‘participate’ with the countless other ‘virtual’ attendees; when we use the telephone; when we listen to the broadcast of a speech, where are we?

Poster poses a similar set of questions and offers an important answer:

If I can speak directly or by electronic mail to a friend in Paris while sitting in California, if I can witness political and cultural events as they occur across the globe without leaving my home, if a database in a remote location contains my profile and informs government agencies which make decisions that affect my life without any knowledge of my part in these events, if I can shop in my home using my TV or computer, then where am I and who am I? In these circumstances I cannot consider myself centred in my rational, autonomous subjectivity or bounded by a defined ego, but I am disrupted, subverted and dispersed across social space.

(Poster 1990, pp. 15-6)

The social spaces to which we and Poster refer are new, abstract, non-physical social spaces. They represent a new kind of social, something that has been with us at least since the invention of the telegraph. Which as Carey so keenly observed ‘permitted for the first time the effective separation of communication from transportation’ (Carey 1989, p. 203). The reliance upon terms, even the term ‘space’, that are used to describe our uses of the new and not so new information media, underline the difficulties we have in talking about them. Not so Jon Perry Barlow and Mitch Kapor, who saw that computers, connected together, had the capacity to create an environment which human beings could and did inhabit. They called it cyberspace4 after Gibson’s description of a futuristic place rather like it which they found in his novel Neuromancer.

What began as a world dominated by material social spaces and into which the telegraph was put, is now a world in which material social spaces are increasingly being replaced or, at the least, overlaid by virtual or cyberspaces

What began as a world dominated by material social spaces and into which the telegraph was put, is now a world in which material social spaces are increasingly being replaced or, at the least, overlaid by virtual or cyberspaces; the face-to-face social pace is increasingly ‘experienced as an anachronism’ (Hinkson 1991, p. 10).

What then are the implications of these new kinds of spaces for the social space we call the classroom?

Hinkson (1991) identifies ‘information’ and ‘image’ as the two elements that constitute the new spaces and reconstitute us as their inhabitants. These two elements are significant for the classroom and its association with curriculum in different ways. Information, once the basis for the gaining and internalising of knowledge in formal education settings is, according to Lyotard (1984, p. 4), undergoing a ‘thorough exteriorization’.

That is, the logic of information calls forth a self which relates to information as an externality which is never internalised—the self is in relation to the databank, and the question of equity becomes one of access to the ‘bank’.

(Hinkson 1991, p. 12)

In this account the teacher’s role shifts from one who knows to one who knows how to facilitate access to the databank, captured in the slogan, ‘learning how to learn’. The educated person becomes less someone who knows things and more someone who knows how to find out things. Lyotard captures this new relationship with information. ‘Data banks are the encyclopedia of tomorrow. They transcend the capacity of their users. They are “nature” for postmodern man’ (Lyotard 1984, p. 51).

But in such a redefined ‘nature’ what role does a classroom have and how does it remain associated with the social practice we call curriculum? Some schools, perhaps wanting to explore new ways of working with information have begun to experiment with large numbers of ‘take-home’ computers. Other schools have been making extensive use of modems. For both, what was a discrete architectural space, a classroom, is altered spatially and temporally by their use of the new information and communication technologies. The social practice of curriculum, once defined by the material presence in a single space of what Schwab called ‘classroom commonplaces: teachers, students, subject matter, curriculum decisions, and milieu’ (Schubert 1981, p. 187) becomes dispersed through time and space.

In addition to school-based explorations of new arrangements of student, teacher, information and curriculum to the communications revolution, students, in particular, experience other manifestations of the new information media. In the home, image-based media have proliferated over the past decade. Television, video recorders and video games are now commonplace in many Australia households. They transmit and receive the other element in Hinkson’s analysis, image. In a recent account of the postmodernity and education, Hinkson (1991) argues that increasingly, people are integrated into a culture which is structured around image-mediated consumption. The temporary, fleeting nature of image and its ability to present information that engages our imagination more than print gives the medium a unique and powerful integrative role socially. So much so
contends Hinkson, that the mass media have replaced schooling as a more important socially integrative mechanism.

The importance of image in the formation of social relations must also be considered in the context of the social relations that schools and classrooms support. Classrooms and the practices they maintain are particularly attached to a different communication medium, the book. The classroom as a social space can be seen as a construction of print technology. The curriculum too, in large part, can be seen as a technology similarly based upon print, mainly textbooks. While there is much enthusiasm for and talk about other media being used in the classroom (multimedia is the currentfad) there is little evidence that the introduction of any amount of new media will somehow transform classrooms from their historical dependencies on, some would say their logic of, print. Thus the text-based classroom faces the image-based mass media not only in terms of social integration but increasingly in terms of information delivery. As the mass media explores the construction of new and different forms of social relationships with its audience, education and information become blurred with entertainment giving rise to the new categories like ‘infotainment’ and ‘edutainment’. Compare for instance, a teacher of biology chalking and talking her/his way through a lesson on the rain forests of the Amazon, with a TV program in which David Bellamy is recorded crawling around in the forests of the Amazon. It is not just that one media is more engaging than another. For the students who experience it, image and not print is more natural. This is the medium which saturated the world into which they were born. While teachers do their best to appropriate television, video and computer-based resources into curricula, increasingly the mass media targets the home rather than the school as a more important site for the delivery of all forms of information, entertainment and their hybrids (Bigum 1992).

Thus the association of schooling and curriculum, held together by the book is loosened even uncoupled by information and image mediated via the new information and communication technologies. The uncoupling, not unlike that which has occurred between employment and economic activity (Menzies 1989, p. 29) warrants careful attention. Ironically, the new information and communication technologies brought into the curriculum to (post-) modernise provides a means from within for the destabilisation of the classroom. New forms of classroom to support new social relations have already begun to emerge. The continuing use of the term ‘classroom’ to talk about these new, virtual spaces simply underlines our unease and unfamiliarity with what is happening. As Reid suggests:

'Discarded inventions, such as schoolrooms, puzzle us, while living ones, such as classrooms, dull our imaginations with their excessive familiarity. Yet we too are inventions of their time, with a beginning and, we can confidently predict, an end. Though the classroom places constraints on the delivery of curriculum, we need not view these constraints as fixed forever.'

(Reid 1990, p. 210)

The classroom is indeed a living invention that frames much of how we think about schooling and curriculum. Lemke, like Reid signals the importance of understanding all social institutions as having finite lifetimes. Drawing upon biological metaphors of change to describe an 'ecological dynamics of society, he underlines the interdependence of social systems and the life-like stages that all institutions pass through. For Lemke, classrooms and schools as they are conventionally understood, are coming to the end of their life-cycle and will only 'continue to exist in patches, but they will grow sparser, less relevant to the system as a whole, to its futures' (Lemke 1993). Lemke is not alone in predicting the demise of schools and classrooms. His prediction is interesting because of the ecological models he employs in explaining the interdependence of books, classrooms and schools. He therefore talks in terms of a decline in schooling as the dominant form of education. Lemke, like many others, puts great store in the emergence of mass databases, virtual reality systems and the promised panoply of future high technology for education. But, as we have argued, you do not need to invent scenarios involving electronic libraries in order to describe the changed and changing relationship between classrooms and curriculum.

The uncoupling of classroom and curriculum is not a new idea, nor one that is necessarily tied to the growth of the new information and communication technologies in classrooms and elsewhere. As a number of scholars have shown, there are good reasons for considering pedagogies and curriculum outside of schooling (e.g. Giroux 1992; Postman 1985, Schubert 1986). In this respect, Postman in particular, is concerned with television:

Television has become our primary means for conversing on a cultural scale. It is our new form of talk. Consequently it is among the first and arguably the most persuasive of the messages reaching the minds of our children. Television has become for American youth a curriculum. Indeed, if one may define a curriculum as a specially designed information system whose purpose is to train or cultivate the character of the young, then television, which does all this with a relentless at purpose no single human could dare to equal, has become the curriculum.

(Postman 1985, p. 189)

CLASSROOM THINKING: LOCAL AND GLOBAL

A consideration of the information and media-altered circumstances in which the 'modern' classroom operates, demands a rethinking of many of what to date have been stable educational categories: schooling, classroom, teacher, student and curriculum. It will mean asking questions of scenarios which describe future classrooms as...
simply 'hi-tech' versions of what we have at present. Equally, it will mean interrogating the offerings of social commentators like Postman, Perelman and Kenner. At one time when it appears that a number of 'old' social institutions are unravelling, the technology-induced uncoupling of classroom and curriculum becomes an important marker in education. The challenge for teachers and schools is therefore considerable. As the moves away from print-based media continue both inside and outside the classroom and the likely pressures on schools to become more efficient, more in tune with the economic needs of the country, increase, there will likely be a proliferation of new forms of classroom, new forms of curriculum, new kinds of teachers and certainly new kinds of students (Green & Bigum 1993). Some of the changes are unlikely to be fast. Some of the changes we will have to notice. For classrooms however, it is already apparent that things have begun to change.

The most reassuring observation that can be made in these times of ongoing uncertainty and change is that future predictions of what might be are notoriously inaccurate. For some reason their inaccuracy seems to increase when the prediction involves the new information and communication technologies. What is clear though is that it will be no longer sufficient for educators to bury their heads in the technological sand. Their use of computers inextricably ties them to the things that computers have spawned outside the classroom. We believe that to ignore these cultural and social shifts is educationally irresponsible. A dictum of the Green movement seems a useful way of capturing what we intend: 'act locally, think globally'.

These actions and thoughts however will need to be informed by other than technological considerations. As Preston and Symes argue. In short, education will need to place technology in an ethical and moral context, at the broadest level possible—namely the global—in which the appreciation of the consequences of technological change are profound rather than superficial and in which every innovation is judged in terms of negative and positive contributions to the well-being of all species, both in the short and long term. In order to do this, we believe a new technological mind-set will have to be produced by the educational system. (Preston & Symes 1992, p. 217)

This is not a new position. Joseph Weizenbaum (1984) has been arguing along these lines for many years. We need to turn our gaze from what computers can or might do to what they ought to do in our local and global classroom thinking. Only then will be in a sound position to move educational computing towards the interests of progressive education, social justice and critical democracy, in and for these postmodern times.

ENDNOTES

1 By this we mean the conventional idea of the classroom, as a powerful image in the (re)production of educational commonsense.

2 Note that this term was transformed into 'version' in the above quote, no doubt inadvertently; a good instance of 'the return on the repressed' in truth-claims such as this.

3 A term used in Lanham (1989) to identify the printed book, as against the textual practice associated with the word-processor.

4 Of course there is a sense in which it already is; on this matter, see Weizenbaum (1984, p. 225).

5 Watkins (1986, pp. 9-11) indicates how this term is often misused in contexts such as this; as he observes, '[t]he Luddites were not against technology but they were against the way particular technologies were developed and used in an attempt to break any power and control the worker may have had.'

6 In William Barrett's sense, cited in Porush (1989, p. 395): 'A machine is an embodied decision procedure.'

7 It is significant the 'economic considerations' are given scant attention in this kind of argument.

8 This is, of course, precisely how distance education works; see Bigum (1990).

9 It needs to be said that Papat works here with an extremely dubious sense of the concept 'curriculum'.

10 See also Benedikt (1992).

11 See for example Cuban (1986).

12 There are commonalities here with Perelman's (1992) position.

13 For a more detailed account of this position see Green and Bigum (1993).

14 See for example a number of accounts in Barrett (1992).

15 David Hamilton's work meticulously describes the beginnings of the classroom (see for example, Hamilton 1980).

16 This paper was first published for an Electronic Salon held at Deakin University during the joint AARE/NZARE conference of 1992.

17 For a typical example see Sherwood (1991).

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