though conscious of the need for a succinct introduction, I have included the following vignette to underscore the intent of this article:

'All aboard the Ed Tech Express, now departing. First stop Extension, all those for Extinction please move to the back of the train,' calls the Fat Controller.

'How can you get on bored!' asks an aspiring young teacher stepping up.

The following statement offers an alternative and provocative focus for my introduction: You probably know about Yuppies and about Dinks but have you heard about MADMUPS? Middle-Aged Downwardly Mobile Under-employed Professionals.

I hope a concern for potential teacher MADMUPS will emerge by the end of this article.

NOW IS THE TIME
In his official opening speech at the World Conference on Computers in Education (July 1990), the Australian Governor-General, Mr Bill Hayden, emphasised that the time is 'now' for educators and policy makers to reassess the potential applications of new computer technology. He emphasised that every child must become confident and competent with computers and so must his or her teachers.

A stark contrast between governmental rhetoric and action seems to be a perennial dilemma in education in Australia.

There is presently a current ratio of one computer to every 40 children in New South Wales. This is far from the OECD target of one microcomputer per 10 students by the commencement of the 1992 school year.

Shortfalls in funding and professional technophobia are two vital areas which are encumbering, for a large part, present educational change.

In light of a Federal Government initiative of 1989, one can wonder at the genuine commitment of our politicians in ensuring opportunities which will extend the classroom horizons by making children and teachers confident and competent with computers.

In February 1989 the Australian Federal Government released a Report entitled An Apple for the Teacher? - Choice and Technology in Learning. The Report was tabled in the House of Representatives through the Minister for Employment, Education and Training, The Standing Committee that produced this Report was established in September, 1987. The Committee was asked to inquire into and report on the potential of new technology to improve educational access and outcomes in Australia.

THE MESSAGE ABOUT THE 'MEDIUM'

Statements from the introduction of the Report (Standing Committee on Employment, Education and Training, 1989, p. ix) use such definite and resounding terms as 'growing demand' and an 'increasingly important requirement for education' to be 'made available on the student's terms' ...

'crucial need' .... 'an integral part' .... 'priority issue' .... 'necessary to increase educational opportunities substantially'. Without knowing much more about the content of the Report, or even taking the above comments out of context, one doesn't have to think much further to speculate as to the Report's message about the 'medium'.

There is little doubt that there is currently considerable attention being afforded to the ascendency of technology in Australian education.

From frameworks as unfeigned as the young child's growing perceptions of various cause-and-effect consequences of pushing electronic buttons on a video recorder, to the eminent domains of federal politics where education and technology are proffered as priority areas requiring the development of national strategies, modern technology has become a social and political focal point.

In focusing on technology with a little more rationality (rather than through intuition or by trying to read between the lines), it is significant to realise that children now entering primary school in Australia will leave school in the next century. There seems little point in providing these children with an educational curriculum that prepares them to meet only the apparent needs of the current decade.

Children are presently entering a system that has not changed much in substance since the beginning of the twentieth century. The Holmes Group from the United States of America find this a curious situation. Their Report, Tomorrow's Teachers (1986) notes:

While the intellectual and social demands on teachers have escalated at an astonishing rate since this century began, the nature and organisation of teachers' work have changed only a little since the middle of the nineteenth century. We now live in an age when many primary school students have their own microcomputers. These students can put some of the most amazing achievements of modern science and technology to work in support of their learning. Yet their teachers are still working with the same job descriptions that teachers had in the mid-1800s. (p. 6)

There is indeed a conspicuous contrast. Even in these slick 'hi-tech' years, teachers are still holding down jobs that creak with antiquity whilst their charges, quite independently of any institutionalised intervention, are unassumingly resonating with visions of a technological future. Despite the past century of knowledge explosion and science revolution, teachers are still being assigned vocational frameworks that have remained very nearly the same as they were before the great intellectual revolutions. So where does teaching stand if it is to adequately
address the world of the new state of mind.

Some children entering primary school in 1992 could leave school in the year 2002. It is ironic that the year 2002 has a palindromic number. Whereas the number 2002 may be read as the same number in reverse, there may well be features of the society of 2002 which turn out to be irreversible. For many of us, the onset of these features can be felt modulating in the here and now.

For example, Grattan (1987, p. 28) suggests some features of our future society may well be that:

- there will be a significant increase in unemployment;
- microelectronics will continue to transform manufacturing and commercial activities and processes;
- the proportion of elderly and retired people in the community will increase;
- there will be a decrease in the length of the working week, coupled with a significant growth in leisure time;
- employment pressures and social opportunity will lead to a more mobile population;
- the rate of scientific and technological progress and the growth of knowledge will be significant;
- women will continue to seek and gain a more significant and responsible role in society;
- everyone — youth, older schoolchildren or adults — will demand a greater say in his or her educational and training opportunities.

There appears that there will be certainly significant educational ramifications which will be precipitated from the consequences concomitant with the incredible rapidity of change in present-day social and technological developments.

One possible scenario is that continuing education might replace the conventional, institutionalised educational delivery system presently in operation. Continuing education in the sense that training and retraining will become more in demand with changing employment and unemployment pressures.

On average, the next generation of workers will have to make no fewer than five complete job changes in a lifetime, not counting the multiple tasks (which will also be changing) associated with each respective job. (Cetron, 1988, p. 13)

The employed will have to upgrade to stay abreast of changes in their field (primarily technology driven) and the unemployed will be looking to retraining in order to be competitive in a mutating work scene. Earlier retirements and shorter working hours will create opportunities and demands for more individuals to follow more independent avenues of self-development. This infers that

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increasingly differentiated needs will have to be met. It could also mean that there will be pressure arising from requests for access to education and training at various times of the day and in various places and in various ways, from 6.00 a.m. till 11.00 p.m.

Learning is becoming a lifelong pursuit for many citizens: arguably it should become for all. Knowledge and the ability to learn through and to communicate via many [technologies] are becoming universal economic necessities. The action required of us is clear. The old must embrace the new, if society is to meet unprecedented educational demands. (Mecklenburger, 1986, p. 18)

In the international arena, on delivering his summary paper for the Educational Media International Conference entitled 'Communication, the Essence of Education', Richard Tucker (1987, p. 39) suggested that the implementation of new technologies is going to extend the teaching process if they haven't done so already, and consequently the learning process will generate new methods so that there will be new consequences for us within education which will require methodological changes.

A LOOK AT THE CORE — AN APPLE FOR THE TEACHER?

The Australian setting is acknowledged as no longer being distanced from the current of international change. The recommendations of the Report, An Apple for the Teacher? (1989) reflect an awareness and appreciation of developments from around the world. According to the Report (1989, p. 2) the starting point for this task is the school system. As future participants in a work force and a society faced with advanced and changing forms of technology, students must feel comfortable with new technology and appreciate its potential.

The Report indicates that technology can help in making progress in an overdue, educational system transformation. It is noted that there is a pressing need to offer a greater range and diversity of learning opportunities. In raising the flag of expediency and efficacy, the Report calls for the Federal Government, through the Australian Education Council, to act as a ‘key organisation to promote coordinated planning and cooperative endeavours’ (1989, p. ix) across the nation.

It is interesting to look at some of the recommendations from this Report in specific detail. In calling for a national strategy the Report (1989) makes a series of recommendations, which include, that the Australian Education Council:

(a) be responsible for, and give priority to, the development of national strategies for the educational uses of technology;
(b) promote and monitor the implementation of educational technology strategies approved by the Council;
(c) encourage the adoption of guidelines and standards which ensure that new communications and information technology used in Australian education is compatible within and between sectors;
(d) investigate the need for and feasibility of a national educational telecommunications network covering all of the education community;
(e) ensure that adequate resources are provided to the Education and Technology Conference to allow it to perform the functions identified at (a), (b), (c) and (d) above;
(f) and that membership of the Education and Technology Conference of the Australian Education Council be expanded to include representatives of the non-government school sector and higher education institutions. (p. 10)

The Report (1989), in regard to schools, recommended that:

all students in all schools be provided with increased opportunities for 'hands on' computer experience; and further, that sufficient financial funds be provided to enable schools to meet the OECD target of one microcomputer per ten students by the commencement of the 1992 school year. (p. 10)
The Train is a-Comin'

As with many educational innovations requiring change and redirection, considerable resistance to instructional technology can be expected from the 'chalk face'. Despite the potential inertia and opposition from the formal schooling system, the committee for the Report (1989, p. 108) remain optimistic in the hope of seeing 'a great leap forward in the use of technology in Australian education'. The report concludes that if things are not done, and the present situation continues, a major opportunity will have been missed.

Dede (1985, p. 256) provides a more cogent conclusion — if things don't change and/or if impediment and repression from within the teaching ranks is too severe, commercial interests and the developers of the technology may bypass the school and direct their marketing efforts primarily to homes and industries. External organisations supported by large businesses may conceivably challenge the State Department of Education's monopoly in being the only recognised authority of educational accreditation' (Dede, cited in Anandam & Kelly, 1981:135).

Conclusion — All Aboard, Please!

Sylvia Charp (1988, p. 32), suggests that it will take many years to achieve the visions 'a la An Apple for the Teacher?'. She suggests that there will be substantial impediments to fundamental change. Her concerns relate to teacher preparation, finances, the expectations of business and of the public at large, curriculum, federal leadership, and evaluation.

Not optimistic about a scenario of 'transformation', Charp is one of many who warns of the distinct possibility of revolution.

Confronted with a technological revolution transforming the rest of society, schools can cling to traditional forms and ways of operating — but only at the cost of becoming ever more alienated, obsolete, and ultimately irrelevant to that society. (Perelman, 1988, p. 24)

So it seems that we either afford our tickets now or we may very well miss the educational train. The risk of becoming MADMUPS can be alleviated by becoming MADKEENS, or at least enthusiastic. Faced with the prospect of a threat that the traditional educational environment could become extinct, it's time for schools and teachers not to get on 'bored' but rather, with proactive commitment and audacity, to take the controls of the educational train and steer the technological revolution along the inevitable tracks of change.

Acknowledgments

Unquestionably, some potential implications: the cost of mass production and delivery of educational materials and of purchasing and using new equipment; a lack of knowledge among administrators and teachers about the potential of new technological developments to improve education; and a lack of incentive for teachers to innovate.

Dede (1985, p. 243) acknowledges that on a world-wide basis, changes in education systems are under way. He suggests that the required changes needed to reshape education in addressing the technological boom-time may well see a dramatic alteration of the size, method of operation and content of education. The effects of technological innovation can be highlighted through the illustration of some potential implications:

the necessity for massive changes in both pre-service and in-service teacher training;
high initial capital investment in developing and delivering systems;
realistic cost reductions and economics of scales, large numbers of devices must be used, and curricula will have to be centrally produced.

Within these implications are sown, unquestionably, seeds of prohibitive costs. In the Report, An Apple for the Teacher? (1989) there are some acknowledgments of concern for potential prohibitive costs, for example:

...the cost of using AUSSAT for School of the Air ... would make it less expensive for the Australian Government to provide a personal professor to each student for their entire educational career.

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