This report presents the findings of a survey of language and literacy teachers in the Adult Migrant Education Program, whose work increasingly involves computing. It approaches educational computing as a social issue as well as a technical or a technological issue. Reflecting a literary perspective, it sees the focus of educational computing not on the computer, but on the texts that are mediated by the computer, and at the practices surrounding those texts.

The report is of particular significance for those with responsibility for the planning and provision of resources and training for the Adult Migrant English Program. Program providers and teachers will be able to judge their levels of competence in the context of the report's findings and plan local and state responses. On a broader scale, the report should be of interest to anyone concerned with the practical implications of the increasing convergence of work, technology and education.

Other titles in the series are:
1. Language Audits and Industry Restructuring
   Giselle Mawer, 1991
2. Computer-enhanced Language Assessment
   Chris Corbel, 1993
3. Teachers Interactive Decision Making
   David Nunan, 1993
4. Learner Pathways in the Adult Migrant English Program
   Lilli Lipa, 1993
5. Non-language Outcomes in the Adult Migrant English Program
   Elaine Jackson, 1994
6. From Proficiency to Competencies: A Collaborative Approach to Curriculum Innovation
   Youle Bottomley, Jeanette Dalton and Chris Corbel, 1994
7. The Process Syllabus in Action
   Diana Simmons and Sylvia Wheeler, 1995

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The Computing Practices
of Language and
Literacy Teachers

Chris Corbel
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Executive summary

This project describes current computing practices of teachers in the Adult Migrant English Program and outlines the policies and practices needed to meet emerging educational computing needs.

The computing practices of language and literacy teachers have until now focused on two main areas — the use of computers to teach language (CALL), and as a tool for both teacher and learner use. Teachers have not only had to learn how to use the computer to mediate texts, but have had to teach others as well. Now the convergence of tasks, roles and media is introducing a third area of educational computing, ‘information competence’ or ‘online literacy’. As with CALL and word processing at present, teachers from now on will have to learn how to use and learn how to teach these new competencies/literacies. At the same time, there is a continually-developing multimedia capacity in all three areas — computer assisted (language) learning, computer as office tool, and now computer as networked communications medium — which ensures a continuing demand for learning in even supposedly familiar areas.

The results of this survey suggest that in general, teachers in the AMEP are well-positioned in skills and attitude to meet this challenge. Work, learning and technology are converging into a way of living and learning that these teachers are already successfully undertaking. However, although many teachers have, or are gaining, the necessary competence, not all have the confidence to put it into practice. The fact that these skills do exist or are being acquired needs to be publicised in order to prevent the positioning of teachers as impediments to a technological solution. With appropriate support in policy and budgeting terms, AMEP teachers will continue to demonstrate and extend the skills of lifelong learning they are teaching to their students.
Recommendations

1. The AMEP should adopt the NBEET objective to train all staff in the AMEP to the level of enhanced tool skills user, to train more than 50% to the knowledge tool skill cluster and to train more than 3% to the innovative/creative tool skills cluster by the year 2000.

2. The AMEP should continue to support the identification of educational computing competencies and their development into training modules through its research and development projects.

3. The AMEP should specify educational computing as central to its programs for NESB learners.

4. The AMEP should support the conversion of training modules in information competence for staff (Recommendation 2) into information and training materials for language learners.

5. AMEP providers should be required to have a policy on educational computing. These policies be communicated to staff and be consistent with AMEP policy. Priorities for educational computing be established in the Annual Operational Plan.

6. NCELTR should ensure that AMEP providers are informed of the issues in educational computing policy.

7. Educational computing policies should be developed and funded at local level.

8. Teacher access to computers should be maximised through timetabling, the availability of notebook computers for borrowing, and other forms of support that acknowledge that for many teachers educational computing takes place outside the worksite.

9. The time for teachers to develop educational computing competence should be maximised through an acknowledgment of the ever greater demands on teachers’ time from a range of sources, and that teachers be allowed a greater degree of control over how they use their time in meeting these demands.

10. AMEP providers should develop hardware and upgrade policies that meet the increasing demands on educational computing.

11. AMEP provider budgets should have formal lines for educational computing with identified percentages for hardware, software and training.

12. DIMA, in conjunction with other relevant agencies, should support the development of formal training materials for Information Competency, based on fully-developed descriptions of information competency. Such materials should be in modular form for flexible delivery. Courses based on such materials should be accredited. Initiatives begun in 1995, and continuing in 1996 through NCELTR research and training programs, should be the basis of this development.

13. A range of informal learning modes should be supported by providers, and the role of informal mediators of computing practices be acknowledged and supported.

14. Local teaching sites should have an appropriately trained and supported Educational Computing Teacher.
Chapter 1

Introduction

This report presents the findings of a survey of a group of professionals, language and literacy teachers, whose work increasingly involves computing. Their involvement is of two main types — as part of teaching itself, and as part of the surrounding work context in which their teaching takes place. It exemplifies the convergence of technology, work and learning characteristic of the ‘knowledge society’ (National Board of Education and Training 1995).

The report approaches educational computing as a social issue as well as a technical or a technological issue. Reflecting a literacy perspective, it sees the focus of educational computing not on the computer, but on the texts that are mediated by the computer, and at the practices surrounding those texts. This reflects an emerging shift away from ‘the notion of literacy as a set of skills with identifiable consequences’ towards the view ‘that literacy can only be understood in the context of the social practices in which it is acquired and used.’ (Barton 1994:24). As Scribner and Cole put it:

Instead of focusing exclusively on the technology of a writing system and its reputed consequences...we approach literacy as a set of socially organised practices which make use of a symbol system and a technology for producing and disseminating it.

(Quoted in Barton 1994: 24–5)

This project is concerned with teachers’ socially organised practices and thus it looks at teachers’ educational computing practices as literacy practices. Seeing literacy as social practice shows the significance of the people, the settings, and the relationships, as well as the hardware and software involved, in the development of teachers’ ability to work with print texts as well as computer-mediated texts. This view goes beyond a simple description of what happens, however. As Baynham observes:

Investigating literacy as practice involves investigating literacy as ‘concrete human activity’, not just what people do with literacy, but also what they make of what they do, the values they place on it and the ideologies that surround it.

(1995:1)

The report begins by describing the work environment of language and literacy teachers, in which, as for many others, there is an increasing convergence of computer-mediated tasks and roles. It presents a perspective of educational computing as the development of literacies, and presents a view of electronic texts as products, processes and practices. The report summarises previous studies of teachers’ computing practices, and presents an analysis of the findings of a large-scale survey of language and literacy teachers in the Commonwealth Government of Australia’s Adult Migrant English Program.
The report concludes that there is strong low-level computing competency among a good proportion of the teachers surveyed, and that, with appropriate policy and funding, they and the Adult Migrant English Program are potentially well positioned to meet the emerging demands of networked computer mediated communication.

The report is of particular significance for those with responsibility for the planning and provision of resources and training for the Adult Migrant English Program. Program providers and teachers will be able to judge their levels of competence in the context of the report’s findings and plan local and state responses. On a broader scale, the report should be of interest to anyone concerned with the practical implications of the increasing convergence of work, technology and education.
Chapter 2

Background

Aims and outcomes of the project

The National Centre for English Language Teaching and Research (NCELTR) has responsibility for providing assistance in professional development to state and territory level providers of the Commonwealth Department of Immigration and Multicultural Affairs’ Adult Migrant English Program (AMEP). The AMEP is the largest government-funded adult English language teaching program in the world. It is federally funded and coordinated by the Department of Immigration and Multicultural Affairs (DIMA). In 1995 there were some 64,261 enrolments at more than 250 language teaching venues around the country, run by state Adult Migrant English Services, TAFE colleges and independent providers.

With an awareness of increasing demands for computer use among teachers in the AMEP, NCELTR needed an accurate picture of the demands on teachers for computer use, and how the training to meet these demands was being carried out. The present project was set up to gather and present this information. NCELTR’s investigation is extremely timely, given the recent call by the Employment and Skills Formation Council of the National Board of Employment Education and Training for a focus on ‘the identification of skills and attributes required by the workforce as a result of the growth in converging technologies’ (1995: iii), as well as an analysis of the current situation of technology use in educational sectors.

The project goals were to:

• describe the current computing practices of teachers in the AMEP
• identify needs for new skills and practices
• plan training to meet the needs in the areas of current and emerging computing practices of language and literacy staff in the AMEP.

The outcomes were to be:

• a statement of educational computing competencies,
• an indication of competency levels among AMEP staff
• specifications for training to meet needs.

The full project brief is in Appendix 1.
Converging technology, work and learning —
a text-based view

The Computing Practices Project has adopted a text-based view of educational computing, which takes as its starting point the fact that all texts are mediated in some way or other, that is, they are created with and exist in some form of medium (or more colloquially, media). We are all familiar with print-mediated texts, that is, texts which are presented in the medium of print. This project seeks to identify the implications of the computer-mediation of texts, that is, texts which are presented, either in their final form or during their development, on a computer screen. Before addressing this issue, however, we need to consider the broader issue of the computer-mediation of work generally.

The computer-mediation of work

The computer-mediation of work is now a fact of life for most professionals. Although much of life is computer-mediated in the sense that many of our day to day activities involve digital processing of information, such as when we buy things at the supermarket, our concern here is with workers who work overtly with computers; those who actually sit down at a keyboard and work with computer-mediated texts.

Work that is mediated by computers involves electronic texts. Sometimes the electronic text represents a stage in the development of a printed text, such as in word processing. In others it is the final stage of development, such as in Computer Assisted Instruction (CAI). Many texts nowadays are digital at some stage in their existence. That is, they are composed not of atoms, as is a printed text, but of bits — tiny electronic signals. As more and more types of information become digitised, the media that carry them are converging into a seamless blend of sound, image and text called multimedia.

As media converge so too do the tasks involved in their creation, and the tools with which the tasks are carried out. There is integration of tools for different stages of information collection, storage and presentation. Computer applications that in the past were sold separately now come bundled together, usually with a common 'look and feel'. Roles are converging too, with tasks previously carried out by specialist staff, such as typing and layout, now being done by the same person. In a broader sense convergence is taking place between various telecommunications services, such as telephones and television, and computers, leading to the revolution in the nature and movement of texts often called the Information Superhighway.

The increased use of computer networks and multimedia puts increased demands on users. However, people vary greatly in their competence in dealing with electronic texts. This is significant when we realise how closely individuals' economic security, career success and academic progress are tied to an ability to master computer-based work. Even among professionals who are already skilled writers there are many who are not really working at the full capacity and potential of the computer tools they are using. Our informal observations revealed little use of such word processing features as styles and outlines, for example.
The work of language and literacy teachers

The project was based on three assumptions that reflect the current state of play in language and literacy education for adults in Australia.

The increasing computer-mediation of work means that it is no longer a question of whether we should use computers in education. There is no longer an option. The questions to be answered are how, when and where we should be using them, what the roles should be and who should be engaged in those roles.

Computing in language and literacy teaching is not just about Computer-Assisted Language Learning (CALL). The term educational computing was chosen deliberately to reflect this. Educational computing encompasses three main areas of application:

- Computer Assisted Language Learning (CALL)
- the use of computers as a tool in everyday work (eg word processing)
- the emerging forms of communication and textual practices based on computer networks such as the Internet.

The critical element in all of this is the teachers — their competence, confidence and concerns — and not the computing hardware or software. The survey thus treats educational computing as a fact of professional life for teachers, and seeks to find out how this aspect of their professional lives can be supported and enhanced.

Why not ‘computer literacy’?

The project was initially conceptualised as being about the ‘computer literacy’ of language and literacy teachers. This concept was rejected as representing an increasingly outdated view of literacy as being something that one either does or doesn’t have. Almost everybody in Australian society uses computer-mediated electronic texts, either directly or indirectly. What varies is their skills and confidence in their use. Teachers’ use of computers is embedded in a range of other social activities, often involving print texts. The preparation of a worksheet, for example, may involve formal print texts such as curriculum guidelines, as well as informal handwritten notes. The worksheets may subsequently be collected and stored for use by other teachers. The project has looked at teachers’ computing practices from the point of view of their repertoire of literacies with electronic as well as print texts. The survey is thus not simply about CALL, nor is it about a simplistic notion of ‘computer literacy’. It seeks to situate teachers’ work broadly and socially. As Negroponte observes, ‘Computing isn’t about computers any more. It’s about living.’ (1995:9)

Others have used different terms in referring to these issues. The National Board of Employment Education and Training (NBEET) uses the term ‘information competence’ to describe the needs of teachers and learners in dealing with computer mediated texts:

‘An undoubtedly advantage of information technology is the rapid discovery of all information in digital form and the potential to use, evaluate and transform
that information. Some describe this skill as ‘information literacy’. The Council prefers the term ‘information competence’.

Information competence is a natural extension and elaboration of the key competencies and is an important way of broadening and deepening the idea of computer literacy.

Developers of curricula, training programs, courses and community learning programs need to incorporate identified generic skills which enhance technological understanding, knowledge and skills’ (1995:xxv)

The NBEET report conflates terms such as skill, literacy and competence, all of which seem to be used interchangeably. However, whether we use terms like information competence or online literacy is simply a reflection of our starting points; the issues remain basically the same.

**Current practices and new practices**

The primary goal of the project was to identify current educational computing practices. These would provide the basis for identifying the competencies of individuals, and providing training for their achievement by others. A secondary goal was to identify new practices, processes, skills, or strategies that might be needed by teachers as they work with electronic texts in an increasingly convergent, online (computer-mediated, networked) workplace. If these could be identified, they might also form the basis of subsequent training.

**Current computing practices**

*Surveys of computing practices of ESL and adult literacy teachers*

There have been a number of examinations of the computing practices of language and literacy teachers prior to the current survey. They vary from sensationalist media reports to rigorous studies. A recent article from the media, for example, headed *Illiterate teachers block superhighway*, positions teachers as having a low level of computer literacy on the basis of an unsourced survey, and blames them for this state of affairs (McIntosh 1995). On a more positive note, AMES Victoria has developed a set of competency statements for all staff based on inservice training courses held from 1992–4. Staff at all centres were mapped against the competencies in April 1995, and relatively high levels of competence recorded.

Several surveys relate directly to the AMEP. Anderton and Nicholson (1995) investigated technological, including computer-mediated, support for synchronous (real-time) interaction at a distance. Simpson (1994) surveyed a small number of AMEP staff on Computer Mediated Communication practices and found very limited use. Corbel (1993) surveyed AMEP locations nationally, with the focus on the potential of Computer Enhanced Language Assessment. The report considered activities, behaviour, practices, beliefs and understandings of respondents. It found interest but limited uptake, due to funding constraints and a lack of policy support. Kaufmann (1992) surveyed AMES
Victoria centres and various other AMEP sites nationally. Her report focuses on literacy teaching, with sections on hardware, uses, software, support and attitudes. It has a strong teaching workplace focus. The report found a need for training and specialist support.

In the context of adult basic education, Anderson et al (1990) provide an optimistic, positive and widely quoted survey of administrators, teachers and learners (but see Bigum and Green (1993) for a critique of its uncritical acceptance of the technicist assumptions of educational computing. For a general critique of this issue see Bowers (1988)).

An early statement of the kinds of competencies language teachers need appears in Taylor (1989), which focuses on the preparation of new teachers. Also from this earlier era is the work of Levy and Ferrugia (1988), which surveyed teachers at Footscray TAFE on use, placement and value of a range of CALL programs. It has a strong software and learner focus. Levy and Ferrugia found that the role of the teacher was crucial, even in self-access work.

**Surveys of studies of teachers’ computing practices**

Surveys of teachers other than language and literacy teachers include Sudzina (1993), which summarises trends in educational computing research, and calls for a central role for technology in teacher training; Hannafin and Savanye (1993), which focuses on teachers’ resistance to new roles with educational computing; Cuban (1993), which presents likely and desirable scenarios for the United States; Aston and Fakharo (1992), which focuses on teacher training in Arab countries; Plomp, Pelgrum, and Steerneman (1990), which found limited integration of educational computing into Dutch schools; and Pelgrum (1992), which surveys international trends. What is noticeable in these surveys is a general move towards looking at teachers rather than technology as a significant factor in the uptake of educational computing.

**Case studies of teachers’ computing practices**

Of the many case studies of computer literacy, and computers and change available, several have particular relevance to this project. Durrant and Hargreaves (1995) surveyed English teachers across Australia concerning computing attitudes, anxieties, policies and practices. The survey has a strong focus on individual teachers. It provides a relevant comparative group for AMEP teachers, since English teachers in schools are also concerned to some extent with language and literacy teaching. They found that:

> computers are being used by a large proportion of respondents mainly in lesson preparation and in word processing and desktop publishing in the classroom... While there seems to be a reluctance by users to dabble in some of the more sophisticated applications of computers such as interactive programs, multimedia, email, and the World Wide Web, there are some respondents engaging in these activities.

(1995:48)

Singh (1995) explores the social construction and reconstruction of computing discourses in relation to educational discourses of evaluation and transmission.
Kay (1993) presents a ‘practical research tool for assessing ability to use computers, which combines four subscales — software ability, computer awareness, programming skills, and perceived control.

Standish (1993) focuses on a school district and emphasises the significance of staff development. The paper includes a survey instrument and detailed training plan. Cicchelli and Baecher (1990) used Hall’s Stages of Concern, which are intended to reflect the relationship of individuals to innovations, and which are also used with the same group of teachers as in the current survey by Bottomley, Dalton and Corbel (1994), who describe the introduction of a competency-based curriculum in AMES Victoria in 1993. The use of the Stages of Concern model in the current survey enables comparisons to be made with a similar group of teachers. As with the previous group of studies, the role of teacher preparation was significant.

**New computing practices**

The second strand of the project looked at new computing practices. What knowledge, skills and strategies are called for in the convergent, digital, computer-mediated workplace? From a literacy perspective the issue is how users expand their repertoire of print-based literacies to include the use of electronic texts.

There are three broad ways of looking at texts, whether print or electronic — as products or objects; as emerging from and being used in processes; and as integrated into social practices. In this section we look at computer-mediated electronic texts (etexts) from each of these perspectives.

**New textual products — ‘etexts’**

Although there is relatively little work directly addressing the relationship between print and electronic texts, much of the work on related areas is useful. Studies of hypertext (computer-based non-linear texts, which are linked in ways different to print, such as Help screens) are relevant, particularly if we see all electronic texts as being hypertextual to some degree (Whalley 1993). Collaborative writing studies are indirectly relevant, although some work on writing environments focuses on specially constructed environments rather than what the average computer user may have. As we saw earlier, standard desktop applications are converging, and contain features that in the past had to be created or at best added on. At the same time, some of the work directly addressing the nature of electronic texts is based on electronic textual environments (text rather than graphics-based, stand-alone rather than networked) that are no longer standard. At a broader level, it is not always easy to disentangle the influence of the artefact (the computer), the genre of the text (print based ones such as reports and novels, and electronic ones such as hypertexts of various kinds), and the implications of the fact that the text is in electronic form.

Of the works surveyed, Bernhardt (1993) lent itself most readily to the development of a framework that would enable the issues raised in all the other works to be included. From Bernhardt the following ‘dimensions of
variation’ between print texts and electronic texts were abstracted, and sub-categories added that captured the points raised by Bernhardt and other writers relating to these dimensions.

Dimensions of variation between print and electronic texts:

- Embeddedness
- Interactivity
- Functionality
- Modularity
- Inter(hyper)textuality
- Navigability
- Spaciousness
- Visuality

These are presented in full in Appendix 2.

**New textual processes — computing as a second language**

The term *grammars* (or formats) has been used to describe the standard rules governing ‘such things as arrangement, structure, format and appearance of text’ (Selfe 1989:5). The term covers many of the features identified as dimensions of variation between print and electronic texts. Skilled users of print texts have knowledge of the grammar of such texts and strategies for negotiating meaning based on textual clues. What form would such knowledge and strategies take in the electronic textual environment? How transferable are existing skills likely to be?

Bernhardt suggests there will be a need for new strategies with electronic texts.

> On-screen text … borrows heavily on the evolved strategies readers possess for interacting with printed texts, but provides a more fluid, changeable medium, so that the text itself becomes an object for manipulation and change. As texts change, we will develop new strategies for reading and writing … It will feel natural to move through large pools of information, and we will rely on learned strategies for knowing where we are, where we want to go, and what we want to do when we get there. We will develop new sorts of reading skills, ones based around text that is modular, layered, hierarchical and loosely associative. We will demand control over text — over its display, its structure, and its publication.

(1993:173)

Not just strategies, but ‘stages’ of the writing process may change as well. Cochran-Smith, Paris and Kahn suggest:

> … the possibility that, with word processing, stages and strategies commonly associated as parts of composing are not so distinct as they may be when writers use paper and pencil.

(1991:44)
Selfe supports the view that new strategies will be necessary, and that new literacies will need to emerge.

*Computers add several new grammars to the lists of things individuals must learn before they become successfully literate in a computer-supported communication environment ... These grammars are layered over and have a substantial impact on the tasks of reading and writing.*

(1989:6)

The process of layering literacy, stacking in effect one grammar on top of another, has a profound impact in that individuals making the transition from page text to screen text must change the ways they read, write and make meaning from written text.

(1989:8)

Anderson-Inman, Horney, Chen and Lewin suggest ‘that hypertext literacy involves three types of skills: traditional reading skills, computer skills, and hypertext reading skills’ (1994:285). They call for attention to be given to developing hypertext literacy skills as well as improving hypertext design.

One implication of acknowledging the embeddedness of textual practices in social contexts is that we cannot assume that literacies are easily transferable from one setting to another. On the one hand we know that those already skilled in writing tend to use word processing more effectively (Cochran-Smith, Paris and Kahn 1991). Grow (1988) found the transfer of poor writing practices as well from print to electronic texts among ‘professionals whose work requires them to write’ (as opposed to professional writers).

However:

... most people speak computers as a second language. If we carry this analogy even further, we can predict that some level of interference will be present for (individuals over the age of seven) as they supplement their print literacy with the literacy conventions associated with computers.

(Selfe 1989:8)

The concept of Computing as a Second Language is a relevant one for language and literacy teachers of English as a Second Language.

As Bernhardt observes:

*A reader can come to a book with highly evolved strategies for getting information from print, but users of computer systems are often handicapped by not having useful, productive strategies for approaching computer-based text.*

(1993:165)

To summarise, it seemed reasonable to assume that users are dealing with the demands of new texts by transferring existing skills to the computer, but that this will only be effective insofar as they are consistent with the characteristics of the new environment.
New textual practices

Literacy studies are not just about individuals and the cognitive processes associated with reading and writing. A full understanding of literacy calls for an understanding of the social context of textual use, in particular the following (based on Baynham 1995):

- Literacy practices — the texts that are used by different social groups, how they are used, how they are perceived and valued
- Literacy events — the times, places and context in which texts are used — what they are, who is involved, how other texts are involved
- Literacy mediators — the significant other people who help individuals with texts at different times and in different ways — who they are, how are they supported
- Networks — the web of mediators — who is in them, their roles
- Domains — the broad aspects of social and private life where texts are used — where and when, virtual and real

In this survey we have been particularly interested in seeing how these concepts can help to describe teachers’ educational computing. Having discussed educational computing as a literacy product, process and practice, we now turn to an examination of the last of these in more detail.
Chapter 3

Analysis of computing practices

Methodology

Mercer and Scrimshaw (1993) identify at least five data gathering methodologies for researching the electronic classroom, each with its distinctive strengths and weaknesses. They are experimental research, questionnaire-based surveys, teachers’ accounts, quantitative studies, or combinations of these. For this project a questionnaire-based survey seemed appropriate. While acknowledging Mercer and Scrimshaw’s concerns about this approach — that responses are either restrained or too open to interpretation and that there is potential for prejudgment of what issues are important — it was hoped to address these to some extent by trialing the questionnaire before it was widely used. However, the deciding factor was that the methodology was most consistent with the project’s aims. ‘Perhaps (questionnaires)’ most useful contribution is in policy guidance where the policy maker has a responsibility for the whole class of people or institutions sampled in the survey.’ (Mercer and Scrimshaw 1993:187-8)

The survey questions (see Appendix 3) were based on the instruments used in the earlier surveys listed above, to enable comparisons to be made if appropriate. The survey questions reflect the assumptions listed earlier about the prominence of the teachers and their perceived tasks and support. Thus there are questions intended to build up user profiles, but there are no technical questions. There is a focus on people’s knowledge, perceptions and understandings of policy, planning, implementation, support, influence of computing on teaching, and the ability to influence any of these aspects of educational computing. Respondents had to use their own words in many cases.

The surveys were sent to AMEP providers in Victoria, New South Wales, South Australia, Queensland and Tasmania. One person in each state was identified as being responsible for their distribution and collection. In all states, responses were sought from a wide range of users representing beginning and experienced teachers at a range of different centres and from a range of different learning activities. In Victoria, copies were sent to all 20 teaching centres, and each centre’s Educational Computing Representative (a role explained below) sought responses from a range of users at each centre, including both more and less experienced teachers. The process was guided in this way in order to get responses from those who may not otherwise have been inclined to respond to the survey due to their perceived inexperience or lack of interest in computing. Of 100 questionnaires distributed (five at each centre), 87 were returned. In Queensland the survey was distributed to 90
teachers from across the metropolitan area attending a range of professional development activities on one day of a professional development week. Forty five responses were received at the end of the day. In New South Wales, the questionnaire was distributed at three different inservice activities to a total of 60 teachers. One session was for experienced teachers, one was for new teachers, and the third, the only one directly about educational computing, was a CALL workshop for any interested teachers. There were 59 responses. Representing the smaller state programs, there were five responses from Tasmania and four from South Australia.

The questionnaires were summarised question by question for each respondent to allow for detailed analysis according to variables such as location, experience or gender. This also allowed for a detailed comparison with teachers in other sectors, such as is provided by Durrant and Hargreaves (1995). They were coded according to their sites (venue and state).

After the questionnaires had been completed there were focus group meetings in the three largest states. The groups comprised experienced, specialist educational computing staff. The intention of using these groups was to get as wide a range as possible of realistic and informed comments and suggestions.

Findings

The purpose of the survey was to focus on the teachers, irrespective of their location. In the following sections the results of the survey have therefore been combined, without maintaining distinctions between centres and states. In many cases there were substantial variations in responses from site to site and between states. Among the states there is a considerable difference in the approaches taken to educational computing. Those responsible for state and centre decision making need to make their own comparisons with the findings presented here.

Although the response rate was high, not all questions were answered by each respondent. In cases where the response rate is total, or a comparison calls for it, percentages given are of the total potential respondents (188). In other cases percentages given are of the respondents to a particular question. The following section headings are those of the questionnaire.

Profile

Gender

Computing has often been considered an area dominated by men (Durrant and Hargreaves 1995, Pelgrum 1992). However, within ESL teaching there is a high ratio of women to men. For this survey to be representative we would anticipate a correspondingly high proportion of women respondents.

<table>
<thead>
<tr>
<th>Gender</th>
<th>no. of responses</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women</td>
<td>153</td>
<td>81</td>
</tr>
<tr>
<td>Men</td>
<td>35</td>
<td>19</td>
</tr>
</tbody>
</table>

14 The computing practices of language and literacy teachers
These results show a high response rate by women, an appropriate reflection of the high proportion of women in the AMEP.

**Age**

The demographics of the teaching profession in Australia would lead us to expect a high proportion of teachers in the survey to be in mid to late career. If this is the case, they might be less amenable to change and the uptake of new technology.

<table>
<thead>
<tr>
<th>Age</th>
<th>No. of responses</th>
<th>% of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>21–30</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>31–40</td>
<td>49</td>
<td>29</td>
</tr>
<tr>
<td>41–50</td>
<td>87</td>
<td>52</td>
</tr>
<tr>
<td>51–60</td>
<td>30</td>
<td>17</td>
</tr>
<tr>
<td>60+</td>
<td>188</td>
<td></td>
</tr>
</tbody>
</table>

More than half the respondents to this question were in the 41–50 group. This is consistent with the findings of Durrant and Hargreaves (1995), who found the highest number of English teachers in this range as well. The findings that follow do not support the view that teachers in mid or late career are reluctant to change. On the contrary, many of the more positive responses come from people in this category.

**Experience**

Judging by the number of mature age students undertaking TESOL training, it can be assumed that language and literacy teaching is a field which a proportion of teachers enter in mid career. Is the age distribution representative of years in the field?

**Years teaching language and literacy**

<table>
<thead>
<tr>
<th>Yrs experience</th>
<th>Age of respondents</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–5</td>
<td>37</td>
<td>20</td>
</tr>
<tr>
<td>6–10</td>
<td>49</td>
<td>27</td>
</tr>
<tr>
<td>11–15</td>
<td>38</td>
<td>21</td>
</tr>
<tr>
<td>16–20</td>
<td>39</td>
<td>21</td>
</tr>
<tr>
<td>20+</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>183</td>
<td></td>
</tr>
</tbody>
</table>

There is a very even spread of years teaching ESL. This may reflect people entering the field after working in other teaching areas. In contrast Durrant and Hargreaves (1995) found the percentages rose steadily among English teachers in schools.

Educational computing is relatively recent in language and literacy teaching. How much experience have teachers had?
Years using computers in teaching

<table>
<thead>
<tr>
<th>Yrs experience</th>
<th>no. of respondents</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>40</td>
<td>26</td>
</tr>
<tr>
<td>2</td>
<td>36</td>
<td>24</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>5+</td>
<td>32</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>150</td>
<td></td>
</tr>
</tbody>
</table>

With 69% of respondents to this question reporting two or more years, and 21% more than five, this seems to be a reasonably experienced group. Only six said they had no experience. Clearly computers have been part of the working lives of a substantial number of teachers for most of the 1990s, as has been the case with other professionals. However, we do not know the nature and extent of the use, which may vary greatly between individuals.

What training have you had in educational computing?

Formal teacher training courses increasingly offer units and training in educational computing. However, how do teachers in mid-career learn the new skills necessary? Are in-house offerings available? What about more informal forms of learning? What is the role of members of teachers’ networks, within the workplace and within the home, in supporting their learning?

Accredited course | no. of respondents
------------------|--------------------|
Diploma of Education unit | 10
Graduate Diploma unit | 8
University unit | 2
TESOL course subject | 2
TAFE course | 4

26 (14% of all respondents)

Only a small percentage had undertaken formal study.

Non-accredited course/inservice/workshop: 147 (78%) of all respondents reported having attended non-accredited training. The survey did not identify length or nature of courses, so the actual activity may in fact be substantially greater. Most training was internal, with only four external organisations receiving specific mention. Two respondents mentioned training with their centre-based specialist.

Informal contact with other users/self teaching | no. of respondents
------------------------------------------------|-------------------|
Self taught | 67
Colleagues/peers/other users | 57
Home/family | 14
Local rep. | 8
Central rep. | 5
Manual | 7
Reading | 1
Mentor | 1
Yes (unspecified) | 28

188
Formal training as part of a larger course plays little part in the professional development of these teachers. A large proportion have undertaken training of some kind. This is greater than mainstream teachers in Durrant and Hargreaves’ (1995) study, where 66% had attended workshops in the past three years. However, all respondents reported some form of informal learning. Almost all mentioned others assisting in their learning (home, family, friends, peers). The role of these others is significant. In literacy practice terms they are mediators of the respondents’ literacy practices, that is, they assist them with certain electronic texts.

At the same time, the role of self-direction is significant. Individuals have had varying learning options, as we will see below. Many have applied themselves with whatever resources are available, in some cases, with very little institutional support. This suggests that computing is different to other innovations, like changes in content or methodology. How many teachers would have taught themselves the most recent curriculum innovation in their professional lives, for example, the Certificate in Spoken and Written English (see Bottomley, Dalton and Corbel 1994), or been able to call upon an external network for support? Perhaps the credentialing of some of the current in-service offerings would offer an appropriate way of standardising the skills and knowledge.

Have certain staff members been allocated designated roles?

This question was intended to identify proportions of support staff to general staff.

<table>
<thead>
<tr>
<th>Role</th>
<th>no. of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>141</td>
</tr>
<tr>
<td>Support</td>
<td>72</td>
</tr>
</tbody>
</table>

The results are somewhat surprising. Some respondents rated themselves as both user and support, thus total responses are higher than the total number of respondents. What is interesting is that whereas 72 (38%) of respondents said they had a support role, there are in fact very few formal support positions. Apparently many individuals see themselves as having an unofficial support role. In some cases this is acknowledged by the organisation, through time release (see below), but in many cases it is not. This is consistent with surveys of companies in the private sector:

*Studies in Australia and North America show that while most companies manage a support ratio of 1 to 75, the de facto ratio is closer to 1 to 12, as many users help out their work colleagues without management realising they are doing so.*

(Cookes 1995)

Remarkably, in the case of the AMEP the ratio appears to be closer to 1 to 2. From a literacy practices perspective we can again see the significance of the role of literacy mediators, that is, other people who assist in working with texts that may be unfamiliar or difficult.
How would you rate your general skill level in educational computing

The project sought to identify the levels of competency of teachers. This question was expected to indicate individuals’ general sense of confidence in their overall computer use.

<table>
<thead>
<tr>
<th>Skill level</th>
<th>no. of respondents</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Some</td>
<td>65</td>
<td>35</td>
</tr>
<tr>
<td>Reasonable</td>
<td>87</td>
<td>47</td>
</tr>
<tr>
<td>High</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td>Very high</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

187

Sixty percent are in the reasonable and higher categories. Overall this response is very positive, considering common perceptions that those of mature age, and women, are not skilled at computing. All four respondents who rated themselves ‘Very high’ were women aged above 41. In three states no-one rated themselves ‘None’. The distribution was similar in Durrant and Hargreaves’ (1995) survey of English teachers in schools.

Workplace

A number of respondents worked part-time in more than one sector of the AMEP. Therefore numbers in this response are higher than the total number of respondents.

<table>
<thead>
<tr>
<th>Sector of AMEP</th>
<th>no. of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMES</td>
<td>163</td>
</tr>
<tr>
<td>TAFE</td>
<td>31</td>
</tr>
<tr>
<td>Private</td>
<td>12</td>
</tr>
</tbody>
</table>

Number of current learning activities at your workplace?

‘Learning Activities’ refers to the range of formal or informal courses provided. Smaller work sites may have difficulty locating and supporting educational computing, since they may lack extensive resources and space.

<table>
<thead>
<tr>
<th>No. of activities</th>
<th>no. of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5</td>
<td>17</td>
</tr>
<tr>
<td>5–10</td>
<td>33</td>
</tr>
<tr>
<td>10+</td>
<td>106</td>
</tr>
</tbody>
</table>

Most teachers are in medium to large sites.

Location of computers

The degree of integration and nature of use may be indicated by location. One to one use is typical of Independent Learning Centres (ILCs) and libraries. Where specialist computer rooms (‘labs’) exist, class use is possible, which may call for greater integration of content. Location can also indicate who
has control — the micropolitics of educational computing. This is less likely to be an issue in AMESs, which are specialist language and literacy providers, as it is for providers in larger institutions who may have to deal with the ‘traditional’ owners of computers, the science and maths departments.

Pelgrum found that ‘in the majority of schools around the world … computers are located in special computer rooms. However, as one moves down the educational pyramid, there is a clear trend towards placing computers in classrooms rather than the special computer laboratory’ (1992:343). Perhaps the AMEP represents a lateral movement in relation to the pyramid, with a range of locations reflecting concerns in adult education for flexible delivery. Levy and Ferrugia (1988), in their study of adult English language learning, found Self Access Centres (ILCs) to be the most common location of a wide range of programs. On the other hand, Kaufmann’s (1992) survey found that slightly more sites had their computers in a computer room than in the ILC/library.

Individual usage therefore seems to be most common, though it is not necessarily the case that ILC location means only one to one, since classes may use the ILC. In addition, the numbers may be complicated since some respondents gave numbers of computers in the location.

Do you have input into educational computing decisions in your workplace? If so, how?

*Change research indicates that participation in the decision-making process at all levels of an organisation helps develop a clearer understanding of the aims of the implementation and this in turn influences the development of a sense of commitment to the innovation.*

Bottomley, Dalton and Corbel (1994:34)

<table>
<thead>
<tr>
<th>Response</th>
<th>no. of responses</th>
<th>% of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>104</td>
<td>64</td>
</tr>
<tr>
<td>No</td>
<td>58</td>
<td>36</td>
</tr>
</tbody>
</table>

Overall 64% of responses to this question indicated some input, though this does not make clear the nature or the effect of the input. A strong ‘No’ vote was registered in several sites, and a total ‘No’ at one. Unlike the top-down implementation process of the Certificate in Spoken and Written English (Bottomley, Dalton and Corbel 1994), there was a sense at some sites of impatience at the lack of uptake by management (see below). This was in contrast to the experiences of the English teachers reported in Durrant and Hargreaves (1995:43), where ‘close to half of the respondents indicated that one department dominated computer ownership in their schools’.
Is there a policy (formal or informal) on educational computing?

From an educational change perspective, it is important for teachers to know what the official position is on a curriculum innovation.

**At your workplace?**

<table>
<thead>
<tr>
<th>Response</th>
<th>no. of responses</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>102</td>
<td>54% of all respondents</td>
</tr>
<tr>
<td>No</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Not sure</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>

**In the organisation that employs you?**

<table>
<thead>
<tr>
<th>Response</th>
<th>no. of responses</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>70</td>
<td>37% of all respondents</td>
</tr>
<tr>
<td>No</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Not sure</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

This varied from site to site and state to state. Respondents had a clearer idea about their local circumstances than at the more central level. In many places there is a policy, and where there is, many staff know about it. Even where there isn’t a policy, staff know that there isn’t, which suggests a good level of informedness at least. However, the high ‘No response’ suggests uncertainty still exists.

Is there an implementation plan for educational computing? If so, describe it briefly.

Respondents were asked if they knew of (a) a plan at workplace level, (b) a plan at organisational level.

The experience of the introduction of competency-based curriculum frameworks such as the CSWE showed the need for a flexible and adaptable implementation plan, the details of which are known by all involved.

**Knowledge of workplace plan**

<table>
<thead>
<tr>
<th>no. of responses</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>62</td>
</tr>
<tr>
<td>No</td>
<td>18</td>
</tr>
<tr>
<td>Not sure</td>
<td>33</td>
</tr>
</tbody>
</table>

**Knowledge of organisation plan**

<table>
<thead>
<tr>
<th>no. of responses</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>42</td>
</tr>
<tr>
<td>No</td>
<td>11</td>
</tr>
<tr>
<td>Not sure</td>
<td>25</td>
</tr>
</tbody>
</table>

There was even less certainty than in the previous question, but as before, it is encouraging that in some cases there is a perceived plan in place.
How would you compare the introduction of computers into your workplace with the introduction of another educational innovation, such as the CSWE or another competency-based curriculum?

Many of these teachers have recently encountered another major innovation, the introduction of competency-based curricula such as the CSWE, a new curriculum framework that all teachers had to follow. There was therefore an opportunity to compare reactions to the implementation process.

Very few respondents saw similarities between the two implementation processes. Two said they were both important, another suggested that in both cases they had been thrown in at the deep end. As before, some teachers embraced the innovation while others resisted it. Both induced ‘culture shock’, said one respondent.

The differences were far more pronounced. Nine respondents commented favourably on the overall implementation, two saying it was ‘excellent’. Four commented on the importance and practicality of the innovation. Fifteen respondents commented that their centre had been more significant than central office in the implementation process. There were variations between centres, but for four respondents this was not necessarily seen as a bad thing. The role of Central Office was criticised by nine respondents, suggesting differing, or at least unexplained, priorities between Central Office and centres. Criticisms varied from lack of vision to lack of action. Twenty-two respondents commented on training. There had been a lot for the CSWE, but less for educational computing. The implementation process was seen as less formal and less systematic by five respondents, but much more thorough by one. Four saw it as gradual, another four saw it as quicker. Two respondents felt there was no comparison — one felt there had been no innovation at all.

Different perspectives reflect the variations from state to state, since states varied in their approaches to both the competency-based curricula and educational computing. Respondents may also have conflated local problems, such as getting computers installed, with the overall implementation. The comments reinforce the significance of a commitment at all levels of the organisation, as well as the need for training.

Use

How did you come to use computers in your teaching?

It was already known that individuals varied in their educational computing practices. Since there had not been an organisational directive as with the CSWE, how had teachers begun to use computers? Where did the initiative come from?

Personal interest 75
Part of the curriculum 66

The responses suggest that a slight majority of respondents to the question actively sought to take up educational computing, whereas others began as a part of a redefinition of their regular duties. This suggests a positive stance among some users, who are seeking ways to improve their professional practice. Again the role of management was mentioned — lack of vision in
some cases, a central role in others. A number who said personal choice suggested it was in spite of management. This makes an interesting contrast with the phenomenon noted in Dutch schools by Plomp, Pelgrum and Steerneman (1990) in which ‘…different educational actors seem to be waiting for each other. Schools wait for teachers to start activities: teachers, however, wait for a policy at school level. Both schools and teachers are waiting for a policy at national level’ (1990:169) The teachers in this survey seemed reluctant to wait!

**Do you have a choice whether to use computers or not?**

Effective usage may depend on choice, since attitudes may be more positive in the absence of compulsion. To what extent are teachers being forced to use computers?

<table>
<thead>
<tr>
<th>Response</th>
<th>no. of responses</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>118</td>
<td>63</td>
</tr>
<tr>
<td>No</td>
<td>55</td>
<td>29</td>
</tr>
</tbody>
</table>

This obviously depends on how choice is imposed. It may be a vague general social compulsion; it may be a timetabling directive. Whatever it is, 63% of all respondents felt they had a choice, which suggests that uptake may well be accompanied by positive attitudes. However, force appears to be not necessarily a problem. One site with high overall competencies said mainly No. Respondents at another site with very high skills said they had had no choice, yet they were still positive about computer use. Again, sites with high choice levels expressed frustration at how little management was doing.

**What sort of access do you have to computers in your workplace?**

Uptake depends on access and the opportunity to experiment in a non-threatening setting.

<table>
<thead>
<tr>
<th>Response</th>
<th>no. of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very good</td>
<td>22</td>
</tr>
<tr>
<td>Good</td>
<td>28</td>
</tr>
<tr>
<td>Fair</td>
<td>3</td>
</tr>
<tr>
<td>Limited</td>
<td>40</td>
</tr>
<tr>
<td>Poor</td>
<td>14</td>
</tr>
<tr>
<td>None</td>
<td>1</td>
</tr>
</tbody>
</table>

Although only 57% of total respondents answered this question, the majority of these rated access good or very good. In terms of availability, however limited, the response was about 99%. Not all respondents indicated their attitude to the access, instead stating the location of computers. Only two mentioned personal fulltime access. It seems that many computers are shared, often in staffrooms.

Most common reasons for limited access were small numbers of computers (11), timetabling (6), high demand (4). (though this was implied by other respondents who gave staff computer ratios). Since computers are in rooms, numbers and timetabling are significant. Usage must be high to justify the expense, but this limits informal access by individual teachers.
Twelve respondents mentioned the availability of laptops/notebooks. At least three centres have bought notebooks for teachers to borrow. These rated highly, and three teachers mentioned it specifically (two at one site). However, even with laptop access, one teacher rated access as limited. Access often seems to be in the eye of the beholder, since responses varied even at the same site. Many mentioned the age of PCs as a problem. This may be related to what Plomp, Pelgrum and Steerneman (1990) call the disadvantage of early starters, whereby early adopters have to wait for upgrades until late adopters are supplied. At one site actual space and security was an issue.

Do you use a computer at home?

If teachers have access elsewhere, they may have additional learning opportunities, particularly in a supportive environment. This may alleviate access problems to some extent. In addition, there are increasing opportunities for Computer-mediated Communication on professional matters, but these depend on teachers having home access.

<table>
<thead>
<tr>
<th>Response</th>
<th>no. of responses</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>138</td>
<td>73% of all respondents</td>
</tr>
<tr>
<td>No</td>
<td>45</td>
<td></td>
</tr>
</tbody>
</table>

This is very similar to the proportions of home use found by Durrant and Hargreaves (1995). This is well above the rate in Australian households of 49% (Higgins 1995) or 36-40% (Potter 1996) and the 41 to 48% anticipated in 1996. (Potter 1996)

If yes, do you have, or intend to get, a modem?

<table>
<thead>
<tr>
<th>Response</th>
<th>no. of responses</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>65</td>
<td>30%</td>
</tr>
<tr>
<td>No</td>
<td>62</td>
<td></td>
</tr>
</tbody>
</table>

Thirty percent of all respondents have or intend to get modems, which of course does not guarantee Internet access, but is a possible indicator of it. This is well above the 17% of all Australian households reported in The Australian (Higgins 1995), or the 6% reported in The Age (Potter 1996), and the 15 to 21% predicted in 1996 (Potter 1996). Clearly respondents are well in advance of ‘average’ usage. Many are ‘early adopters’, not the illiterates implied by some media reports.

How often do you use computers?

What tasks are teachers doing with computers and how much time are they spending on them?

<table>
<thead>
<tr>
<th>Task</th>
<th>no. of responses</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation of class materials</td>
<td>148</td>
<td>79</td>
</tr>
<tr>
<td>Teaching</td>
<td>133</td>
<td>71</td>
</tr>
<tr>
<td>Preparing reports, fliers, news-sheets etc.</td>
<td>128</td>
<td>68</td>
</tr>
<tr>
<td>Self education</td>
<td>115</td>
<td>61</td>
</tr>
<tr>
<td>Accessing information</td>
<td>36</td>
<td>19</td>
</tr>
<tr>
<td>(other than AMIS/ARMS)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Networking with colleagues</td>
<td>17</td>
<td>9</td>
</tr>
<tr>
<td>Other</td>
<td>58</td>
<td>31</td>
</tr>
</tbody>
</table>
Many respondents mentioned several applications, so percentages do not add up to 100.

The most common task was preparation, being done by 79% of total respondents. This does not tell us how frequently it is used, however. It is slightly less than the English teachers surveyed by Durrant and Hargreaves (1995), who found that 83% of respondents used computers in preparation sometimes, often or always. Thus, enhancing traditional print materials is the most frequent activity. If we add other forms of preparation the number is quite high.

There was a considerable occurrence of multiple uses, such as teaching and preparation, and a substantial amount of more administrative type of work. This reflects a broadening of teachers' roles, and convergence of tasks. Standish (1993:22) found that teachers had 'increased planning time because of the use of time-saving management computer software. The word processing and grade book programs have replaced many hours of work that were tediously accomplished by hand'. Whether teachers perceive that they have more time, or whether extra time is swallowed up by extras tasks, needs further investigation (see Hargreaves 1994).

Usage for self education is high, which suggests teachers are prepared to see computers as part of their own learning. We don't know what it is that they are studying — it may be computing as such, rather than a content area. There is relatively little use of networks, with only 9% responding 'Yes' to this question. This compares with 5% of English teachers in Durrant and Hargreaves' (1995) survey. However, some within the previous category may be accessing information from the Internet.

How many hours a week do you spend on educational computing?

Pelgrum (1992:346) found that 'the more time spent by teachers working with computers, the greater the likelihood that teachers will innovate'.

<table>
<thead>
<tr>
<th>At work (in teaching)</th>
<th>At work (other)</th>
<th>At home</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>2.4</td>
<td>2.5</td>
</tr>
</tbody>
</table>

The roughly equivalent times spent on teaching and other uses at work reflect the responses to the earlier question. However, it shows that teachers are also using home time, and presumably their own computers, for work-related computing. In total it suggests about 7.5 hours a week doing educational computing.

What CALL programs do you use? Why?

Do teachers use a wide range of programs? Do a small number of programs feature strongly? Are newer multimedia programs replacing older text-based ones? What changes can we see from earlier surveys? Respondents mentioned a wide range of programs designed for language teaching, which included Storyboard (86 respondents), Choice master (31), Calis (23), Matchmaster (13), GapMaster (13), Fun with texts (7), Alphabet (6), Vocabulary (5), Grammar (5), Skillshift (4), Games (3), Textplay (1). Respondents also mentioned programs or applications which are not specifically designed for language teaching.
including word processing (13), typing tutors (4), Write (3), Clarisworks (2),
MacGlobe (1), Encarta (1), Works (1). Reasons for use included reinforcement
of lessons, extension, links to classroom, and ease of use. Six people said, in
effect, ‘because they’re there’. This section was not completed in some cases,
indicating no use of CALL at all. Three respondents asked, ‘What is CALL?’

The great majority of CALL programs in use are the ‘classics’ — text-based
programs developed in the early 1980s. The programs feature in earlier sur-
veys by Kaufmann (1992) and Levy and Ferrugia (1988). The clear leader is
Storyboard. Part of the reason for its widespread use in Victoria is that it
is supported centrally through the development of CSWE materials. Other
reasons included: (it’s) designated, easy, simple (3), useful (3) can author (4),
can be tailored to classroom (2), interesting stories (1), cheap, fast, meet needs,
user friendly, good, appropriate. As one respondent put it, ‘Storyboard com-
bines language learning with hands on skills development’. Unlike the others
in this group Storyboard activities need no planning and development of
individual items. It is thus easy to learn and use for teachers and students.
In addition it runs on all computers from the oldest to the newest. Story-
board is one of very few programs that are text based rather than focusing
on language subsystems such as the alphabet or vocabulary, which is typical
of the rest of the programs in this category.

The more recent, and more complex Australian-produced multimedia program
Skillshift was mentioned in only one state. There was no mention of the Aussie
Barbie or any of the other videodisc programs developed in the late 1980s
and early 1990s. One state did not mention any CALL at all. The extensive
list of non-CALL programs suggests that teachers are interpreting CALL
more broadly than simply programs developed to teach languages. Most in
this category are linked to word processing. Overall the picture is of wide-
spread usage of simple text-based programs. One notable difference from
studies of other teachers work outside the AMEP was the absence of teaching
about programming.

**What CALL programs do you author?**

Modifying the content of programs ranges from the very simple (Storyboard),
to the more complex (CALIS), with programs like Choicemaster in between.
If users modify content it gives an idea of how much control users may have
over the programs they use, and their level of competence. Respondents
mentioned Storyboard (46), Choicemaster (16), Matchmaster (5), Vocabulary
(4), Gapmaster (3), Crossword (2), Calis (1), with four unspecified.

The complexity of the task is reflected in the number working on each program.
As with an earlier survey of AMEP computing (Corbel 1993) relatively few
respondents reported authoring, the same programs were most popular.
Not surprisingly Storyboard, the simplest to use and modify, is the most
common. (What is perhaps more surprising is how few people actually do
modify it.) There may in fact be fewer people authoring than the numbers
suggest since the same person may do several programs. The very limited
amount of program modification of even the simplest kind is striking con-
sidering the amount of educational computing teachers do, and the opinion
teachers expressed in Kaufmann’s survey about the importance of authoring
options. Perhaps there is a difference between seeing something as important and doing something about it. Or perhaps it is not the teacher’s role. (In Victoria most centres designate one or more persons to do this task). These findings are consistent with trends in the CALL literature away from the idea of generalists authoring. Therefore the role of key people in program modification needs to be acknowledged.

**What aspects of word processing can you do?**

An earlier question sought an indication of competence level. The features in this and the next question focus on the three levels of training presented centrally by AMES Victoria in 1993/4. These three levels were derived from an analysis of typical tasks teachers were likely to have to carry out, from simple handouts at level 1 to simple reports at level 2 and newsletters at level 3.

<table>
<thead>
<tr>
<th>Task</th>
<th>no. of responses</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Load and save document, format and edit text</td>
<td>46</td>
<td>27</td>
</tr>
<tr>
<td>2. Columns, borders, and other more complex formatting, use tables</td>
<td>29</td>
<td>17</td>
</tr>
<tr>
<td>3. Use styles, outlining, table of contents, objects</td>
<td>95</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>170</td>
<td></td>
</tr>
</tbody>
</table>

Some people ticked more than one box. In these cases the highest level was recorded. In only two cases did respondents tick the highest, lowest, but not the middle box. This suggests that the levels do not overlap.

We might have anticipated a general fall in numbers, with high numbers at the low levels and low numbers at the high level. In fact more than half the respondents rated themselves at the highest level of competency. Non response was 9%. Even if we interpret this as no competency, we have high levels overall. There is a noticeably higher proportion at the lowest rather than the middle level, suggesting the need for more training.

**What aspects of computer management can you do?**

As with the previous question, this question is based on the AMES Victoria educational computing competency levels. The tasks are indicative of the three broad levels.

<table>
<thead>
<tr>
<th>Task</th>
<th>no. of responses</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start up and shut down, find programs, use menus</td>
<td>41</td>
<td>25</td>
</tr>
<tr>
<td>Create and manipulate documents, files, directories/folders</td>
<td>49</td>
<td>30</td>
</tr>
<tr>
<td>Troubleshoot problems</td>
<td>76</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>166</td>
<td></td>
</tr>
</tbody>
</table>

Again we find a reversal of what we might anticipate, with rise in numbers towards the higher levels.
Responses to these two items reinforce the view of teachers quite highly competent in educational computing. Levels seem to be a bit higher than global reporting of competence suggests. People may underestimate their abilities on a broad level, but when asked for examples of what they can actually do, find that their competence is actually higher. Overall high levels may be influenced by the Victorian responses, which reflect training programs. However, this does not alter the fact that the skills exist.

Support

This section looks at teachers’ awareness of what is available in this area, rather than a formal statement from management of what it makes available. Some surveys also ask for opinions on the value of certain hypothetical scenarios. This survey tried to avoid this, and attempted to find out what teachers actually know about and use, as well as to encouraged people to think of improvements without putting words in their mouths.

‘The success of the implementation depends on the extent to which the change is supported by administrators and skilled teachers committed to the change and the procedures in place for ongoing support, especially for new teachers’. Bottomley, Dalton and Corbel (1994:84). Local support included support by the principal, time release, peer support, meetings, training, and resource sharing. We consider each of these in the sections below.

Time

An earlier survey of educational computing in the AMEP concluded that ‘There is no substitute for a clear commitment of time and finance from the organisation’ (Corbel 1993:50). Has such a commitment been made with this innovation?

Do you have any time allowance for your educational computing role?

<table>
<thead>
<tr>
<th>Response</th>
<th>no. of responses</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>No</td>
<td>99</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>124</td>
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</tbody>
</table>

The highest time allowance was six hours, but even this person wanted more. Most seemed to have one to two hours. Two respondents said they had little time but that was okay. The question did not distinguish between those with specified support roles and those who did not have specified roles. Thirty-six respondents saw more time as the way to improve the situation, four asked for a specified time, and six for more money. More access was requested by three respondents, with less teaching and less administration also called for. Nine wanted more training, two wanted more computers, and one a ‘total overhaul’.

If we take the nil responses as ‘no’s’ then only 13% of total respondents had time available. The fact that for these respondents some time was available is a start, and suggests that in some cases supporting educational computing may be seen as a clear and legitimate task. Not surprisingly, more time was
the most common suggestion, together with several ways in which it might be gained. The call for more money is presumably for replacement. However, training and hardware were also seen as significant.

**Training**

Training is perhaps the most frequently mentioned variable in the uptake of educational computing (see for example Aston and Fakhro 1992, Standish 1993, Corbel 1993). As Pelgrum observes, ‘the computer knowledge and skill base possessed by teachers is significantly related to training received. Furthermore, the amount of training received and the type of topics covered in training are related to the degree to which computer use is integrated into the curriculum’. (1992:346)

**What is available to you as a staff member at your workplace and in your employing organisation?**

In response to this question, 63 mentioned inservices at unspecified locations. Fifteen respondents mentioned centrally run inservices, eight mentioned local inservices, including two after work hours. Two mentioned specialist training as an Educational Computing Representative. Meetings, networks and curriculum days were mentioned by another seven respondents. Mentions of collegiate support were common, including peers (10), specialist staff (8), unspecified others (5), and mentors (3). Two respondents mentioned PC tutorials, and one mentioned a newsletter. The question did not specify frequency, but numbers varied with one per year as the minimum. Nineteen comments were critical of the amount of training — four respondents commented favourably.

The most common suggestion for improvement was simply *more* (34). Seven called for higher level training and five for more specific training. Six wanted it to be more ongoing and two wanted it more systematic. Local training was requested by five respondents, with another two wanting central training. Four wanted more formality, with a program to follow and a credential. Flexible approaches, including one-to-one, self-help and distance learning were mentioned by five respondents. Courses should be more intensive (1), more regular (2) and ‘better’ (1). One respondent requested paid training.

Again, the issues of time, finance and resources were significant, with 22 respondents calling for more, or better organised, time, six wanting more money, six more resources, and two better access. As one person said, ‘PC proficiency requires daily practice — (it’s) not always possible’. The role of outside learning had mixed responses. One said training was not needed as the respondent had good family support. Another needed paid training at work since there was no time at home. One respondent commented that training and support came after PCs had been introduced. However, one respondent felt that a standard had been set and should be maintained.

Training obviously means a range of things, not just sitting in classrooms. Teachers were aware of a range of options. There seem to be calls not just for more training but for learning pathways, with a range of flexible support materials. There is an issue of attendance in paid time or not, and who pays course fees. The role of others — specialists or mentors — is again significant.
Support from specialist staff

Formal computer training may be isolated and decontextualised. We know that people learn informally from others, and some centres have specialist staff support. In 30 cases this was a special staff member (‘most helpful’, but also ‘overworked’). Seventeen mentioned a particular (non-specialist) person or teacher. Five mentioned a Library/ILC/teacher aide. For one it was ‘Anyone who has knowledge’. A smaller number referred to central staff, with 16 in Victoria mentioning the centrally-based Educational Computing Support Officer. Five mentioned the ISU/central computer unit. Three mentioned phone support. Five thought the amount available was good, four thought it was poor, and for 18 it was non-existent. One respondent expressed concern for the specialist staff — ‘I have insufficient time to become confident/familiar with enough software. Help is available but they are overworked and I don’t want to be a nuisance’.

Although three respondents saw no need for improvement, others suggested changes, with 25 calling for an increase in the numbers of specialist staff. Eight wanted more training with these staff; nine suggested more training for them. Four suggested a time allowance for the local specialist. However, there was support from three respondents for a wider range of contacts with skilled staff others than the local person. Eight saw room for improvement in central support as well. As with other support areas, general issues of finance, training and resources were commented on, with eight mentioning more time, seven more money or resources, six asking for more training, and one suggesting a checklist of computing skills.

The significance of the role of local colleagues is reinforced. These may be formally designated or informally known. There may be a need to separate central IT staff from educational computing staff.

The role of interpersonal skills is significant. Teachers value ‘the human touch in a people industry’ (Leanne Trembath, AMES Victoria Educational Computing Support Officer). It is noteworthy that many of the support staff are women, who not only present a positive role model for colleagues, but may approach the training task differently to men. This would be an interesting area of further research with enormous potential significance.

Meetings with other staff

Networking is a fundamental way of informal professional development. Networks were central to the introduction of the CSWE (Bottomley, Dalton and Corbel 1994). Networks may be informal, semi formal or formal. Twenty-eight respondents mentioned casual, informal or occasional meetings. More formal meetings were the Central Network (Victoria), mentioned by 14 respondents, and interest groups by three. Ten saw educational computing as part of staff or curriculum meetings, seven saw it as part of inservices. Twenty-three saw no meetings at all.

Suggestions for improvement included more regular meetings (6) or a regular timeslot in other meetings, with more time for ideas exchange (8). Two respondents requested more meetings but another two said there were too many already.
Feelings on meetings did not run high, but seemed to depend very much on local circumstances. Perhaps people are ‘meeting-ed out’; perhaps the meetings need to be more focused.

**Electronic connections to other people and resources**

There has been a huge expansion in Computer Mediated Communication generally and in particular for professional development purposes. However, respondents reported relatively little use of CMC, with seven mentioning ELSINET (an AMEP network run by NCELTR), six mentioning the Internet, three mentioning email, and one a bulletin board. Twenty-five said ‘nothing’.

Suggestions for improvement included Internet access for teachers (14) and students (1), ELSINET (2), and ‘connections’ in general (5). Three suggested that the organisation should supply a modem. Nine requested more funding, and three more training. Five respondents questioned the value of connectivity at this stage.

There was a high ‘No’ and ‘No response’ to this question. This is consistent with Simpson’s November 1994 survey which showed little usage of networked communication. Perhaps people are still concerned with more routine applications, particularly since there is little immediate teaching application in ESL. However, the NBEET report referred to earlier shows this area to be one of great potential significance, both for teachers and learners.

**Teaching**

Most surveys ask for respondents’ opinions about the potential of various forms of computer-mediated learning. We have focused on educational computing as actual rather than potential, and sought to see how it is being used now.

**What learner needs and teaching goals are met through your computer use?**

‘Teachers are the key to educational change, and they need to see how computers can be of personal use to them’ (Standish 1993:7). Kaufmann (1992) found that teachers believed educational computing to be of value in a range of areas. Is this reflected in their practice? To what extent teachers are aware of and critical of the principles and methodology of the programs they use?

The largest area of use was in the reinforcement (12), revision (6) and practice (5) of low level reading and writing subskills such as spelling and grammar (32). An equally large area of application was familiarity with computing (32), which was seen to improve employment chances (12). Almost as large an area was word processing in general (28), and more specifically, writing letters, resumes and reports (10). Twenty-one respondents mentioned better presentation of materials. Many saw computing as meeting needs other than language, such as self esteem and confidence (19), individual learning styles and needs, and disparate levels (16). Sixteen commented that the computer put more control in hands of students, was student centred, self-paced and motivating. Two saw educational computing as avoiding loss of face. Only two mentioned spoken language applications.
These findings reflect both the old and new of educational computing. The traditional support role of computer based practice of low-level subskills remains strong. Equally important is the use of the computer as part of modern training, reflecting the significance this is seen to have as part of employment prospects. There is a strong reflection of the AMEP’s learner centred, needs based curriculum philosophy, and its commitment to principles of adult learning in the significance given to learner characteristics supported by educational computing. The findings are consistent the findings of Kaufmann (1992) who found AMEP teachers valued a range of types of use. There was no reference to computer enhanced language assessment, suggesting little uptake of the recommendations of Corbel (1993), and virtually no comment on the underlying principles of the programs.

Pelgrum found that ‘there are several models regarding the aim of placing computers in schools. Learning about computers — the technical model — and learning with computers — the integrative model — represent two major conflicting goals’ (1992:348). There was little sense of conflict here, perhaps because learners were not so much learning about computers as using computers in real world tasks, as well as using them to learn. These two models seem reasonably well integrated in many cases, though in some cases using computers far outweighed learning with computers.

**How do you do integrate computer use with other learning activities?**

Is educational computing simply a Friday afternoon filler or something selected and integrated into a program of work? In 1988 Levy and Ferrugia noted that teachers in their study had not had to match activities closely with courses. This survey showed more integration. The most common form was the preparation of employment-related tasks, such as writing resumés (21). There were various forms of follow-ups to more language oriented classroom activities, including general reinforcement (19), revision of grammar, conversation, themes and topics (14), Storyboard based on classwork (5), links to classwork (5), practice of classroom activities (4), revising and extending classroom activities (4), consolidation (3). Five linked educational computing to competency stages. Four respondents saw integration as high, eleven saw it as low.

In most cases, educational computing is about doing a stage of teaching (practice, revision, etc) in a different way, one that reflects learners’ preferences. There is very little presentation of material. Perhaps because there is relatively little authoring there is little adaptation of content. However, we don’t really know what is being practised or reinforced. One person took a broader view of integration: ‘Language of technology infiltrates everyday language’.

Plomp, Pelgrum and Steerneman found little integration, but felt that this was not surprising. It is important to realise that a real integration of computers in the curriculum comprises more than a simple innovation; it appears as a ‘bundle of innovations’ with many components and persons involved’ (1990:169). We should not underestimate the complexity of the task, and the many other changes that AMEP teachers have had to integrate over the past few years.
Has your teaching changed since you've been using computers? If so, how?

This question was aimed at finding out whether teachers feel that computers force them to work in certain ways, or do they mould them according to their needs? Are they neutral tools or more influential on their users' practices?

Respondents reported change of six main kinds — outputs, perspectives, work, self-perception, roles and response to students. Changed outputs included clearer worksheets, easier preparation, and higher standards (32), and resumés and formal letters becoming more authentic (2). Changed perspectives included an added new dimension (3), added variety and challenge (3), and enhanced, altered or extended focus (2). Five respondents said their work was more effective, integrated or organised. Seven said their self-perceptions had changed — they saw themselves as having more confidence, self-esteem, expertise, and being more skilled and aware. Roles had changed for five respondents — four now teach word processing, one is a centre 'rep'. Some saw changes in their ability to respond to students, saying classes are more individual (2), with more time available to respond to needs (3). For 31 respondents however, there had been no change. One hoped for change; another saw no change because she had ‘always had PCs’.

The major change noted was the enhancement of traditional work. This is consistent with responses to earlier questions. There is also a sense of extension of work into new areas. However, there is no strong sense of teaching having changed so much as other aspects of professional work. This is similar to the introduction of the CSWE, where ‘at the final interview all but one reflected on the fact that they didn’t feel their actual teaching methodology had changed a great deal.’ (Bottomley, Dalton and Corbel 1994:110)

One reason for a minimum impact is the nature of the programs being used. In the general field of computer assisted learning some programs are intended to teach content area material. These programs contain pre-specified and unalterable content and present materials in developmental stages. Most of the programs used in the AMEP are not of this kind. (One of the few that is, Skillshift, was only mentioned four times). These programs are simpler and are clearly adjuncts to other work. There is no sense in which they might be seen to replace the teacher. Using these programs is like selecting some different exercises from a text book. The change in teaching need be minimal. At the same time, teachers need to go beyond simply enhancing traditional work, to see how that work might take on new forms, otherwise the potential of educational computing may not be met.

Can the contents of the CALL programs you use be modified? Are they? If so, by whom?

This question was intended to get an idea of how much control teachers have over the content of the programs they use. Responses indicated a range of people who modify content, including specialists (29), other teachers (23), students (3) and the respondent personally (4).

Modifications are thus mostly done by specialists and are ongoing. Only two programs were specifically mentioned, Storyboard 4 and Calis (‘not easy to
Six respondents expressed some uncertainty expressed about whether modifications took place at all. Two wanted the changes but were unable to make them. There was a relatively high non response.

This suggests relatively little control over content, at least by individuals. Even where changes are made, it is likely that they are relatively simple, such as modifying Storyboard. The responses suggest a slight change from Kaufmann’s findings that responsibility for modifications was equally split between specialists and interested teachers. It seems that now there are more specialists doing the task. However, we do not know how well they are supported. The earlier comments about teachers authoring apply here. There is no clear sense that this is part of a widening repertoire of computer-related skills.

Beliefs, attitudes and understandings

The success of innovations depends as much on beliefs, attitudes and understandings of participants as it does on more ‘objective’ things like numbers of computers. Teachers need to feel positive about the innovation for it to become continuously and fully integrated into the curriculum. Are teachers using computers because they want to or because they have to? Are they using them critically?

Are you aware of programs other than those you are using? If so, how have you become aware of them?

This question was intended to identify teachers’ sources of information about educational computing. Do teachers seek information outside the ‘official’ version implicit in the programs that are on the computers when they walk into the room? What are their information sources?

There was a positive response to this question, with 99 (53%) of total respondents answering ‘Yes’, and 24 (13%) saying ‘No’. Responses can be grouped into six categories. Personal contacts included husband, family or children (13), word of mouth from friends (13), peers (14), support staff (5) and students. Group contacts included inservices (15), CALL meetings and network (8), workplace demonstrations and displays (6), and meetings (4). Some respondents mentioned the media, with magazines being most common (15), followed by bookshops and libraries (7) and other media (5). Suppliers, catalogues and PC shops were mentioned by eleven respondents. Twelve mentioned external sources — study and previous work. Two mentioned visits; one said ‘accident’.

Most information comes from outside the organisation, in an informal way. The role of family and friends is noticeable. Unlike other areas of language teaching innovation, computing is something that many others know something about, at least in a technical sense. Most contacts are personal, but a number are using the media. There is a general sense of self direction and information gathering, which is not reliant on the employing organisation. Users might therefore be expected to be informed and able to judge their employers’ policy critically.
What educational principles do you see underlying the CALL programs you use?

This question sought to discover the extent to which teachers are aware of the underlying principles as well as the surface features of the programs they use.

Responses can be grouped as reflecting aspects of curriculum philosophy, and differing beliefs about learning. Adult education concepts, such as self access, flexible delivery, open learning, adult learning, and learner-based curriculum, were mentioned by 26 respondents. Concepts relating to exploratory, constructivist learning, such as problem solving, developing autonomy and confidence, and prediction, received ten mentions. Cognitive processes mentioned included reinforcement (5), recycling (4), practice (4), goal achievement (3), and memorising and recall (2). Three respondents mentioned motivation. Three others saw links to vocational skills.

Most comments related to the way computers fitted into a broad curriculum philosophy rather than to the content of the programs themselves. The two main educational models reflected in Computer Assisted Learning materials, tutorial (cognitive/behavioural) and exploratory (constructivist) are equally represented, since they underlie the programs themselves in similar proportions. This suggests a grasp on the part of some respondents of the principles. Interestingly, very few respondents commented on a specific language purpose as underlying programs. In other words, the programs reflect certain views of learning rather than views of language. A few comments reflected uncertainty about what Storyboard is supposed to do, which is also reflected in the literature.

Do you feel that the programs you use are consistent with your understanding of language learning? If not, how could they be made more appropriate?

Many teachers are critical users of print texts in their teaching, but to what extent are they critical users of electronic texts? Anecdotal evidence in Victoria suggests a more deferential attitude to electronic texts than to print texts. Are teachers looking below the surface? Are they adopting a critical stance or allowing the computers the status of expert? Are they applying their views of language learning to the software?

Sixty-one respondents (32% of the total) said ‘Yes’. Only one said ‘No’. Some comments suggested that things are not as black and white as the question implies — it depends how they are used, on the learners, and when they are used. Only four respondents were generally critical of programs, citing among other things inflexibility and their ‘remedial’ nature. Suggestions for better software included more interactivity (8), more exploratory and open ended (2), less simplistic and more wide-ranging (3), and more ‘communicative’, easier to author, more imaginative, more graphics-rich, and with Australian content (3). Suggestions for achieving this included programmers having a knowledge of language learning, and more teacher input. Three respondents simply didn’t use programs they thought inappropriate.
There may be frustration felt by those wanting an exploratory style with the programs they have, hence the requests for more exploratory programs. However, we know from the previous question that there are some exploratory programs available. Some comments here suggest teachers' concern that their views of language are not reflected in the software. Responses suggest some choice is available — teachers might need to look for ones that suit them best.

As regards underlying learning principles, AMEP teachers appear to be ahead of others in school systems elsewhere, particularly in the United States. Increasingly the educational theory underlying good educational computing is constructivist, which sees the users developing their own theories and knowledge based on highly-engaging computing experiences, as opposed to a mastery-learning approach. Cuban (1993) sees this at the heart of the lack of uptake of educational computing.

Do you have concerns, whether personal or educational, about your computing practices? If so, what are they?

Participants in educational change may have no formal way of expressing their concerns about the change that is taking place. A great deal of passive resistance may develop. This question is intended to allow for an expression of any concerns individuals might have.

There was a high response rate — only two did not respond. Only 13% (25) expressed no concern. As one said 'I am very satisfied with my use of computers'. One respondent was concerned about priorities: 'I am happy to use PCs as an educational aid but they are expensive — could money be spent more wisely?'. Concern fell into four main areas — market demand, educational, personal skills, the CALL/word processing mix and resources.

One person saw PCs as a response to market demand (like the CSWE), and was not convinced of their value for language acquisition. Others commented on their popularity with students. One was concerned that a lack of CALL diminished the professional image of AMES in student eyes.

Some questioned their educational value, and wondered about skill learning and transfer, their appropriacy for all learners. A few expressed concern about their use by other teachers: 'PCs are like TV for kids — great babysitters — could be a waste of money at some centres'; 'Are underskilled teachers giving wrong information to students?'; 'It can be a cop-out from teaching.'
Twenty respondents expressed concern about their personal knowledge, skills and competence. There was a tendency to blame themselves — one called herself a ‘slow learner’, another felt ‘enormously inadequate’, another ‘illiterate’. Some doubted their capacity to carry out a specialist role — ‘I’m seen as the expert, but I’m learning too.’

Should educational computing be about word processing or language teaching? ‘Sometimes word processing becomes more important than teaching English language’. Two respondents felt unqualified to teach word processing. There were numerous comments about time and computing resources. As one put it ‘Upskilling is time-consuming’.

In summary, there is a notable concern about competence levels, even though these are overall quite high. There are concerns about personal adequacy and keeping up. Some are dealing with this well. One respondent said there was so much to learn but was still very positive — she enjoys teaching CALL and finds it exciting. Another felt less confident ‘Feel unqualified to teach word processing’. She would rather teach in the classroom and feels pressure to broaden skills. There is a sense of constant change in this area. It may not be possible to say exactly what you need to be able to do.

Do you feel you are encouraged in your computer use? If so, how?

Standish (1993) sees encouragement by administration and colleagues as one of the five conditions for successful educational computing use (the others are training, vision, encouragement, time and resources, access.) If teachers feel the organisation is supportive they may be more likely to commit their own time.

Forty-three percent (80) said ‘Yes’. Support came primarily from other people, as well as training and resources. There was also a sense of external pressure as well. The most significant support came from Students (17), Peers (13), CALL Rep (11), Principal/director (8), Self (5), Central rep (2), CALL network (2), Support staff (2), Staff meetings (1), Staff feedback and support (2), Organisation (1), CES (1). Five respondents were encouraged by the training available, while seven mentioned access and availability of computers. Eight mentioned opportunity as important. For some the encouragement came from changed job requirements — ‘PC skills seen as desirable, especially for casual employment’. Others felt pressure rather than encouragement — ‘obligated’ to do it.

Nineteen percent (36) said ‘No’ with specific comments about unsupportive management attitudes in two cases. One casual teacher wanted ‘to feel the organisation values casuals as a positive and resourceful tool. Always need to be updated and improved.’ There was a feeling in some cases of general pressure: ‘A lot of pressure for everyone to learn how to use PCs regardless of the availability of training’. Encouragement in the form of external pressure may not be necessarily a bad thing, as the comments from that section indicate. Unlike almost any other curriculum innovation, educational computing involves the development of transferable skills and knowledge. At the same time, pressure for uptake is far less externally ubiquitous with other innovations.
Again we can see the significance of other people in the teachers’ environment, the closer they are, the more significant. Encouragement from students is highest of all, perhaps because the teacher spends most time with them.

**Has educational computing changed the work of teachers as professionals? If so, how?**

Various research on professionals’ work suggests they may be disempowered by the computer mediation of their work. Zuboff (1988) and Aronowitz (1992) document the difficulties that can happen to relationships to work products, processes and practices with the introduction of computer-mediation. Apple (1986) applies this analysis to the work of teachers as professionals. Har- greaves (1994) describes two views of the changed nature of teachers’ work — the professionalisation argument, which sees teaching as becoming more complex and skilled, and the intensification argument which sees the additional work as being routinised and deskilling. Do teachers feel that they are losing control over aspects of their work? Are they actively colluding in their own de-skilling?

There were relatively few responses to this question. Seven simply said ‘Yes’. Other responses focused on improving existing work, others saw work as enhanced. Many comments reflected the cost of this additional enhancement, though not all were critical. Many comments reflected concerns about individuals’ capacity to deal with the changes.

Fifteen respondents mentioned improved skills — educational computing seems to be a part of professional development. Four saw new dimensions, directions or horizons. Another five saw their knowledge, experience, expertise or credibility broadened. There was a tradeoff for this — work is easier yet more time consuming, with more rewards yet more demands, involving widened expertise yet with increased workload and responsibility.

Some were pragmatic. Eight saw it as just another resource — ‘Educational computing is just a tool, not a revolution’. Others acknowledge that there were new skills to be learned, but saw these as part of the standard skills teachers need — ‘Teachers must be computer literate to survive’; ‘PC literacy should be criteria for new staff or support staff’; ‘Replacement teachers must have PC knowledge’; ‘To ignore PCs is to tempt unemployment — I accept it as part of my job and part of my gaining employment.’

For others there was simply a greater workload. Things were more demanding generally — teachers are ‘forced to keep up to date’. Three said there was no change, two not much, and one not yet. There was a sense that change was coming — ‘We are on the way to a new and necessary skill’, involving ‘a technological dimension that we must strive to master and exploit’. Not everyone was positive — one teacher mentioned a competent colleague being ‘distressed’ at the thought of teaching educational computing.

The most common comment was still a pragmatic one — improvement of traditional practices. Some welcomed the opportunity to do more — others saw educational computing as a fact of modern life, which they accepted more
or less willingly. This contrasts again with the media image of illiterate teachers. These teachers are very positive. The responses neither confirm nor disprove the professionalisation or intensification debate. One reason in favour of the professionalisation view is that educational computing does not involve the replacement of teachers' classwork with pre-set content in unchangeable forms, of the kind that Apple is concerned with. When teachers teach word processing their work is being added to, but it calls for more rather than less skill. One respondent said they now 'view texts differently'. This may reflect the new ways of looking at texts that comes when they are electronic as well as print based.

Which of the following best sums up your feelings about educational computing?

The Concerns-based Adoption Model (Hall and Hord) is based on the belief that concerns change over time in a fairly predictable way.

<table>
<thead>
<tr>
<th>Item</th>
<th>Category</th>
<th>Item Description</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Impact</td>
<td>Refocusing I have some ideas about something that would work even better.</td>
<td>27</td>
</tr>
<tr>
<td>5</td>
<td>Collaboration</td>
<td>I am concerned about relating what I am doing to what others are doing.</td>
<td>16</td>
</tr>
<tr>
<td>4</td>
<td>Consequence</td>
<td>How is my use affecting learners?</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>Task</td>
<td>Management I seem to be spending all my time getting material ready.</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Self</td>
<td>Personal How will its use affect me?</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>Informational</td>
<td>I'd like to know more about it.</td>
<td>80</td>
</tr>
<tr>
<td>0</td>
<td>Unrelated</td>
<td>Awareness I am not concerned about it.</td>
<td>3</td>
</tr>
</tbody>
</table>

Forty-one percent of responses are in the Impact grouping, which is consistent with a high degree of comfort with the practicalities of the innovation and concern with broader, less personalised issues. This is consistent with the responses to the other questions in the survey. The large number in Category 1 is perhaps surprising. On the basis of the responses to previous questions we might have anticipated this bulge occurring in Category 3. Still, both categories are within the Self-focused group. Bottomley, Dalton and Corbel (1994) found nearly all respondents in the top three categories.

General comments

This section allowed for comments that had not been covered by other questions. Five were concerned with other teachers’ attitudes, feeling that not all are involved, nor want to be. One commented on the stress on 'PC illiterate'...
teachers. Another was positive about teachers needing to think about the link between technology and language learning. Management again came in for criticism, with calls for greater awareness and direction from four respondents. As one put it, ‘Those who can make a difference re introduction of PCs still think the world is flat’. Four respondents were very positive: ‘Needs to be a commitment to improving word processing and educational computing across Australia’; ‘Computers are our future — use them to their capacity’; ‘Technology is everywhere and all should have at least a basic knowledge’; ‘Everyone can do it.’

**Focus groups**

The task of the focus groups was to comment on the survey results. Focus groups comprised people with some specialist knowledge that would enable them to comment on the results in an informed way, and to make recommendations based on a broad as well as local perspective. The groups commented on the raw data, not the synthesised version that appears in this report.

**Victoria**

The group met in Melbourne and comprised Educational Computing Reps (representatives) from most AMES centres. The Reps’ role is to provide informal training and support at their workplace. They are supported in turn by a centrally-based Educational Computing Support Officer.

Comments from the group reflect the positive aspects they saw in the survey responses: ‘There is a general willingness to accept educational computing. It’s seen as part of a bigger picture, and as a way of keeping up with the kids.’ ‘There is strong support for the reps’ role.’ ‘There has been expanded access to resources with a large installed base now in place.’ ‘It is seen as valuable both in teaching and in teaching preparation.’ ‘There is value to learners in terms of empowerment — learning a modern basic skill.’ ‘Independence.’ ‘Privacy, which encourages risk taking.’ ‘Pleasure from being in control.’ ‘Taking on different roles — helping others.’ ‘Real communication.’

**Issues**

The group noted the following:

- The support of the principal is important.
- There needs to be more training (no matter how much there is already). Attendance is a problem, even when training is free. The value of training which in other contexts would cost teachers money needs to be emphasised. Out of hours training is done in some places. Certification of training should be considered, especially for staff running courses for external agencies.
- Time allocation and duties of specialist staff need attention. They vary between centres, as a result of local autonomy. These staff do not always have access to budget discussions concerning educational computing. They need training in record keeping.
- Access remains an issue for teacher preparation.
Recommendations

These focused on the specialist staff:
• Training needs to be provided and certified.
• Replacement needs to be standardised.
• Position statements outlining duties are needed.
• They should be involved in relevant budgetary decisions.
• At the policy level, educational computing needs to be clearly supported centrally though support for educational computing structures and training, through funding and time release.

Queensland

The group met in Brisbane. Participants were seven teachers from four Metropolitan TAFE institutes Yeronga, Bremer, Logan, and Southbank. (In Queensland, AMES is part of the TAFE system.)

Issues

• AMES centres physically attached to TAFE institutes were better equipped and supported than isolated centres. Technical support in TAFE is not dedicated to AMES, although TAFE institutes had technical people who could support AMES teachers.
• Lack of standardisation [in software] across institutes.
• Levels of awareness, confidence and skills vary from centre to centre.
• Funding is the big issue as AMES is part of TAFE. Whose budget does computer funding come out of? Who writes the submissions?
• Time is in short supply for professional development, on-going in-service, authoring, trouble shooting, on-going monitoring and support.
• There is a need for acknowledgment of the role of computers in the ESL area and in the relationship between CALL and word processing in achievement of Learning Outcomes.

Recommendations

• Develop an implementation plan on organisational and centre levels.
• Recognise the fact that ongoing changes in technology require commitment and mechanisms in place to keep up to date with hardware, software and training.
• Training for support persons — initial and ongoing.
• Flexibility in support roles — eg someone in administration who can also play the role of support person.
• Higher profile for computing information in ‘Network News’.

The group's ‘wishlist’ was for more multimedia, more Australian software eg Alphabet; all teachers to have access to email; technical possibilities for new programs to be explored by NCELTR.
The group saw the following positive outcomes of the survey:

- Greater awareness of what is going on in computing across AMES in Queensland TAFE.
- Getting people focused on computing.
- Good for Professional Development to identify needs.
- If there is not a plan [for computing], there needs to be one — it should be an integral component of general planning.
- "I made a decision to buy a modem." [one focus group member]

**New South Wales**

The meeting took place in Sydney at AMES, Mary St. Participants were eight teachers representing AMES centres in Marrickville, City, English in the Workplace, Parramatta, Program Support and Development Services, Information Systems Unit, Cabramatta, Burwood Distance Learning and Fairfield.

**Issues**

Level of awareness and confidence varies from centre to centre. Two years ago, in some centres, many older permanent teachers were very unaware of computers, and not very interested in learning about them. Now there is less hostility. Teachers are beginning to see they may need computer skills to get jobs.

There is some embarrassment with teachers that students have a higher level of computer skill than they do. At one centre only about 10 out of 85 teachers had computers at home. The ratio was thought to be higher in the inner city centres.

Access is a problem — computers tend to be taken up with DEET classes because computers are required as part of some DEET funded programs. Some time is set aside for teacher training, but no time is allocated for practice or teacher preparation. Not everyone has a desk to put their computer on (if they had one). Shared computers were not felt to be a workable idea.

Some focus group members were aware of an AMES policy for PCs not Macs, but only relating to administration. A staff member was reported to be working on a discussion paper on a new computing policy for management. There is no standardisation of equipment. In centres it is about half PCs and half Macs, with Macs in the labs. PCs and software need upgrading. There is a need to fit into the larger picture of state and federal government policy on computing and to raise computer awareness among organisational management.

The idea of supporting teachers or providing incentives to buy computers for use at home, or portables, was canvassed. The tax implications of percentage of use would be an issue, as well as the implication that teachers doing more work at home outside paid preparation hours could be seen as eroding hard-won paid preparation time. Insurance implications would have to be considered.
Technical support was not available on-site. This was a major issue. When programs crashed or machines broke down, teachers had to approach more technical peers, or in one case, someone from the National Management Information Unit. Teachers are not generally aware of technical support via suppliers.

Computers are having a tremendous impact on teaching and learning outcomes. For example, teachers reported that low literacy Afghani women developed confidence and viable workplace skills through computers.

The focus group members felt that management needed to understand the issues, and the urgency about improving the computing situation. Focus group members believe the issue is vital — ‘AMES could sink or swim on this issue.’

Competitiveness in tendering is seen as hinging on the level of computer-awareness and provision. NSW AMES has generally not seen computer literacy as central to their task — more as an add-on. Computing skills have tended to be seen in instrumental terms — as mechanical training. Teachers have resisted, as they do not want to be trainers of word processing skills.

**Recommendations**

Policy needs to be developed in the areas of:
- curriculum
- funding
- training/teacher skills
- hardware, software, technical support
- professional development for CALL, networking, resources
- equity
- networking — eg email, bulletin boards

A planning model needs to include both top-down and bottom-up approaches. Planning needs to be done centrally and at the local level.

Educational computing is not monolithic, although it has tended to be seen that way by management in the past. There are at least four areas where different issues need to be considered:
- client needs and curriculum
- professional development/training and resources
- delivery modes
- administration data base

**New practices**

As outlined earlier, the project was concerned to identify not only current practices but also new skills and competencies (literacy processes and practices) that would be called for in working with electronic texts and working
It had been the original intention to collect observational data, but time and funds made this problematic. It was decided instead to have users complete a questionnaire after a typical computing session. The questionnaire would be in two parts — an analysis of the users’ actions, and an open-ended section with general questions to answer. The questionnaire appears as Appendix 4.

**Action analysis**

Users answered a number of questions, and indicated which of the actions they had used in the just completed session, and how frequently they used these actions. The intention at this stage of the project was to analyse the users’ electronic textual environment in the light of what we now knew about the grammar of electronic texts. It seemed appropriate to focus on a text being run by a word processor application as the ‘default’ electronic text, since this is a very common text type, as has been shown by the survey, even when users are networked or doing other tasks.

On the basis of the literature review it seemed reasonable to assume that users would use the knowledge and strategies of their ‘first’ language medium (print), but would be less likely to apply knowledge and strategies that did not exist in print to the ‘second’ language environment, that of the electronic text. It was therefore necessary to see what in the second language environment had equivalences in the first, and what was new. It was felt that strategies and knowledge would be reflected in the actions performed by users within the electronic textual environment, and that we could compare these with the actions available, which were defined as all the features of the electronic textual environment that are either labeled (such as menu items), or are on the screen (buttons, boxes, bars). If we knew which of the actions did and did not have equivalences in print texts the comparison would give some indication of the extent of skills transfer.

Each of the actions available in Microsoft Word 6 was coded as follows:

- **P**  Has a direct and exact equivalent in print
- **P/E** Has an equivalent in print, and its manifestation electronically makes the equivalence clear eg Footnote
- **E/P** Has an equivalent in print, though its manifestation electronically is substantially different eg Outline
- **E** Has no equivalent in print eg Zoom

126 available actions were identified, which were coded as follows:

- **P** None
- **P/E** 29
- **E/P** 35
- **E** 62

The full coding appears as Appendix 5.
What is striking is that about half (49%) of all actions had no equivalent in print texts. If we add the E/P actions the proportion goes up to just over three quarters (76%). No actions were identical.

Clearly there are substantial shortcomings with this coding process, which need to be acknowledged.

- It is inevitably impressionistic to some extent.
- It does not capture the complexity identified in the first stage of the project.
- It is static, even though it is about actions.
- It is performance-based.
- It will not capture how and why and in what order people do the actions.
- It does not account for different task demands.

It had been anticipated that, if users were using only print text skills, then actions coded E and E/P will be marked as N(ever used) by respondents, and those actions coded P/E and P will be coded as one of Rarely, Sometimes Frequently or Almost Always. The questionnaire was piloted with three members of the AMES Victoria Central Office staff. The results appear below. Also included are summaries of their responses to the open-ended questions.

<table>
<thead>
<tr>
<th>Self ranking</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tasks</td>
<td>Average</td>
<td>Submissions</td>
<td>Average</td>
</tr>
<tr>
<td>Table work</td>
<td>Report writing</td>
<td>Assignments</td>
<td>Submissions</td>
</tr>
<tr>
<td>Report writing</td>
<td>Minutes</td>
<td>Materials development</td>
<td>Assignments</td>
</tr>
<tr>
<td>Minutes</td>
<td>Letters</td>
<td>Letters</td>
<td>Materials development</td>
</tr>
<tr>
<td>How has the work changed?</td>
<td>Less time-consuming, more professional.</td>
<td>Used to do handwritten drafts and cut and paste. Materials development now needs attention to appearance and fitting text to page.</td>
<td>Can design page and format, use symbols and clip art. More creative.</td>
</tr>
<tr>
<td>Actions consistent with only print skills</td>
<td>82 (65% of all actions)</td>
<td>61 (48% of all actions)</td>
<td>67 (53% of all actions)</td>
</tr>
<tr>
<td>Electronic text actions (E and E/P)</td>
<td>30 (23% of those available)</td>
<td>51 (40% of those available)</td>
<td>49 (39% of those available)</td>
</tr>
<tr>
<td>Difference between print texts and etexts</td>
<td>Print easier to read.</td>
<td>Print gives clearer indication of what you want. Etext doesn’t always come out the way you think it should.</td>
<td></td>
</tr>
<tr>
<td>Have print literacy skills influenced our work with etexts?</td>
<td>They have improved because of my computer work.</td>
<td>I’ve done most of my work on computer for so long now that I can’t remember.</td>
<td>Not quite sure.</td>
</tr>
</tbody>
</table>

44 The computing practices of language and literacy teachers
It is noteworthy that even the respondent who has the highest proportion of actions consistent with the use of print literacy strategies still only has 65% of her actions accountable in this way. Clearly more complex things are going on which we are not capturing with the current process.

The pilot showed a number of limitations with the survey instrument.

- It does not capture process.
- It does not distinguish between different ways of getting to the same action.
- It does not distinguish between toolbar, menu and keyboarding as ways of initiating an action.
- It does not capture movement between different documents and applications.
- It does not acknowledge that some actions are relevant only for certain genres.
- It does not acknowledge that some actions are unavoidable eg Save.
- It is naive about the embeddedness of actions.

As Stanton and Baber put it:

> Human computer interaction is characterised less by the use of specific declarative knowledge concerning precise commands, etc, to use, and more by procedural knowledge relating to the context in which the tasks are to be performed.


Since the results seemed likely to be highly inconclusive, it was decided not to proceed with further individual investigations of use. However, further investigation into these issues is a necessary underpinning of effective training for information competency/online literacy.

**Open-ended questions**

Participants at the NCELTR Short Course, ‘Online Literacy for Language and Literacy Teachers’ in November 1995 completed the open-ended sections of the New Practices survey. Participants were self-selected from around Australia and New Zealand. Almost all had roles beyond teaching, so they represent a more specialised group than that surveyed. Not all were from the AMEP.

**What tasks do you do involving computers?**

This question was intended to encourage respondents to take a task-based rather than feature or application-based approach to educational computing. Responses included word processing (letters, worksheets, assignments, notes, presentations, reports, news sheets, submissions) (15); spreadsheets (budgeting, calculation of results, pay, tax) (8); email (6); CALL (3); database (3); Internet (3); information management (2); graphics/layout (2); also ARMS training, information search, bulletin boards, project management, games. This represents a wider range of tasks and a higher level of skills than in the survey group. This is not surprising since this was not a random group. There was a higher incidence of online activity and relatively little CALL.
How have you learned how to use the computer to do these tasks?

Responses included workshops/training (9), trial and error/practice (7), self-taught (6), from colleagues at work/asking others (6), previous computer training (2), also manuals, divisional computing officers, helpline. If we combine trial and error with self taught we find, as with the previous group, a high degree of self-directed learning.

How has the way you do these tasks changed as a result of working with computers?

This question was intended to give an indication of how working with electronic texts differs from working with print texts. Participants’ responses are given in full to show the range of ways in which the work has changed.

‘Wouldn't have done most of these tasks without computer. I think more about the page — its space and readability.’
‘More professional layout, presentation.’
‘Use templates more. Use phone less. Class lists more efficient (uses spreadsheet). Use spellcheck more.’
‘Faster/self reliant/easier to modify. More open attitude to possibilities. Less planning, straight into draft.’
‘Quicker, easier. Start with outline — add in as you go.’
‘Faster, easier, but sometimes slower and harder when learning new things. Not afraid to make mistakes. Willing to experiment.’
‘Classwork better prepared, more professional looking and legible. Greater efficiency. Easier access to notes for reference and duplication.’
‘More interesting for teacher and students, better presentation of worksheets, etc.’
‘For example writing essays — start in the middle. Get the notes down — easy to change later. Focused on presentation — size font indent. Able to move text around easily eg one document to another.’
‘More analytical, better able to improve past practice.’
‘Increased ability to manage several tasks at the same time. Increased time efficiencies — greater workload. Less face to face/hardcopy communication.’
‘Because of easier training, more editing to get a better finished product. Able to do more — expectations of quality and quantity of documentation to be dealt with have increased.’

These comments present an interesting range of processes strategies, attitudes and outcomes. Overall there is an impression of faster, less linear, more confident work.

Have you customised your workspace in any way? If so, how?

This question was badly worded, with most assuming it meant physical rather than virtual workspace. The few responses reflect a degree of control over the electronic working environment.
'Links to other computers/email nicknames/Personalised graphics. Hot menu on startup. Reduction of frills in Windows eg no wallpaper, patterns, etc. Auto-starts, colours.'

'Adapting Windows, icons, menu bar.'

'Stationery documents, templates of often used documents. Aliases (bookmarks) to commonly used sites.'

**How have your print literacy skills influenced your work with electronic texts?**

This question was directed specifically at the issue of transfer. Responses are given in full.

'First the reverse: have to become skilful in wading through numerous manuals in order to find the relevant information. Reading in a linear fashion plays little part in work involving computers.'

'They help me keep in mind the end product — the printed text to be used by Ss. They make me want to explore in a linear way and hold on to those old (in the past successful) approaches.'

'Not sure, but where final product is print text then this is an overriding concern eg not including a photo because I know it won’t print well.'

'Ease of movement of parts of texts — relationship with awareness and understanding of language as way of making meaning.'

'Scanning, predicting to filter unnecessary information. Ability to read quickly and write at the same time as thinking eg minimising number of drafts.'

'Skills of skimming, scanning and searching in print are easily transferred to electronic text.'

'I still need to get an overview by seeing the text in print.'

'Initially dependent on print literacy skills until learning skills appropriate to etexts. Knowledge of text construction is not necessarily transferable to electronic texts.'

These responses suggest a degree of comfort with the fluidity and extensiveness of etexts, and some awareness of how far print literacy skills will take the etext user. More detailed investigations are needed to evaluate these strategies and develop them into a format for teaching.
This survey was undertaken on the basis of certain beliefs and assumptions about the increasing computer-mediation of teachers’ work. It is intended to provide:

- a statement of educational computing competencies
- an indication of competency levels among AMEP staff
- specifications for training to meet needs

The following section addresses the first two project outcomes — a statement of educational computing competencies, and the levels of competency of AMEP staff. The next section addresses the training issues. In both sections recommendations for future action are presented.

**Educational computing competencies and competency levels among AMEP staff**

Most people in the language and literacy field are well aware of the issues involved in defining competencies. An essential issue is one of detail — how broadly or narrowly are competencies to be described. Are they to be of the generic Mayer Key Competency type (Mayer Committee 1992), or are they to be at the level of detail of industry competencies? Inevitably in educational computing the competencies fall somewhere in between, since neither the broad nor the detailed competencies have been developed in detail. We now turn to a consideration of the results of the survey in the context of two perspectives on competency, one state and one national.

**AMES Victoria competencies**

AMES Victoria has developed a broad three-tiered set of competencies for each of six ‘key curriculum areas’, one of which is educational computing (Howell and Corbel 1996). The first level describes the skills and knowledge all teachers should have. The second level describes the skills and knowledge that specialist teachers at centres should have. The third level describes the skills and knowledge necessary for teachers whose work takes them between centres and into external arenas. In educational computing certain tasks and related computing features have been identified and these formed the basis of training in 1993/4. Summaries of these tasks and features form the basis of questions 3.9 and 3.10 in the survey. Thus in Victoria these ‘competencies’ have emerged from teachers’ practice and at the same time have shaped it. The competencies appear in Appendix 6.
As we saw above, more than half the respondents were at the highest of the three levels. While this is a positive finding, we must remember there are two more types of training necessary — that for those below that level, and that for those who are there. Where do they go next? As we shall see in the next section, there are levels other than those addressed by the AMES Victoria approach. In addition, the demands at each level keep rising.

**Information competence (NBEET)**

In November 1995 the Employment and Skills Formation Council, on behalf of the National Board of Employment Education and Training, published a significant report on the training and education issues associated with the convergence of technologies in the communications and computer industries (DEET 1995). The report focuses on the skills and attributes required by the workforce as a result of the growth in converging technologies. Its treatment of competencies is of particular relevance for this survey.

**Competency levels**

The Council has developed a table of 'categories of computer use' and associated 'skills clusters'. These are in five levels — basic tool, enhanced tool, knowledge tool, innovative tool and creative tool.

Although the survey question 3.9 does not match the Council’s categories exactly, it is probably safe to say that it covers the content of the first two, basic tool and enhanced tool. Seventy-three percent of respondents were in this category, with 56% of respondents at the top end of it. However, when we look at the group attending the online literacy course we find a higher and wider range of tasks and skills, which clearly place many of the respondents in the third category.

The Council’s Recommendation 14 is that:

*An objective be adopted to train all staff in Australia’s education and training institutions to the level of enhanced tool skills user, to train more than 50% to the knowledge tool skill cluster and to train more than 3% to the innovative/creative tool skills cluster by the year 2000.*

The AMEP is well on the way to achieving the first part of this objective. It is likely, had the survey included specialist staff in areas such as materials development, that the third part would nearly be reached. In the second part the AMEP is behind, but with 35% of respondents having a modem, many AMEP teachers are clearly ready for this next step.

Until now the main focus has been on general computer skills. Training in skills necessary for utilising converging technologies has yet to be undertaken, though the NCELTR Short Course Online Literacy for Language and Literacy Teachers in November 1995 marked a start in identifying and developing the skills necessary. A follow-up project in 1996 will develop self-study material based on the course content.

**Recommendation 1**: The AMEP should adopt the NBEET objective to train all staff in the AMEP to the level of enhanced tool skills user, to train more
than 50% to the knowledge tool skill cluster and to train more than 3% to the innovative/creative tool skills cluster by the year 2000.

**Recommendation 2**: The AMEP should continue to support the identification of competencies and their development into training modules through its research and development projects.

**Access for disadvantaged groups**

The Council is concerned that all groups within the community need guaranteed access to the new technologies. The needs are of three types — access to equipment, access to networks, and ‘increased computer and communication literacy skills and for training in the use of general computer skills (eg word processing, spreadsheets) and in communications technologies (eg accessing the Internet)’. The Council recommends:

> Develop information materials to raise the awareness of people from non-English-speaking backgrounds of the need to update their skills in the converging technologies and to develop measures of assistance where they are urgently needed to meet this need.

(1995:67)

Clearly the AMEP is in a position to address this need.

**Recommendation 3**: The AMEP should specify educational computing as central to its programs for NESB learners.

**Recommendation 4**: The AMEP should support the conversion of training modules in information competence for staff (Recommendation 2) into information and training materials for language learners.

**Teachers’ attitudes**

The Council asks ‘some fundamental questions’ about relevant learning theories, the quality of technology, teachers’ attitudes, learners’ attitudes, and the responses of employing authorities.

In the case of teachers the Council is positive:

> The Councils work shows that some teachers in schools, TAFE colleges, and universities have embarked, as individuals and in small groups, on quite substantial integration of the technologies. These examples are characterised by strong leadership but they represent only a small fraction of the teaching force.

(1995:82)

In this survey we can see evidence of a limited degree of integration being undertaken by a much larger proportion of the teaching force. It is a characteristic of many AMEP providers that such innovations are not ‘hot housed’ with high-end applications in a few locations, but are more widespread, albeit at a lower level of sophistication. The Council continues:

> If teachers and trainers are given proper opportunity to develop along with the technology, awareness, confidence and finally competence will develop. It was often pointed out during consultations
that Australia has an ageing education workforce in all three sectors. To some extent this may be a constraint. Yet those in the current workforce possess a vast wealth of experience, knowledge, skills and attributes. They may also have the time to learn, given the right motivation and opportunity. In any case, their experience should be treated as invaluable for the production of multimedia education content. It is very much a matter of producers having the desire and competence to 'listen' and to use this accumulated experience in new multimedia projects.

(1995:82)

This survey provides support for this argument, showing that although the AMEP workforce is ageing, in keeping with general trends, it is demonstrably capable of learning and change. We will return to the issues of time and opportunity below.

**Meeting needs**

In this section we come to the third of the project outcomes — the specification of training needs. If there is one theme common to the research on educational computing, as well as the findings of this survey, it is the significance of training. As Standish puts it, summarising the recommendations of earlier reports:

*The first condition is training. Teachers are the key to educational change, and they need to see how computers can be of personal use to them. Second, teachers need a vision of technology and education. They must have time, expertise, resources and structure to re-evaluate learning with a focus on using technology. Next, innovation should be encouraged by administration and colleagues. Lastly time and resources are needed by providing release time for teachers to attend classes and learn. Teachers need access to technology during and after training to be able to practise and use what they have learned.*

(1993:7)

The issue of training will be dealt with in more detail below. We first turn to the other issues raised by Standish.

**Vision**

The impression gained from this survey is that there is a vision held by many people in the AMEP, but that most of them are teachers. A substantial number of respondents were critical of the lack of perspective, policy and priority on the part of management. At the central office level, program, finance and administration staff need to understand the central role of educational computing in the provision of language and literacy training. The attention of many in central offices has been directed towards mainframe administrative computing. The AMEP has made a huge commitment to this area over the past decade, with the result that educational computing has been a much lower
priority. It is ironic in the extreme that a recent overhaul and upgrade of the national system has actually reduced its former (meagre) capacity to support computer-mediated communication among AMEP staff (see Bottomley, Dalton and Corbel, 1994, for a description of its use in an earlier curriculum innovation). Educational computing has to be seen as something equally important to administrative computing, but different enough to warrant specific policy and funding. Thirty-seven percent of respondents knew there was a policy in their organisation. Perhaps each provider does have a policy, but if it does, in many cases it is not being sold to the staff. The figure should be much closer to 100%.

In addition to policy comes priority. A policy is all very well, but if it does not receive active attention, it might as well not exist. Only 22% said that their organisation had an implementation plan. Perhaps there are plans, but, again, they are not being sold to those most affected by them. For there to be priority, there must be understanding and vision. This must exist at the very top of the administration. In December 1995 NCELTR ran a one-day course on the implications of the Internet for the AMEP. It was a useful and informative session, and participants went away informed and aware. However, few participants were senior staff. It will not become a priority until management takes the time to understand the issues.

**Recommendation 5**: AMEP providers should be required to have a policy on educational computing. These policies should be communicated to staff and be consistent with AMEP policy. Priorities for educational computing should be established in the Annual Operational Plan.

**Recommendation 6**: NCELTR should ensure that AMEP providers are informed of the issues in educational computing policy.

**Encouragement**

The role of middle level management, particularly principals of centres, is significant in providing encouragement. At this level there seems to be more awareness among staff of policy and planning, with 54% of respondents saying that there was a policy at their workplace, and 33% saying that there was an implementation plan. Although only 8 respondents nominated the principal as a direct source of encouragement, it is likely that indirectly principals were more influential. Principals can set the tone of centres with their attitudes and interests in certain areas at the expense of others. Particularly in the absence of central direction, the value the principal places on educational computing, and how that translates into time allowances in particular, is crucial to the success of an innovation.

‘The range of support they (principals) offered was influenced by the value placed on the CSWE. Support ranged from the provision of resource support, especially in terms of time release for experienced teachers to support colleagues, to the setting up of organisational structures such as the stage meetings to help teachers work through the meaning of the change together.’ (Bottomley, Dalton and Corbel 1994:48). Such support would be valuable for educational computing as well.
Principals have to have the vision to provide the encouragement. Because the introduction of educational computing has been far less formal than the CSWE there is more need for central management to ensure the vision is shared and the encouragement provided. Vision has to be tempered with a sense of the reality of teachers’ lives, however. Encouragement must be manifested in less direct, but equally fundamental ways to do with access, time, finance and resources and training.

**Recommendation 7**: Educational computing policies should be developed and funded at local level.

**Access**

There is perhaps more concern for student-computer ratios than for teacher-computer ratios. AMES Victoria has funded a certain ratio, the Skills Formation Council recommends another one in its report. The problem is how to work out a teacher-computer ratio. Number of computers divided by number of teachers is highly misleading, since it ignores such issues as location, timetabling, shared usage, portability, compatibility, and so on. A fundamental problem is that personal computing is supposed to be just that — personal! — and for most teachers it isn’t.

There is a need to acknowledge the large amount of time spent at home on educational computing by some teachers. This could be achieved through lending notebooks, or supplementing software purchases for home use. At the same time the concerns of the NSW focus group, that there is an automatic assumption that this work will be done at home, should be acknowledged.

**Recommendation 8**: Teacher access to computers should be maximised through timetabling, the availability of notebooks for borrowing, and other forms of support that acknowledge that for many teachers educational computing takes place outside the worksite.

**Time**

More time was the commonest single suggestion in the survey. The National Board of Employment Education and Training (1995) found that ‘the issue of time to learn was a very big one indeed’ (89). Respondents made a number of suggestions as to how this could be achieved: more money for replacement, less teaching.

Others suggested a willingness to find time provided the need was acknowledged, and educational computing be prioritised over other increasingly demanding tasks. (Ironically, these tasks are often related to the documentation of competency based courses. There was virtually no mention of educational computing assisting in this area. It may be that this is conflated in users’ minds with the demands of administrative computing.) Hargreaves (1994) summarises the situation that emerges from the conflict between two different perspectives on time — the monochronic administrative perspective which calls for more control and accountability for time, and the polychronic teacher perspective which balances the multiplicity of classroom demands:

*The solution to this impasse is not to be found in appeals to more sensitivity and awareness among administrators as they devise*
and develop new programs and timelines for change. The time-related misunderstandings between administrators and teachers are endemic to the distance there is between their two lifeworlds — a distance which appears to be increasing. It would seem more fruitful to explore solutions which question the strength of the divisions between administration and teaching, between development and implementation and which question the bureaucratic impulses that support such divisions. In particular, it may be more helpful to give more responsibility and flexibility to teachers in the management and allocation of their time, and to offer them more control over what is to be developed within that time.

(1994:114)

**Recommendation 9**: The time for teachers to develop educational computing competence should be maximised through an acknowledgment of the ever greater demands on teachers’ time from a range of sources, and to allow teachers a greater degree of control over how they use their time in meeting these demands.

**Resources**

Unlike other forms of innovation educational computing calls for a substantial investment in equipment, which in a relatively short time needs upgrading, particularly if newer equipment is installed. It has to be acknowledged that the widespread use of text-based CALL may largely be due to the simplicity of the programs used and their capacity to run on just about any computer. It may be that learner expectations will call for more graphically-oriented and less text-based material. Interestingly, only a handful of respondents asked for greater multimedia capacity, though the requests for greater interactivity could be interpreted in this way.

*Converging Technology, Work and Learning* (National Board of Employment Education and Training 1995) focuses very strongly on multimedia. We need to reflect on the relative lack of uptake of the only two AMEP-supported multimedia ventures, and establish an equipment policy that acknowledges the perceived demand for multimedia, yet the reality that a text based-approach may be quite suitable for learning aspects of language subsystems.

The major issue is networking. There is less immediate appeal in going online as a language learning experience for ESL learners than there is, for example, for LOTE learners. However, online literacy (or higher levels of information competence) are going to become what word processing is now — a set of standard skills that everyone in the workplace is expected to have. For this to happen, AMEP teachers and learners will need access to networks to both learn the skills and to teach them.

**Recommendation 10**: AMEP providers should develop hardware and upgrade policies that meet the increasing demands on educational computing.

**Money**

The implications of the above are that formal budget lines for educational computing have to be established with identified percentages for hardware, software and training.
**Recommendation 11**: AMEP provider budgets should have formal lines for educational computing with identified percentages for hardware, software and training.

**Training**

There are two broad directions that training must take:

- towards greater systemisation and formality
- towards readiness to hand/just in time

**Formal training**

The content of training needs to be based on a common set of skills/competencies derived from an analysis of the tasks currently carried out by teachers and likely to be carried out by them in the future. What do teachers and other staff do now, and what will they need to do in the future, with computer-mediated texts? How does this vary between generalists and specialist staff, and between levels of the organisation?

Some guidance for this already exists in the materials developed by AMES Victoria. These may form the basis of a set of competencies that would have applicability across the AMEP. Development of such competencies needs to bear in mind the categories and skills clusters of the NBEET report, as well as other work that may be underway.

The training needs to have a more extended range. While the three broad levels of competency of the AMES Victoria program cover current practice, they only cover the first two levels of the NBEET skills cluster. There is a need to develop descriptions of tasks at higher levels. Some guidance for this already exists in the materials developed for the NCELTR Short Course on Online Literacy, and in the results of the survey of participants reported earlier.

The outcome of such an analysis would be identification of competencies organised according to levels, which would produce sets of modules in the standard Competency-Based Training form. This would allow for accreditation and improve accessibility. On the basis of the modules, teaching activities should be developed to provide a hands-on approach. The formality of the training will come through the development of modules, against which individuals can match their current competency levels, and subsequently through accreditation of the training. An accredited course would be of potential interest more widely among other training institutions.

Courses based on the modules should run locally. Group sessions would be facilitated by a specialist staff member (the Educational Computing Teacher (ECT); see below). Central training will focus on management and the ECTs. Teachers will be able to study at home as online access to modules and staff will become available. A Modular competency-based approach allows for continuity, and variations in intensity and pacing according to individual and group needs.

**Recommendation 12**: DIMA, in conjunction with other relevant agencies, should support the development of formal training materials for Information 56 The computing practices of language and literacy teachers
Competency, based on fully-developed descriptions of information competency. Such materials should be in modular form for flexible delivery. Courses based on such materials should be accredited. Initiatives begun in 1995, and continuing in 1996 through NCELTR research and training programs, should be the basis of this development.

**Informal training**

‘Hands on with the trainer at the centre is the key.’ (Respondent).

Our computing practices perspective shows how a range of other people mediate teachers’ computing — peers, colleagues, family, as well as designated specialists. Survey respondents frequently called for one to one training. This reflects the special nature of educational computing, with its strong technical component. Perhaps more than any other innovation it calls for support that is ready to hand, or, in the language of management, just in time.

A typical response to this issue is to attempt to redefine the way the user interacts with the computer — to improve the Help screens, to simplify the screen, and so on. Our perspective is to acknowledge the embeddedness of computing in social practice and to accept that teachers will ask colleagues and get useful advice. This is not to deny the importance of learning strategies for getting support from the computer — computer-based support is increasingly sophisticated and probably underutilised. We need to strike a balance between interacting with the computer and with colleagues in carrying out tasks dealing with etexts. Too much reliance on colleagues is expensive and disruptive: too much reliance on the computer may be equally time-wasting.

Support should come from a formally designated specialist, the Educational Computing Teacher (ECT). The ECT should support a local network of skilled teachers who are available for informal one to one support. A mentor system might be established between these teachers and less experienced ones. However, one to one work will be in the context of the training modules referred to above. Acceptance of the role of others in supporting computing practices means that their work must be acknowledged. Acknowledgment for the skills of knowledgeable teachers can come in various forms, not necessarily formal.

**Recommendation 13**: A range of informal learning modes should be supported by providers, and the role of informal mediators of computing practices should be acknowledged and supported.

**Educational computing teachers**

Educational Computing Teachers are teachers with time release to support other users. ECTs are pivotal to the success of educational computing, but certain conditions must be met:

- Training needs to be provided and certified.
- Replacement needs to be standardised.
- Position statements outlining duties and levels of competency must be provided.
- Involvement in relevant budgetary decisions must be available.
Central support must be available to provide guidance and vision.

The competencies of the ECTs need to be described as a part of the process outlined earlier in which educational computing competences are identified. These must include technical, educational and interpersonal knowledge and skills.

**Recommendation 14**: Local teaching sites should have an appropriately trained and supported Educational Computing Teacher.

## Conclusion

The National Board of Employment Education and Training (1995) recommends:

> By the middle of 1996, each school system and training sector to provide to the Ministerial Council a broad analysis of the current position in relation to technology infrastructure, workforce capability and the application of multimedia products.


This survey meets that requirement, and shows AMEP teachers well on the way to the levels of competence required.

However, despite the successes, there is still much to be done. The computing practices of language and literacy teachers have until now focused on two main areas — the use of computers to teach language (CALL), and as a tool for both teacher and learner use. Teachers have had not only to learn how to use the computer to mediate texts, but have had to teach others as well. Now the convergence of tasks, roles and media is introducing a third area of educational computing. The demands of ‘information competence’ or ‘online literacy’ are increasingly being felt. As with CALL and word processing now, teachers will have to both learn how to use and learn how to teach these new competencies/literacies. At the same time, there is a continually-developing multimedia capacity in all three areas — computer assisted (language) learning, computer as office tool, and now computer as networked communications medium — which ensures a continuing demand for learning even in familiar areas.

This survey suggests that teachers in the AMEP are well-positioned in skills and attitude to meet this challenge. With appropriate support in policy and budgeting terms, teachers will continue to demonstrate the skills of lifelong learning they are teaching to their students. Teachers have, or are gaining, the competence, but not all have the confidence to put it into practice. These skills need to be publicised in order to prevent the positioning of teachers as impediments to a technological solution. Work, learning and technology are converging into a way of living and learning that these teachers are already successfully undertaking.
Bibliography

Anderson et al. 1990. *The use of technology in adult literacy programs*. Canberra: DEET.


Online Literacy Course Handouts.


<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMEP</td>
<td>Adult Migrant English Program</td>
</tr>
<tr>
<td>AMES</td>
<td>Adult Migrant English Service</td>
</tr>
<tr>
<td>ARMS</td>
<td>AMEP Reporting and Management System</td>
</tr>
<tr>
<td>CALL</td>
<td>Computer-Assisted Language Learning</td>
</tr>
<tr>
<td>CES</td>
<td>Commonwealth Employment Service</td>
</tr>
<tr>
<td>CMC</td>
<td>Computer Mediated Communication</td>
</tr>
<tr>
<td>CSWE</td>
<td>Certificate in Spoken and Written English</td>
</tr>
<tr>
<td>DEETYA</td>
<td>Department of Employment, Education, Training and Youth Af-</td>
</tr>
<tr>
<td></td>
<td>fairs (formerly DEET)</td>
</tr>
<tr>
<td>DIMA</td>
<td>Department of Immigration and Multicultural Affairs (formerly</td>
</tr>
<tr>
<td></td>
<td>DIEA)</td>
</tr>
<tr>
<td>ECT</td>
<td>Educational Computer Teacher</td>
</tr>
<tr>
<td>ILC</td>
<td>Independent Learning Centre</td>
</tr>
<tr>
<td>ISU</td>
<td>Information Support Unit</td>
</tr>
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<td>NBEET</td>
<td>National Board of Employment, Education and Training</td>
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<tr>
<td>NCELTR</td>
<td>National Centre for English Language Teaching and Research</td>
</tr>
<tr>
<td>NESB</td>
<td>Non-English Speaking Background</td>
</tr>
<tr>
<td>TESOL</td>
<td>Teaching English to Speakers of Other Languages</td>
</tr>
</tbody>
</table>
Appendix 1

Project brief

NCELTR computing practices project

22 May 1995

The project goals are to:

- describe current practice
- identify needs
- plan training

in the areas of current and emerging computing practices of language and literacy staff in the AMEP.

Administration

Manager: Sandra Gollin (NCELTR)
Steering Committee: Cathy Simpson (NCELTR)
              Chris Howell (AMES Victoria)
Project Officers: Chris Corbel, Leanne Trembath

The project consists of two parts — a survey of current practice and a description of new computing literacies.

Survey of current computing practices

Background

There is a need for an accurate picture of the demands on teachers for computer use, and the extent to which these needs are being met. Building on the results of previous surveys and several years of professional development activities, AMES Victoria has developed a draft set of competencies in computing practices and has done a preliminary mapping of Victorian AMES teachers’ skills against them.

Action

- Refine competencies
- Map skills of teachers against the competencies

In Victoria all teachers have been mapped approximately to the draft competencies. Sample groups from other states will be identified and mapped.

- Identify training needs and options

Focus groups of experienced teachers will consider the outcomes of the survey, and to recommend training. Particular attention will be given to the use of Computer-Mediated Communication in the provision of professional development activities.
Outcomes

- Statement of educational computing competencies
- Indication of competency levels among AMEP staff
- Specifications for training to meet needs

Survey of new computing practices

Background

Teachers and administration staff are increasingly working with electronic texts as part of their professional tasks. Electronic texts are what appear on computer screens, irrespective of the particular program, application or task the user is carrying out. These texts have some things in common with printed texts, but have other characteristics that are completely new, and are only partially understood.

Some teachers and administration staff have undertaken formal courses in particular computer applications, such as a word processing packages. Others have undertaken informal sessions with colleagues. All have learned individually and informally.

Many users still report frustration and difficulties with aspects of their computing work. Informal observation suggests that users vary greatly in their knowledge and skills in working with electronic texts, and in using them in the process of producing print-based texts.

It is hypothesised that one reason for this is that users are attempting to transfer literacy processes and practices relating to printed texts to their work with electronic texts. Although the two types of texts have enough in common to allow this transfer to be effective up to a point, the differences are substantial enough to cause problems.

This transfer is the result of the natural attempts of users skilled with printed texts to apply those skills to electronic texts. Formal training does little to assist in this, since it focuses only on individual features of various applications. It does not focus on an understanding of the characteristics of electronic texts, and the skills and strategies necessary to work with them. It is hypothesised that users will benefit from training which raises to consciousness the characteristics of electronic texts that make them different from print-based texts, and practises the skills involved in making effective use of these characteristics.

The results of this research will have implications for training, and will provide input for the NCELTR Short Course on Online Literacy in November.

Action

- On the basis of a literature review (already largely completed), summarise the characteristics of electronic texts, and the skills and strategies involved in working with them, that may not be easily identified and acquired from experience with print-based texts
- On the basis of these findings, interview and observe a small number of experienced users. Identify areas of difficulty.
- Develop specifications for training that will address the issues identified.
## Appendix 2

### Variation between print and electronic texts

<table>
<thead>
<tr>
<th>Print text</th>
<th>Electronic text</th>
<th>Reference</th>
</tr>
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<tbody>
<tr>
<td>Embeddedness in the situation</td>
<td>Situationally embedded. Part of ongoing activities — integrated</td>
<td>Bernhardt</td>
</tr>
<tr>
<td>Readers</td>
<td>Users/doers/seekers</td>
<td></td>
</tr>
<tr>
<td>Extended engagements</td>
<td>Raids</td>
<td></td>
</tr>
<tr>
<td></td>
<td>eg Help systems</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Collaborative writing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Part of the physical system — the machine</td>
<td></td>
</tr>
<tr>
<td>Transportable</td>
<td></td>
<td>Costanzo</td>
</tr>
<tr>
<td>Interactivity processes</td>
<td></td>
<td>Bernhardt</td>
</tr>
<tr>
<td>Mental processes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– constructing meaning, interacting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mental processes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>– manipulating, transforming</td>
<td>Creely</td>
</tr>
<tr>
<td></td>
<td>Little delay between intent and result</td>
<td></td>
</tr>
<tr>
<td>Roles</td>
<td></td>
<td>Bernhardt</td>
</tr>
<tr>
<td>Reading and writing separated</td>
<td>Reading and writing combined</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Merges roles</td>
<td>Bolter</td>
</tr>
<tr>
<td></td>
<td>Writing space shared between reader and writer</td>
<td>Bolter</td>
</tr>
<tr>
<td></td>
<td>Reader can change text</td>
<td>Murray</td>
</tr>
<tr>
<td>Reading direction</td>
<td></td>
<td>Selfe</td>
</tr>
<tr>
<td>Top left – low right</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Etexts permit readers and texts to interact — literally</td>
<td>Reinking</td>
</tr>
<tr>
<td></td>
<td>Encourages awareness of reading and writing as matters of choice</td>
<td>Costanzo</td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total control</td>
<td>Control via a device</td>
<td>Costanzo</td>
</tr>
<tr>
<td>Strong reader control</td>
<td>May be quick and accurate but analytic</td>
<td></td>
</tr>
<tr>
<td>Functionality indicators Systems</td>
<td></td>
<td>Bernhardt</td>
</tr>
<tr>
<td>Grammatical system</td>
<td>Management — menus</td>
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</tr>
<tr>
<td>Layout and typography</td>
<td>Navigation — scrollbars, bars, links</td>
<td></td>
</tr>
<tr>
<td>Simple — margins, indents, page numbers</td>
<td>System status — messages</td>
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</tr>
<tr>
<td></td>
<td>Informative/ideational</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mapping richest on borders</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complex — all print options and more</td>
<td></td>
</tr>
<tr>
<td>Landmarks</td>
<td>Physical orientation device</td>
<td>Current mode indicator</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Modularity</td>
<td></td>
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</tr>
<tr>
<td>Hard structures (determined by material)</td>
<td>page</td>
<td>bits, pixels</td>
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<td>Soft structures (what's on the material)</td>
<td>punctuation, paragraphs, fonts, colour</td>
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<td>Structural units</td>
<td>Books, magazines, chapters, articles, boxes, sidebars</td>
<td>Screen as window on text base. Screen as structural unit of prose. Focus on idea grouping. Problems of local cohesion. Scrolling unsatisfactory. Compiled.</td>
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<tr>
<td>Written</td>
<td></td>
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<tr>
<td>Fixed size and order</td>
<td></td>
<td>Temporal window on a virtual text</td>
</tr>
<tr>
<td>Use spatial indicators to relocate info</td>
<td></td>
<td>(May) lack spatial-contextual clues</td>
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<tr>
<td></td>
<td></td>
<td>Electronic texts can control readers' access to text during independent reading — like a window revealing a portion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plus windows, menus</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inter(hyper) textuality</td>
<td>Intertextuality hidden or explicated (footnotes)</td>
<td>Intertextuality ready to hand</td>
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<tr>
<td>Indicators</td>
<td>Footnotes, parenthesis</td>
<td>Windows give illusion of depth</td>
</tr>
<tr>
<td></td>
<td>But essentially flat, linear</td>
<td>Can be in many places at once</td>
</tr>
<tr>
<td></td>
<td>Indicators embedded in text or separate eg contents</td>
<td>Text can be actually structured loosely</td>
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<td>Recursive at syntax level</td>
<td>Recursive at discourse level</td>
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<td>Computer-mediated texts may be structured differently than printed texts</td>
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<td></td>
<td>Hierarchical</td>
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<td>Navigability indicators</td>
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<td>-----------------------------------------------------</td>
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<td>Physicality</td>
<td>Physical — can be held</td>
<td>Behind glass</td>
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<td>Can’t be held. Can’t be seen as a whole</td>
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<td></td>
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<td>Ets make available a wide range of symbolic elements that can be integrated with written prose</td>
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<td>Incorporates marginal elements, pictures, sound</td>
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<td>Produces light</td>
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### Variability

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<th>Other media</th>
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### Malleability

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<th>C-S</th>
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<tr>
<td>Permanent writing</td>
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<tr>
<td>fixed</td>
<td>malleable</td>
<td>Murray</td>
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<tr>
<td></td>
<td>evanescent, like oral texts</td>
<td>Murray</td>
</tr>
<tr>
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<td>soft copy</td>
<td>Ballestri in Creely</td>
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### Form

<table>
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<tr>
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### Display

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### Publishability

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<tr>
<td></td>
<td>Public in final form and preparation</td>
<td>Murray</td>
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---

**Based on Bernhardt 1993**

- ‘etext-in-process’ 56
- may be non-standard eg typos in email (though not public language)
Appendix 3

Current practices survey

NCELTR computing practices project

Current practices questionnaire

This project is gathering information about current educational computing practices among AMEP teachers which will be the basis for training and support recommendations for funding agencies and providers. This questionnaire will be completed by AMEP teachers across Australia.

Educational computing refers to any computer use, inside or outside the classroom, related to your professional activities as a teacher. It most specifically refers to CALL programs and word processing, but may include a range of other activities.

Thank you for taking the time to complete the questionnaire.

Chris Corbel, Project Officer (03 344 8986)

Please circle or tick the appropriate item, or add the relevant information for the questions below.

1. **Profile**

1.1. Gender  
   F  M

1.2. Age  
   21–30  31–40  41–50  51–60  60+

1.3. Experience  
   Years teaching language and literacy  
   1-5  6-10  11-15  16-20  20+
   Years using computers in teaching  
   1  2  3  4  5+

1.4. Training  
   What training have you had in educational computing? Give details:  
   Accredited course

   Non-accredited course/inservice/workshop

   Informal contact with other users/self teaching

1.5. Role in relation to computers  
   User  Support
1.6. General skill level in educational computing
How would you rate your general skill level in educational computing?
None Some Reasonable High Very high

2. Workplace
2.1. Type: AMES TAFE Private
2.2. No of current Learning Activities at your workplace
<5 5–10 10+
2.3. Location of computers
Classroom Lab ILC Library Other
2.4. Do you have input into educational computing decisions in your workplace? If so, how?
2.5. Is there a policy (formal or informal) on educational computing? If so, describe it briefly.
At your workplace
In the organisation that employs you
2.6. Is there an implementation plan for educational computing? If so, describe it briefly.
At your workplace
In the organisation that employs you
2.7. How would you compare the introduction of computers into your workplace with the introduction of another educational innovation, such as the CSWE or another competency-based curriculum?

3. Use
3.1. How did you come to use computers in your teaching?
3.2. Do you have a choice whether to use computers or not?
3.3. What sort of access do you have to computers in your workplace?
3.4. Do you use a computer at home? Yes No
If yes, do you have, or intend to get, a modem? Yes No
3.5. How often do you use computers? Give examples

Preparation of class materials
Teaching

Accessing information (other than AMIS/ARMS)

Networking with colleagues

Self education

Preparing reports, fliers, newssheets, etc

Other

3.6. How many hours a week do you spend on educational computing?
   At work (in teaching)  At work (other)  At home

3.7. What CALL programs do you use? Why?

3.8. What CALL programs do you author?

3.9. What aspects of word processing can you do?
   Load and save document, format and edit text
   Columns, borders, and other more complex formatting, use tables
   Use styles, outlining, table of contents, objects

3.10 What aspects of computer management can you do?
   _ Start up and shut down, find programs, use menus
   _ Create and manipulate documents/files, directories/folders
   _ Troubleshoot problems

4. **Support**

4.1. Time
   Do you have any time allowance for your educational computing role?
   How could this be improved?

4.2. Training
   What is available to you as a staff member at your workplace and in your employing organisation?
   How could this be improved?
4.3. Support from specialist staff
What is available?

How could this be improved?

4.4. Meetings with other staff
What is available?

How could this be improved?

4.5. Electronic connections to other people and resources
What do you have (eg ELSINET, Internet)?

How could this be improved?

5. **Teaching**

5.1. What learner needs and teaching goals are met through your computer use?

5.2. How do you integrate computer use with other learning activities?

5.3. Has your teaching changed since you've been using computers? If so, how?

5.4. Can the contents of the CALL programs you use be modified? Are they? If so, by whom?

6. **Beliefs, attitudes and understandings**

6.1. Are you aware of programs other than those you are using? If so, how have you become aware of them?

6.2. What educational principles do you see underlying the CALL programs you use?

6.3. Do you feel that the programs you use are consistent with your understanding of language learning? If not, how could they be made more appropriate?

6.4. Do you have concerns, whether personal or educational, about your computing practices? If so, what are they?

6.5. Do you feel you are encouraged in your computer use? If so, how?
6.6. Has educational computing changed the work of teachers as professionals? If so, how?

6.7. Which of the following best sums up your feelings about educational computing?
   • I have some ideas about something that would work even better.
   • I am concerned about relating what I am doing to what others are doing.
   • How is my use affecting learners?
   • I seem to be spending all my time getting material ready.
   • How will its use affect me?
   • I’d like to know more about it.
   • I am not concerned about it.

7. General comments
Appendix 4

New practices survey

NCELTR computing practices project

Thank you for agreeing to participate in the project. You should be completing the survey after having been working on a task at the computer for about half an hour or so. This survey is for people using Microsoft Word for Windows 6. If you are not using Word for Windows 6 you will not be able to complete the survey.

Rank your experience as a computer user

Novice Average Skilled

Describe the task you have just been doing

How often do you do this task?

How has the way you do this task changed as a result of working with computers?

How have you learned how to use the computer to do this task?

What other tasks do you do involving computers?

How have you learned how to use the computer to do these tasks?

How has the way you do these tasks changed as a result of working with computers?

Have you customised your screen in any way? If so, how?

What are the similarities and differences between a printed text and an electronic text (a text on the computer screen)?

How have your print literacy skills influenced your work with electronic texts?

The Screen Items Chart (See Appendix 5)

The items in the left hand column are from the screen you see when you use Word for Windows. Words in capitals refer to objects on the screen. Words in bold are items from the main menu. The other words are those that appear when you select a particular item from the main menu. In the second column, write the approximate number of times you used the item on this occasion. In the third column refer to how often you use an item in all your computing, not just on this occasion. In this column use Never, Rarely, Sometimes, Frequently, almost Always. The Comments column is for anything you’d like to say about the item.

Don’t worry if you don’t know what an item is, or don’t use certain items, or can’t remember exactly how many times you used, or use, an item. Just answer as accurately as you can in the circumstances.
## Appendix 5

### Word actions analysis

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<th>E</th>
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<td>E</td>
</tr>
<tr>
<td><strong>RESTORE/MAXIMISE BUTTON</strong></td>
<td>E</td>
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<tr>
<td>Document Control Menu</td>
<td>E</td>
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<tr>
<td>New</td>
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<tr>
<td>Open</td>
<td>P/E</td>
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<tr>
<td>Close</td>
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<td>Save</td>
<td>E</td>
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<td>Save as</td>
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<td>Save all</td>
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<td>Find File</td>
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<td>Paste (from another doc)</td>
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Appendix 6

AMES Victoria educational computing competencies

Level 1

Teacher

Use computers to facilitate English language learning and teach computer use.

**Tasks**
- select appropriate educational computing materials
- integrate educational computing activities into classroom practice
- contribute to educational computing resources

**Knowledge**
- educational computing programs
- local software availability
- windows environment
- basic word processing
- educational computing policies of the centre and the organisation

**Skills**
- access computers

Level 2

Educational computing representative

Provide leadership and support in educational computing at centre level.

**Tasks**
- provide Level 1 teacher support and training
- troubleshooting
- load and delete programs
- maintain equipment
- network (formally and informally)
- keep records of hardware and software
- develop materials

**Knowledge**
- technical requirements
- educational computing software
- appropriate action to take
- educational computing policy at centre level and organisational level
- security procedures

**Skills**
- familiarity with types of problems
- ability to describe problems accurately