The context of IT is changing life on two levels:

**Individual level** where and how individuals participate in society,

**Social level** where the juxtaposition of local communities, the national, state and global society is altering because of connectivity.

**Educators - perspectives from an individual level**

If teachers are to be participants in modern society and reflect its operation, they need to be immersed in using information technology as much as possible and need to understand the processes and their consequences. They need to reflect on their experiences as they play the role of consumer, parent, member of a community, state and nation, and member of a team of workers in their workplace. In their workplace, they are employees, fellow workers, professional colleagues and friends. In their homes they are parents, partners, relations and friends. In their community, they are consumers of commercial and government services, information and products, a part of a consumer market, a part of a community and part of a society. Information technology is explicitly or implicitly significant in all the processes that surround the roles teachers play as they live. They need strategies and opportunities to reflect on their lives and to understand the linkages between the technologies of their experiences and the technology and processes children know and need to know. Ideally, teachers would understand the relationship of technology to how we live personally and how individuals contribute to the information technology prowess of the nation. The global context that increasingly impacts on most aspects of life in Australia adds urgency to the need for this understanding.

Australians have embraced technologies in their personal lives. NBEET (1998), reports that Australia is second in the world in its adoption of computers, mobile phones and Internet services as home and personal products and services, a statistical picture supported by NOIE (1998). The pervasive-ness of technology in the lives of Australians (a pervasiveness not present in schools) is a choice they make and this collective trend alters the circumstances in which we all live. Kelly (1998, p.5) perhaps captures the heart of the trend; “Computing, in conjunction with communications, will have a profoundly greater impact on society. This is because communication skills are at the heart of what makes a society and a civilisation.”

The issue for teachers is that they need the ability to identify, observe and reflect on the changes happening around them. Having done so, they need to address the impact of changing Australian lifestyles on the material that they help children learn. What value can teachers add to children’s experiences outside of schools, and how can they help children make sense of their new and changing society, one that is fundamentally different to that experienced by their teachers as children?

Part of the dilemma is that schools are now technologically poor, compared to the technologically rich communities they serve. This is a statement that means more than measuring ratios that count computers per child and minutes per child per computer. It is about recognising that the context of children’s lives in the world outside the school gate is rich in technology processes and attitudes. The context of their parents’ lives is also technologically rich (Downes, 1998), leaving teachers in the position of usually having very poor technological environments from which they then interpret the world and reflect their view of the world in classroom practice. They have access to neither computers nor technological work practices which help them interpret the world inside and outside of the school gate - a sense of blissful ignorance prevails. This situation would be bad enough if it were static. However, the difference between schools and wider society increases as technology continues to change.

This document is suggesting that teachers’ professional lives need changing if they are to provide children with authentic learning experiences. It is
suggesting that unless teachers use technology and experience a workplace that parallels the technological processes in business, government and community, they have insufficient basis to know what skills, knowledge and attitudes children need to develop. Further, there is a risk that technological ignorance may prevent them from being able to critically observe and reflect upon the technological pervasiveness that surrounds their lives outside of schools. Criticism from outside the education systems begins to ask why people with such incomplete experience of society should be considered competent to teach children who are to face an information-based society: the reality is that few other people with the necessary educational skills and qualifications are ready to step into this role, leaving the responsibility on the existing workforce. Teachers need programs of professional development, which provide them with experience and understanding of the use of information technology and which provides frameworks for them to interpret their personal experiences.

Educators - perspectives at a social and economic level.

Local (national) level

The pervasiveness of technologies in our personal lives is a response of and to the growing significance of technologies in Australia’s economic, business and government community. Markets do not exist without consumers who in turn demand the services be invented as their levels of sophistication changes. Australia’s economic position and practice is determined by its relationship to the global economy and market structure and the values and beliefs of the global society. This is not only about producing Australian technologies and technological services within all industry sectors (in a global market place), but also about the impact of globalisation of industry and technological infrastructure, on how people work, what they do and how the interrelationships between businesses are altering producer, consumer and socio-cultural practice.

Governments throughout this country are convinced that information technology is the cornerstone of economic development and Australia’s ability to provide employment and hence a quality of life for Australians. International competitiveness, the impact of the new globally-operated corporations, global marketplaces, and global financial environments mean that Australia’s increasingly deregulated business sector must use information technology processes in order to survive, let alone grow. The role of global networks and networking in this is obvious. Although the goals can be rationalised and defended, NBEET (1998, p.xiii) comments that Australia may well not have adopted IT processes and thinking sufficiently quickly, nor at a sufficient level and that although we know ‘Australia can not simply afford to be a spectator’, we may already ‘be condemned to be an also-ran compared with other nations’.

For groups thinking about Australia’s economic future, the role of the education sector is quite clear.

Our education and training systems must equip all Australians to be enterprising, innovative, adaptable and socially responsible participants in the information economy. There is an urgent need to recognise that Australia will be at a serious disadvantage in the global knowledge economy if it fails to produce workers, professionals and managers with the skills to work in the online environment.

(NOIE p.11)

The NOIE report (amongst others), also points out that helping people participate as consumers and members of society is part of the role for schools and educational systems. So the question for this document is: what role might teachers play and how are they equipped to meet the challenge?

That schools might shape the future of Australia is a long-held belief in our culture and, in wider educational theory, schools both reflect society and act as agents to change it. Schools provide students who participate, with the advantage that they might be better citizens and workers and perhaps help resolve the worker shortages that limit Australia’s economic development. NBEET (1998) clearly emphasise the shortage of workers in the IT industry and of IT literate workers in all industries. It is now well established that IT literacy is also about thinking skills, analytical skills, communication skills, team work skills, problem solving skills and creative processes; classifications of skills which will sound familiar to every educator whose curriculum documents reflect the Mayer key competencies. Schools have long resisted the calls that their only role is to supply a workforce. Indeed most employer groups have asked for graduates who have multi-disciplinary skills, creativity and positive attitudes, and a broad base of skills that could have been derived from Mayer’s key competencies list. In helping teachers define what information technology is and what it means in the context of the concerns for Australia’s future, it may be useful to help teachers understand the connection between the skills now embedded in schools curricula and practices, and the skills which are valued in workplaces and what the collective impact is when the country makes use of its skills. This context provides not only the rationale to use technologies in schools, but provides guidance in the skills to embed in the activities children undertake with information technology while learning.

A range of national and state policies have recognised the importance of students emerging from school with IT skills and backed this with commitments stated as goals. For example the Adelaide Declaration on National Goals for Schooling in the Twenty-first Century (http://www.detya.gov.au/schools/adelaide/text.htm, accessed 1/6/1999) states as goal 1.6

Schooling should develop fully the talents and capacities of all students. In particular, when students leave school, they should:

... 1.6 be confident, creative and productive users of new technologies, particularly information and communication technologies and understand the impact of those technologies on society.

This document is suggesting that
educators and education systems do have a responsibility to support Australia's efforts to compete in a technologically-enabled global market place and that what students are taught and how they are taught has considerable impact on that. It is suggesting that curriculum documents already have embedded into their frameworks the skills that are necessary to help students become consumers and producers of products and services and that the documents illustrate the potential to help students develop creativity and attitudes that will support them in all facets of Australian life. This document also suggests that teachers need to consider their curriculum documents in the context of the connectivity enabled by global networks and that their classroom activities need to contribute to help children understand the impact of global connectivity on individuals, nation-states and global well-being.

**Educators - the global context**

The link between globalisation and telecommunications systems is well established and its power understood. The sheer size of the new communities, the diversity of consumer marketplaces, the collective wisdom, the melting pot of political and ideological beliefs and the concerns for the future of the earth are all facets of the Internet that are ever present in the commentaries about the impact of this global network on our lives, countries and society. Understanding the Internet only as a technological artefact, or as a place to store information may not be enough. Selwyn (1998) claims, "There is no sense in adopting the functionalist philosophy of this technology that posits a priori neutrality for technological artefacts, whereby technology merely has its good or bad uses or is merely a tool". Teachers should be aware that the Internet is socially and politically constructed and synonymous and interconnected. Teachers have a role in helping children see beyond their local lives, towards the integrated global picture. They can exploit the global connectivity provided by technology to do this. This needs to occur with the understanding that the same technology permeates the mass media, and thus has profound impact on the view that children in classrooms see of the world. The difficulty for educators is how to make use of these technologies to enhance educational programs or perhaps to redefine educational programs so students can become critical in their use of information rather than passive consumers of media.

If we accept the previous view, teachers need the opportunity to use information technology as often as possible and in as wide a range of circumstances as they can. Teachers need to take into their hearts that globalisation and the impact of information technology are central to this learning technology competencies movement and the future.

Globalisation is not only the concern of business and Government. It alters personal lives, within and outside of western society. Children and their teachers need to understand that.

This process starts at primary level, goes through the whole of education, and indeed is a lifetime process. (NBEET 1998, p.37)

For teachers then, this document suggests that they need to be immersed in circumstances that enable them to confront globalisation and the use of information technology in the globalisation process. They need also to understand the local context and defend how activities in schools are part of the holistic context.

State Governments should examine the quality of IT education at the primary and secondary levels with a view to implementing the world best practice in terms of IT and teacher competence.

(NBEET 1998, p.xiii)

Although most teacher competency movements in Australia emphasise the use of learning technologies throughout curriculum and encourage teachers to use technology to support learning processes, government position papers also ask schools to consider the significance of IT education in schools. This document recognises that IT studies in Australian schools need competent and capable teachers and that alongside programs which encourage all teachers to understand why learning technology is so important, it is also important to provide support to those teachers who teach in information technology programs of study and IT related disciplines. Further this document recognises the significance of also supporting those educators in schools who manage and develop the increasingly complex and extensive IT environments and learning technology programs in schools.

**Information Technology and**
Learning

Outcomes based justification of investment in IT

The introduction of information technology to the education system has not been driven solely by the need to prepare children for a role in an information economy. As education systems (along with many other public and private enterprises) have moved towards greater levels of accountability, re-examination of business processes has been undertaken with a view to improve quality of output and/or efficiency of service delivery. In this process, the use of information technology to enhance learning outcomes has been examined. Even under the gaze of the economic rationalist, information technology has the potential to ‘pay its way’ in improving educational delivery.

The view that IT can improve learning outcomes has largely been supported by several bodies of research (DECCD, 1997), some of which have been sponsored by IT companies and others of which are independent. However, the research also shows that the technology on its own is of little value unless educators are supported in using it in the classroom.

Clearly, in a system where a decision has been taken to use information technology to attempt improvement of outcomes, and a substantial investment in the necessary infrastructure has been made, it is problematic to have employees who are unable to utilise this infrastructure effectively. There is an expectation (which may extend to a formal statement of accountability) that teachers will use this technology, even though many have never used it in a classroom environment.

Improved learning outcomes: diagnosis and remediation.

The diagnosis of problems and deficiencies in individuals’ prior learning is a complex and time-consuming process. It can assist in this process by providing some tools that would otherwise be only available through the presence of a specialist professional. The limited availability of such professionals can thus be used more efficiently, if classroom teachers, in advance of their visits, can employ suitable screening and diagnostic tools.

In a similar way, some remediation can be enhanced by appropriate use of IT. This is perhaps most useful where a child has missed a piece of work through absence, and where the provision of this missed work can assist in overcoming the problem.

Improved learning outcomes: student centred learning

Student-centred learning is certainly not dependent on computer technology, but the availability of appropriate technology can assist teachers to provide an educational environment over which students have some control.

Improved learning outcomes: efficiency and performance

The ability to use information technology as a tool to improve learning outcomes in “traditional” curriculum areas has provided a powerful rationale for the introduction of such technology into all curriculum areas and levels of schooling.

IT can be used to improve teaching and learning not only by enhancing existing classroom practice but also by opening up opportunities to stimulate cognitive processes in ways that are impractical in a classroom environment devoid of technology.

Clearly, this places demands on teachers which are similar, but not identical, to those placed on them by the increasing role of computers in society. While the latter provides a social reason for incorporating information technology into education, the introduction of information technology as a tool for teaching and learning has strong educational foundations. While systems, schools and teachers may choose to ignore social change on the basis that schools need not reflect all aspects of society, it is more difficult to reject an educational argument: if one is in the business of education, it is almost impossible to ignore a tool which can improve that business.

For some teachers, this issue becomes a source of internal and personal difficulty. Most teachers highly value their professional skills and are motivated to do all they can to provide their students with every opportunity to make the best of their education. When confronted with evidence that information technology can improve educational outcomes, and the expectation from employers or education systems that this technology will be used in their classes, these teachers feel a moral obligation to incorporate it into their practice. However, many are quick to realise that their low exposure to information technology has left them
extremely poorly prepared to cope with basic computer operation. Even when they master these skills, the curriculum integration and pedagogical issues, which are involved in incorporating information technology in the classroom, remain to be mastered. For people without ready access to the necessary technology, technical support and professional development, the expectation that they will achieve competency is a difficult one to reconcile.

For many of these people, the existence of “competencies” represents a framework against which they fear they will rate poorly and almost by definition be deemed “incompetent”. Consequently, any attempt to define or mandate competencies will only gain acceptance with the profession if it is supported by provision of the necessary time, resources, equipment, support and professional development to allow teachers to gain competence.

### Changing nature of education. Schools and students

Schools are changing in definition, purpose and function. As society deals with changing employment patterns, increased concerns about youth employment and impacts of global media on youth culture, schools walk the tightrope between community and government demands. Teachers are expected to take increasing roles in increasingly complex circumstances and cater for each “new” innovation and educational solution to community problems and concerns. This is amidst the task of understanding curriculum and pedagogical responsibilities in the context of changing information technology environments, applications and consequences.

Students on the other hand are also changing as they react to the global cultural shifts accelerated by information technology advances which are changing the media, popular cultural industries, employment patterns and lifestyles. Young people need to survive and thrive in a world more complex than that experienced by their parents. It is up to teachers to understand how to make use of information technology and technological processes in curriculum contexts, to provide students with opportunities to make sense of the world.

### Structural changes

Structural changes in schooling are systemic and school level reactions to the increasing pressures to make school more relevant and valued by the stakeholders. For some schools, altering how schools are organised is an answer. The Middle Years of Schooling programs, College structures for older students and Open learning programs within schools are just some reactions. Teachers are expected to understand both the relationship of IT to the changing circumstances and the role of IT in helping facilitate the changes. Part of the response to the structural changes to make schools more relevant is the recognition by schools, commerce and industry that the education market place is a significant global and local market and that IT is both the key to enabling educational programs to be delivered to distributed students and the key to attracting students to schools. Laptop programs for students, brochures promoting technology facilities and technology field days are testimony to schools taking advantage of parent and community fascination of the link between IT and learning. However teachers carry the burden to make the link between information technology and learning technology practices.

### Curriculum

The types of educational programs that are available in schools are also changing. For secondary schools, the integration of vocational education competencies in traditional syllabuses and distinct Vocational Education and Training programs in schools, traineeships, apprenticeships and other school-to-work structures add to the complexity of structures, resources and teaching programs. In some schools, IT industry programs and IT-related programs increase the need to recognise that some teachers need to have specialist IT competencies and knowledge as well as learning technology competence.

The changing curriculum frameworks within which teachers build learning environments and activities for students, are changing the nature of teaching and learning. These frameworks represent the reactions to the changing demands on educational systems to answer national and global issues, most of which are caused by, or related to, information technology use in society. In using appropriate constructivist, student-centred pedagogical techniques teachers will provide learning environments that connect students to authentic contexts and situations. It is important that teachers are able to match learning technology processes to these demands for changing learning environments.

### Teachers

Thus for teachers, there are a myriad of technological processes, ideas, infrastructures and contexts to navigate as they play the roles of learning facilitator, counsellor of students, work colleague, employee and member of a profession. Therefore, in defining learning technology competence, systems and other stakeholders need to take a holistic view of teachers’ lives and not reduce such competencies to a list of technical skills or even pedagogical and curriculum skills that ignore the connection between the roles and circumstances of teaching.

### Concluding comments

This background paper has outlined the Information Technology context surrounding Australian teachers. It has examined this from a personal perspective and from a social and economic perspective at local (national) and global levels. This context needs to be taken into account when debating the issues raised in the Position Paper (part B). That document makes a summative comparison between existing teacher IT competency frameworks such as those developed by some education systems within Australia and beyond. It raises a number of issues on which ACCA has developed draft positions and recommendations. The final outcome and ongoing evolution of the issues raised will contribute to the Australian education sector playing a strong role in Australia’s future.