E-literacy and higher order thinking via web-conferencing

with teacher education students.

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For four years we have been working with first year teacher education students, trialing various approaches to running asynchronous tutorials first via e-mail and then by web-conferencing (Osborne, Wilson & Iles, 2000). This has been a response to "saturated selves" (Gergen, 1991) and the "options generation" (McKay, 1997), calls for flexible delivery (ostensibly to cut teaching costs), and to assist students to use information technology meaningfully in their future roles (Bigum & Green, 1993; Green & Bigum, 1998; Yelland, 1997) in ICT rich schools.

Saturated selves refers both to the busyness of contemporary life and the possible changes to the very notion of a unified self (Gergen, 1991, pp. 68 - 80). Modern travel, media and technologies, all of which have increasingly impacted on our lives over the last thirty years and with massive impacts over the last ten years, keep us very busy and make many competing calls on our time and energies. Being freed from time and place is one presumed advantage of asynchronous web-conferencing. The argument goes that students can interact with others about the content of their subjects at times, and from places, which suit them. Thus rather than having to attend particular tutorials, students can interact with others from the convenience of their own homes at times that suit their busy lives. This can be after kids are in bed, very early in the morning, or after a late shift. If they lack a home computer, they can interact at convenient times on campus.

Gergen (1991) goes beyond this mere busyness to suggest that the essential self as a stable entity is giving way to a self which, chameleon-like, adapts to different contexts because such possibilities are available in ways that were once unavailable. The interchange below illustrates the notion of saturated self which occurred in a second year f2f tutorial class this year:

> Student: This has been some week! I've had three big assignments to do this week - one Tuesday, one today and another on Friday.

> Me (glibly): I don't now how you manage to party when you're that busy.

> Student: Yes, but I didn't drink!

I read this to mean that while the student restricted partying by not drinking, despite the academic pressure of the week, partying continued - nearly everything still needed to be squeezed in.

McKay (1997) makes a similar point as he examines the values and ways of people born since 1970 - "the options generation". In their world where rapid change has been the norm, where uncertainty prevails and where as they reached adulthood the economy and hence jobs faltered, this generation has hung loose, uncommitted to single goals or single lines of action, and has set about going with the flow. Where once many chose to stick at their studies for ultimate benefits, now more and more students are comfortable juggling rather than prioritising multiple and competing options. Part of the appeal of web-conferencing is the attractiveness of being able to squeeze in university study among all the competing demands. There was also a press, during times of extreme financial stringency, that flexible delivery would cut teaching costs across our two campuses. However, we bought into web-conferencing as a form of flexible delivery with a commitment to use it only if the educational outcomes were substantive and that personal costs to staff were not too great. In other words, we wanted to see real learning/teaching occurring, not merely to use gimmicky ICT for its own sake or as a cheap alternative to real academic engagement.

Indeed, we were keen to require our students to use ICT meaningfully within core subjects beyond the two that are ICT specific - one in first and the other in fourth year. Hence we built its use into two first semester core subjects - Introduction to Education and Language and Literacy in Education. Our rationale is that if we meaningfully integrate ICT learning experiences into these core subjects, that students would come to see it as integral to their lives as students and ultimately as teachers.

This paper identifies some of the dilemmas my students and I faced, some of the gains we made and some of the new understandings that emerged and are emerging as we attempt to go beyond mere incorporation of ICT to matters of higher order thinking. However, before we tackle these lofty aims, it is important to describe initial dilemmas and how we dealt with them. The dilemmas are not unique, nor are the ways we dealt with them, but they are fundamental and help those seduced by the extravagant claims of ICT enthusiasts to keep their feet on the ground.

A Review of literature

Blanton, Moorman & Trathen (1998) reviewed the literature on "the application of computer-based telecommunications to teacher preparation from the perspective of social constructivism" (p. 239). Their search of almost 800 articles narrowed to just 52 that were not "poorly written, described poorly designed or methodologically flawed research and/or were incomplete" (p. 240). Their review covered three fields of study of which only the section titled "Use of Telecommunications in On-Campus Courses" is relevant and from that we use only those studies involving undergraduates, i.e., eleven. In that section they report that while the use of e-mail is common, the majority of selected studies were "atheoretical" (p. 243) about links between teaching/learning or about telecommunications and anxiety. Eight of the studies merely provide descriptive analyses of e-mail messages.

Two of the remaining studies "provided at least limited theoretical rationale" (Blanton et al. 1998: 243). Norton and Sprague (1996) framed their study in terms of educators' resistance to change and compared undergraduate and in-service teachers' pairing in e-mail collaboration "to create lessons that integrated databases into the curriculum" (p.244). They found "no differences in the quality of lesson plans on any of five criteria" but significant changes "in beliefs and attitudes about telecommunic-ations ... only among undergraduate[s]" (p. 244). The other study in this pair, by Williams & Merideth (1995) was framed from a "social and cognitive construction of knowledge perspective...[and] hypothesised that computer-mediated communications would enhance 'undominated dialogue'" (p. 244). E-mail was widely used, produced high levels of satisfaction and resulted in a small increase in a "sense of professional competence" (p.244).

The final undergraduate study, by Anderson & Lee (1995) had a stronger theoretical grounding in multiple literacies (Blanton at al. 1998: 245). They found that it "can provide a means for requesting support, building support, building concepts, taking risks, supporting and affirming membership in the class, and building a more democratic environment. The permanent and asynchronous quality of e-mail networks is thought to lead to more recursive and reflective dialogue, particularly when the dialogue is brought back into the class" (p.245).

Select Feedback from Our Students

Space precludes detailed examination of all systematic feedback we obtained over the four years. The results from e-tutorials in 1998 are included in column 2 in Table 1. In 1999 we switched to web-conferencing which is not only potentially more powerful but also more complex to access. We did not administer the 1998 questionnaire in 1999 because there

had been too many hassles with introducing the new technology. Results from web-conferencing in 2000 are in column 3 of Table 1.

In the process of dealing with the access hassles of 1999, we sat with students who had experienced difficulty joining conferences and discovered a range of difficulties they were having. We then constructed a list of 35 potential glitches - grouped as keyboard skills, errors of carelessness, errors accessing the system, confusion across subjects, confusion over terminology, dilemmas with the process of group allocation, system glitches, system support dilemmas and the Web screen. This provided an alternative questionnaire which we had them check against each of the glitches they had encountered. A brief Likert scale at the end of this 1999 questionnaire indicated that only 17.3% of the 127 students were satisfied with their groups' inputs and only 10.2% found Web-conferencing helpful.

Table 1 Some comparisons of first year e-tutes/web-conferences 1998 and 2000.

Statement about e-tutes or web-conferences	1998 % Agree/ Strongly agree N= 139	2000 % Agree/ Strongly Agree N=96
Chose for own convenience	22.8	59.5
Peer feedback helpful	75.4	54
Tutor feedback helpful	78.7	35.5
Let them say their piece better than f2f	45.7	25.5
Made them more careful about answers	54	57
Were impressed by	60	50
E-mailer/web user prior to Ed1401	25.4	48
Now experienced e-mailer/web user	74.8	69
Prefer e-mail tutes/web-conferences to f2f	16.6	17
Learn more from e-mail/web conference than f2f	21.6	13.5
Learned a valuable skill	83.1	65
Drop in % hating computers	19.4 -> 9.7	20 -> 9

By 2000, we had ironed out many of the glitches, but some are proving intractable. Indeed the level of some favourable responses fell substantially across the two years (see peer feedback, tutor feedback, let me say my piece better, and learn more) while the convenience of Web-conferencing seemed to be appreciated by considerably more students. Notwithstanding the variations across time, there are several important findings. We dropped

reported computer phobia to about half each year. Besides, two thirds or more reported that they had learned a valuable skill.

On the basis of the glitches we identified in 1999 (second column, Table 2) we set about preparing students better to Web conference in 2000, and checked with the 1999 cohort as second years against the same set of glitches (third column in Table 2). Also the server worked much better in 2000, although it was down from time to time (twice because of cyclones). It or Webboard was down more frequently on weekends and Mondays than at other times. However, surprisingly, negative responses to system glitches rose in 2000. This may have meant that students' disenchantment with the system in 1999 tainted their responses in 2000. It could also have meant that we raised students' expectations too much about the superiority of the new system at the beginning of 2000 and when these were not met completely, students reacted perhaps more negatively than they might have - they did not reflect on how much poorer things had been in 1999. Yet again it may have been that students, as saturated selves, were very frustrated if the system glitch occurred just when, in their busy lives, they had sequestered some time to work on Webboard.

Responses to tutor feedback were less favourable in 2000, but that may have been a function of the more open-ended questions/tasks to which they related. Response to peer feedback was also less favourable, indicating perhaps that the less structured tasks of 2000 were taken less seriously by some group members than had been the case in 1999 and this was frustrating to those who continued to use Web-conferencing conscientiously. "Mistyping of URL's" rose as did "rushing/ impulsivity" and group allocation glitches - these aspects are outside of our control, but quite in keeping with students as saturated selves and also possibly encouraged by the medium itself. Although we had put in place "trained" peer support to assist with systemic support dilemmas in 2000, responses to peer support stayed similar - we cannot provide 24-hour support, seven days per week. Even so, we are concerned that so many students continued to have problems after two years with the same software.

Table 2 Glitches in using Webboard - Frequency of mention as percentage

Statement about glitches	1999 N= 127 in Ed1401	2000 N= 56 in Ed2490
Key boarding naivete		
A. Not knowing that shift key = capitals	1.6	1.5
• Not knowing that caps lock does not give capitals on numeric pad	7.1	1.5
Carelessness		
A. Password punctuation	8.7	7

• Random capitalisation of password	4.7	5.5
• Mistyping URL	8.7	16
• "New user" confusion	15.7	7
• Not following instruction re "reply/quote"	18.9	7
• Forgetting password	7.9	5.5
• Rushing/impulsivity	17.3	19.5
• Glibly changing passwords	5.5	0
System access		
• Failure to ensure previous user has logged off	6.3	5.3
• Confusion over logon name/password	22.1	7.5
• Generic initial logon later confused	16.5	7
• Glitches from unactivated accounts at enrolment	11.8	10.5
• Outside providers' access dilemmas	17.3	20
Confusion across subjects on Webboard		
• Logged on to wrong subject	22.8	2
• Assuming reply/quote was required in other subjects	11	6
• Not reading symbols (+, (3,7) etc)	12.6	2
Confusion over Webboard terminology		
• Web-conferencing ≠ chat	13.4	9

• Chatting leads to loss of message	16.5	11
• Clicking "Reply" leads to ready loss of access to original message	14.2	13
• Web-conferencing ≠ e-mailing	8.7	9.5
• Confusion over tutorial subgroup membership	33.8	13
• Confusion with Webboard's three different "posts"	29.9	15
Group allocation		
• Not understanding that manager allocates groups	15.7	21
• Failure to logon promptly caused frequent group remaking by managers	9.4	15
• Having to wait to be allocated to a group once logged on	22	16
System glitches		
• Server down caused frustration	56.7	69.5
• Frustratingly slow response time if many students accessed Webboard at the same time	30	32
• Not knowing if lack of access is server or user related	43.3	48
Systemic support dilemmas		
• Lack of immediate technical support	30.7	28

• Library staff unable to help	19.7	17
• Inappropriate peer support	16.5	14.5
Web screen		
• Difficulty with scroll bars/actions no longer visible on screen	11.8	9.5
• Inability to resize space for text entry	7.1	11

We made as many adjustments to the use of *Webboard* as we could. The system is unlikely to ever be without glitches but we have managed to make several

important gains through its use - developing an important skill for teachers and reducing dislike of computers by about half of the 20% of computerphobes.

However, my fundamental reason for introducing electronic tutes was to improve learning of intended outcomes. So what evidence is there that quality learning is occurring (Shears, 1995)? To answer that question, I turn to some actual conferences - first year and second year, which have fictitious student names to protect anonymity.

Some examples of Web-conferencing

Discussion begins from an analysis of the following first year board set around the questions "How have teachers' lives and work changed?" and "How important have teacher organisations been?" based on Vick (1998).

Sal: Teachers now have a 'partnership' with their employers, rather than being strictly controlled. Teaching is now seen as a profession, not a trade. Teachers' organisations are very important as their two main focuses are on industrial and self-improvement which contributes to the overall development of education.

Barbara: Teachers' lives have changed enormously over the years. Teachers' private lives were very much a part of their teaching lives....

Sue:

>As well as the two points you made Sal, the position of teachers has changed

>because in the 1990s teachers were entrepreneurs, and established their own schools >as their own businesses....

Jo: Teachers have changed a lot because they can now keep their home life and their school life separate....

These four interactions by the first year group show only one person reacting to an earlier response (Sue with > comment to Sal). The others are individual inputs unrelated to prior answers and did not use appropriate buttons to permit prior text to be edited. Accordingly, the content from Barbara and from Jo is merely additional to what has gone before. Across this interaction there is no querying, no seeking clarification. There is no higher order thinking. Indeed, the question did not require a debate, a serious discussion of issues, or an insight that related to personal experience - it required a relatively low level of thinking.

Conversely, a good example of higher order thinking comes from a second year group, involved in a self-selected, problem-based search for a humanistic way of meeting the learning needs of a student with a learning difficulty (see next page). My analysis of this series of second year interactions is that it is of high quality, displaying higher order thinking with clarification, synthesis (not only from within the subject, but also from previous studies), analysis via engagement with the ideas of other group members. While two of these students are excellent scholars, there were four other group members who were drawn into quality thinking across many Web conferences and f2f meetings to establish a strategy for humanistic intervention for a student with learning difficulties.

On 8/05/00 20:34:00, Jill wrote:

>On 4/05/00 18:44:00, Mick wrote:

>>On 4/05/00 18:04:00, Sue wrote:

>>>That is wonderful, so revealing to the topic at hand. I've just been reading a book titled the ABC's >>>for learning disabilities and the approach taken by the author regarding "remedial" work contains >>>no such "empathy" at all in there remedial work suggested for learning support teachers. This

>>> surprised me so much as it is a recent publication (1996) and I thought that it would be included >>>in this day of age. (Sue)

>>Mick here, I am not surprised it is not in the book. We are just so cutting edge. I mean Rogers only >>wrote in the 60s. Our main strategy is to identify underlying causes of learning difficulties. >>Emotional via empathic understanding. Cognitive via method critique. Physical via Maslow's >>hierarchy of needs.

>***(Jill) Yes, but we have to remember that some children in our classes will not even have some of >the most basic needs being met at home. Some adults never reach the top of Maslow's hierarchy and >reach self-actualisation! Perhaps we should have some studies in how to 'know yourself' at university >for preservice teachers?!

>>(Mick) I think we are agreeing here. The point being that to identify a deficiency in basic needs goes >>a long way to identifying learning the causes of learning difficulties. Critical reflection is >>emphasised in our courses but I agree we would benefit more from a specific focus on this. >>Cultural/Social via equitable interaction. Personal via Self-actualisation.

>***(Jill) Does this mean that, in order to successfully teach in an empathetic way, using Humanist >principles, the teacher him/herself has to be 'self-actualised'?

>>(Mick) I think self-actualisation is a process rather than a goal. In this sense however we meant that >>personal causes of learning difficulties could be discovered during the process of working towards >>self-actualisation. I am of the opinion though that to be a successful (humanist) teacher one would >>need to be devoted to the path of self-actualisation.

>Also have you looked at Bloom's Taxonomy of Educational Objectives? I think that using the >categories within the Affective Domain apply well to this philosophy of teaching, like:

>• receiving - student is willing to receive certain stimuli

>• responding - active participation on the part of the student

>• valuing - how much does the student value the experience

>• organisation - integrating values across a range of experiences and then into a philosophy of life

>• characterisation - a sign that the student has incorporated value systems into their lifestyle (Jill)

Not all second year groups functioned at that level; indeed some did not e-function at all (they opted for f2f only). Others, like the one provided on the next page used Web-conferencing to clarify what had happened in f2f group meetings, to socialise and to organise future tasks, but did not engage in higher order thinking:

On 2/05/00 16:26:00, Pete wrote:

>Thanks everyone for the discussion we had today. We have changed the topic slightly as we decided >that routines are all a part of Behaviour Management but as that topic is so broad we will only do >routines. The three scenarios that we have decided on are:

>Preventative: -Routines that help create an environment conducive to learning and help address >problems before they really exist.

>Control: - The routines that teachers use to enable classrooms to return to a learning environment >when the students are off task for various reasons.

>Whole School: - Routines instituted by the school/department to manage the behaviours of students. >This can include the routines teachers are to follow in the playground, when the classroom routines >are ineffective with a particular student etc. We have a little problem distinguishing between rules and >routines in this section.

>Control/ Preventative routines are to be taken on by Michael, Lana, and Myself (Pete)

>Whole School - Lynn and Nora

>This split was convenient on Sec/Prim education lines.

>Also especially for Nora who left early - tease tease - from the one who arrived late:

>We have decided to have the 5 strands incorporating the four key factors split between us as I counted >and there are 5 of us. Primary Maths - 1 each

>Therefore:

>1) The learners - Pete

>2) The Planning Process - Michael

>3) Teacher/Student Role - Lana

>4) Learning Environment - Nora

>5) Ensuring Learning - Lynn

>If each of us can put this together for our next meeting 1pm 9th May outside tute room and we will >check each out. Aim for this to take Approx 2 mins in presentation.

>If we could use technology in the presentation such as OHT and PowerPoint it would be good - >Maybe as part of the introduction? Any suggestions? We could start off with each of us doing a >routine we have observed: ie Clap hands, Bell ring, Quiet voice, Raised voice etc. What do you think?

>I think this just about covers the organization part of our discussion. Until next time

>Pete.

I read this input as consolidating the f2f discussion, confirming who will be responsible for various parts of the task, and beginning a brainstorming of where to next. I consider these are appropriate uses for web-conferencing, but they provide no evidence of higher order thinking - even though it invites some.

Reflections towards a model of the complexity of web-conferencing

My reflections on data provided in this paper, open-ended responses to questionnaires and periodic discussion with students and tutors led to a loose model of the complex and often self-contradictory factors related to web-conferencing. Figure 1 identifies multiple factors to be juggled when using asynchronous web-conferencing. At the center are staff and student multiple purposes for using web-conferencing, which are sometimes in tension with each other. Around this set of purposes are peer feedback; convenience of time and place; record of interaction; tutor feedback/ clarification; types of questions posed; and provision of scope for social constructivism. All of these factors contain tensions and/or contradictions.

Purposes of web-conferencing

There are many potential purposes for using Web conferences: as a teacher educator I want students to overcome computer phobia, accept ICT as an integral part of the lives of teachers and to use it as an effective tool for their own learning. As a tool it can provide opportunity for both the social construction of meaning around set texts and students' lived experiences via committing themselves to print and using feedback from tutor/peers. I like to track students' thinking so asynchronous Web-conferencing is preferable to chatting - but this tracking implies an unequal power relationship when students read the lecturer as using their inputs for informal assessment purposes even though they are excluded from formal

assessment. Students use web-conferencing for learning, as a means to organise and consolidate their groups' work and f2f meetings, as well as for socialising.

I have also come to understand that the genre of asynchronous Web-conferencing is quite different from genres of f2f tutorial discussion. Hence it is a "new" form of literacy - an e-literacy. This involves mastering both access to the conference and the genre of e-discussion as socially constructing meaning from text.

Peer feedback

Peer feedback was a concern for students - they wanted immediate feedback (as in f2f or in a chat session). However, if several group members did not actively participate (phantoms), keen students became bored with discussion being limited to just one other peer - this is also occurs in f2f tutorials. Even so, phantoms can and do access others' ideas and learn from them as they do in f2f tutorials. Another tension is that students want prompt, quality feedback, but are also pressed for time to read other's work and adapt their prepared answers to what has gone before. This was exacerbated if others' responses were long or comprised a long string of additive answers rather than real discussion of prior content. They also had only brief times available to type in their inputs. Students also found it difficult to sustain quality interactions where only the same two group members interacted.

The convenience of time and place

While many students, with considerable family and paid work responsibilities, appreciated the convenience of place and time flexibility, they were impatient about delays in receiving feedback. They also missed the non-verbals and found the genre of web-conferencing unfamiliar. For example, many did not want to insert comments into others' texts. It may also have been that so early in their university lives they were unfamiliar even f2f with disagreeing with others' inputs, or with providing evidence to support arguments. Others with no home computers reported frustration if they could not readily access labs or the WWW. Given that they were very busy, this delayed access disadvantaged them relative to those with home computers.

Record of interaction

The permanency of an interaction made some students more careful with their choice of words, but for some it inhibited their willingness to input in case their ideas were taken the wrong way. For others it was easier to "take the floor" than during f2f interactions. From the point of view of staff, the written record is a useful way of tracking the quality/line of argument. Accordingly, I avoid using chat sessions and perhaps this impacts on the openness of interactions. Hence, maybe knowing that the tutor monitors inputs is seen as surveillance, not just corrective or positive feedback.

This surveillance might be seen to be linked to assessment in the subject, even though the Web-conferences are excluded from formal assessment.

Surveillance and assessment relate to power of tutors/lecturer, as this vignette indicates. A second year group was trying to link three things they had discovered during their independent, school-based component of the subject. These were multi-age classrooms, social constructivism and their implications for outcomes-based education. I found this combination of issues delightfully original and highly desirable and told them so in their e-discussions. Subsequently, one student surfed the web and mentioned that he had located references to disadvantages of multi-age classrooms. I cautioned them to be careful with web articles because there may be no quality control. They dropped the Web references,

presumably out of deference to me. He also had his concerns about outcomes-based education excised from the assessable component, partly because of the group's reading of my "position" favouring multi-age classrooms and partly because he read the rest of the group as unwilling to run with his ideas. Hence, the earlier reference to "undominated dialogue" (Williams & Merideth in Blanton et al. 1998, p. 244) is not universally accepted by students in my version of web-conferencing.

Tutor feedback/clarification

Students were keen to receive tutor feedback, sometimes rather promptly, to check if they are understanding parts of the text. This enables them to proceed confidently with their reading or to enter discussions from a firm understanding of the content. At times they felt that they had to wait too long for this clarification/ confirmation. This expressed need for prompt clarification could stem from students seeking a single truth/answer, rather than opening up discussion to multiple readings and then judging their adequacy. This relates both to their prior positioning within a scientific worldview and to closed versus open questions.

Types of questions posed

Closed questions inhibit discussion, but open questions can lead to "common-sense" answers based on no understanding of the text. There are several issues related to the nature of questions and student understandings. I have shifted from rather open questions to more closed ones for two reasons. The first was that open questions of the kind which take the reading as fully understood in order to work out implications for, say, teaching may be starting with a false premise namely that full understanding of the text has occurred. If students new to academia do not understand the text, then they are poorly placed to make informed generalisations or discuss implications and contradictory inputs. They can easily hunt a phrase, take it out of context and try to relate it to what they already know. Thus they hide a shallow understanding of the text. Besides, they have few authentic mechanisms for checking the quality of each other's anecdotes. So the close link between theory->practice->theory, i.e. praxis is not established. The second is that I do not want to discount students' lived experience as part of praxis and of academic demand - to do so disenfranchises prior experience and marginalises student voice. However, moving from open to closed questions reduces opportunity for quality interactions and minimises the chances of higher order thinking if the text is not generally understood. I continue to grapple with how to help students come to grips with text and incorporate their experiential knowledge. There is also the matter of academic demand. These are closely related to student prior understandings and how these link with higher order questioning and social constructivism. This requires a greater focus on social aspects of learning (Salomon & Perkins, 1998; Cole, 1995), particularly in a virtual context.

Scope for social constructivism

While web-conferencing provides scope for social constructivism - discussion, debate, seeking clarification - only some students engage in it. Some seek single answers, single truths. Others struggle with text and cannot yet argue about it or defend their readings of it.

Next steps

The questionnaire data provide some support for a "saturated selves"/ "options generation" reading of our students. Students' lives are busy, they are impatient with delays accessing web-conferences, and they want quality, prompt feedback from both peers and tutor. They also want to avoid lengthy strings of additive answers but often do this themselves rather

than commit time to interact with prior messages. These tensions are unlikely to diminish. My challenge is to establish web-conferencing to assist rather than impede learning. This involves both system and teaching changes.

Our questionnaire data reveals that access to web conferences has been a major impediment for students. *Blackboard* has three features to improve access for students. There is a simpler logon process than before. Allocation to groups is also simplified. The system itself is supposed to be more resilient and because it will be on a main server, more quickly rebooted. If these operationalise, students' interfaces with conferencing will be less complex and less frustrating. With appropriate teaching of a web-conferencing genre students can socially construct meaning and develop higher order thinking skills. This means scaffolding four aspects of it.

The first is to model and scaffold how to extract meaning from texts. This will be supported by Web-based testing for understanding of several early readings via quizzes on*Blackboard* in 2001. The second is that the genre of academic texts, including argument building and using evidence to support an argument needs to be articulated, modelled and scaffolded - again we will use *Blackboard* to assist here.

The third is that using the genre of asynchronous Web-conferencing itself needs to be articulated, modelled and scaffolded - it is a new genre and warrants such a specific introduction. The fourth is that linking text and lived experience probably needs to be explained, modelled and scaffolded. The end product of such modelling and scaffolding should be better social constuctivism, praxis, text construction and ultimately teaching. Indeed it should develop not only another in student teachers' repertoire of multiple literacies (Kalantzis & Cope, 2000) but also higher order thinking if I ask appropriate, open questions for e-discussion.

If subsequent adjustments to first year lead to more accomplished reading of texts, better praxis and better use of Web-conferencing, then it is possible that in subsequent years students will use it better too. In the process of our ongoing praxis related to Web-conferencing we will get better at explicating, modelling and scaffolding a new genre. However, we like students are "saturated selves" - work intensification and other trends in society at large are impacting on us too. Hence there are limits to what we can realistically afford to do, just as there are tight limits on what our students can/will do. Even so, Web-conferencing, as we come to understand the medium better and as we improve the ways we use it, opens exciting possibilities for our teaching and for our students' learning through it.

References

Anderson, J., & Lee, A. (1995). Literacy teachers learning a new literacy: A study of the use of electronic mail in a reading education class. *Reading, Research, and Instruction, 34,* 222 - 238.

Bigum, C. & Green, B. (1993). Changing classrooms, computing and curriculum: Critical perspectives and cautionary tales. *Australian Educational Computing, 8*(1): 151 -170.

Blanton, W. E. Moorman, G. & Trathen, W. (1998). Telecommunications and teacher education: A social constructivist review. *Review of Research in Education, 23*: 235 - 275.

Cole, M. (1995). Socio-cultural-historical psychology: Some general remarks and a proposal for a new kind of cultural-genetic methodology. In J. V. Wertsch, P. del Rio, & A. Alvarez. (Eds.), *Sociocultural studies of mind* (pp. 187 - 214). Cambridge, England: Cambridge University Press.

Gergen, K.J. (1991). *The saturated self: Dilemmas of identity in contemporary life.* New York: Basic Books.

Green, B. & Bigum, C. (1998). Re-tooling schooling? Information technology, cultural change and the future(s) of Australian education. In J. Smyth, R. Hattham, & M. Lawson (Eds.). *Schooling for a fair go.* Leichardt, NSW: Federation Press.

Kalantzis, M & Cope, B. (Eds.). (2000). *Multiliteracies: Literacy learning and the design of social futures.* South Yarra: Macmillan.

McKay, H. (1997). *Generations: Baby boomers, their parents and their children.* Sydney: Macmillan.

Norton, P. & Sprague, D. (1996). On-line collaborative lesson planning: An experiment in teacher education. In D. Willis, J. Price, & J. Willis (Eds.) *Technology in teacher education annual 1996* (pp. 885 - 889). Charlottesville, VA: Association for the Advancement of Computing in Education.

Osborne, B., Wilson, E. & Iles, M. (2000). A new literacy not just a new tool: asynchronous e-tutorials/web-conferencing in first year teacher education (1997-1999). Paper presented at 9th annual Teaching Learning Forum, Curtain University of Technology, 2-4 February.

Salomon, G. & Perkins, D.N. (1998). Individual and social aspects of learning. *Review of Research in Education, 23*, 1- 24.

Shears, L. W. (1995). *Computers and schools.* Camberwell, Vic: ACER.

Vick, M. (1998). Quills, pens and keyboards: teachers and teachers' work in a changing society. In J. Allen (Ed.) *Sociology of education: Possibilities and practices*(pp. 62-82). Katoomba, NSW: Social Science Press.

Williams, H., & Merideth, E. (1995). Internet outposts: Communication patterns in computer-mediated classrooms. In D. Willis, J. Price, & J. Willis (Eds.)*Technology in teacher education annual 1996* (pp. 638 - 642). Chartlottes-ville, VA: Association for the Advancement of Computing in Education.

Yelland, N. (1997). Technology: Changing the way we think and learn or maintaining the status quo*? Educational Computing, 12*(1): 3 - 8.