

# TECHNOLOGISED SUBJECTS: SCHOOL, STUDENTS AND LITERACY IN AN ELECTRONIC AGE

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## ABSTRACT

*In a case study of one school, different students are observed developing diverse, sometimes contradictory forms of literacy involving communications and information technology. Using Foucault's theory of 'individuals' as the human subjects of institutions, discourses and practices who derive thereby their 'subjectivity' or sense of self, this paper explores some ways in which different student selves are constructed in the processes of making meaning with technologies, whether as readers of basal reading material in skill and drill software, as writers of home pages, or as test pilots of the logics of computer programmes.*

'... Because I'm an individual,' said the Year 10 student, when asked why she had downloaded from the Web a very assertive ready made 'wallpaper' of heaped red and green apples for her home page. It's an intriguing instance of how this 'screenager' (Rushkoff, 1997), like many others today, is declaring and constructing an 'individuality' as a quilt of technologically manufactured patches (whether pop groups and their music, designer label jeans or a cocktail of mood altering drugs). In this article I explore some of the ways in which school students are shaped as individuals and members of a community by their involvement in practices involving literacy and digital technologies.

Such hardware and software are often called 'communication and information technologies'. It's a common sense expression; but in the first section below I question the common sense understanding of each of its constituent terms. This is not the whole of my case (for further detail see Morgan, 1997), but my definitions here ground my further argument about the making of technologised and literate student subjects.

## LITERACY, TECHNOLOGY AND SCHOOLING AS SOCIAL PRACTICES

The ability to process and utilise written 'information' and to construct a text for the 'communication' of meaning – these are the skills the media and politicians expect students to be taught 'properly'. Literacy however cannot be summed up so simply as decoding and encoding print; like other recent theorists of literacy associo-cultural practice (e.g. Street, 1984; Gee, 1990, 1991; Fairclough, 1989, 1992; Lemke, 1995; Lankshear, 1997) I argue that literacy is a range of practices: material, historical, social, cultural and political practices which always involve some form of technology, and always give us our sense of who we are, as more or less literate members of a particular (sub)culture. Of course, what is proper – normal and normative – at one time and place is not necessarily so at another; and so we too as literate subjects do not have some universal core or essence of 'human nature': we are as we 'perform' ourselves and believe ourselves to be.

At any period of history literacy as a material practice always involves a particular

relationship between language and the available technologies for recording and communicating information. We sit at desks, using books and computers; we may still use the old fashioned technology of a pencil. These and similar literacy technologies affect how we read and write and what we take reading and writing to be. They also affect us materially as readers and writers, from our posture at a keyboard staring at a screen to our sense of ourselves as intimately connected to those electronic prostheses that extend the reach of our senses and minds.

Such historically situated technologies and texts inevitably condition the (changing) social and cultural practice of literacy. As a tool a technology is a means by which things get done socially and culturally; and as a tool it also shapes the activities and hence also the people around it. That is, a technology, and thus a technologised literacy, helps constitute socio-cultural institutions, practices and thus people's sense of self and place and scope for action within a literate community. A technology can never be neutral (Bowers, 1988).

In this and in other ways a technologised literacy is inevitably also a political practice – involved with people's relative power, authority and status to mean and to act and to gain access to the world's goods and advantages. This point follows inevitably from the previous one – because where there are social and cultural communities, there will also be differences and discrepancies between communities, hence also inevitably inequalities and inequities (Lemke 1993). Those differences, and all that follows from them, involve literacy. Any text promotes or represents as commonsense, normal or desirable a particular culture's way of being in the world and acting on it. And any culture will promote or represent as commonsense, normal or desirable a particular way of being literate around texts. Particular kinds of (technologised) texts and textual practices may in gross or infinitely subtle ways affect the life chances of those who do not feel at home in the texts and practices of others who are culturally, economically, politically powerful in a society.

The implications of this for the subjectivity of students schooled in a newly technologised literacy are explored in the rest of this article. But first, to clarify the material, historical, socio-cultural and political practice of literacy and technology, consider the following 'snapshot' of a moment recorded while I was gathering data as part of a team carrying out a national research project into technology and literacy (Bigum et al., 1997).

Members of a Year 6 class are preparing to publish their home pages on the web. Their teacher is revising with them the html tags they will need to insert into their self-portraits. She uses chalk on blackboard and the students copy the codes down into their exercise books as she talks the logic through with the class. At the same time three students with literacy difficulties are working on the verandah with a learning support teacher, labouring to write with pencil on paper self-descriptions for their webpages. 'My name is Larry and I am 12 years old...' one writes with tedious difficulty and massive support from the teacher.

The reason for this talk and chalk, pencil and paper step in the process of home page construction is that the primary school does not have a bank of internet worked computers. The neighbouring secondary school has been booked for a future evening, to enable the students to get up their pages: they will enrol their parents in keying in copy and instruct them in inserting the tags.

The ironies in this vignette of students' learning to use an electronic programming meta-language are obvious. The older historical and material practices of literacy involving the technologies of chalk and pencils here persist as the means of instruction in the new. The students are 'doing it by the book' – writing instructions on paper for writing instructions for the computer. They are thus at this stage doubly dependent on the authority of the teacher's written word. At the same time – it is characteristic of the complexity of such situated practices – the students as members of a social community (the classroom) within a wider set of communities (Aboriginal and Caucasian, local and globally distributed) are being inducted into the new practices and hence the culture that come with a digital literacy. This will entail the students taking on the role of experts and teachers of their parents and thus reversing, if briefly, the normal social and cultural relations within families. For changing practices of a material, socio-cultural practice may also affect power relationships with those who have been advantaged by older practices. They may – or may not, depending on the economic circumstances and cultural practices of those on the margins of the mainstream. Another glance at those students with literacy difficulties, out on the verandah, must lead one to wonder what disjunctions there may be between the cultural practices of literacy in home and community and those in school.

### THE MAKING OF TECHNOLOGISED, LITERATE SELVES

These students, like their teachers, are variously developing not only a set of capacities for a new literate practice but also thereby a sense of self, an identity, a way of acting, thinking, being in the world (Turkle, 1995). It is often useful to ask: In a 'technologically textured' world (Idhe 1990: 1), what do the hardware and software invite us to become, as 'wetware', in a network of agents that are both technological and human?

That question drives our examination of further snapshots taken in the context of a particular (and peculiar) 'communications and information technology': the school (Hodas 1996: 217). For schools can be described as a technology insofar as they are the application of certain knowledges (subject disciplines, developmental psychology, curriculum theory and the like) to the crafting of a product: a population of subjects fitted for participation in a particular society.

At this point I need to clarify further what I mean when I write of human 'subjects' and 'subjectivity'. The shift to these terms from others still current such as 'self', 'individual' or 'person' brings with it a different way of thinking. In educational talk the latter have long dominated, deriving as they do from progressive humanist views of the value of individuality and personhood: each student is a unique self (a kind of pre-existent essence) which is to be developed. Psychological theories compatible with these views still prevail in many educators' talk and thinking: these theories explain 'the' self as the result of certain mental processes, cognitive and affective. By contrast, post structuralists, most notably Foucault (1981, 1982, 1988; for a poststructuralist feminist approach see Weedon 1987), have more recently argued that the starting point of the self is not the individual and the psychological but rather the material and socio-cultural worlds as we 'know' these. How we know these depends on the ways in which we and others represent these 'realities' in various forms of language as used in different areas of institutionalised practice. These are often called 'discourses' (Macdonell 1986). Thus who we present ourselves to be depends in part on the language available to us that gives us our meanings, our understanding of the world and our

roles as selves in it.

But if we are subjects (both 'that which is spoken and written of' and thereby 'that which is prone or obedient to') – subjects of institutions, discourses and practices, this does not necessarily fix our identity for us. While poststructuralists contend that human beings are not autonomous (the point of origin of their actions, understandings and selfhood) or unified (always the same, always present to themselves as conscious and rational beings), these theorists also argue that we are in process. We are always in the making (shaping and shaped), always with a number of selves in play (sometimes contradictory, sometimes irrational or unconsciously generated). And therefore our selves are always open to change – insofar as other discourses, other forms of subjectivity are available to us. We are not individual representatives of some universal human nature that persists across times and cultures. Instead, our society has diverse potential selves on offer which we might be more or less able to take up and internalise, make our own, through the cultural practices that become become our habit – our custom and our 'clothing'. It follows then that we need to ask what are the conditions in which a particular kind of subjectivity is most im/possible: educationally technological conditions and a technologised subjectivity.

That is precisely the theme of what follows. These ideas about subjectivity are complex, not least because they run counter to the prevailing common sense. (Indeed, it would be the height of hubris to imagine that one could in a few pages deal adequately with so complex a matter as the making of human subjects.) So, rather than trying to explain these further through theoretical discussion, I shall attempt to clarify them by means of some snapshots of differently technologised and literate subjects. The value of this essay I believe lies in its exploration of matters generally overlooked or understood differently in discussions of information technologies in education.

The following observations were made in the same school, Panmure, a P-10 school in a rural community whose innovative projects using the Internet and other computer applications have won favourable notice and prizes. The differences, even contradictions, between these snapshots not only remind us of the inevitable unevenness of technology and literacy practice in the one site; they also warn us that these are conditions of possibility, not necessity, for the making of subjects.

#### SUCCESSMAKER: THE SURVEILLANCE OF COMPUTABLE SUBJECTS

SuccessMaker is a widely used American 'educational' software programme, which has a series of 'tutorials' in carefully graded levels, from preschool through senior secondary and adult education, in English, mathematics, language, science, life skills and other areas. The school is currently conducting a trial of the programme, which is to involve all the Year 8 and many of the Year 9 students. Apart from its more general applications, the staff see a particular advantage for their Aboriginal and Torres Strait Islander students, a number of whom have very delayed literacy development and need dedicated help – beyond what their classroom teachers can provide, for all their commitment – in 'getting up to speed' in literacy.

Since my focus here is not on its conception and implementation of literacy instruction as such, but only as this impinges on the making of student subjects, a brief sketch of its

approaches must suffice. In the early literacy workshops, for instance, the programme offers comprehension questions on decontextualised fragments of text, cloze exercises, questions about text categories (e.g. tall tale, poem, myth), analogy completion tasks, 'word building' identification of synonyms, and the like. More advanced levels persist in these old fashioned, worksheet approaches to literacy whose efficacy has long since been judged inadequate, even pernicious among literacy educators who recognise that meanings are made within cultural and social situations, not 'there' in texts independent of contexts.

Reflected in the computer screen is a microcosm of much previous educational practice, based on a Skinnerian view of stimulus, response and reinforcement; and what they reinforce is a model of reading as a hunt for 'right' answers to questions that may be irrelevant to a young reader's desire to make meaning by following a story line to closure. They elevate second order concerns about lexicogrammar, generic category and the like to first order of importance. And they neglect the cultural contexts and social situatedness within which various reading practices are acquired. They're not in my view made more sound because a computer can offer various 'eye candy' tricks, such as animated winners rosettes prancing across the screen. Although the programme may play a part in the learning of that larger complex of skills, attitudes, understandings and behaviours involved in reading,<sup>1</sup> it most overtly drills and tests a reader's already acquired ability to carry out tasks, and suggests that this is identical with reading. Thus it teaches teachers and students a very limited idea of what it means to 'be' a reader. It is this subjectivity I want to trace briefly.

Students are initially assessed for their literacy ability, then 'enrolled' at the 'correct' level. Such enrolment works not only to register the student, but also to give him or her a role, an identity as a certain kind of defined reader. Levels, classes, teams – such groupings are familiar ways of establishing norms and so defining (ab)normality (see Foucault 1979 on normalisation). In this case, the role assigned to such students is to achieve normality as readers through the technology that defines success for them in certain terms. In answering the programme's prompts they are also responding to its invitation to become a certain kind of 'successful' reader and to define themselves in these terms.

The determination of this normativity depends on a technology of surveillance: one of the features of the programme is its ability to record, in raw figures and percentages, the number of right answers a student offers in a session, and to compare the latest with previous performances. (During one of my observations the learning support teacher called up the score of a Torres Strait Islander boy who was as a young adolescent just on the threshold of literacy: 'Twenty seven right answers: that's seventy-seven percent.' Luke was visibly pleased.)

As an exemplum of surveillance which superseded more overt and brutal forms of coercive power, Foucault (1979) famously analysed a model prison of the eighteenth century, the Panopticon, in which prisoners were always visible to warders whom they could not see. This knowledge was designed to lead the prisoners to exercise self-surveillance: to internalise that gaze and regulate their own behaviour. SuccessMaker could be said to operate in a similar fashion; and while this may seem a sinister overstatement, the programme does render students as readers visible to be read and known in a certain way by a teacher. And where such 'reading by numbers' is available also to the students, they can internalise this knowledge of both the surveillance and the identity ('I'm on 77% now') as constructed by the



technology. In taking on this identity as their own they are likely to seek to produce in themselves the desired form of being held out to them by the software. So they are rendered technological subjects and take on a technologised subjectivity. They also become measurable, calculable, 'computable' objects – (human) figures to be crunched even as they demonstrate their proximity to normality.

Consider the following exchange as illustration. (Margaret, now in Year 8, came to the school in Year 7 from the Torres Strait. She speaks English as her second language and could not read when she was in Year 6. She has been using SuccessMaker consistently for a year.)

Interviewer: What's the best thing about SuccessMaker, as far as you're concerned?

Margaret: When you're getting it all right, all these little pictures coming out at you.... Sometimes I can beat my lower scores, like I'm going up.

Interviewer: What's the worst thing about SuccessMaker?

Margaret: When I get it wrong.

It seems that for this student SuccessMaker is beyond criticism; she accepts its judgement of her errors – indeed, the programme is identified with her personal sense of success and failure: 'I'm going up', 'I get it wrong'.

Such software encourages a particular practice of (self) discipline (Foucault 1979, 1981) by virtue of having a kind of 'therapeutic authority' (Miller and Rose 1994). That is, it has a productive power (to make a 'success' of its subjects) which depends on its promise of 'healing' weakness and correcting abnormalities in readers, by offering 'personalised' coaching.

Indeed, the individualisation of such software is often proclaimed as its pedagogic advantage. As the computing studies teacher at the school noted, it 'tutors the student on a one-to-one basis. If they have problems it gives them clues and prompts them before it comes up with the answer.' And when the school recently conducted a survey/interview of about twenty nine students who were using SuccessMaker, 'the overwhelming majority enjoyed using SuccessMaker, thought it helped them to learn, liked the way it would prompt and guide them if they were unsure of an answer and the way they could learn at their own pace.'<sup>2</sup> The students, it seems, enter into a humanised relationship with the computer, which is represented as taking the initiative: *it* 'tutors'; 'gives ... clues', 'prompts', 'comes up with the answer'. An amiable guide indeed, and most intimate (virtually inter-subjective) exchanges.

Now many busy teachers would be grateful to SuccessMaker as a useful resource and supplementary tool. But as noted earlier, any computer technology is never just a resource, a tool – it also brings with it a context for learning and a culture for understanding what you do to be a learner, and what counts as reading. In my belief this programme encourages dependence and docility, and – where boredom does not set in – it serves as an efficacious SubjectMaker, as students more or less willingly collude with it in shaping their practices and

their (sense of) selves.<sup>3</sup> Let us not see such students as 'victims' of a demonised technology; it is also a source of productive power for such students as they make themselves up.

The next episode also focuses on a practice of self-shaping through electronic technology. In a different way from the foregoing – not as a practice of surveillance but as one of self-presentation it ostensibly offers more scope for freedom of linguistic expression; but this is not to be understood naively as the depiction of an original identity' which exists independent of its representation.

## THE HOME PAGE: CONSTRUCTING A VISIBLE SELF

A home page is an instance of an emerging genre and a new practice of literacy. At this historical juncture of transition, some examples will bear the marks of older, print forms, while others are more experimental – exploiting the potential of hypertext links, graphics, animation and sound. Whether nostalgic or transgressive, a home page offers an electronic version of the identity of the 'home owner', offered to that most unknown of public audiences, the millions connected via the web. In these ways therefore a home page is a cultural and social practice of literacy: as a sub-genre of autobiography it functions within a global culture online; and in presenting a textualised self to the gaze of viewers world wide it participates in a virtual social community. It is not only global, however; it is also a home grown product, fabricated alongside friends' in a classroom, within a local, tailored curriculum. More particularly the home pages of the students at Panmure are framed by the school's web site and are also conditioned by the processes of production set up by the school's computer teacher. And so too the students are both global and local: they are more or less full members of a westernised culture and society of 'mediated' adolescence (the Aboriginal students for instance exchanging their school uniforms after hours for home boy pants, sneakers and baseball caps); they also partake of an intense social life within the local culture of this rural community. Given the ensemble of productive influences at work in this literacy practice, it is a most salient site for tracing something of the construction of a technologised subjectivity.

When the Year 9 and 10 computing studies students were first learning the technical aspects of how to produce web pages they were given a sheet of prompts that their teacher had adapted from a proforma for a letter of self-introduction to a potential pen pal. This tip sheet for an older literacy practice includes the usual data: name, age, physical details, likes in music, hobbies, sports, family, friends, home and so on. This is a venerable kind of list whose selectivity is no longer visible: it has become 'natural' for most of us to define ourselves according to such categories. But of course any such schema can never be a way of recording 'true', factual information; it is rather a means of constructing a version of ourselves by speaking of some things as significant and leaving silences about others (Foucault 1970).

While some more confident students have diverged from the 'tried and true' formula provided, a number of students have adhered to it in writing their self-descriptions; as the teacher noted, this structure has 'enabled them to construct a home page of which they are usually quite proud'; some would otherwise have been 'struggling for weeks'. The ready made frame is usefully generative of a patterned self, a subject whose structure of characteristics is recognisably like others'. (Of course, one of the advantages of electronic



publication is that the students can at any time add to or alter their home pages: their self representations can be as volatile, or as apparently stable, as themselves. Yet during the time the self is made a visible object for examination, that individuality is fixed, and may exert an influence on the student's self representations even beyond the time the home page lasts.)

As Hall (1996) puts it, identity is a 'point of suture', a sewing together of components from various cultural kit sets of personality. This is true not only of the students' words but also of their images, many of the latter even more 'hand me down'. For example, during the time of my observations many of the students, like the girl sketched in the introduction to this article, were busily engaged in choosing background 'wallpaper', importing a photo they had scanned or a graphic they had found and downloaded from the net. The new literacy practice of home page construction demands the development of these new skills, as well as the application of layout principles such as use of white space, direction, emphasis, suitability, opposition, balance, and cohesion. The outcome is a demonstration of a subject with these specific capacities. It is also the construction of a self as a collage of 'off the hook' items: by graphics rather than by written text, such adolescents electronically represent their personality, their 'individuality', as they construct it out of doubly mediated patches grafted to the self.

### TECHNOLOGICAL SUBJECTS AS ENTERPRISING AGENTS

One or two of the students at Panmure have made multimedia productions of their selves. Philip, for example – whose voice can be heard below (on the page) has taught himself – with help – to include sound and moving graphics on his home page. He is therefore defining himself, for the world, as technologically competent – worth a second look and listen.

In this third episode therefore, we do listen briefly to two Year 10 boys, members of the school's team of student computer systems administrators. These boys and girls help the other students to maintain their web pages and put up contributions to the student online magazine. The sense of self of these administrators are being formed in part through such practices. In the following discussion, these boys describe the ways in which the electronic technology offers them a subjectivity as interrogative, enterprising learners.

For example, the boys offered a contrast between themselves and the other students who were dependent on their teacher to talk them through various operations on the computer:

Jacob: They'll be able to tell you that they clicked this button and it happened, but they won't be able to tell you why that happened. That's like you're getting there but not understanding how you're getting there.

Interviewer: Mmm. That kind of understanding I think is pretty important, and you people obviously do, too.

Philip: Yes. It's like the alphabet. Anyone can say the alphabet.

Jacob: But do you understand how to formulate the alphabet, make it make sense?...

The two went on to explain what they learned from exploring computer applications:

Philip: You think methodically about the computer, and if you're with the computer all the time, you automatically start thinking methodically [about maths].

Jacob: And you start to understand it and think about it as a tool, as an extension, instead of as a big mystery, so you can start to use it for more things....

As I suggested earlier, tools are never merely that: they involve social practices that also shape the tool makers. So here in the boys' comments we can I believe see how the habitual practice of software manipulation contributes to the formation of selves with certain ingrained cognitive capacities ('you automatically start thinking methodically'). Indeed, as 'an extension' of the self the computer becomes an intimate part of a cyborg hybrid (Haraway 1990).<sup>4</sup> Jacob asserts that he gains power as an agent through this interactivity ('you can start to use it for more things') and this is undoubtedly the case; but the technology is also thereby powerfully productive – of this specific form of his subjectivity (Weizenbaum 1984).

The following conversation reveals something of how this is developed:

Jacob: Say if we're doing a spreadsheet, people are going to complain, 'Oh, it's boring, we've got spreadsheets again,' because all they're doing is exactly what Mr P is saying: 'Click this button here, click this button there, and this will happen.' And they're not actually going '... And I wonder what this button over here does?' – they're just doing exactly what he says, and then that's it. You know, you've got to be able to press this button over here and then check what this one over there does.

Philip: You don't really need a lot of experience; you just need to be inquisitive, really, to find the things out.... You start experimenting with things, and when you can make things happen, you feel as though you've got power and you can make things happen, so you start exploring more....

Interviewer: You boys would have learnt that more or less by experimenting, by playing around, trying out, that kind of thing?

Philip: And working with Mr P and Mr T [the Computer Studies teacher and his assistant].

Jacob: Yes. See, we did Computer Studies, we did learn things like spreadsheets and all that, but then lunch times, before school and that, when you're just experimenting, and you go – 'Mr T, what's this doing? How do we get into there? How do we find that?' And so it's like exploring on your own, but with someone there to get you past the hard bits.

Interviewer: That's right. Otherwise you're just sort of fearful in case it happens again?

Jacob: Or you're not going to be as careful next time. If you're just told this is going to happen, the borders of reason aren't going to be as clear....

'[E]xploring on your own, but with someone there to get you past the hard bits': we can take these words as applying to self-paced learning, but in a very different way from that permitted by SuccessMaker. But Jacob's words also remind us of the social practices which work in conjunction with any technology to confirm (firm up, fix) certain ways of being. An ensemble of conditions (personal and cultural history, the acquisition of certain forms of literacy, the innumerable accidents of education, family circumstance and the like) have come together to make possible for Jacob and Philip a certain kind of subjectivity which is currently beyond the reach of the likes of Luke and Margaret.

Intriguingly, these boys claim that the technology is teaching them where 'the borders of reason' lie – the limits of any system or field of knowledge or form of meaning making. While they may sense that they are approaching the Ultima Thule of reason by the persistence of their explorations, it could also be said that the technology is defining reason for them by delimiting it in particular ways (as the brightness of the normal is outlined by its darker negative, the abnormal: Foucault 1965, 1970). And so too they are aligned with this reason, and 'inscribed' by it – enlisted as learners with a specific capacity for 'computer cognition'.

#### CONDITIONS OF POSSIBILITY FOR THE CONSTRUCTION OF SUBJECTS

My sketches of the above episodes have necessarily been brief; they can therefore only gesture towards a fruitful direction for more adequate, more fine grained mapping of sites in which a technologised subjectivity is in the making. My aim has been to offer a plausible account of some ways in which selves are made in the processes of making meaning with technologies, whether as readers (of basal reading material), writers (of self descriptions), or test pilots of the logics of computer programmes. That the episodes described here were observed in the same school, within the same week, is a reminder of the unevenness, even contradictions, that are bound to occur in the one educational space. This is not a matter of some students being 'empowered', while others are 'disempowered', in some binary distinction between the (computer) literate haves and the relatively illiterate have-nots, or between on the one hand freedom of exploration and expression and on the other the repression of regimentation and surveillance. Forms of knowledge, forms of power, are at work, productively, in all the practices described here. These offer, even in this one small school, a diverse range of subjectivities. Certainly not all the students can avail themselves of the subject position taken up with such alacrity by Philip and Jacob. All the more important, then, to inquire into the conditions by which this self, or that, can come into being with the help of that latest of midwives, electronic technologies of information and communication.

#### NOTES

1. The Learning Support teacher believed that SuccessMaker was in part responsible for the greatest improvement in the Aboriginal students' literacy skills she had seen in her four years at the school. The Computer Studies teacher also acknowledged her outstanding dedication and hard work in helping those students, and this is a useful

reminder of the importance of the teaching context and uses of any technology; of itself no programme can be wholly good or bad, and even the more numbing of drills could perhaps be rendered pretty innocuous if embedded in skilled, enlightened teaching. However, I would also claim that such tutorial programmes, founded as they are on certain assumptions about literacy learning, encourage the kind of transmissive teaching that is congruent with them; and so they teachers too of a certain kind are constructed by the technology.

2. The teacher offered judicious endorsement of SuccessMaker: '... as an additional tool in the overall school approach to assist students in developing their literacy and numeracy skills. The actual amount of time spent on SuccessMaker per week, one to three periods out of thirty five periods, represents only a very small fraction of their overall school week and there are many other strategies being employed in addition, to ensure a broad approach to assisting these students. In general I believe that the advantages outweigh the disadvantages: students enjoy using the programme and appear to make steady gains if they have sufficient access to SuccessMaker system, although, in a school situation where there are many strategies that are being employed it is not possible to clearly identify the amount of gain made by any one particular strategy.'
3. This is the opinion of a very critical reader, on very brief acquaintance, and there will continue to be debates with and among those like the Education Department of Queensland and schools in other states of Australia and elsewhere that have invested their funds, hopes and beliefs heavily in SuccessMaker. Evaluative research has already been undertaken; and while research can be used to support or critique just about any teaching technology, some such research, with particular underpinning theories, questions and hypotheses, methodologies and instruments – far more elaborate than the brief foray reported on here – supports the effectiveness of this programme. Readers interested in assessing for themselves the contribution of this programme to the learning of new literacies through new technologies will find some information at [http://www.dse.vic.gov.au/cal\\_eval.htm](http://www.dse.vic.gov.au/cal_eval.htm) which provides an executive summary and complete report commissioned by the Victorian Department of Education.
4. The 'cyborg' is defined by Haraway (1990) as a fusion of the cybernetic (computer) with the organism.

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