

Sitting in rows and teaching on-line: Life-histories, technology and pedagogy

Sue Middleton

School of Education

University of Waikato

Private Bag 3105

Hamilton

New Zealand 2001.

e-mail: s.middleton@waikato.ac.nz

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It was the last week in June, 1998, my first week of teaching on-line – a level 200 undergraduate course entitled '*Educational reform in Aotearoa/ New Zealand.*' My class of around 50 students were pre-service primary school teachers enrolled for a three year Bachelor of Teaching programme. They were now in the second semester of their second year, so they already knew how to study on-line and had high expectations of their teachers. I was excited and a little nervous, although I had had help in learning the software from the colleagues who developed the on-line version of the BTeach programme and would continue throughout to participate in a support group of the wider on-line teaching team (Campbell, 1998). This wider programme is known as Mixed Media Presentation (MMP) because – in addition to their on-line studies and teaching practice in their local schools - the students come onto the campus three times a year for four or five days for face-to-face encounters, which may include lectures, group tutorials, seminar presentations, library sessions, and social events. I had had two one and half hour sessions with my group the week before, and would see them again for a similar time allocation mid-way through the semester. So, on that late Autumn evening in June, I was sitting in my home office wondering how the students were coping with the readings I had set them. I was waiting for them to e-mail me their first assignment – one of four sets of responses to historical readings, including a chapter from the book Helen May and I had written especially for introductory educational theory courses - *Teachers Talk Teaching 1915-1995: Early*

childhood, schools and teachers colleges (Middleton & May, 1997). I planned to write to them that night... What, I wondered, is changed by teaching and studying on the internet?

In preparation for teaching this course, I had made the students a CDROM, containing hypertext linked pages – pictures, text, and slide show and to do this I had to learn and use new software (Page Mill and Power Point) and hardware (a scanner and a digital camera). As I did so, my mind flashed back to earlier experiences with new teaching technologies, starting with an overhead projector and a 16mm film projector at teachers college in the late 1960s. In schools I was an avid user of Banda machines and cassette tape recorders in the early 1970s and a few years later, both Super 8 movie and 35mm slide cameras and projectors. As a university lecturer in the early 1980s, I used a video camera and reel-to-reel video player; then since the mid-1980s have been swept in the escalating rush of successive generations of computers – (I am on my fifth)... I adored them all ... How did these devices influence the way I taught? Were they formative of my pedagogy, or did my existing pedagogical orientation determine their use? I began to wonder about generations of teachers before me as they encountered – took up or resisted – new information technologies. What, in the course of the twentieth century, have been the nature of relationships between information technology, educational theories, and teachers' everyday practices?

These questions raise considerations of space – architectural, virtual and conceptual. To orient my thinking, I begin with a conceptual map. Second, I consider technology and pedagogy in school classrooms by creating a brief oral history. I then raise questions about some of the 'virtual' teaching spaces created in the process of my on-line teaching

Mapping pedagogies: A tool-kit.

Educational theories map the ground they stand on. In David Harvey's geographical sense, the dynamics between teachers and students and the interactions amongst students

are always spatial and exist within a certain produced framework of spatialities. Put another way, social relations are, in all respects, mappings of some sort, be they symbolic, figurative, or material. The organisation of social relations demands a mapping so that people know their place (Harvey, 1996, p. 112).

'One place' in a formal educational setting varies according to the discourses (enacted theories) that govern it. Foucault's methodology for historical inquiries provides a useful 'tool kit' (Foucault, 1980, p143) with which to think historically and geographically.

Within schools, Foucault argued - as in other apparatuses of social regulation - the bodies of individuals are subjected to the 'panoptic' (all-seeing) gaze of authorities: "a relation of surveillance, defined and regulated, is inscribed at the heart of the practice of teaching, not as an additional or an adjacent part of it, but as a mechanism that is inherent in it and which increases its efficiency" (Foucault, 1977, p. 141). This 'relation of surveillance' - so central in teachers' everyday work - includes monitoring the spatial locations of students (where they may be and with whom they may mix); the postures students may assume within their allocated spaces inside and outside the classroom (static or moving; sitting in rows or in groups, in desks or on the floor); and the surveillance and standardisation of their dress and demeanour.

For Foucault, the school was a quintessential site of disciplinary power. Viewing freedom and subjection as flip-sides of the same coin – as complementary rather than contradictory – he argued that "The Enlightenment, which discovered the liberties, also invented the

disciplines" (Foucault, 1977, p.222). The democratic forms of government characteristic of western capitalist states rested on the ideal (or fantasy) of individual rational autonomy - the core Enlightenment value. Yet the social order required citizens who were not only autonomous and free, but who were, at the same time, both economically productive and subjected (rendered governable). As products of the Enlightenment, institutions of public schooling straddle this contradiction. Children in school learn to be both autonomous and governable - free and subjected.

"Discipline", wrote Foucault (1977, p.141), "proceeds from the distribution of bodies in space." In bureaucratic organizations, including schools, disciplinary power

breaks down complex multiplicities into simple units ... carefully repartitioned in a basically cellular space: for each individual a place and for each emplacement an individual. It breaks down activities and actions into simple, momentary movements, thus allowing their control and ordering through routines and timetables (Patton, 1979, p. 121).

Shifts in the 'grand narratives' (discourses or overarching theories) of education policies are mapped 'on the ground' by changes in the partitions and classifications of school timetables, curricula, and classroom spaces. When the teacher is conceptualised as 'source of information and authority,' children are seated in rows facing the front. In 'progressive' classrooms, oriented around 'teachers as facilitators of children's development as rationally autonomous inquirers' students sit or lie around in groups and move freely around, even outside, the classroom (Middleton & May, 1997, 1999; Walkerdine, 1984). Advocates of progressive education describe it as liberatory and as oppositional to the 'top-down' model of the traditional classroom. However, as Valerie Walkerdine (1984) has argued, rather than 'liberating' children, progressive pedagogies make the processes of discipline, regulation and normalisation more covert: "the child supposedly freed by this process to develop according to its nature was the most classified, catalogued, watched and monitored in history. Freed from coercion, the child was much more subtly regulated into normality" (Walkerdine, 1992, p.18).

How, in the twentieth century, has the introduction of new information technology been implicated in such changes in the 'classification and framing' (Bernstein, 1971) of school knowledge, and the 'placement' of students and teachers in school spaces? When students and teachers are no longer located in the same place, but connect 'virtually' through cyberspace, what else changes? Mark Poster suggests that recent history may usefully "be periodised by variations in the structure ... of symbolic exchange" (Poster, 1990, p.6). He identified three "stages in the mode of information," but warns that these categories are useful not so much as a developmental sequence or teleology; but, rather as simultaneous, dynamic, and interactive. He 'tentatively' designates them as: "face-to-face socially mediated exchange; written exchanges mediated by print; and electronically mediated exchange" (p.6). Each 'stage', he argues, is constitutive of a different kind of human subject:

In the first, oral stage the self is constituted as a position of enunciation through its embeddedness in a totality of face-to-face relations. In the second, print stage the self is constructed as an agent centred in rational/ imaginary autonomy. In the third, electronic stage the self is decentred, dispersed, and multiplied in continuous instability (Poster, 1990, p. 6).

Conceptualising this framework for purposes of researching mass communications media, Poster did not apply it to educational settings and to do so requires some blurring of his first and second categories. Characteristic of cultures that do not depend on the written word, elements of Poster's 'oral stage' are also evident in everyday life in classrooms. In print-

based societies face-to-face encounters within public institutions such as schools are variously scripted and mapped. These scripts and maps are mediated by print (Poster's second stage) in the sense that their parameters (or discursive framings) lie in texts such as government and institutional policy documents; theoretical writing; and curricula. There have been numerous studies of how print has characterised the modern (or industrial) age - the age of standardisation in which emerged the various 'bodies of knowledge' (academic disciplines) to which as teachers and members of professional organisations, we bear allegiance (Foucault, 1977, 1980; Harvey, 1990; Lyotard, 1984). It has also been formative of the regulatory apparatuses with which students and teachers are policed – examinations, psychological testing, and school inspections.

The third, 'electronically mediated' mode of information has been seen by many scholars as definitive of an epochal shift to a post-modern age (Lyotard, 1984). There is, asserts Spender (1995, p 14), "a new flexibility associated with the electronic media which is at odds with the very idea of standardization and regulation". Similarly, Poster argues that:

If modern society may be said to foster an individual who is rational, autonomous, centred and stable (the 'reasonable man' of the law, the educated citizen of representative democracy, the calculating 'economic man' of capitalism, the grade-defined student of public education), then perhaps a postmodern society is emerging which nurtures forms of identity different from, even opposite to, those of modernity (Poster, 1995, p. 24).

At the end of the millennium, are we on the verge of what Poster (1990, 1995) and others have referred to as 'a new media age'? Does this signal the demise of the school and face-to-face campus as we know it? Speculations on the nature of this shift spiral us out through 'black holes' into the speculative realms of science fiction ...

Teaching spaces and students' places, 1915 - 1995: An oral history

How were information technologies incorporated into classroom practices in the 'age of print'? Did they substantially change the ways teachers taught, or did they merely enhance their existing practices? Did they influence the core theoretical assumptions of teachers – their ideas about the nature of knowledge, of children, or wider social goals?

To address these questions, I have revisited an electronic data base created for a wider project. During 1994-1996 Helen May and I tape-recorded life-history interviews with 150 teachers and former teachers born between the years 1899 and 1973. They told us about their experiences and perspectives as pupils, trainee and practising teachers. The resulting book (written and used as a set text for my on-line course) is an oral history of educational ideas in New Zealand 'from the bottom up' (Middleton & May, 1997). I have pulled from my interviews all references to mechanical and electrical devices used in classrooms to copy, project or amplify printed or filmed images or sound.

Slates, chalk and balopticons: The power of writing 1900-1970

The Victorian and Edwardian classroom is epitomised in Foucault's description of the 'writing child':

A well-disciplined body forms the operational context of the slightest gesture. Good handwriting for example presupposes a gymnastics – a whole routine whose rigorous code invests the body in its entirety from the points of the feet to the tip of the index finger (Foucault, 1977, p. 152).

Ian McLaren (b1928) described the lessons which "always took place after lunch" on how to write with a dip pen:

we spent a great deal of time learning to write with pen pointed over the shoulder, at the right angle and you had to move your wrist and you had to keep your elbow there and so on ...the important thing was the angle of the pen back over your shoulder.

In the early quarter of the century, most families possessed few books and schools had few textbooks or recreational readers. The Department of Education's monthly *School Journal* publication was greatly valued:

We had *School Journals*, and it was because of the *School Journals* that I learnt to read very fast, because they were the only thing that came and they came every month. And it was a glorious day when they arrived. People sat there and read them through, and read them through again, because we had no library whatsoever. We had nothing else really. Although my parents read quite a lot, in our home we only had a complete set of Dickens and the Family Bible, that was the sum total of our reading ('Enid Horton', b1930).

While all teachers used 'copying from the blackboard' as a supplement or alternative to textbooks, some of the more technologically oriented also used projectors. Percy Hunt (b1899) recalled a "very formal" classroom in the early 1900s in which the head-master supplemented 'chalk and talk' with a 'magic lantern' and home-made three dimensional models:

We had many things that were not in other schools. For instance, he had a picture machine in the corner that used a gas container, acetylene gas, and he would show pictures.

SM: Sort of like slides, were they?

PH: Yes

SM: On a screen?

PH: Yes. And I remember he had a chest with numerous drawers in it and in each one there'd be models. For instance, the movement of the earth around the sun. I think they were tennis balls that he'd use. They were all set up permanently. Models of glaciers, mountains.

In this example, information technology was used to enhance the printed page in a traditionally formal, teacher-centred classroom environment.

Patricia Harrison (b1921) described an early form of epidioscope in use at Anderson's Bay primary school in Dunedin in the 1920s:

They used a balopticon to show pictures on the wall, long before the days of film strip projectors, and movie projectors in schools. It projected these stories from our picture books. It was Snow White and so forth, straight on to a wall, which I can recall wasn't painted white. It was a timber wall, with some of the studs interfering with the pictures, but nevertheless it was quite an exciting experience.

She went on to describe a classroom where there was:

Every attempt to give us small children experiences. Miss Cox had an aviary not far away with lots and lots of coloured birds, and I can remember being taken with the members of the class there to see those, so there were experiences given to us.

This strongly suggests a 'progressive' orientation to 'learning from experience' (Tanner, 1997).

The international movement known popularly as progressive education became influential on many New Zealand educators' thinking and practices - particularly in infant education - during the 1920s and 1930s (May, 1997). Critical of the regimented drills of traditional schooling, progressive ideas were centred around the Enlightenment values of liberty and rational autonomy. Drawing on psychoanalytic or psychological theorists, the more individualistic variants of progressive education were based on the idea that there were (natural) 'stages' of human development and that the role of the teacher was to observe, facilitate, and monitor the progress of the developing child (May, 1997; Walkerdine, 1984). Children were conceptualised – not as passive receivers of information – but as active creators of knowledge. 'Learning by doing', often in small groups, became the favoured teaching method. Bessie Shilton (b1927) experienced a dramatic transition from a Victorian to a child-centred pedagogy in a 1930s infant room where the apparatus used to teach handwriting changed accordingly. At first,

there were the slates and the slate pencils and the water bottles and my father had to scratch the lines on my slate so that I would learn how to write in a straight line. They were scratched on, I remember that. And the slate pencils scratched and the water bottles were dirty and I don't have happy memories of the teacher either. But after three weeks I ended up ill with rheumatic fever ... And when I finally resumed school we had a new Infant Mistress and she was what they called 'of the new generation'. We used blackboards, chalk and we had stories. I remember it being nothing but a joy because we had activity. We didn't just sit at our little desks all the time. I remember loving the chalk and the blackboards and drawing and writing stories.

The more 'sociologically' oriented (eg Deweyan) versions of what came to be called the 'new education' focused on the collective, or social, benefits of education - the teaching and practice of democracy in schools would create citizens who would preserve democratic values in adult life (Greene, 1995; May, 1997; Tanner, 1997). Bob Katterns (b1931) ran a Dewey-based progressive classroom in the early 1950s:

I taught my kids how to interview. There were no tape recorders in those days so 'one' had to interview and 'two' had to take turns with rest periods of taking notes while they interviewed the local Postmaster down at Surrey Crescent. Then I had to find reading materials and I re-wrote materials appropriate to their reading level so that they could research like a university student. And when they did their projects they had to plan out an outline and I had a system (there was no sellotape in those days) of stapling pad papers together so you made a concertinaed booklet and on each sheet the theme for the sheet would be at the top and the points 1,2,3,4,5 - so there was a structure. They would repeat their presentations about three times in the various groups in the room and they could talk to their concertinaed booklet which they could open out. They were allowed to look at their notes and their points just as if

they were giving a seminar at university level, but they were eight. They could handle it.

By the mid-1950s, this constellation of ideas and approaches to learning and teaching (derogatively labelled by their critics as 'playway') had become dominant in many of New Zealand's preschools and in the infant classes of primary schools. 'Jan Calder' (b1941) was an infant in the 1940s:

the classroom had blackboards all the way round the walls, on three walls, and you were given a piece each. Each child had a piece of blackboard which was yours. Every day you'd practice your printing standing up at that. Looking this way and having to turn around to look at the blackboard to see the printing.... look back. So I can remember doing a lot of printing.

Before schools had access to copying technology, preparation for small group teaching could involve teachers in long hours of manually writing out work sheets in individual children's exercise books. In the 1950s infants had 'jotter books' (blank notebooks) as an infant teacher described:

I used to just stay after school every night and write in every single jotter book - work that had to be done the next day. You had about six reading groups ... If there was something we were doing in science, they needed something that they could work on. Or just ruling up their printing for the day - I always used to do the printing down the sides, and put all the dots where they had to start each letter. And their reading sheets - you would just print the sentences out leaving the gaps. I used to leave school about half past five at night.

However, by the early 1960s many schools had more sophisticated ways of reproducing multiple copies of text.

Meths, and skins: Copying print 1945 -1980

The ways the new 'copying machines' were used varied according to the 'mapping of social relations' and 'frameworks of spatialities' (Harvey, 1996) within the school. Most primary teachers were used to teaching heterogeneous classes. Those who worked in sole charge or small rural schools had children of different ages in the same room. In larger schools, where classes were homogeneous in terms of students' age-groups, children were usually classified into ability groups, which might vary for different curriculum subjects. Within this spatial mapping, progressive ideals encouraged a diversity of student inquiries.

The 'classification and framing' of post-war secondary schools was usually different. The spatial organisation of smaller (eg rural) high schools was similar to that in primary schools in the sense that teachers often had to cope with classrooms of multiple age groups and curriculum subjects. However, this was rare in the majority of urban high schools, where teachers were used to moving between supposedly homogeneous classes which were streamed by a combination of measured intelligence and subjects taken (academic, technical etc). In such streamed classes whole-class instruction, rather than group work, was the norm:

I would come to school in the morning, because I had eleven classrooms; I didn't have my own classroom, I was sort of peripatetic. I'd come in early and fill the board with notes. The kids would come in. It was sixth Form. I'd explain it all. While they were writing it down I'd check to see how they were getting on. Rub off what they'd written and write more. And it was pretty much that

way. Once they had a stack of information, and I had stacks and stacks of information, then it was easy enough to be able to teach, or to check, or to really evaluate what was happening. But it was hard work, very hard, I was very much on my own ('Eric Cotton', b.1939).

The exhausting and messy chore of writing notes on blackboards was somewhat relieved by the introduction of copying machines. The Gestetner printed multiple black and white copies from stencils cut with a manual typewriter or, in the case of maps and diagrams, with a sharp stylus. Some primary teachers used Gestetners to produce materials at levels suitable for different ability or age groups in their classrooms. In the streamed secondary school classes, the Gestetner supplemented the blackboard and set textbook:

It was fairly formal. Lots of blackboard work, lots of coloured chalk. When I was teaching the lower classes I remember I became a real whizz kid at drawing palm trees and coral atolls and things for the geography in the Pacific. Summary notes on the board so that there were not too many of them. We had a Gestetner of a fairly primitive kind so for a local survey, we had maps for them to fill in (McLaren, 1928).

'Vera Grant' (b1929) taught senior physics and, for her practical laboratory classes, relied heavily on

the old Gestetner. We hadn't got to the Banda stage. I didn't have a prac. book - I was working my way through text books, to decide what to teach. I'd go to the Head of Department, and say to him, "I've found this section here", and then I'd have to run it off for the class.

Unlike the Gestetner, the Banda machine allowed teachers and students to produce coloured copies of typed or handwritten text, maps, diagrams or pictures which they had typed or drawn onto special paper 'skins' underlaid by coloured carbon paper. Copies were produced by laying the skin on a drum which, when one turned the handle, revolved and brought the skin, sheets of newsprint, and methylated spirits into contact – a messy and smelly business. An infant teacher described how in 1961 she had

46 new entrants. We had a Banda machine, those awful things that got purple stuff everywhere. And so I used to do work-sheets and things for children. We used to do reading comprehension - there would be gaps in the sentences. The children would have to read a story and they'd have to fill in the gaps.

Some teachers spent many hours outside school time producing maps, diagrams and text on the Banda. Jocelyn Fish was in her first year of secondary teaching in the 1950s. For social studies resources she relied on the Banda:

I was flatting with my close friend. We had the same degrees and were teaching the same subjects, so we used to pool our resources. We would structure a lesson so that you probably lectured a bit to start with and then either gave out something that you had pumped through on the Banda machine - all the meths. You used to spend hours producing pictures on the Banda and you gave them out and they coloured in the pictures, then you presumably set them some sort of activity in the latter part of the period. They were probably 45 minute periods in the junior classes.

The fragility of Banda skins could lead to heart break. 'Hannah Bell' (b1917) was head of a large secondary school English department in one of the first secondary schools to classify

its students into mixed-ability classes. Influenced by early 1970s 'neo-progressivism', in a time when suitable printed resources were scarce, Hannah had to co-ordinate the production and distribution of suitable resources for her whole large department:

The kids helped me, whether they could type or not - they used to type with one finger. They'd stay after school and they'd type the top of the skin, leaving me to find a poem that fitted in to do the next week. And one day there were builders. Nobody asked me, but the man wanted to use a circular saw. And so he opened my window and plugged it in there, and when we came back the next day! All these little kids had put their rows and rows and rows of the skins down and they were all covered with sawdust so that you couldn't use them.

Such problems were lessened with the introduction of the photo-copier some years later.

Audio-visual aids, 1950s-1970s

The post-war decades also saw advances in film and audio technologies (popularly known in schools as 'audio-visual aids'), all of which were incorporated into classrooms. 'Jack' (b1913) encountered the 'new' (progressive) education and new technology together at a teachers' refresher course for soldiers returned from the Second World War. The new subject, social studies was, he said about "how people lived" and he was impressed by

The interest the children took. That was the vital thing. Their faces lit up straight away. To help me I purchased a film strip machine ..I got that idea of film strips and that was a different way of attacking a subject altogether. The children's' faces lit up from learning.

In the teachers' colleges of the 1950s and 1960s, students were able to qualify for the 16mm movie projectionist's certificate that was required before teachers were permitted to send to Wellington to borrow films from the National Film Library. Ernie Shilton (b1922) remembered

the introduction of the film library and films. We made use of that in some subjects, but mostly literature. You showed a Shakespearian play or a well-known novel that had been filmed or something like that. There were often instructions. Some of them were documentaries, which were useful. The big thing was to raise money and get a 16 mm projector.

Some teachers were concerned that the boundary between 'instruction' and 'recreation' be firmly maintained when using films for school-work:

If we went to see a film, it had to fit in with the science and social studies programmes. Returning to the classroom, I would write a framework on the blackboard and the children had to write up the programme. If there were no follow-up work, children tended to look upon the film as entertainment. There had to be a reason for seeing a film (Bernard Hansen, b.1920).

Films were also used in foreign language classes, as were radio and sound recordings. 'Margaret Mason' (b1914), a secondary school French teacher in the 1960s, described how the introduction of audio-lingual methods revolutionised foreign language teaching in what was a very mono-lingual Anglophone environment:

As far as the languages were concerned it changed. Not so much with philosophy as the availability of tape-recorders and films. We got some really

good French films in those days. And we always listened to the Monday afternoon broadcasts to schools at a quarter to three. There was only one room that had a radio in it, and there was always a class time-table to make use of that, and you could record it. And the books were excellent, the handbooks that went with them, so even if the girls hadn't heard the broadcast they were able to use the books and sing the songs. We had one room with a piano (apart from the music ones). And we were time-tabled to go into that.

All of the visual and sound technologies described so far fall within what media theorists describe as the 'broadcast model.' In the broadcast, images are "transmitted from a small number of centres to a large number of receivers, either by air or coaxial cable" (Poster, 1995, p. 25). This 'mode of information' is consistent with the text-based spatial mappings of a teacher-centred classroom, students are commonly positioned as 'receivers,' albeit, in the better classrooms, as active and critical readers. This same 'mode of information' characterises reading the blackboard, textbook or Banda sheet; viewing movies; listening to sound recordings or radio. Reversing (but not collapsing) this binary, students, however, were sometimes positioned as writers, producers, or broadcasters. A primary teacher described how he taught his class formal radio broadcasting conventions using the school's 'inter-com':

We did radio work. Each week, a different set of children volunteered. They had to prepare world events, New Zealand events, local events, school events, sport, a short story, a short poem. All information for the events usually came from the newspapers for the week. An announcer controlled the programme, finishing off with a quiz. The programme was always put over on a Friday, using the school communication system, so that other classes could listen in if so desired. Over the year these children gained in confidence in how to use a microphone. The announcer would use three chime bars...bong...bong...bong. Good morning listeners. This is Radio (the school) bringing you its weekly broadcast. This morning, you will hear (the announcer would read out the names of contributors and their topics) with the quiz being taken by so and so. Your announcer for today is.... ('Barry Horton', b1920)

By the early 1970s, some school radio stations were less constrained. Run by the students they reflected the impact of adolescent youth culture. An older teacher at one of the more progressive secondary schools, complained:

They always had school students playing rock music over the loud speaker, which just about drove me mad. Every interval and lunch time you'd have this blaring. They took turns to run the radio station, and they went on protest marches.

While in the 1950s, the youth culture as evidenced in films and popular music was seen by many educators and policy-makers as an 'evil influence' (Middleton & May, 1997), by the mid-1960s, many were embracing its educational 'relevance' in the lives of school pupils. Television was introduced to New Zealand in the early 1960s and several of our older interviewees were impressed by its impact:

With the advent of T.V. the children became more blasé, up with things. Today they are right up ahead of everything. Its brought them all on. They're interested in everything. They can catch up with everything ('Jack', b1913).

Multi-media classrooms, 1970-1995

A shift towards progressivism in secondary schools became apparent in the late 1960s and early 1970s, when the teachers' union produced a document entitled *Education in change* (NZPPTA, 1969), which was grounded in a humanistic developmental psychology of 'personal growth'. With the support of key teachers' organisations, the Department of Education developed new curricula consistent with this discourse. The impact of mass media was to the forefront of the social changes many teachers perceived as being in need of address in the classroom. Patricia Harrison (b1931) was on the committee that wrote a new secondary school English syllabus:

We looked at the whole of pop culture - where kids were at - the way they developed language, how they learned best. We looked at the fact that students needed more than just reading and writing basic skills - they needed a greater facility with language and a confidence in using it... It began because of the exposure of young people to television and the media and it was looking at language in a much wider context ... It was looking at the needs of young people and the different pressures. I mean the pressure of advertising, the pressure of television, the pressures from the Maori moving in from the rural to the urban area and being without any kind of focus or roots. All those things impacted and came together. I think there were people who were truly educationalists and we just sparked each other off.

The urbanisation and alienation of Maori and Pacific Islands students was addressed by a discursive shift in government policy - from the post-war discourse of equality of opportunity ('equal means the same') to one of education for diversity - cultural pluralism, or multiculturalism (Middleton, 1993).

In the more liberal/progressive secondary schools, notions of diversity and pluralism generated major upheavals in the ways knowledge, students, and teaching spaces were 'mapped.' Traditional streaming [tracking] - based on what had been seen as 'objective' tests - had disproportionately relegated Maori and working-class Pakeha [white New Zealanders] to the non-academic (technical or homecraft) streams. Re-conceptualising cultural difference as valuable diversity rather than as deviance or inferiority, many high schools de-streamed during the 1970s. De-streaming tore down the 'fences' that had segregated students who took different courses (academic, home craft, commercial, agricultural, or industrial) and reclassified the student population into co-educational classes of mixed ability and mixed race. Teaching in non-streamed classes made whole-class instruction difficult and forced secondary teachers to develop the kinds of individualised and small-group teaching methods which up till this time had been characteristic only of primary schools.

'Hannah Bell' was head of English in one of the first de-streamed urban secondary schools. Using the Banda she created a room full of resources for her staff and their classes to choose from and to add to. This growing collection of pictures, poems, and stories was classified around the themes successive cohorts of English classes had chosen by ballot. 'Sandra Curran' (b1947) was a junior member of Hannah's staff in 1971. Straight out of teachers' college, she was impressed with Hannah's approach. As she gained confidence she augmented these printed resources with her own collection of 33rpm sound recordings:

'Hannah' had this resource room which had all these pigeon holes with materials. So there would be poems about cats and stories about dogs and all this sort of stuff. And then we went on to choosing our own themes. I remember my third form did something on war and we did something on rock

music. And I used a lot of music. I played records of Bob Dylan, Simon and Garfunkel and Joan Baez and I used the words as poems.

'Sandra' later ran a progressive classroom in a multicultural intermediate school in the mid-1970s. The simplified and cheaper cameras that became available at this time enabled her to use multiple media in her classroom:

Their assignments often involved doing some art work or doing some photography. The kids wrote books based on the black and white photos they took. We made colour slide shows and recorded the sound track on cassette tapes. And I was spending all my own money on this stuff. But it was really working. Then I got into super 8 film, making movies . . . I said to them "We'll have a film-making camp." They were really keen . . . We made this film. We used the beach and we used the bush.

Similarly, 'Martin Dunn' (b1951) had worked with children making their own movies on social studies themes in the late 1970s:

We made a few films, I remember that. That was really good fun. There were a couple of us who were really keen on filming. A good mate of mine got me into using the old Super 8. It was good fun. And the kids, of course, loved it. So whatever we were doing - the Aztecs or the Middle Ages. I remember making a film about the American Indians.

A decade later, 'Jan King' (b1969) got her multi-cultural English class (mainly Pacific Islands students) to do a feminist analysis of American black gangsta rap videos:

I taught music videos as one of my topics. I was teaching in a school that was very multi-ethnic and I suddenly realised that the way the students were dressing - their hairstyles, the way they spoke, everything - was coming from the music videos in American films. They all wanted to be gangstas. I stopped the video every 10 seconds and we analysed what kind of image it was.

Secondary school history teacher 'Nigel Harris' (b1970) described himself as "very active" in using a video camera to bring history alive:

The kids often laugh at me because I'm always jumping around. I've looked at my past teachers, and said, "Basically, I'm not going to do that." Social Studies, History, some of the History can be very dry, very dry. But you've got to teach it because its part of the syllabus; so I try and make it as interesting as possible, bringing role-plays into it, bringing video cameras into the class and let the kids see themselves.

By the 1980s, some classrooms in secondary and intermediate and many in primary schools were organised on the basis of 'centres of interest.' 'Nancy Clayton' (b1972) incorporated a combination of traditional print, cassette tape recorders and computers in her primary class:

I'd have five reading groups. In a typical day, I might have one group starting off working on their fluency boxes, which are books that they've read before, and familiar to them. So they're quietly reading independently. I might have another group starting off on alphabet activities that I set up, or they might be working with a parent on alphabet activities, if that's where they're at. I might have had another group doing a play or listening to the, listening post, or working on the computer.

For teachers committed to student-centred pedagogies, what were known at the time as 'audio-visual aids' could foster 'relevance.' For these teachers, tape-recorders, video or movie cameras and projectors, and recorded music helped school knowledge 'connect' with students' expressed 'needs and interests' at the appropriate 'level of development'. The technology lent itself to group work in classroom environments designed to cater for diversity.

Others incorporated the new appliances into a 'top-down' pedagogy. For example, the overhead projector is arguably the simplest 'visual aid' to operate. While some teachers allowed students to create their own transparencies and use the projector to display their own individual or group projects, others used it as a sort of 'permanent blackboard' and projected the same notes unchanged from year to year. 'Yvonne Nelson' (b1969) was a pupil in the 1980s and "had a fifth form Dean who used to put up OHT's and you used to have to copy them. We never discussed anything. We never role played anything. We were just writing copious notes." Similarly, 'Aroha Jones' (b. 1971) described "one teacher who we dubbed Miss O. H. T. because all that we ever did was just screeds and screeds and screeds of O.H.Ts for Economics ... and she would read it off as we wrote it down."

For some, however, new technologies were simply irrelevant, as a frustrated young head of department reported: "I've got one teacher in particular who will never use an overhead projector. Does not like it. Will never use group work. Totally resistant to change. And it's very frustrating to see that sort of thing still in the education system."

Throughout the twentieth century, schooling has involved what Foucault described as "school discipline, which succeeded in making children's bodies the object of highly complex systems of manipulation and conditioning" (Foucault, 1980, p. 125). Whether teacher-centred or student-centred in style, teaching has involved the panoptic surveillance, monitoring and regulation of students' bodies in designated spaces according to codified compartments of time in order to induct them into specified classifications of knowledge according to rationally determined criteria. For schools the bodily presence of students and teachers has been paradigmatic.

But what are the educational implications when the bodies of teachers and students are not located together in space? What are the educational implications of electronic communications that are a-synchronous in time? A young history teacher described how:

We just get on the computer - everything's through e-mail now. For social studies at the end of last year we talked to a school in Capetown, South Africa, through the Internet; basically finding out what their school was like; them asking us what our school was like. At the beginning of this year we did an audio conference with a school in Montreal, Canada ('Nigel Harris' b1970).

The information technologies of the 'broadcast model' in what has been termed the 'first media age' were products of the Enlightenment and the print-based mode of information: "patterned practices that elicit identities as autonomous and (instrumentally) rational" (Poster, 1995, p. 32). In contrast, it has been argued, the internet heralds the coming of a 'second media age' characterised by a "shift to a decentralised network of communications" which "makes senders receivers, producers consumers, rulers ruled, upsetting the logic of understanding of the first media age" (Poster, 1995, p. 33). Similarly, Dale Spender has argued that

We are the last generation to be reared within a culture in which print is the primary information medium. Because we have grown up and become skilled in a print-based community, we have developed certain ways of making

sense of the world. We are, to some extent, what print has made us. And now we have to change (Spender, 1995, p xv).

So, with my tool-kit in my ruck-sack, it was time to check whether or not my on-line students had responded to the message I had sent them earlier that afternoon...

Backpacking into cyberspace

As I made myself a coffee, I wondered whether or not the question of using the Internet as teaching space fundamentally alters the nature of the pedagogical relationship between university lecturers and their undergraduate students. Some have seen 'electronically mediated exchange' as fundamentally undermining the subjectivity of the rationally autonomous Enlightenment individual and as signalling an epochal shift into postmodernity (Lyotard, 1984):

Words cannot any longer be located in space and time, whether it be the 'real time' of spoken utterance in a spatial context of presence or the abstract time of documents in a bureaucrat's file cabinet or library's archive. Speech is framed by space/time coordinates of dramatic action. Writing is framed by space/time coordinates of books and sheets of paper. Both are available to logics of representation. Electronic language on the contrary, does not lend itself to being so framed. It is everywhere and nowhere, always and never. It is truly material/immaterial (Poster, 1990, p. 85).

When they are segments of conventional degree programmes, on-line university courses, such as mine, are premised on the same Enlightenment individual of modernity as are conventional face-to-face courses or those distance courses taught by print-based correspondence methods. Is there anything inherent to on-line delivery that undermines or decentres this form of subjectivity?

Internet technology is a by-product of military and commercial, rather than educational, expansion (Haraway, 1995) and its "progress entails the conquest of space, the tearing down of all spatial barriers, and the ultimate annihilation of space through time" (Harvey, 1990, p. 205). It is structured by the power relations on behalf of which, and within which, it is continually created. As apparatuses of panoptic power, universities mesh easily into the threads of the internet.

To log into my course, I must enter the password that gives me access to the 'Top Class' segment of the School of Education's server. On-line university courses – like face-to-face, or conventional distance courses - fence off knowledge as 'private intellectual property' with rights of access available only to staff and enrolled students. If I choose to use it, a feature of the software will show me which students have logged in, who has read which on-line documents, who has read my announcements and when these connections have taken place. The panoptic surveillance of students' time is, if anything, increased by the potentialities of this one-way 'broadcast' format. Top Class also has interactive electronic discussion spaces, including a 'cafeteria' which staff may not enter. It is the interactive discussion group that includes 'the lecturer' into which I have sent my inquiry...

The reading and writing bodies of my students - spatially dispersed but dwelling in communities - communicate with one another electronically, by telephone, letter, or in local face-to-face study groups. They can choose if or when to include me in their discussions. The a-synchronous nature of e-mail discussions confuses everyday temporality – they are "new language experiences that are electronically mediated, fitting easily into the parameters of neither speech nor writing" (Poster, 1990, p.78).

On-campus students have to attend classes. While on-line students' working days are not synchronised this minutely to a university timetable, larger blocks of their time (as measured in weeks) are – as is also the case with on-campus students - demarcated by semesters and deadlines for assignments. As it expands into cyberspace, the university's time-frame becomes "ever more homogenous and universal across space" (Harvey, 1990, p. 266-267). It elicits from students at specified times and in pre-determined sequences the production of specified texts – electronic, visual, printed etc – and categorises these according to rationally accountable grading criteria. Teaching on-line brings institutional surveillance to bear on invisible bodies in unseeable places. And 'on the ground' it maps its "practical rationalisation of space and time" (Harvey (1990, p.259) onto students' – and their teachers' - 'private places'. I re-read the questions I wrote in the open discussion forum:

Date: 24/6/1998 9:08:09

Subject: Greetings from an old laundry.

Hi there. It's a rather odd feeling thinking of my 'class' scattered all over the central North Island. I don't have a mental picture of your working spaces... At present I'm in my study at home. I live in a 1930s inner city bungalow. It once had a big wash house out the back - with a copper and tubs and lots of space. Five years ago I claimed this space for my writing. We had the back porch turned into a modern laundry and the old wash-house is now my study complete with computer, work station, and strewn with books and papers and disks. This in itself is a statement about technology - my mother would have needed this space for washing. My laundry hums away unattended outside my study door. I can do the washing and write to you at the same time. My Mum had to stand over her copper and later her washing machine constantly - before the days of automatics... My writing space has tongue and groove timber walls painted a pale avocado colour. On the walls I have mementos of people and places.... A change from the early 1980s when I punched out my PhD on an old manual typewriter on the kitchen table surrounded by children's comings and goings. Or the 1970s when I hand-wrote masters assignments surrounded by nappies! So that's where I am. Where are you?

There was something else I wanted to know. So I had added, anxiously: "And do you like the book and the CD ROM?" And, with one click of the mouse, this message had gone to my 50 students ...

As part of a university degree programme, my semester length course is of twelve teaching weeks duration – six teaching weeks on either side of a six week practicum ('down time' for my course), when the students are doing teaching practice in their local base schools. For the first six weeks, they do intensive reading of the text *Teachers talk teaching* (Middleton & May, 1997), supplemented by additional photo-copied readings. They also have the CD ROM I made for them – this contains a hypertext version of the course outlines linked to historical photographs, slide shows, and some supplementary text. A CD ROM is a kind of a 'broadcast model' because its creator determines which hypertext links are possible, and like Donna Haraway (1995, p.128) I wonder "which connections matter, why and for whom" ... This first section of the course is an overview of the history of educational ideas as 'lived' by New Zealand's teachers and students in schools, teachers colleges and early childhood centres from 1915-1995. The students have to send in weekly responses to questions on these texts via e-mail and these are marked and returned the same way within a week of receipt.

The mid-semester on-campus session addresses methodological and ethical issues in life-history research interviewing. On returning home, each student sets up an educational life-history interview with a relative or local person, carries it out, and sends in a brief summary report via e-mail. At the end of the course they each submit a full typed research report – in which they contextualise their life-history interview narrative case study in the constraints and possibilities of their interviewee's 'location' – historical, cultural, geographical etc. They are encouraged to tap the oral and archival resources of their local schools and communities – school records, photographs etc. This final report has to meet the normal stylistic conventions of the university research essay. The teaching method and assessment for this course, then, straddle all three of Poster's 'modes of information' - "face-to-face socially mediated exchange; written exchanges mediated by print; and electronically mediated exchange" (1990, p.6).

As in my other, face-to-face, courses (Middleton, 1993; 1998), my main educational objective is to enable the students to conceptualise their interviewees and themselves as 'inside' the educational theories (or discourses) that are their object of study (in this case, a course on 'educational reform.') Rather than presenting educational ideas and policies as a flat, or two-dimensional, map, we study ways in which we – as teachers, as students, as social researchers – are positioned inside the social, local, and educational phenomena that are our objects of inquiry. Teachers are viewed not as passive recipients of the ideas of policy-makers or the latest theoretical or technological fashion, but as creative strategists whose theories-in-practice are products of our own agency within the constraints and possibilities afforded us by our biographical, historical, socioeconomic, cultural and geographical situations and the theoretical or conceptual resources to which our circumstances have afforded us access. The nature of the assignments, combined with the life-history methodology demonstrated in their text-book (Middleton & May, 1997), lends itself to a focus on the students' own local communities and schools. I want our teaching space to enable students to use academic knowledge to make sense of their places. As Harvey argues (1996, p.316), "... what goes on in a place cannot be understood outside of the space relations which support that place any more than the space relations can be understood independently of what goes on in particular places."

As I dialled in to see if any of my students had replied to my message, I experienced an anxiety different from the 'stage fright' that – even after 25 years of face-to-face classroom teaching – still plagues me on the first day of a new course. As with face-to-face classes, I had read through the list of those enrolled. From this I knew that all but one of the students were women and that some had Maori names. The 'disembodiment' of encounters in cyberspace has been the subject of considerable discussion in the literature (Cherny & Weise, 1996; Haraway, 1995; Kenway, 1997; Spender, 1995). The markings of body shape; skin colour; clothing; vocal pitch, tone or accent; physical 'attractiveness' or disability may all be hidden in electronic encounters. The invisibility of the 'body' that writes can, say these authors, be emancipatory since the 'markings' that designate relations of power are erased. Because of its 'mixed media' nature, the full extent of such anonymity is not available to students in our sort of programme, but our brief encounters in on-campus week had not been enough for me to associate individuals' names with their 'bodies'.

As I logged into the 'open' on-line discussion group for my class, I wondered how the students would respond to my description of my home office. I had read David Harvey's description of the history of such private spaces. With reference to research by Wigley, he described the "insertion of truly private and individualised male space – the study – into the house" (Harvey, 1996, p. 228). The territory of the rational autonomous man of Enlightenment print-based culture, it was:

an intellectual space beyond sexuality and the power of the woman, it was the space of an isolated male identity engaged in writing ... It was from this kind of space that a certain kind of 'monadic' discourse became possible ... signalling a withdrawal from the 'chaos' of daily life and the shaping of knowledge and identity through the production of texts produced in enclosed, secure, and very private spaces (Harvey, 1996, p. 228).

Similarly, Harvey (1996, p. 75) conceptualised the on-line scholar as a "monadic individual locked onto a computer screen connected by modem into a vast world of correspondence in cyberspace." Feminist scholars have critically engaged with the 'monadic individual' male scholar – detached from the embodied world of domesticity. In the 1920s, Virginia Woolfe (1978, p.64) observed that "if a woman wrote, she would have to write in the common sitting room". What Woolfe called 'a room of one's own' may not be available to the on-line student – especially the mother of small children. While on-campus students have access to public spaces, such as university libraries, these are not available to on-line students. How would my students – nearly all women with children – create study space?

Their responses burst – I felt enthusiastically - onto my screen. Rather than striving to be 'monadic individuals, some preferred to feel 'connected' while working. Moemai wrote:

My desk is tucked in the a corner of the lounge. The theory behind this is that I'm out of the view of the laundry, the wet-back warms my back on cold days and most important is that I maintain contact with the family in the living room, even though I am always gazing at the computer.

Pets were company for some. 'Elizabeth' had "four cats and one family dog in our house so I have lots of company when I am trying to do my typing in the office." Several women married to farmers shared the farm office. Others, like Cathrine, used different rooms for different study activities:

When I'm reading I usually sit in the kitchen where there is plenty of light and it is warm. It's a small kitchen with a hotch potch of furniture. When its time to type up my assignments I move to the office, a porch room just inside the front door. I share this space with my husband. He is a classical Homoeopath, part time, and he uses this space for a consulting room.

Hilda worked in the bedroom:

My laundry washes while I sit at the computer in the bedroom. Not an ideal place 'cos of all the dust, but where else could it go? There is no room in the lounge with a piano and other furniture, the dining room has the TV in it, and with four children and a husband around, our lovely sunny bedroom was the place.

The students' messages also opened windows onto their outdoor environments: "When I look out of windows I see a garden that is in great need of love and attention. " Cathrine described how

Outside on our boundary are two large Pohutukawa trees. They are very old and the council maintains them. They are my barometer for the changing of the seasons. At the moment they are quite bare, but still beautiful. They flower before Christmas each year and when they shed their flowers our lawn is like a crimson carpet.

Through Moemai's ranch slider and bay windows we are shown "a view of a large estuary-lagoon and hill country and I often hear the sea roaring. One day I hope to plant the paddock in native trees, so that I will be able to collect plants for medicinal uses etc." In contrast, Hilda lived "right in the centre of Gisborne - easy to find if you are travelling as it is near the second roundabout coming into the city. Despite rain and storms everywhere, the sun is shining again here today." As the course proceeded, students' questions and comments on readings were juxtaposed with such descriptions of domestic spaces. We heard about storms, floods, illnesses, and marital breakups. For some, the oral histories in the readings brought back "memories, some of them pleasant and some not so pleasant." Sometimes the students hinted of more personal difficulties: "The readings I have found very hard to read - this is due to personal problems at the moment - but I am getting an insight into how it was for students and teachers in the past," and "who knows what the future will hold for me at the moment?" The events in their lives, and the specificities of their places, became visible in our teaching spaces.

We are, as David Harvey reminds us, experiencing "an intense phase of time-space compression" (1990, p. 286). But in this form of on-line teaching we have, I believe, not yet moved into the 'something else' of post-modernity. The question of whether or not we are 'becoming something different' in a 'new media age' is something that will continue to puzzle us as – woven into multiple networks of power and authority – we log into a new millennium

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