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ABSTRACT

Features of the information society are discussed, and implications for education are reviewed. The information society is dominated and even overwhelmed by information. Its future is uncertain, but regardless of the eventual potential for good or harm, information literacy is a precondition of the information society. Young people in Australia are becoming more computer literate, and education authorities are developing new educational agendas for the information society. Resource-based learning is an approach that is particularly appropriate in fostering the development of individual students. The shift in emphasis from the content of what students learn to the processes of learning depends on the use of information and the development of information skills that define the purpose of an information task, locate data, select and interpret data, and use the information to complete the task. A look at information skills as they are taught in other countries highlights developments, with implications for teachers, teacher-librarians, and principals. Effective information skills programs depend on a wide range of resources. Information technology in all its forms must be an integral part of the school curriculum. (Contains 44 references.) (SLD)

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INFORMATION SKILLS: AN EDUCATIONAL PERSPECTIVE FOR TOMORROW

Joyce Kirk

Education takes place in a social and economic context and so it is necessary to review briefly some of the characteristics of our present times, remembering that in the present are the seeds of our future. The post-industrial society has arrived. In fact that term has been with us now for thirty years. This new era, known also as the information explosion, the IT age, the knowledge revolution, the information society and the electronic age, is being shaped largely by the convergence of two technologies, computing and telecommunications. The ripples of the impact of that convergence can be seen in most aspects of our daily living routines. From the time we wake to the clock radio broadcasting news beamed around the world by satellite to the time we go to bed after our dinner prepared with ingredients bought with a credit card, we are affected in some way by the technologies themselves and by what it is they process and transmit-information. In this paper, I will identify some of the features of the information society and discuss some implications for education, particularly for information skills curriculum. I will propose an educational rationale for the use of information technology in learning programs in school and I will conclude by discussing some of the features of effective information skills program.

THE INFORMATION SOCIETY

The information society is dominated and even overwhelmed by information. There is ample literature which attests to the fact that the volume of information which is generated and disseminated is growing. As long ago as 1963 de Sola Price predicted that by 2032, scientific papers will outweigh the earth itself. (1) The volume of scientific periodical literature is increasing at an exponential rate and in most areas of research there have been more papers published since World War 2 than in all prior human history. The weight of engineers' plans, drawings and specifications for a jet aeroplane are estimated to weigh more than the plane itself. (2) Even junk mail in letter boxes seems to increase in volume every couple of months.

Not only is the volume of information changing but so too is its nature. Bell has argued that the empirical knowledge of industrial society based on manufacturing has given way to some extent to theoretical knowledge based on what he describes as "the codification of knowledge" into abstract systems of symbols that can be applied to a range of circumstances. (3) Econometrics, systems analysis, decision theory, cybernetics and some branches of information science are areas all dependent on this codification of knowledge or intellectual technology. Another area in which intellectual technology is becoming more predominant, and one

which is perhaps more within our own worlds, is the management of organisations and enterprises.

There are of course changes in employment patterns as a result of the convergence of technologies. One of the traditional bench marks for having arrived in post-industrial society is having a greater proportion of the labour force engaged in white collar rather than blue collar employment as the shift from a manufacturing-based to a services-based economy occurs. In Australia, Lamberton has identified and information sector in the services-based economy. The sector comprises forty-one percent of the work force based on 1981 census figures, and includes researchers, information gatherers, scientific and technical consultants, administrative and management personnel, clerical staff, educators, librarians, communications and media workers, telephonists, machine operators and technicians. (4) The nature of work itself is affected by technological developments. The 1980 Report of the Committee of Enquiry on Technological Change in Australia suggested that new technology will effectively increase the number and range of intellectual tasks while at the same time decrease the number of skilled tasks. (5) Technological change has no one single effect on employment. It can render some jobs unnecessary, it can alter the skills required for some jobs and it can create completely new jobs. The Report considered that of all activities, information processing, storage and dissemination are probably the most vulnerable to the impact of the technologies of the microprocessor and microcomputer. The advent of the electronic office is a case in point. It demands the restructuring of office staff as the need for typists is reduced in favour of keyboard operators, and clerical functions are changed because of the storage of information in data banks. New skills are required for keyboard operation, computer program development, data base development and maintenance, and the maintenance and servicing of equipment.

What does this very brief overview of the information society say for its future, and ours? Simply, that the future is uncertain. For some, such as Bell and Toffler, the future is almost a Utopian ideal. The assumptions are made that more information is better than less, more information leads to improved decision making and that more information results in increased productivity. Perhaps the position of the "white" futurists is best summed up by Stonier: "just as industrial society eliminated slavery, famine and pestilence, so will the post industrial economy eliminate authoritarianism, warfare and strife."

(6) This ideal has been tempered by the realities of economic and social developments in the last fifteen or so years, and also by the fact that it ignores the power structures and struggles operating within the information society. Recognition of these structures was very much in the forefront of a unique study of the French economy, commissioned by Giscard d'Estaing in the 1970s. From an analysis of the balances of power and the relationship between corporate and national economic development, Nora and Minc recognised the powerful position of information technology companies such as IBM and the extent to which the power of those corporations could threaten national independence. (7)

Some critics of the Post-industrial Society have recognised a role for libraries in contributing to the diversity and richness of society. Blake points out that the information needed by most people differs in form and content from the information required by, available to, the educated elite (or Bell's intellectual technologists). (8) Questions of access and equity need to be asked constantly in the light of trends towards the concentration and centralisation of the generation, transmission and dissemination of information. The debate on the recent media power play in this country has indeed been brief.

On a similar theme Hill has argued that post-industrial society is a culture of inequality, of domination by information panic, and of distance. (9) So much for the global village in reality! The information-rich and the information-poor are members of a two-class system within an information ecosystem in which technique maintains pride of place ahead of the quality of interpersonal relations. Hill describes libraries as having the potential to become "human cathedrals of post-industrial society...a home for the human spirit, rather than a steely-eyed reflector to silicon-chip morality." (10)

EDUCATION FOR THE INFORMATION SOCIETY

Having looked at some of the more salient features of our times in regard to the provision and dissemination of information, it is appropriate to look at some of the implications for education, with a focus on information literacy.

One writer whose ideas reflect a developmental view of technological and social change is Eugene Garfield. He argues that progress to a fully fledged information society is preceded by a phase of information consciousness, where people recognise the importance of rapid access to information but do not necessarily have the information they need. (11) It is the rapid delivery of needed information that is the distinctive characteristic of the information society itself.

A precondition of the information society is information literacy, defined by the Information Industry Association in the United States as knowledge of "the techniques and skills for using information tools in molding solutions to problems". (12) A somewhat broader definition has been developed by Tessmer and refers to "the ability to effectively access and evaluate information for a given need". The characteristics of information literacy are:

- an integrated set of skills and knowledge...
- developed through acquisition of attitude...
- time and labour intensive
- need-driven...
- distinct but relevant to literacy and computer literacy. (13)

Information literacy is a challenge to educators and to education authorities in Australia where the Adult Literacy Council has estimated an adult illiteracy rate of ten percent. In New South Wales, one study of young people suggested that seventeen percent of fifteen year olds are subliterate or illiterate and that a further thirty two percent of fifteen year olds are semi-literate. (14)

Young people are becoming increasingly computer literate partly as a result of the national Computer Education Program which has provided students with the resources to learn about and to use computers and computing. All States have developed curriculum based on these resources and most of them have viewed computers in their wider social contexts. One example, the Computer Awareness Course, Years 7-10 designed by the New South Wales Department of Education, serves to show how the resources provided by the national Program can be used in the educational setting of the School. The Course aims to:

> develop in students those understandings which give them a greater measure of control over their lives in relation to their changing environment, individually and collectively, now and in the future. The computer is used as one significant example of wider technological change. (15)

The minimum goals for computer awareness go well beyond the gadgetry of computers and are related to students' use of computers as a learning tool and resource in investigation, discovery and problem-solving.

The South Australian Education and Technology Task Force has expanded on computer literacy in its recent report, referring to technological literacy in the context of accessing information. The report suggests that "keyboard skills, some understanding of how data are organised in databases and an ability to take in data by the screenful rather than the page" are the basis of technological literacy. (16)

It is interesting to note that education authorities in Australia are developing new educational agendas for the information society. One report, Education in Western Australia (17) acknowledges the growing importance of technology and argues that students need to understand and use computers from their early years at school. It establishes life-skills as a major focus of schooling designed to meet the immediate and future needs of students. It places "increased emphasis on skills for locating, analysing, interpreting and applying knowledge and on investigative and evaluative skills". (18) The life-skills identified include personal skills, social skills, intellectual skills, knowledge acquisition skills, environmental skills, mathematical skills, creative skills, general living skills and computer management skills.

The Western Australian response to information technology is appropriate to the information society for several reasons. Firstly, the use of technology is subsumed in life-skills and it does not become an end in itself; secondly, it does not view student use of technology only as a preparation for work; thirdly, technology takes

its rightful place alongside other teaching/learning materials with the result that computer education becomes a whole-school responsibility integrated into the curriculum; fourthly, the emphasis on life-skills should enhance information literacy; and finally, but perhaps most importantly in the light of recent initiatives toward equity and participation in education, the selection of life-skills which are basic to a school's education program and to meeting students' needs changes according to student needs.

The emphasis on the student as an individual with unique talents and abilities has been with us for a long time and is embodied in most statements of aims of education. Teachers are urged in their pre-service education to cater for individual differences in cognitive styles, interests, need, abilities, backgrounds, rates of learning, confidence levels, and preferred learning modes when planning, implementing and evaluating educational programs. In addition, teachers are encouraged to design these programs so that they further students' independence in learning.

There is one approach to learning which is most appropriate in fostering the development of individual students, and that is resource-based learning. It rests on the assumption that students:

> learn from [their] own direct confrontations, individually or in a group, with a learning resource or set of resources, and activities connected to them rather than by conventional exposition by the teacher. (19)

It is an approach which assumes that learners are active participants in their education. It is also an approach which fosters learning skills in such a way that a foundation can be laid for lifelong learning. Success in managing the information explosion at a personal level, meeting the likely need for vocational retraining and understanding the changing patterns of knowledge, are all predicted on independent and lifelong learning.

The shift in emphasis from the content of what students learn to the processes of learning how to learn depends on the use of information, and its sources. In general terms, resource-based learning reflects the current aims of education expressed for example by the New South Wales Department of Education in this way:

> [The central aim of education is]... to guide individual development in the context of society through recognisable stages of development toward perceptive understanding; mature judgement, responsible self-direction and moral autonomy. (20)

One of the essential ingredients for this development is information.

INFORMATION SKILLS

Broad in scope information skills are part of the processes concerned with meaning, understanding, knowing, doing, thinking, imagining, expressing and communicating. As we have seen already they underpin:

- information literacy, akin to literacy and computer literacy
- resource-based learning, an holistic approach which takes account of individual differences in students
- self-directed learning, in which students take control over and responsibility for their own learning
- lifelong learning, essential to the effective management of personal, social and technological change

Information skills are information-based, rather than library-based. They are not specific to one school library, nor to one teacher-librarian's program nor to one collection. In addition to their broad scope they also draw on all levels of the cognitive processes of knowledge, comprehension, application, analysis, synthesis and evaluation as well as on effective processes. More specifically, they are the skills which enable students to:

- define the purpose of an information task
- locate sources of data
- select
- interpret
- and use information to complete an information task

Developments in Information Skills Overseas. The growing interest in information skills in Australia reflects that in other parts of the world. Most of the research and development projects associated with information skills has taken place in the United Kingdom and has been an outcome of the resource-based learning movement as well as the demand for information literacy hastened by technological developments. The initiative for most of the projects has come from the British Library and it has been assisted by various education authorities including the Schools Council, the Council for Educational Technology, universities and higher education institutes. Current activities include the development of whole school information skills policies and program, studies of the role of the school librarian and teachers in information skills programs, and an investigation of the information needs of students. (21) These activities have been given a high priority by the British Library's Research and Development Department which has also assumed a responsibility for disseminating information about the projects themselves and any learning/teaching materials developed from them. As part of the dissemination process, reports of seventeen completed projects are currently available.

Another research organisation, the National Foundation fo: Educational Research in England and Wales has acknowledged the significance of information skills by appointing a liaison officer for schools. The Foundation has similar aims to the British Library's Research and Development Department and is involved in fostering the implementation of information skills programs and in disseminating the research results to schools, education authorities and teacher education institutes.

Canada too is prominent in its information skills activities and progress, and one of the leading exponents is Ken Haycock, who is involved in curriculum development with the Vancouver School Board. He is well published and has received recognition national and international for his work. The Ontario Ministry of Education has adopted resource-based learning as its preferred model for curriculum development. It describes a partnership among principal, school board services, teachers and teacher-librarian. A successful partnership requires knowledge of, and respect for, the skills of others, their philosophies of education and their responsibilities. The partnership operates within an environment of cooperation, support and communication. (22)

Developments in Information Skills in Australia. Information skills have been and continue to be addressed by education authorities in Australia. One Catholic Education Office has applied Bloom's taxonomy of skills to the development of resource-based learning and has identified strategies appropriate for student development at all levels of the taxonomy. (23) The point is made that resource-based learning is one approach to the learning of information skills.

A different approach is presented in the Northern Territory statement **Information skills in the primary school.** (24) Although the identification and location of resources and the interpretation and reporting of information are given as a rationale for teaching information skills, the tables of skills for Transition to Year 7 assume a timetable library lesson which may contradict the effective learning of information skills within the school curriculum.

The Beazley Report on Education in Western Australia has been referred to already. It identified several living skills which have direct application to information skills. For example, some of the intellectual skills are critical analysis and problem-solving, knowledge acquisition skills include information seeking, organizing, analysis and synthesis, one mathematic skill is interpreting information presented in mathematical tasks, and one computer management skill is communicating by computer keyboard skills. (25)

Teaching students how to learn: ideas for teaching information skills (26) was published by the Education Department of Tasmania. It offers a teaching approach, examples of the implementation of the approach in the classroom, ideas for developing a whole-school approach, and materials for use in teachers' seminars. Information-skills are grouped according to locating, selecting, interpreting,

evaluating and communicating information. The document is an interesting one for its emphasis on teaching as opposed to learning.

In November 1985, the Education Department of Victoria released a draft framework for teaching information skills, which encompass study skills, library/locational skills and research skills. Four categories of information skills are identified: identifying and locating sources, information intake, organising information and communicating information. The framework follows nine questions for students, adapted from the work of a project in the United Kingdom.

> What do I need to do?
> Where can I get the information?
> How do I get at the resources I want?
> Which resources shall I use?
> How shall I use them?
> What information shall I record?
> Do I have the information I need?
> How shall I present my information?
> How have I done? (27)

The most recent developments in an information skills curriculum have occurred in New South Wales and South Australia. The guidelines documents being produced by the respective central education authorities are due for release later this year and early next year. The New South Wales curriculum adopts a process approach to the learning of information skills and the taxonomy of information skills on which it is based is the key to the document. It adopts a process approach: that is, it is concerned first and foremost with the facilitation and development of skills. The taxonomy recognises that the objective of learning and teaching should be those skills which the learner needs in order to acquire, organise, generate and utilize in a satisfying and productive manner the wealth of information that is available. Further, these skills are transferable. Being neither task nor problem specific they are in effect ways of dealing with a range of different situations, events an circumstances.

INFORMATION SKILLS AND INFORMATION TECHNOLOGY

Information skills and information technology have a common element-information. In general terms information technology is concerned with physical access to information, and information skills with intellectual access to the information process and transmitted by the technology, synonymous in the main with the computer. The distinction between physical and intellectual access to information is an important one, particularly as it forces us to attend to information-related issues. What is information: is it a commodity to be traded or is it a social good? Can it be both? Is information altered or changed in some way by the medium which transmits it? Does a reader gain the same information from an article via a newspaper and via a full text database? Does information have a value? The answers or at least the challenge of arriving at answers to these questions, will

influence our approaches to information skills programs in schools. They are also questions pertinent to students and teachers as members of the information society.

Sections of the information industry are aware of the potential for their products in schools. Summit, President of DIALOG Information Services Inc., the host for ERIC has been quoted as saying that "we need to incorporate technology in the core curriculum of secondary schools, both as a skill to be learned, and as a tool to expand the horizons of curiosity and intellectual endeavour". (29) Similarly, George Matlby, Managing Director of Overseas Telecommunications Corporation, claims that it makes sense to teach students at school how to search remote databases using the currently available technology. (30) In the light of challenge such as these the education industry needs to make clear its priorities to ensure that information technology in schools meets educational specifications first and foremost.

It is essential to reflect on the application of information technology as a learning resource and tool. The South Australian Education and Technology Task Force report highlights the application of information technology in the development of cognitive skills.

We need to de-emphasise the learning of facts and acquiring of information, and instead, focus on the development of thinking skills and the ability to translate thoughts and ideas into actions or artefacts. In the past there was an emphasis on being able to recall facts; now the emphasis is on students being able to use their skills in the available information storage and retrieval technologies as tools. (31)

The work of Seymour Papert, a Professor of Mathematics and Education at Massachusetts Institute of Technology, has particular relevance to any discussion of cognitive skills and information, or computer technology. Papert has been involved in the field of artificial intelligence, an area which impinges on learning theory. His development of LOGO allows students in elementary school to program, and therefore control, computers. Some critics of computer technology have been concerned that computers program their users, but Papert has shown that concern to be unjustified. He sees students as active participants in learning with computers and argues that there are exciting possibilities for students to learn, think and grow emotionally and cognitively in a future where computers are common place. Papert writes of learning in a computational environment as encouraging an "empowering sense of one's own ability to learn anything one wants to know..." (32)
Papert worked with Piaget in Geneva and was influenced by the Piagetian cognitive development model. According to Papert the computer has the potential to shift the boundaries separating Piaget's concrete and formal thinking stages. He demonstrates that with a computer, a student can approach concretely the knowledge that was formerly accessible only through formal and abstract processes. (33)

Ken Sinclair, coordinator of the IBM Project in Australian secondary schools contends that the most impressive feature of microcomputers is their potential for changing the way people think. He claims that:

> The activity of handling information in the class-room through the use of data management and processing programs and activities, simulations and word processing may be expected to encourage flexible, and adaptive and independent thinking...It will help stimulate the development in students of skills in analysis, synthesis, decision-making, problem-solving and evaluation. (34)

Skills such as these are at the core of information skills programs and are involved in all the processes of defining the purpose of an information task, locating sources, selecting data, interpreting and presenting information and evaluating an information task.

Research has identified some of the benefits for students of the application of information technology in education programs. The outcomes of the Schools Information Retrieval (SIR) Project in Britain confirm the improvement in the quality of students' work based on information technology. Trialled over a two year period the SIR project met its objectives in assisting students the underlying principles of computerised information organisation. The SIR program allows teachers and students to build their own databases and to retrieve information from them. One important finding from the project in terms of schools providing resources matched to a range of student ability levels is that the less able students were able to cope well with what is a complex and sophisticated computer program. (35)

Another British project, the Microcomputer in the School Library (MISLIP) based in Scotland has confirmed the link between information skills programs and the development of students' decision making and thinking skills. In addition through using a computerised information retrieval system designed to provide keyword access, students came to appreciate the need to define their information purposes as an initial step in the process of finding and using information. (36)

Several American research studies have concentrated on the use of microcomputers as communication tools and have looked at online searching in information skills programs. Wozny demonstrated that online searching introduced a new dimension of resources to students and that student assignments reflected the use of current materials such as government documents and conference proceedings. (37) Fiebert found that students developed two new skills through online searching, one being the reading and interpreting of print-outs and the other the writing of abstracts. (38) More ambitiously, Fiebert claims that students have not always been able to express an information need adequately when encountering traditional printed and indexed sources, and that online searching provides another tool for approaching a topic.

A different student-teacher relationship in manual and online searches was identified by Levinson and Walcott. The online process stimulated more interaction between teacher, teacher-librarian and students as the search was formulated and the information retrieved. Levinson and Walcott make an interesting point that because technology often causes teachers to reevaluate their traditional strategies, there is a chance that the same level of interaction can be achieved through more traditional manual searching. (39)

The computer can also influence affective learning although its full potential will not be realized in that area for some time. In making decisions about computers as learning tools we need to consider them along with other learning tools available to students. We need to match the computer and all information technology with students' needs, abilities and interests, and to adapt the technology where necessary to meet those needs, rather than adapt the student to the technology. The application of information technology in education should confirm the central position of students in learning processes.

INFORMATION SKILLS PROGRAMS IN SCHOOLS

The literature identifies two key elements in effective information skills programs and each element has implications for the roles of teachers, teacher-librarians and principals. The first of these is the adoption of an integrated approach to information skills learning and is dependent on cooperative planning and teaching. The second is effective resource selection and management. An integrated approach to information skills necessitates the integration of resources into the curriculum. They are not dispensable items; they influence both how and what students learn. It is a truism that resource-based learning is dependent on resources.

Information skills integrated into the curriculum. Information skills are embedded in education programs in schools by their very nature. Because information is a basic necessity for student development, then skills related to information handling are also a necessity. Marland, who worked on one of the British Library/Schools Council projects mentioned earlier has argued that there is no one school subject or activity in which information skills can be learned. (40) He favours a spiral curriculum where skills are introduced, explained, and practised, and pursued in greater depth as students proceed through school, refining the processes of handling and using information in a range of curriculum areas and subject discipline.

The school principal is a significant factor in a truly integrated whole-school approach to information skills. If the development of independent learners is a goal of a school's program, the principal can contribute to its realization by involving staff in the development of school policies, by arranging for professional development and inservice courses for staff where necessary, by demonstrating leadership within the school and supporting staff initiatives, and by encouraging a school climate conducive to open communication and successful teaching and learning. Research supports this view of the role of the school principal. In a study

of six schools in an outer London borough, Sneath found that the factors which should be considered when implementing information skills across the curriculum were the enthusiasm of the principal, the enthusiasm and interest of staff and librarians, the school environment, the stability of the staff and the resources available. (41)

The teachers' and teacher-librarians' contributions to an integrated information skills program rest on cooperative planning and teaching for effective development. While the principal is most influential in policy development across the curriculum, teachers and teacher-librarians are influential in the planning and teaching of information skills programs or in translating policy into practice. Haycock goes so far as to suggest that the most important role for the teacher-librarian is cooperative program planning and teaching with classroom teachers. (42) In this way teachers contribute their knowledge of students and curriculum areas. They are responsible for class programs. Teacher-librarians contribute their knowledge of resources and of the skills required for physical and intellectual access to the information they store. Lundin describes their contribution as including:

> (a) participating in the planning and implementation of the school's total curriculum, particularly by advising on the use of resources;
>
> (b) selecting with the involvement of teachers, acquiring, organizing and operating a collection of resources and services appropriate to meet the needs of students;
>
> (c) cooperating with teachers in the planning, teaching, and evaluation of units of work;
>
> (d) negotiating with teachers to determine what will be covered for particular groups of students, and who will accept prime responsibility for the teaching and application of skills;
>
> (e) teaching some of the skills as mutually agreed upon;
>
> (f) and giving incidental, follow-up support and reinforcement to individual library users... (43)

One particular service which teacher-librarians can provide to improve the quality of students' learning experiences involves the professional development of teachers. Studies in the United Kingdom and Australia indicate that many teachers themselves are not sophisticated users of information, nor have they developed a broad range of information skills. (44) Professional development activities for teachers which can be initiated and coordinated by the teacher-librarian include inservice sessions, current awareness, listings of new materials, bibliographies, and involvement of administrators and teachers in establishing new information services. Without the professional development of teachers, for which education

authorities have a responsibility, it is likely that information skills will not be adopted across the curriculum.

Resource selection and management. An integrated approach to information skills with its emphasis on resource-based learning implies that a wide range of information and learning resources will be available to students and to teachers. For students, the resources will be characterised by a range of formats, readability levels, content and curriculum applications.
The variety of resources consistent with students' information needs will ensure that their learning is improved, enriched and reinforced. Activities in which resources are matched to students' interests and abilities will individualize learning and provide opportunities for students to develop independent learning skills. For teachers, current information related to curriculum development is essential and research has identified their need for current, reliable and comprehensive information about education in their own and other systems. (45)

The teacher-librarian has expertise in resource selection and management. The information skills program will be strengthened when the teacher-librarian builds a functional resource collection appropriate to the unique needs of the curriculum, the students, teachers, school executive and the school community. In building the collection, the teacher-librarian consults with staff and students and cooperatively evaluates the resources according to criteria documented in a school-based library policy. There should be an educational rationale for all the resources in the collection.

The Ontario Ministry of Education's Partners in Action: the Library Resource Centre in the School Curriculum lists the following areas of responsibility for the teacher-librarian in the selection of resources:

- reading current reviews of materials and equipment and keeping teachers informed about new resources;

- visiting displays of new materials;

- previewing resources such as videotapes, multi-media kits, filmstrips, and audiotapes;

- working with teachers to select appropriate print and non-print materials for purchase;

- developing and maintaining materials that will assist teachers in the selection of textbooks and reference texts for classroom use;

- developing a useful collection of reference materials, periodicals, popular fiction, and other resources not specifically geared to any one subject program;

- assisting with the establishment of the school's learning resources selection policy;

- discussing with teachers the needs of exceptional students in the school and making a special effort to ensure that the library resource centre collection contains appropriate materials to meet these needs;

- evaluating the use of various types of print and non-print resources;

- using appropriate aids for the selection of resources;

- participating in board-sponsored evaluation committees;

- adapting and developing learning resources to meet specific program objectives and learner needs;

- adapting and extending the basic research-skills program to meet the special needs of individual students. (46)

Because the teacher-librarian needs to be aware of new learning materials and equipment, selection tools may need to be extended to include resource review information online from the Australian Schools Catalogue Information Service (ASCIS) database, and curriculum information on the Australian Curriculum Information Network (ACIN) database.

It is reasonable to expect the nature of resource collections in schools to change in response to the developments in information technology and especially when current information is required. For example, the AAP database, a news service, accessed online is updated daily. In some instances, as in the case of the ACIN database, information is available only online. New periodical titles may be added to the collection in response to frequency of citation in online searches. Reference monographs such as the Macquarie Dictionary, Australian and New Zealand Encyclopedia, directories and yearbooks may be replaced by their online counterparts. New information technology in the form of computer software has already been accommodated in school library collections and many teacher-librarians are showing an interest in CD-ROM.

There are several aspects of the management of the school library collection apart from selection which are pertinent to information skills programs. Resource management involves budgeting and forward planning. It is crucial that the teacher-librarian adopt an advocacy role and interpret the function of the library resource collection in the school curriculum to the principal, teachers, parents, students, consultants and regional officers so that realistic funding priorities can be established on a school wide basis.

Access to resources is another aspect of the school's resource. It can include shelving arrangements whether integrated or not: the format of indexes to the

collection, whether on cards, microfiche or online; the arrangement of indexes to the collection, whether dictionary catalogues, subject indexes. KWOC lists; the indexes to collections beyond the school, whether community files, local union lists; the resource sharing networks and interlibrary loan services to which the school library belongs. Document delivery is an essential part of access to resources beyond the school and will be enhanced by videotext and electronic mail systems.

Access refers also to equipment. Student use of audiovisual equipment does not seem to be widely accepted. Information skills programs highlight the need for student access to equipment, instruction manuals and maintenance sheets for equipment may need to be located in the collection or at least with items of equipment so that students can use them to develop their skills in independent learning. Circulation policies for equipment may need to be more flexible than they have been in the past.

Effective information skills programs depend on a wide range of resources. It is vital that the strategies adopted for the management of library resource collections reflect the priorities and intentions of the school's educational program. If it is accepted that resource-based learning is an approach fundamental to the development of our students' potential and abilities, then resource-based information skills must be an integral part of the school curriculum. Because we are part of the information society, it follows that information technology in all its forms must also be an integral part of the school curriculum. As long as school programs serve students' needs, then our present goals are clear, and the future takes care of itself. This may seem to be an optimistic view, but as long as our perspective focuses on humanity then we can begin to answer T.S. Eliot's haunting question from "The Rock":

> Where is the life we have lost in living
> Where is the wisdom we have lost in knowledge
> Where is the knowledge we have lost in information?

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