

## Making the connections: computers and literacy

Literacy education is about the distribution of knowledge and power in our society. Who gets what kinds of literate abilities is a key issue significant both for individual students and for society as a whole. Students' careers and power as participants in society are influenced by the kinds of literacies, the multiple literacies, they encounter and learn at school.

This concept of multiple literacies is useful as it highlights the extensive literacy demands required of people to participate effectively in our increasingly complex world. It also implies that our responsibilities as educators are more multifarious than ever before: students need to be provided with opportunities to acquire a number of literacies so that they may become more critical and informed participants in our literate culture. Integral to students' literacy development is computer writing literacy. Computer writing research indicates that computers have the potential to enhance students' writing and thinking skills. Computers not only eliminate the dreaded task of recopying, but also offer students sophisticated capabilities which facilitate the generation, revision and improvement of texts. It follows that as Australia moves into a new age, where major partnerships between education, employment and training are prefigured and comprehensive literacy skills are required, then computers should be assuming a key role in our language and literacy classrooms.

It is evident, however, that the computer's potential influence as a felicitous writing tool is not available to all our students, not even to most of them. Although I have been unable to secure detailed information from Canberra and state education ministries about which schools have computers, the numbers of computers within schools, and who uses computers for what purposes, it would be safe to make a number of assumptions. Firstly, there are significantly more computers in the private sector than in the state, and more in secondary schools than in primary; secondly, senior Maths and Information Technology students have priority over English students in accessing the machines; and thirdly, more boys than girls get to use them. This describes the status quo. But what do our policy makers envision for the role of computer writing literacy in education? Their spoken and unspoken agendas determine the ways in which computers are used or not used for writing in schools. It is important, therefore, to scrutinise what they prescribe as their decisions also have a critical effect on students' post-school lives, in employment, further education and social relations.

To identify the proposed role for the writing technology, I examine a number of major policy documents which have been developed over the past few years: those that deal directly with literacy for schools and those which have been prepared to promote a revised workforce. The focus of the analysis is the degree of importance the documents attribute to the use of computers for writing. Before examining these documents, however, I establish what we know about the connections between computers and students' literacy development.

## Computer writing research: some key findings

During the past decade, major changes have occurred in the teaching and learning of writing, many of which have been directly influenced by the use of computer writing technology. The cumulative research in composing over the past twenty years provides evidence that writing is both a cognitive and social activity (Cook-Gumperz 1986), one which fosters creative and critical abilities (Emig 1977; Berthoff 1981). In addition, research in writing across the curriculum suggests that there is a symbiotic relationship between writing and the discipline in which it is practised: in other words, writing requires a certain kind of thinking about a discipline and improves understanding of that discipline through the articulation of that thinking (Fulwiler & Young 1986).

These insights may be considered together with our growing understanding of how computers can be used as a tool to help writers think and learn in all subject areas. The computer is a text-making tool which makes language more flexible. Its use saves the writer the arduous task of recopying, leaving more time for reflecting, thinking and experimenting. The efficient revision facilities provided by word processing software accommodate the recursive nature of the composing process. There are complex and important interconnections between computers, thinking, learning and writing (Snyder 1992a).

As with many educational innovations, the introduction of computers for writing was hailed as a panacea for all writing difficulties. The early studies (e.g. Collier 1981) anticipated that simply giving students access to the electronic writing tool would improve their writing. This initial expectation was followed by the realisation that, like all new technologies, their use has to be accompanied by good teaching and classroom organisation designed to ensure that effective learning is facilitated (e.g. Sommers 1985). And we now have a clearer idea of what effective teaching involves. Perhaps most significantly, recent research demonstrates that the effective teaching of writing is less a matter of teaching grammar to students and more a matter of "promoting and refining the writing process" (Nystrand 1990, p.154). Information about writing (e.g. parts of speech, paragraphs, punctuation) makes the most sense to students in the context of the writing activity itself. Effective teaching of writing also involves familiarising students with the linguistic choices involved in the production of different text types, and arranging opportunities for students to draft and conference their writing both with the teacher and peers. Teachers can integrate computer technology with a writing pedagogy which takes into account the understandings of writing as a social and cognitive act.

Computer writing research studies indicate that the technology may facilitate revision (e.g. Daiute 1986), but only when accompanied by direct teaching in the processes and strategies associated with revision. The ease with which texts can be changed, exchanged and distributed may be exploited to the advantage of the writer. Further, as many researchers have noted, the computer screen is far more public and collaborative than pens or typewriters, tools associated with writing as a private and solitary activity (e.g. Dickinson 1986). When computers are present, the classroom culture becomes more cooperative and collaborative (e.g. Herrmann 1985). However, whether the use of computers does indeed decentre authority in the

classroom and encourage writers to see their work as social and collaborative is not axiomatic. The fact that the use of the technology has the potential to lead to these practices does not mean that it will. Research suggests that the tool does not function as an independent variable impacting on students and teachers. Rather it becomes part of the social practices of the particular classroom. So if the teacher sees value in collaborative work then computers have the capacity to facilitate such learning patterns.

We know that when computers are introduced, students respond positively to their use (e.g. Bridwell, Sirc & Brooke 1985). Moreover, teachers' attitudes are changing: apprehension and trepidation are being replaced with enthusiasm (Selfe 1985). (For a more comprehensive overview of the focuses and findings of the computer writing literature, see Snyder (1992b).)

My own study (Snyder 1990, 1992a, 1992c) confirmed a number of these findings: the importance of effective teaching of writing when computers are used, positive attitudes in students composing with the writing tool, and the development of a more cooperative and collaborative classroom atmosphere. The finding most pertinent in the context of this paper was that the group of Year 8 students, who used computers for writing over a school year, produced argumentative and expository texts judged to be of higher quality than those produced by a similar group using pens. The study found that word processors are particularly useful for improving the quality, assessed globally, of the two text types with which junior secondary students are less familiar, less confident and less competent, but which are influential in determining success at school. Indeed, research on students' writing skills suggests that competence in the construction of reasoned cases for and against issues lags far behind levels of competence in other kinds of writing such as narrative (Freedman & Pringle 1988). Yet as students progress through the school system, demands for higher-order thinking, the ability to synthesise, conceptualise, abstract, the kinds of thought processes which in schools are associated more with argumentative and expository writing than, for example, narrative, increase. My study highlighted that the computers were useful for the text types which become increasingly more important at senior levels, and of course, in many post school writing contexts. The study demonstrated that students can be given the opportunity much earlier than the final years of secondary school to learn the linguistic choices associated with the production of certain text types, in particular argument and exposition. Moreover, students may be assisted in this endeavour by the use of computers. Thus the findings strongly suggest that the combined effects of computers, together with access to those text types "which convey more power than others" (Kress 1986, p.43), challenge schools to review patterns of school success and failure. This is even more relevant in schools whose students do not come from literate middleclass homes, schools which may have traditionally offered less opportunity for students to develop skills in these critical text types with the assistance of a powerful tool.

It could be argued that the question of which text types are critical to successful school learning is a relative one; it depends, perhaps, on how

and to what ends particular students use them beyond school. Different postschool directions determine the particular literacy skills the student requires. However, if students are familiar with the potentially socially empowering text types, collectively identified as "essay-text literacy" (Gee 1990, p.67), then they have greater opportunity to choose from a range of postschool directions and possibilities. Essay-text literacy, as a post-industrial phenomenon, emphasises a particular syntactic mode and explicitness, namely the common language patterns of the dominant middleclasses. Indeed, there is no access to power in society without control over the social practices in thought, speech and writing of essay-text literacy. And what the findings of my study suggest is that the computer can play a significant role in the process of gaining control of this crucial form of literacy.

A word of caution. At the same time as acknowledging the computer writing tool's potential power, it is important not to present it as a magic bullet which will eradicate all literacy inequalities. Just by giving as many students as possible access to the writing tool does not mean that the desired equality will necessarily result. The computer by itself will never effect cognitive, social or political transformations. Such outcomes are dependent on a more complex interplay of a range of factors, such as the student's gender, ethnicity and socioeconomic status. Nevertheless, providing access is an important step. Moreover, efforts should be made to equalise their distribution and to suggest how they may be used effectively as liberating writing tools.

The national documents and directions in language and literacy policy  
There are currently three national documents dealing with language policy: Australia's Language: the Australian Language and Literacy Policy (1991), the National Statement on English (1991), and The National English Profile (1992). Australia's Language outlines the language and literacy policy and establishes the brief for the Statement and the Profile. The National Statement on English and the National English Profile are being developed by project teams for the Australian Education Council (AEC) and are still in draft form. English teachers have been involved in the developmental process through their professional organisations such as The Victorian Association for the Teaching of English (VATE) and The Australian Association for the Teaching of English (AATE), although there has been time and money for only one round of consultation. Interim versions of these two documents are near completion and it is expected that the final products will be published, after further consultation, in several years time (Brock 1992).

One element common to all three language documents is the broad goal that our schools should aim to produce students who have achieved a functional level of literacy competence which prepares them for work, further education and social life beyond school. Attempts have been made in each document to develop a comprehensive definition of literacy, indeed Australia's Language talks about the need for "literacies" (p.35) and argues that there are "different literacies, related to different contexts" (p.35). Although moving in a positive direction, explanations of literacy which emerge from an understanding of the notions of multiple

literacies, essay-text literacy and critical literacy for example, are not fully represented in the three documents directly connected to English curricula.

In Australia's Language (1991), I could locate only one reference to the use of computers for writing:

Literacy development is also influenced by the prevailing technologies. For instance, many people now learn literacy skills through computers and word-processors ... A critical awareness and use of these developments will form an essential part of literacy programs. (pp.36-7)

It represents a recognition of the role computers may play in the development of literacy skills. The importance attributed to "critical awareness" and "use" of the electronic writing technology is certainly promising. But if the National Statement (1991) and the National Profile (1992) are supposed to reflect the directions identified in Australia's Language, then this objective has not been achieved.

The purpose of the National Statement is:

... to provide a framework around which systems and schools may build their English curriculum programs and syllabi by identifying important components of an English education for the majority of students regardless of their gender, cultural background, socio-economic background, geographic location or physical abilities. (p.1)

The identification of computer writing as an important component of an English education for all students is largely absent. The document does acknowledge that a written text may be produced on a computer (p.5). When the document talks about how we make meaning with language and gain power and are able to read the culture, it does not point out that the computer can be used in these processes as a facilitating tool (p.8). In the discussion of strategies for composing and comprehending (p.11), reference is made to prewriting, writing and postwriting as integral to the writing process, yet no mention is made about the usefulness of the electronic tool in the realisation of these stages of writing. However, when the discussion moves to "presenting writing" (p.11) and "preparing layout or format" (p. 11), it is possible that the reader will make a connection with the potential role of computers in these processes even though explicit reference is not made. What may be inferred by some readers in these references to layout is the understanding that the main advantage of computer writing technology is in presentation. The emphasis, however, would be more appropriately placed on the direct implications the writing tool has for the facilitation of composing and the making of meaning. In avoiding the significant role the computer may assume, the document trivialises the value of the tool, and the reader is liable to think that computers are not important for composing.

The only direct reference to computers is:

Students will learn how to produce and respond to texts using a variety of media such as pen and paper, print, and computers and video. (p.12)

A number of questions can be asked about this statement. Are computers seen as such a commonplace technology that there is no need to identify their advantages in more detail? Are the rich possibilities that computers offer writers simply not recognised? Or rather, does the statement obscure a political agenda related directly to resourcing: if the benefits of computer writing technology are given too much prominence, then the government will be responsible for providing the funds, and in time of economic crisis in particular, this is unrealistic.

Mention is made several times of the importance of developing students' keyboarding skills (e.g. pp. 12, 28, 132) and to the features that computers offer in terms of presentation:

... layout of texts and various forms of print enhancements in published texts: font type and size, bold, italic and underlined characters, spacing. (p. 132)

Again, this seems to be an unbalanced emphasis: it focuses on the desktop publishing aspects of the use of computers but fails to acknowledge their potential to enhance students' writing skills. But if we follow through the speculation that lack of resources is the driving force determining just what is said about the use of computers for writing, then the emphasis seems logical: it could be argued convincingly that no more than one computer and printer per classroom is required to achieve this publishing function of producing a professional looking product.

When the National English Profile (1992) details the criteria to be used to evaluate students' writing performance, it makes no mention of students as electronic writers. Yet all of the facets of writing detailed in this document could be facilitated by the use of computers. As with the National Statement, there is a lack of clarity in regard to the role of computers. When reference is made to spellcheckers (p.35), it would seem that the use of computers is implied, yet no direct mention is made. It is an assumption implicit in this document that some students will be using computers for writing; it is not made clear.

As with the National Statement, in the National English Profile the computer is primarily depicted as a publishing tool encouraging students to use "word processors when necessary to present work clearly and authoritatively" (p.72). The inference is that the use of a word processor gives writing authority because it is printed. Is the implication that tidiness should be the main goal? Or does a neat appearance camouflage an absence of critical thinking? The document does not acknowledge the computer's potential as a powerful writing tool. Only at one point is the computer seen as a tool with the facility to improve sequence and coherence (p.73).

Overall it seems that the seeds are there for understanding the tool's power, but full recognition and articulation of the contribution it can make is not present. Indeed, the documents do not indicate the central role writing, and specifically writing with computers, might play in literacy education: writing with computers could assume a significant part in moving students toward a broader-based literacy oriented toward critical thinking,

analysis and lifelong learning.

Policy documents on post-compulsory education

Even more alarming than the inadequacies of the documents dealing with language and literacy policy is the approach to literacy in "the vocational quadrella" (Stephens 1992, p.50) of post-compulsory education: the Finn Review (1991), and the Mayer (1992), Deveson (1992) and Carmichael (1992) reports. Literacy is understood in these documents to be a series of discrete skills, which begins with basic literacy and which can be sorted into various levels of difficulty. Such a model of literacy may meet the administrative requirements of skills formation in the labour market but it does not take into account the ways in which both children and adults become literate (Farrell 1992).

A more expansive notion of literacy explains it as a way of thinking in a variety of academic and social contexts. Indeed, literacy is never reducible to skills alone; literacy is central to students' lives (Lankshear & Lawler 1987). Students must have abilities in problem-solving, analysis, information management, and social cooperation, all of which add up to a definition of literacy that is dynamic rather than static, and which is directed towards the achievement of a way of looking at the world in which a critical perspective is central. The danger of the limited definition of literacy espoused in these documents is that literacy teaching is directly affected: competency-based training to achieve a functional literacy becomes the dominant pedagogy.

The potential role of computers as a writing tool which enhances composing is not directly acknowledged in these documents. However, the implications for their use may be inferred. The likelihood is that computer writing will be promoted as a basic skill or competency that students should acquire as part of their learning about technology and computing. The computer's possibilities for enriching the writing and thinking of students may not be exploited.

The failure of these four documents to give prominence to the importance of a broader understanding of literacy, which takes into account notions of multiple literacies, essay-text literacy and critical literacy, is disturbing. It is disturbing as it is rapidly becoming clear that these documents are well placed to determine the educational agenda for the rest of the decade. Indeed, Brian Finn of the Finn Review, the Managing Director of IBM in Australia, has recently been appointed to chair the Australian National Training Authority "which will oversee the States' technical and further education systems from 1994" (Bita 1992, p.24). The plan for the 1990s is a future for Australia in which education, training and employment all contribute to national economic and social growth. The articulation between the three sectors will be designed to ensure that all contribute to Australia's competitiveness and "to strive for world best practice" (Stephens 1992, p.50).

Thus literacy is increasingly defined and debated in public discourse by those whose interest and experience is in industry and whose pedagogies are drawn from training experience (Farrell 1992). The chairpersons and members of the committees which developed the Finn Review (1991), the Carmichael Report (1992), the Deveson Report (1992) and the Mayer Report (1992) bear

testimony to this observation: many of them are key players in the corporate and industrial sectors. The real fear for language and literacy teachers is that a functional skills-based discourse is the one achieving currency with governments.

#### Making the connections

Microcomputers have been part of Australian classrooms for over a decade, yet access to and use of the technology remains inequitable. Although the use of computers could be instrumental in implementing improved practices of teaching and learning writing, this has not been the reality. As the number of diverse learners grows, teachers and researchers are challenged to develop new pedagogies and practices to meet all learners' needs. The challenge is to find ways to incorporate computer writing approaches to the teaching of writing in a way that provides equity of opportunity for all students regardless of socioeconomic status, gender or ethnicity.

We must take heed of Kramarae's (1988) warning that while the "new technologies may promise additional competencies and control for those who organise the systems ... they may be used for further exploitation of those who don't" (p.10). For it seems, to express it bluntly, that technology bestows power on those who acquire expertise, or rather on those who have the opportunity to acquire expertise.

Making connections between literacy and computers is essential if our aim is to provide students with more equal access to the social practices associated in society with power and mobility. Otherwise what we will continue to see is the use of the electronic writing technology to accord power and privilege to some while others are excluded. As early as 1982, in his book, *Micro Invaders*, Reinecke cautioned that we have to understand the electronic revolution so that we can make the benefits of the new technology available to everyone. He concludes the book with the warning: "If there is a central core to the objection about how technology is being introduced, it is that never before have so many resources been devoted to creating such inequality" (p.260).

One way in which we may move towards greater equity of opportunity is through the articulation and implementation of policy which can be measured against standards of justice. As Secada (1989) explains:

Equity gauges the results of actions directly against standards of justice, and it is used to decide whether or not what is being done is just. Educational equity, therefore, should be construed as a check on the justice of specific actions, that are carried out within the educational arena and the arrangements that result from these actions. (pp.60-61)

The implication for policy makers is to make sure that language policy documents recognise and promote realistically the value of the use of computer writing technology. It means that efforts have to be made by governments to make available the necessary resources so that the technology may be distributed to all students especially those for whom until now access has been nonexistent or limited.

The documents concerned with post-secondary education and training present the use of computers for writing as just one more skill or competency to be

acquired. The documents dealing with language and literacy policy give no more than scant attention to the development of critical literacy and to the use of a writing tool which may facilitate the process. There is little recognition of the significant role computers can play in teaching and learning and in enhancing literacy skills. When the documents recognise any potential value the computer may offer writers, it is most often as a publishing tool. Even though the importance of the development of students' keyboarding skills is emphasised, it is merely so they may exploit the computer's publishing facilities.

There are several possible readings of this guarded and minimal acknowledgement of the value of the technology. It may be that the members of the project teams writing the documents are largely unaware of the computer's benefits to student writers. If this is the case, and I doubt it, they have also failed to heed the arguments for its inclusion submitted by professional groups, such as the Curriculum Committee of VATE of which I am a member, during the consultation period. I think a more likely reading is that its omission is deliberate; it represents a Realpolitik decision by a government which is motivated to find ways to cut spending rather than make a major commitment to increase it. If the value of the technology is showcased in policy documents, then the government will be obliged to fund the provision of the hardware and the software to schools. In a nutshell, it is a resourcing issue.

If this speculation is close to the truth, and if as teachers we continue to aim to enhance students' abilities to be active and critical participants of a literate culture assisted by a powerful writing tool, what can we do? We can lobby ministers about the value of more equitable distribution of the technology with the hope that as we begin to emerge from the recession more money for government provision of computers for writing will become available. Perhaps the major computer companies should be persuaded to invest further in schools, or perhaps other parts of the corporate sector should be encouraged to fund the purchase of hardware and software. However, it is disheartening to imagine a future of computer resourcing for schools determined by promotional exercises such as the collection of supermarket docketts to "win" computer facilities. And if we think about which parents are most likely to mobilise to collect the docketts, the answer is probably those from the middleclass, so that the entire enterprise may serve to increase privilege rather than to dissipate it. Another possible direction is to follow the British example and, through research projects, identify effective ways to maximise limited resources, mainly through collaborative learning with computers.

It is clear that if our schools are to become institutions that provide opportunities for all students to achieve a level of literacy in its most expansive definition, then we cannot as a nation afford a Luddite evasion of a technology which other nations have already made central. Computer writing technology can no longer be ignored; it is integral to students' literacy development. The challenge is to find ways in which to ensure equity of access for all learners to the writing tool's potential power.

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October 26, 1992

Dr Colin Marsh  
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Dear Dr Marsh,

I would like to submit an article for publication in Curriculum Perspectives. It's called:

Making the connections: computers and literacy

I think that it could be included in either the Articles section or the Instances section. I did not prepare an abstract as it did not appear to be required. If it is, please let me know.

I've enclosed the master copy and two duplicates.

I look forward to hearing from you soon.

Yours sincerely,

Ilana Snyder