Let the Conference Begin . . .

Opening Address by
His Excellency the Honourable Bill Hayden
Governor-General of the Commonwealth of Australia

Welcome both international and Australian delegates to this fifth World Conference on Computers in Education. Not the least important aspect of international conferences such as this, are the strong social bonds that are formed between people from all over the world, people with shared professional and personal interests, people who find in those approaches they have in common, as well as where they differ, that sense of human understanding, and recognition that is so essential in the modern world.

I trust, therefore, that through these informal contacts, as well as in the forums of the conference itself, every delegate finds it as stimulating as it promises to be. Certainly, the subject of this conference, computers in education, could scarcely be more important to the society in which we live.

It has been pointed out often enough that the computer revolution of the past two decades has touched most aspects of daily life in the developed and, to a very large extent, the developing world - in the homes, in the schools and universities, in the workplace - the factories, shops, offices and banks - in scientific and medical research and practice, on the farms, in the mining and transport industries, in communications, the media and information services, in sport and recreation, and in the creative arts: in film and television, certainly, but also in the lonely business of putting words on paper (or at least on PC screens), and in experimental forms of musical composition and the visual arts.

In all these things, computers are transforming the way society has managed itself over the past millennia. They have the capacity to liberate the human mind and open new perspectives on the way we see things, to perform calculations in moments that might have taken days if not weeks to complete manually, to free human beings from many of those mundane and labour-intensive tasks and to make us more productive and efficient.

I recall visiting the Pilbara last year and the north-west shelf gas project in Western Australia. We were told that the entire off-shore rig can be run with just three men supervising the computers on-shore at Dampier - and in fact had been done so during a recent cyclone. Most of the workforce is employed as maintenance staff. I must say one sometimes wonders if the new generation of computers and their associated robotics will not eliminate the need for even this kind of minimal human supervision. I think, for example, of the new crewless ships.

Now, these things certainly raise very profound questions of retraining and redeployment for the displaced workforce, which I do not propose to discuss here.

The essential point to make for this conference is that computers are now pervasive throughout life, as the
Australian Information Industry Association (A.I.I.A.) argued in a recent discussion paper "Towards a New Approach to Computing Education in Schools.\" , it is something that can be expected to continue and intensify. And as the paper went on, "the ability of people to use computers effectively in learning, work and play is therefore of considerable national importance."

You might suppose that such a statement is self-evident. And yet at least in this country - and I suspect elsewhere - there are many outstanding questions as to just how effectively we are coming to grips as educators and as policy-makers with the future needs of the computer age.

Let me mention some of them that you'll be considering in much greater detail during the course of this conference.

Are we producing enough graduates from the institutions of higher education to meet projected needs in the workplace for professionals and paraprofessionals with skills in the computing and electronic areas of information technology?

Are we attracting qualified academic staff in sufficient numbers, or providing adequate places to meet student demands?

In this country, at least, all the literature suggests that the labour market for computer personnel has been chronically understaffed for the past 10 years, and the situation is likely to persist until the end of the decade. A report earlier this year by the information industries education and training foundation noted that in 1987 some 3000 students completed higher education courses in computing - but the demand was close to 7000.

I'm aware that the Commonwealth Department for Employment, Education and Training has nominated computer science and information systems as a priority area for tertiary funding, and that by the end of this year about 4000 people will be graduating in the relevant disciplines.

And yet there is still an evident shortfall. In fact the information industries education and training foundation report suggests on its "best estimates" that Australia will require between 10,000 and 14,000 graduates with computing specialisations by the end of the decade. And the projections for electronic engineering suggest that higher education completions will need to increase from some 700 three years ago to between 1600 and 2300 by the year 1999.

How is this shortfall being met? Well, partly from migration, although given the unmet demand for computer skills in some other parts of the world, one wonders how effective this will be as a long-term solution. The local demand is also being met partly from the technical and further education sector, partly from short courses offered by private institutions, and also - to a considerable extent - from informal training provided by employers.

The A.I.I.A. discussion paper suggests that some 27 per cent of operators are recruited into the workforce directly from the schools. To mention this, of course, is to raise issues of direct relevance for those of you involved with computer education at both the primary and the secondary school levels.

Now, I realise that there is a continuing dilemma on the extent to which education should be concerned with "mere vocationalism" as I once saw a salaried academic rather slightly describe it - that is, with training for the future labour force - and with the far broader issues of enhancing students' life skills - by which I mean developing their intellectual, creative, encoding capacities, enabling them to become more complete and fully-rounded individual members of society.

Both are important in my view. The one depends upon, and follows from the other. As in every other area of life, economic issues cannot be quarantined from their social, cultural or political surrounds - and vice versa. So that when discussing the question of computers in education, it seems to me necessary to consider both streams of thought:

How effective are our schools in equipping students for future employment, where computer literacy will be ever more essential in the labour market? And, as a corollary of that, are we making the best, the most effective, use of computers in the classrooms to equip young people for life?

These questions go to the heart of the many matters that you will be discussing during the course of this conference.

Five years ago, in their paper "Towards a Rationale for the Educational Use of Computer Teaching in Schools", Tony Conabere and Jonathan Anderson argued that the advent of computers offered schools the opportunity to improve dramatically both their technology and the basic literacies that could be offered to students of all ages.

The computer was a tool that could unquestionably enhance the learning experience. It could lead to student gains in motivation and pride in presentation, indeed even encourage some "disaffected" students to stay at school.

And given that children, including very young children, are now more than comfortable with computers and have
correspondingly high expectations of them, computers in schools could "free teachers for tasks more appropriate to their higher skills, without damaging student achievement or interest."

And yet, Conabere and Anderson said, "the irony is that now the computer is available as a powerful and promising tool for education, but the research and development to exploit it are not forthcoming."

For many of you, I know, the irony is also the fact that, five years on, the concerns are still much the same.

I was interested to read in a recent paper by Toni Downes of the University of Western Sydney and deputy chair of this conference, a view expressed following evaluation of the 1983-86 national Computer Education Program that computers have led to little real improvement in education. And she added this: "such a result is not surprising, since most changes to date have been technology-driven, with little attention being paid to classroom implementation."

It is true that computer technology has been penetrating Australian schools fairly rapidly. It's been suggested to me that almost every primary school in this country would have at least one micro-computer, and most high schools would have a computer classroom. We are still well short of the OECD target of a ratio of 10 students for every one computer, however. The A.I.I.A. estimates that, despite improvements, the present ratio is still about 45-50:1, although it varies between states.

In New South Wales, just to give one example, the numbers of computers in government schools have grown over the past seven years from a little over 2000 to a conservative estimate of 20,000 at the beginning of this year. And since 1986 the average student/computer ratio at N.S.W. primary and secondary schools has dropped from 65:1 to 40:1.

I should add here that the House of Representatives standing committee report last year into choice and technology in learning recommended funding to enable the OECD target to be met by 1992.

Yet even as things stand today, how much use is being made of computers in the classroom - or perhaps even more pertinently, how much effective use?

Since the end of the Computer Education Program in 1985-86, there has been no overall national approach - in itself a matter of critical concern to many commentators.

True, the Hobart Declaration last year by the Australian Education Council listed skills of information processing and computing as among its common and agreed national goals for schooling in Australia.

But these are goals. Currently there is no national plan for their implementation. Computer education in the schools - in terms of hardware, software, curriculum development and teacher training - is essentially a matter for varying priorities and funding between the states.

Time does not permit me to examine these differing approaches in any detail. I'm sure they will be considered much more closely during the conference.

However, the A.I.I.A. discussion paper, to which I've already referred, surveyed the position and concluded: "the general picture is one of states doing as much as they can within limited budgets and conflicting priorities to provide as much computer access as possible to students generally favourable towards them."

But it noted a number of problems. There are shortages of trained teachers - not so much in the area of strictly computing skills, but rather among those with an ability to apply computers across a range of subjects in the classroom.

I know this is an area of central importance to many of you here today, and I'd like to say a little more about it in a few moments.

Other problems noted by the A.I.I.A. included wide variations both in hardware and software used in the schools. It appears that while many primary school children obtain at least basic computer literacy, their use of
"It is equally important for older teachers to become proficient in the use of computers to extend the classroom horizons..."

I was interested in a comment by Mr John Reid at an industry symposium a couple of months ago, to the effect that most chief executive officers are barely computer literate. They simply "allow their personal computers to gather dust on their desks," he said, "and generally hope their executive assistant or secretary will be there to call up either a blank page or a document if they feel the need to input information."

And this, it seems to me, is the nub of the matter. The really challenging questions involving computers in education concern not so much the students but rather the teachers.

Certainly, every child must become confident and competent with computers. But for that to occur, so must their teachers. This implies not merely that younger teachers completing their in-service training have some knowledge of the capacity of computers to enrich the classroom experience, and the ability to use them as such, but also have the ability to stimulate a whole range of learning in language, numeracy, social skills, the ability to quickly access databases, to simulate "real life" situations and to encourage that flexibility, understanding and intellectual resourcefulness so essential to a self-confident human being.

I've no doubt that many qualifying teachers today have this experience. Indeed, I believe it is now required in some state teacher-training syllabuses. But they represent only a relatively small proportion of the total teaching strength.

It is equally important for older teachers as well to become proficient in the use of computers to extend the classroom horizons, to overcome those technological suspicions of which I spoke, and to accept computers as easily and as naturally part of the contemporary world as children do, not as a substitute for teachers, but rather as an extension - as a useful classroom tool - freeing them, indeed, for tasks more appropriate to their higher skills.

I read an entertaining article by Jeff Cumming of LaTrobe University, published earlier this year, in which he discussed the modern child's approach to computers: "an
attitude that is nonchalant, yet demanding - what a delight!" Cumming said: "such an attitude is to be celebrated. We need to help teachers achieve it."

It is a sentiment with which many of us would agree. It is an attitude that would enable the uncertain teacher to begin using the school computer for relatively simple and straightforward administrative and resource tasks. An attitude that, with growing personal confidence, would entice the teacher into using the computer with students in the classroom.

Certainly to begin with, many of those "adventure games", such as I saw the children playing on the Cocos Islands, stimulate an interest in reading and writing, in number, in geography and art and an appreciation of the consequences of decision-making.

It is an attitude, too, that will carry on into the secondary levels, not just into computer studies for those wanting to enter the profession - though I do not underplay that - but also into those other tasks that are relevant and meaningful in daily life - in accessing, for example, sources of historical and current information, in word processing, in the use of spreadsheets, in media studies, in science and mathematics, in computer-aided design, in economics, legal studies, accounting and commerce, in small business management. And so on.

This includes tasks that encourage the student to develop those fundamentally important attributes of critical, logical and flexible thinking - attributes that are as essential to a successful career as they are to successful citizenship.

And yet, I am bound to acknowledge, there is still a long way to go before we realise the potential that computers can offer to education. And not just in this country, if I may touch on the international aspect of this conference.

I was surprised to read in a paper given by Betty Collis at last year's Australian Computers in Education Conference, that recent North American surveys showed that while virtually all secondary schools have computer laboratories, they are rarely used for anything other than "computer courses".

Over 90 per cent of the 30,000 students surveyed had never not even once - used school computers in the context of learning science, language or the social sciences, and 85 per cent had never used them to learn mathematics.

Collis commented: "it is clear that a huge gap exists between the potential of computers to expand and enrich instruction, and the realisation of that potential."

And that, I suggest, is the challenge facing all of you as educators, employers and policy makers at this conference and indeed all of us, as members of society and a global community whose future is inevitably tied to that of the computer; a challenge, that is to say, for all of us to realise their liberating potential in the classroom, in the workplace, in virtually every aspect of daily life.

As to how this may be achieved is of course the critical issue. I'm aware that many state and regional studies are underway to increase the access and understanding of both teachers and students to computers in the schools.

At the national level there is a departmental review into the training needs of computing professionals and paraprofessionals. The recent initiatives to establish co-operative research centres promise one avenue of improving co-operation between education and the information industry.

There are proposals to encourage more tertiary students to undertake general bachelor degrees with a computing content of about 30 per cent; to encourage employers, governments and the education sector to become partners in developing skilled and compatible training programs.

Whatever the outcome, it seems to me that the future emphasis ought not to be so much on teaching about computers, as I said, but rather on teaching with them. Still less on scrambling after the latest hardware or software.

Many observers feel that, at least in this country, current programs are delivering enough of both. The real issue is to make the best use in the classroom of what we already have, and to bring as Toni Downes suggests, a substantial purpose and meaning to the use of those resources.

Ladies and gentlemen, I realise that in this address I have touched only lightly on a few of the important issues that you will be discussing during this conference. Yet I hope that I have been able to set them in some kind of context. Few subjects, as I said at the beginning, are more important to our common future.

In thanking you for having invited me here today, and in welcoming both overseas and interstate delegates to Sydney, it is my great pleasure to officially declare open this fifth World Conference on Computers in Education.