In the debate on lifelong learning and on the nature of schooling in the 21st century, there is an emerging discussion on the need for new concepts of schooling and strategies for provision, and a more flexible approach to innovation and change. The concept of “network” promises to be an integral part of all of these.

**The Concept of "Network"**

“Network” differs in nature from other terms that historically have been used in association with schools and other educational institutions, in their organisational arrangements and the ways of understanding innovation and change. It is distinct from traditional forms of grouping schools and systems, whether these are hierarchical and bureaucratic models or the more recent emphasis on organisational forms based on market philosophies and self-management. In contrast, "network" stresses the idea of “community” as the common element and the principle of connection between institutions. Schools are not just “clusters”, which connotes geographical proximity, nor “groups”, which suggests an almost accidental agglomeration of disparate institutions. Rather, they are overtly associated with each other in forms of connection that have been deliberately established and worked on in pursuit of common interests and goals. They are thus intentional constructions, linked together in a web of common purposes, in which all the constituent elements are equal in the weight of their enmeshment and the responsibility that they bear for contributing towards the furtherance of their shared interests.

An appropriate metaphor here is the World-wide Web. Sites are set up and inter-linking connections are made between, and then followed along, a filigree of fields. Enquiry in one area leads through interconnecting pathways and linkages to a congruent or contiguous area from which further avenues of enquiry can be opened up, explored and expanded. The metaphor is especially helpful in considering the international arena, to underline that networks are not merely local but more general and universal. The “flows” of theories, thoughts, cultures, and innovations now being articulated between schools and other education institutions have an increasingly global import and impact.

The relevance of "network" is also about developments in philosophical theory. As opposed to the traditional view of structures based on empiricist principles of disciplinary difference and demarcation,

1 The author would like to acknowledge the contribution made by Professor David Aspin, Professor of Philosophy of Education, Monash University.
new conceptions have emerged in the philosophy of science and language. These argue that the world of theory, knowledge, and learning grows, develops holistically, and is integrated in a parallel way to the gradual construction of the spider’s web. Each strand of thought is capable of connection to neighbouring or even distant other strands, along a tracery of cognitive connections. Together, these constitute an overall reticulation, a unifying cognitive nexus, of the “theory” we have about the world (see for example Quine and Ullian 1970; and Wilson 1998). The new lines of social and political thought have been developed from increasing disappointment with the contra-positions of existing social and political philosophies.

The new strands of thought have served to provide an increasingly powerful basis for envisioning schools as communities and as nodes in the evolution and establishment of learning networks. In recent years, concepts of community have been influential in social and political thinking (Sandel, 1981; McIntyre 1980; Etzioni, 1995, 1996; Gray, 1997). They have underpinned new thinking about political morality, public policy and social relations, and the creation of innovative social forms, structures and interactions, with wide-ranging implications for education.

The Relevance of "Network" for Schooling in the 21st Century

Educating young people for the networked society

Diverse arguments have been made for the continuing importance of schooling in the twenty-first century. For instance, the role and significance of information technology will grow at an accelerating rate and communicative competence will continue to be and even increase as a major requirement for all in the “networked society”. But not all have access to PCs and the Internet at home or even in cyber-cafes, which disbars them from participation in the wider economy and society that depend on such modes of communication. Some young people need thus to secure access to these modes and to the necessary ICT hardware and software, and to do this in an positive environment of guidance and support.

As Ackermann has shown (1980), genuine communication can only take place in a group setting amid a network of interpersonal relationships, where conversations are underpinned by the observance of certain norms and conventions. Schools can be excellent places in which young people are helped to develop interpersonal awareness and, through conversations and communication, a sense of the importance of obligations towards fellow-members of the community. The young can be helped in schools along the road to active citizenship and interpersonal responsibility, learning how to weigh issues, make judgements, and be aware that their action is of consequence to others. Learning of this kind is especially important when the Internet offers students access to untold possibilities, both beneficial and harmful. There are, in some parts of the world, increasing threats of social instability and personal insecurity. Young people are required, as future members of participative democracies, to develop opinions on matters of national and international importance. This kind of learning cannot be picked up from a file-server or a VDU. Young people need models of appropriate forms of interpersonal and social conduct through which to acquire understanding of responsibility and community obligation. The natural location for this is the family but a vital part is also played by a supportive range of significant others in which schools are prominent.

There is further argument for the indispensability of schools as agents of learning in complex societies. Young people need to be introduced to a very wide range of pursuits, from which to make their own selection in constructing a satisfying set of life options. Such a wide range cannot generally be provided solely in the home: there are interests, abilities and aims that are either unfamiliar in the home setting or impossible to cater for there. Schools are not, of course, the only place for following a wide range of activities, but they are well connected to diverse networks of learning and pursuits. They can give young people guidance in becoming selective among them. (Chapman and Aspin, 1997).
Educating flexible, networked workers for transformed workplaces

The OECD Study on Sustainable Flexibility (1997) argues that the nature of work will be transformed in the knowledge-based economy of the 21st century, with rapidly changing technologies and markets for products. This in turn alters expectations regarding the kinds of workers required. This transformation, the authors argue, will be characterised by flexibility and networking, in which there will be a complex interplay between more highly educated workers, prepared to learn quickly to take on new tasks and be mobile, and best-practice firms promoting increased flexibility through training, multiple-task jobs, and employee decision-making. They suggest that the need to develop workers who have higher order problem-solving skills and who can help organise more learning has profound implications for schooling:

- It means that vocational education organised around specific skills for specific jobs is largely anachronistic, except when it can be used to develop problem-solving and organisational/teaching skills in those alienated from more academic approaches to learning.
- It suggests that learning in schools should be increasingly organised co-operatively, where students study and are evaluated in groups.
- The curriculum should develop networking, motivational and teaching skills, promoting an understanding of human and group behaviour. In the learning-centred Information Age, the processes of and motivation to learn should be endogenous to curriculum itself [ibid: 34-35].

Florida, in an examination of environments and infrastructures for the knowledge-based societies of the 21st century, concludes: "The industrial and innovation systems of the 21st century will be remarkably different from those that have operated for most of the 20th century. Knowledge and human intelligence will replace physical labour as the main source of value. Technological change will accelerate at a pace heretofore unknown: innovation will be perpetual and continuous. Knowledge-intensive organisations based on networks and teams will replace vertical bureaucracy, the cornerstone of the 20th century" (1995: 535).

Creating optimal learning environments through teams and networks

In the 19th century, in most Western societies, free education became mandatory for all and schools were designed in terms of what was then accepted about the nature of institutions, the functioning of the mind, and processes of learning. The world-view of the late 19th and early 20th centuries stressed the idea of learning as linear, sequential, generalisable and mechanistic. Schools became characterised by hierarchical organisational structures; knowledge was compartmentalised into discrete and manageable sequences; assessment was based on the measurable and quantifiable. Such assumptions are no longer adequate, if ever they were, to meet the demands of learners preparing for the 21st century. New thinking about the nature and styles of effective learning, suited to students' own modes of cognitive progress and achievement, must lay the basis for work in schools of tomorrow. They should more accurately reflect the findings and implications of the current understanding of learning, knowledge acquisition, and of cognitive and meta-cognitive science.

Griffey and Kelleher, reviewing recent research, conclude that the optimum environment is one where learning is based on the provision of direct experience through action in the context in which it is to be applied, with experts practised in those contexts (1996: 3-9). Individuals should become conscious of their implicit theories about, and strategies for, learning, viewing it as under their control and as intrinsically rewarding. There should be conditions for collaborative teamwork giving experience in learning to learn and reflection on problem formulation and problem-solving strategies. Facilitators and teachers should themselves engage in learning. In line with such conclusions are schools as centres of learning networks, aware of their own identity, their neighbourhood, society and the global community. To achieve such a
model, substantial reforms will be required in curriculum, pedagogy, learning provision and school organisation, including approaches to scheduling and the restructuring of time.

**Learning networks beyond the school**

More fluid combinations - of school-based provision and work, of formal and non-formal learning - are increasingly a feature of the life of schools. This calls for the provision of innovative ways and means for young people to learn through the workplace and the community. Young people need to be active agents, planning and managing their school and further learning opportunities, work experience, and their unfolding careers. Particular attention needs to be paid to how schools assist students to move away from being "at risk" to being "on target", which means *inter alia* more effective career counselling. Work- and community-based learning, in partnership with schools, necessitates considerable inter- and intra-professional collaboration and organisational change.

The new model for building articulated and interconnecting networks for learning in life will be one based not on linear progression through a sequential series of ladders. Rather, it will be built on the notion of a progressively complex and expanding climbing-frame, in which students explore numerous possibilities for personal development and career advancement (Smethurst, 1995). They acquire competence and confidence in moving along a diverse range of pathways, increasing their personal and professional learning gains, and the satisfactions these bring.

**The global network**

The notion of linking schools to the wider community is not only of local, regional or even national relevance but also relates to the international. Schools have traditionally been an important arm of the nation-state, but increasingly its dominance is being eroded, particularly in Europe as regards matters of finance, defence strategies, monetary policy, regional representation and decision-making powers. Schools are affected by the centrifugal forces generating this transformation. They must now address how best to foster among their students a national, regional and international awareness to prepare them for life in the 21st century.

One challenge this poses for schools is how to give all students access to the global society, with regard to employment opportunities, cultural literacy and sensitivity, and inter-cultural understanding. This is especially important when access to an internationally orientated education tends to come only at considerable financial cost, both to its beneficiaries and providers. Another challenge is to ensure that national cultures and a sense of community identity can be sustained at the same time as citizens function in increasingly international settings, under the pressure of global trends. It is significant that just as the dangers become evident of the loss of local identity because of globalisation, there has been growing attention paid to the idea of "community" as a central feature of political, social and individual life. In education, an important issue is the realisation of lifelong learning for all through communities and learning networks.

To sum up, the focus on learning networks and innovation is potentially a very fruitful one for education. It has its intellectual origins in recent advances in theory, science and language, social and political philosophy, and in developments in cognitive psychology and learning theory. The concept of “networks” provides a new basis for thinking about schools as organisations, communities as sites of learning, and co-operative policy development in which the interests of all in society are served.