his issue continues the theme of Computers and theories of learning and language, and readers will find plenty of issues worthy of continued research and debate. The first three articles focus on tertiary education, but have significant implications for all sectors of schooling.

Kay Fielden, a lecturer in information sciences and engineering, takes us on 'a gentle walk through the process of deepening learning'. Drawing on humanistic psychology she describes how she incorporates holistic, interpersonal and creative ways of knowing in a field which traditionally emphasises rational thought processes.

Her comment that 'in this tertiary-technical-education environment interpersonal communication skills are undervalued and underdeveloped' resonates with the findings of our regular contributor Dr Roger Coldwell in his research on the ethical standards of technology students. It was found that students from engineering and computer science courses were less able to anticipate the social consequences of computer crimes than those from other disciplines despite the presence of socially-oriented modules amongst the machine-oriented ones in undergraduate computer science courses. He raises the possibility that students who develop anti-social attitudes in childhood may seek a similar occupation or career path (e.g. computer science). While he hesitates to label computer science 'a delinquent discipline', Dr Coldwell views with apprehension the lack of ethical standards in a profession which, effectively, controls the information flow of the globe and perhaps, other globes within the near future.

In Jeff Richardson's interview with Brian Harvey, Professor of Computer Science at the University of California, Berkeley, the ideal high school preparation for students planning to study computer science is explored. Brian Harvey suggests that all children should have some exposure to beginning programming in primary schools; and then those with a particular interest should become apprentice programmers in high school. His use of the term 'apprentice' denotes an emphasis on the 'realness of the experience' — students writing programs that somebody else actually uses.

Brian Harvey unwittingly reinforces Coldwell's proposition of a 'machine-people' social type when he states: 'Somebody who somehow isn't getting along well with human beings finds the possibility of working with computers as a relief'.

Chet Bowers continues his questioning of the implicit assumptions underlying educational computing in his article 'Ideology, educational computing, and the moral poverty of the information age'. Using Alan C Kay's article 'Computers, Networks and Education', Scientific American, 1991 as a starting point, Bowers argues that the ideology of educational computing is based on fundamental misconceptions about the nature of the individual, what is involved in the processes of knowing, and how individual empowerment relates to social progress.

We have invited Alan C Kay to respond to this article in a future issue of this journal. Many readers will recall his keynote address at WCCE in Sydney in 1990.

Neville Stern refers to Kay's ideas on the connection of the concrete, personal and intimate with the formal and the abstract through the possibility of the personal computer in his article 'The metaphors of constructivism'. He focuses on the sustaining myth of constructivism that learning is (like) building something. This article counters to a degree Bowers' claim that educational computing rests on a belief in conceptually autonomous individuals. Stern reminds us that constructivist themes place such individualistic personal control 'in a tension with the defining circumstances of culture' and goes further to conclude that information itself is a new kind of cultural text to shape and reflect us.

In Liddy Neville's article, 'Sunrise Microworlds' we move from the theoretical foundations of constructivism to classroom reality in search of a Logo pedagogy. Liddy Neville reaffirms the importance of teachers by describing key aspects of their role in a child-centred microworld.

It has been claimed that the ultimate educational software will emerge when teachers become programmers. With the availability of programs like Hypercard and Author some writers have promoted the idea that students and teachers can and should become software developers. The article by Pat Horan and Lorraine Staehr suggests otherwise. Tertiary computing students found it time consuming and difficult to develop CAI materials for chemistry and health science teaching using Author.

The final article confirms what computing educators have known for a long time — that small group interactions with open-ended software promotes on-task talk. The research conducted by Grice and Carr identifies some interesting details concerning the size and gender of small groups. The study suggests the use of pairs and groups of three would be better choices for group work with the computer.

The theme for the September issue of the journal is Computers and the right brain. It will focus on the use of computers in the arts and design. Readers are encouraged to submit letters, short columns or articles.

The tenth annual Australian Computing in Education Conference is being held in Melbourne from 5-7 July. The theme is Computing the Clever Country? Contact the Computer Education Group in your state or territory to order a copy of the proceedings.

Editorial Team