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ABSTRACT

Information literacy is the ability to use information purposefully and effectively. It is a holistic, interactive learning process encompassing the skills-based phases of defining, locating, selecting, organizing, presenting, and evaluating information from sources that include books and other media, experiences, and people; being able to consider information in light of knowledge; adding information to current knowledge; and applying this knowledge to solve information needs. An approach for promoting information literacy and establishing an integrated information skills program in a school is described. At Marist Sisters' College, a secondary school in Sydney (Australia), an action research project has attempted to place information literacy at the center of the curriculum. Using R. G. Havelock's model of the change agent, a range of change agent activities has been used. Qualitative evaluation through interviews with 8 teachers and 110 students in grades 7, 9, and 11 has demonstrated the positive impacts of the approach on student self-concept, the learning process, the view of information, learning outcomes, and the learning environment. Three appendixes contain a summary of the information process, change agent activities, and a diagram of the planning model. (Contains 12 references.) (SLD)

THE POWER OF INFORMATION LITERACY:

UNITY OF EDUCATION AND RESOURCES FOR THE 21ST CENTURY

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WHERE MY BOOKS GO

"All the words that I utter,
And all the words that I write,
Must spread out their wings untiring,
and never rest in their flight"

William Butler Yeats

AN INFORMATION SOCIETY

Given this audience of school librarians in an exquisitely beautiful country, it seems entirely appropriate to open today's session with the words of William Butler Yeats. With lyrical simplicity and an intuitive sense of vision, Yeats beckons us to listen thoughtfully and reflect. The verse might suggest that we have something worthwhile to say - that is for you to judge. But the verse is also a premonition of an information rich society. The urgency of responding effectively to that society is the focus of our presentation.

In just one short human generation, the primary work of the world has moved from the use of muscle to the use of machines, machines that move information rather than goods. We live in the age of the information revolution where the mass production of information and its technology predominate. The speed at which this has happened is quite extraordinary. For instance, it took 229 years between the invention of the Newcomen engine in 1708 to the emergence of the jet plane in 1937. It has taken only 36 years from the development of the first generation computer by Eckert and Mauchly in 1946 to fifth generation computers of the 1990s that mirror the neural communications ability of the human brain. The information revolution has occurred

some 6.5 times faster than the power revolution. And there are signs that the information intensity of our commercial and social environment is increasing. 90% of all scientific knowledge to date has been generated in the last 30 years, and the existing volume of knowledge is expected to double in the next ten to fifteen years. (MASUDA, 1981: 42-45) In the past decade alone, measurement of the information revolution on almost any dimension - numbers, capacity, speed or cost - is described not in mere percentages, but in factors of three, ten, or more. We hear of the gap between populations of third world countries and their inability to feed themselves, and we hear of the ever increasing assaults made on our planet, but no dimension of human affairs, including populations or depredations of the environment, seems to have grown or changed so rapidly as information. (BANKES & BUILDER, 1992: 4) Commentators in sociology, education, government, business and industry assert that ours is indeed an an information society, a society without any historical precedent.

The future is one of of multimedia and hypermedia technology combining artificial intelligence, voice, text and image; it is one of electronic neighbourhoods of information exchange crossing boundaries between culture, education, work, leisure and personal development, and pervading every aspect of our lives. It is also one of uncertainty and change with unpredictable trajectories and tensions. Such rapid transformations of our past and present must encourage us today, as educators and information professionals, to question our future.

It is our firm belief that education for the 21st century must be education for an information society. The current scope and pace of change demands that we develop the flexibility to respond rapidly and creatively to new parameters imposed on us by the information society, and to develop the ability to act pro-actively to capture opportunities being created by these changes. There is an increasingly urgent need to rethink and restructure education processes within an information framework in order to provide existing and future students with the attitudes, knowledge and skills they will use and apply in their public and private roles as members of an information society.

"By the year 2000, today's children will be completing tertiary education and be part of a very different 21st century workforce. They will be entering an information age which will require them to analyse and interpret information, to present it to others in various forms, and to form opinions and to make judgements and decisions from a wide variety of sources. They will need to be prepared to work cooperatively and productively in flexible ways and be ready to accommodate change in all aspects of life. A new set of basic learning skills will be needed to equip them to live in this changing world. Creativity and innovation must be fostered and allowed to flourish." (VOGLER, 1990: 101)

As school librarians, we are in fact the prime movers. In the context of our unique and dynamic roles as educators and information specialists in our schools, we are both a symbol of the dynamic link between learning and information, and key facilitators of unifying education and resources. Both are to be prized within our schools.

It will be useful to articulate this role a little more carefully by examining how ideas and thinking about education and information have changed, and from there, examine how our role has changed. One way of doing this is to focus on the the assumptions, values and beliefs that have substantially shaped and guided educational practice and the provision of information in the past, and the shift that is currently taking place in these arenas. The following study of the shifting paradigms in education and information are synthesised from the collective research of Ferguson and Dervin and Nilan.

PARADIGMS OF EDUCATION AND SCHOOL LIBRARIES

TRADITIONAL VIEW OF EDUCATION

- emphasis on content, acquiring a body of "right information" once and for all
- teacher imparts content - a one-way street; teaching is talking, learning is listening
- learning is a product, a destination
- hierarchical and authoritarian structure where conformity is rewarded and difference is discouraged
- relatively rigid structure with prescribed curriculum that emphasises "appropriate ages" for certain activities
- primary reliance on theoretical "abstract" book knowledge
- classroom designed for teaching efficiency and convenience
- bureaucratically determined; resistant to community input

TRADITIONAL VIEW OF INFORMATION PROVISION

- information is viewed as objective, "bricks" of information with constant meaning
- library focuses on delivery of information - getting information into the hands of the students
- users of information are passive recipients of information - the "destination" of information
- individuality is seen as chaotic; minimum service to maximum numbers
- information fits each person in exactly the same way; individual's response to information conforms to expected group response
- emphasis on provision of "neutral" information
- libraries designed as storerooms for books: convenience of storage rather than convenience of users
- passive approach to the development of services tailored to specific learning needs; little feedback from users on appropriateness of resources and services

21st CENTURY VIEW OF EDUCATION

- emphasis on learning how to learn, how to ask questions, to be open and to evaluate new concepts, have access to information; what is "known" may change
- learning is a process, a journey; learners make decisions about their learning
- learning context is important
- encourages autonomy and independent learning; develops student responsibility for learning, confidence and self reliance
- educational structures are flexible: many approaches to learning and teaching
- flexibility and integration of age groupings- individual not automatically limited to certain subject matter by age
- theoretical and abstract knowledge complimented by experiment and experience, both in and out of the classroom
- concern for the environment of learning that is responsive to the needs of learners
- encourages community input, even community control
- teacher is a learner too - learning is a shared environment
- egalitarian structure where candour is permitted; students and teachers see each other as people, not roles

21st CENTURY VIEW OF SCHOOL LIBRARIES

- information creates meaning and understanding, enables learners to make sense of their situations; meaning varies from person to person
- learner is actively involved in information transfer and does something with the information to satisfy learning needs
- information is understood and utilised according to the learner's existing knowledge and situation
- the learner is an active information processor and decision maker
- information seeking behaviours of learners vary from individual to individual
- the need for learners to have access to information appropriate to their abilities, interests and needs
- education for information literacy is valued
- library is vital link between learners and resources which they need to develop their potential
- satisfying learner's needs are important; feedback is essential
- collaborative approaches between teacher and school librarian to develop information literacy

(based on Dervin & Nilan, 1986, and Ferguson, 1981)

The shift in educational focus is from teacher/content-centred learning to student/process-centred learning, and the shift in the role of the school library is from a storehouse of resources to a dynamic, student-oriented resource-based learning centre where students play an active role in resourcing their own learning. In an information society, learners can no longer be viewed as robotic information processors where information is poured into them like like empty vessels.

This shift in world views has important implications for the role of the school librarian into the 21st century. Essentially the role focuses on developing a dynamic and responsive information environment and fostering learners to be active and autonomous in their learning, to question, to explore, to seek, to contend, and to create new meaning from information so that they can grow toward maturity and independence in an information society. This is an awesome role, and an awesome responsibility. It is the role of bringing together education and information so that students have the understanding, capabilities, confidence and skills vital to surviving in an information society and to being able to make value-based contribution to this society.

INFORMATION LITERACY

What we are talking about is **information literacy**. Information literacy is the ability to use information purposefully and effectively. It is a wholistic, interactive learning process encompassing the skills of defining, locating, selecting, organising, presenting and evaluating information from sources including books and other media, experiences and people, being able to consider it in the light of current knowledge, adding it to a store of knowledge, and applying this knowledge capably and confidently to solve information needs. Students who are information literate thus develop confidence and control over their lives. They not only shape their own lives, but also contribute to the lives of others. (KIRK, POSTON-ANDERSON, YERBURY, 1990: 2-3)

Information literacy involves the processes of:

- defining the tasks for which information is needed
- locating appropriate sources of information to meet needs
- selecting and recording relevant information from sources
- understanding and appreciating information from several sources, and being able to combine and organise it effectively for best application
- presenting the information learned in an appropriate way
- evaluating the outcomes in terms of task requirements and increases in knowledge

Information and information literacy are at the core of all learning, and thus central to the educative process. Information literacy is the essential link between learners and information resources provided by school libraries. It is that which will empower learning for the 21st century; it is what will enable students to take charge of their own learning; it is what guarantees unity of education and resources for the 21st century. And in doing so, it gives power to transform work, personal performance and leisure, and to raise the quality of life.

CURRICULUM RESPONSE

Already educational systems are taking up the information literacy challenge. One of the key goals of "The National Curriculum of New Zealand" being prepared by the New Zealand Ministry of Education is to "give students access to the knowledge, skills and

understanding needed to participate effectively and productively in society and in the economy." It identifies seven categories of essential skills and qualities to be developed by all learners and integrated into all curriculum areas. These are: communication skills; numeracy skills; social skills; problem-solving and decision-making skills; self management skills; work and study skills and information skills.

In September 1991 a landmark document was tabled In the Australian Parliament. The report, "Australia as an information society" asserts that access to information is fundamental to our democratic freedom, to the transformation of our economy, and to the delivery of social justice to all citizens - in other words, to our very survival. It recommends that particular attention be paid to the development of information literacy and skills associated with the use of information and information technology, and that these be integrated into curriculum at all levels of education - primary and secondary - and including teacher education. In addition, the Australian Education Council Review Committee has recently recommended that the following skills should underpin the national curriculum:

collecting, analysing and organising of ideas and information:

- defining the purposes and audience for which information is collected
- being able to find and use a variety of sources of information
- choosing appropriate means for collecting and organising information
- organising information clearly and logically
- interpreting and analysing information and ideas
- selecting information and evaluating its suitability for use in a particular context
- transforming information from one form to another

expressing information and ideas to others

- choosing appropriate means to express information
- demonstrating presentation skills
- evaluating the effectiveness of communication

And much closer to home - ours, that is. New South Wales is now recognized as Australia's leading state in the education of information skills. In 1988 the Department of Education released a policy document Information Skills in the School, to be implemented across government schools by all teachers. The document's sound philosophical basis, its clear articulation of the information skills process (Appendix A) and its nature as a working tool for the planning and teaching of information in primary and secondary schools has gained acceptance across Australia. New curriculums and grading systems in New South Wales now incorporate information skills in their documentation.

The National Catholic Education Commission, the largest non-government educational system in Australia with some 1,700 schools and some 600,000 students, is responsible for developing, co-ordinating and implementing educational policy for Catholic schools in Australia. Its curriculum statement also asserts a skills-based approach to learning:

- to give opportunities to develop the full potential of the human person
- to acknowledge and cater for the diversity of ways in which people learn
- to encourage independent thinking and critical skills and the continuing search for truth,
- and to encourage a critical participation in our society
  (N.C.E.C. Report, 1991: 43)

"So what?", you might say. What we are seeing is a shift from information skills being the domain of the library to the domain of the curriculum. This does not diminish the role of the school library, but revitalises it in the context of the whole school.

As school librarians, this is our future, this is our vision. How do we make it a reality? The dream, at a school level, is to make information literacy the pulse, the very heart beat and sustaining power of the curriculum - to integrate information skills into the curriculum. We are, and must be key players in this dream because we are the ones in the school with information expertise. We must ensure that the skills, knowledge and attitudes necessary to use information effectively are learned as part of the curriculum of the school. We would like to focus now on how it can, and is being done at the grassroots level - in the school.

ONE SCHOOL'S RESPONSE: ACTION RESEARCH, 1991

Four two years now an action research project has been under way at Marist Sisters' College in Sydney. This research has attempted to place information literacy at the centre of the curriculum. It has not been an easy journey, with obstacles and apprehensions expressed by all those involved. In a sense our motivation has come from the very meaning of the word "educate". The latin root of this verb is "educare": to draw out or lead out. We are committed to education that is not a piling up of information, but rather a developing of the latent potential of each student's capacity to learn. We can facilitate students' learning by designing and orchestrating the circumstances which enable them to learn for themselves. Information skills are the key to developing the active, responsible role students have to play in their own learning, and as responsive, autonomous decision makers in society.

In the project, the school librarian Celeste McNicholas has been a key player. Begun in 1991, its broad objective was to establish in the school a commitment to the practice of integrating information skills into the curriculum and to facilitate this by collaborative planning and teaching. The project sought to set up an infrastructure in the school to implement the process, and develop and implement strategies to widen the base on which information skills were practised in the school.

In essence we wanted to take this notion of information skills as the core of learning and make it a reality. We wanted to place information skills outside the domain of the library and school librarian and to put it in a wider context in which it was owned by teachers. Initially this entailed an enormous investment of time, but eventually high returns were reaped. The details of our work in 1991 are presented briefly here. A full report will appear in the School Librarian, to be published in November.

The project was built arcund Havelock's model of the change agent. (Appendix B) Its basis is a range of change agent activities - PROMOTING, INFORMING, DEMONSTRATING, TRAINING, SERVICING, and NURTURING to bring about responses of CREATING AWARENESS, INTEREST, A WILLINGNESS TO EVALUATE THE PROCESS, TO TRIAL, TO TEST, TO ADOPT. The model recognises that full acceptance and adoption of new ideas rarely come when individuals first face the prospect of change. It encourages people to move forward, to test, experience, trial and assess in order build a commitment to practice. Rather than imposing a school-wide policy from the top down, we began at the grassroots level, working with individual teachers in the classroom to develop a commitment to information skills.

The change model was implemented through a number of strategies.

1. establish an interdisciplinary planning team

This team was made up of the school librarian and individual teachers with some information skills experience, and served as a nucleus for planning and implementing the model. It meant that teachers and not just the school librarian owned the process right from the start.

2. regular meetings

We met regularly at a fixed time on a weekly basis. Meetings were kept informal and fun.

3. identification of strengths

We took time to identify the strengths of the school community and used these to promote the importance of a curriculum-based approach to information skills. The school is receptive to new ideas and these are openly fostered and supported by the school principal. This support is of great importance in that the whole information literacy issue is seen as something beyond the particular interest of the library. This inspired us to plan with a certain boldness and to keep moving forward.

4. clarifying the problems

We took time to identify real and perceived barriers that teachers saw as problems in terms of integrating information skills in the classroom. Through lengthy discussion with teachers we developed a profile of "where they were at" in terms of practice commitment, enabling us to identify barriers which we then translated into needs.

We found four levels of commitment to information skills:

1. RESISTANCE: Teachers at this level saw information skills as very time consuming. They liked their classroom autonomy and saw co-operative teaching as threatening. They were very uncertain and apprehensive about the process.

2. CURIOSITY: Teachers at this stage thought information skills were a good idea but didn't value them in practice. They were willing to attempt innovative ideas but lacked direction - where to start and how to do it. They also felt uncomfortable with someone else in the classroom.

3. ACCEPTANCE: Teachers at this stage were those who had some successes with integrating information skills into the classroom, and who were quite happy to work alongside the school librarian. They shared their successes with their colleagues. They still felt pressured to cover content in a given time and still had some reservations about the process.

4. COMMITMENT: Teachers at this stage were committed to teaching information skills in their subject fields. They were not intimidated by teaching in front of the school librarian and were willing to share their successes and failures. They also took initiatives in educating their fellow teachers.

Most teachers at the project school fit into levels one and two. Knowing this enabled us to identify their real fears, barriers and needs, and to develop strategies to meet these. We could target likely candidates with higher probability of success; we could develop a sense of timing; and we could act strategically knowing what objections might be raised.

In essence, we found we could give more appropriate guidance and be prepared for rejection.

5. practising what we preach

To address the barriers and problems of teachers, we implemented two important strategies within the framework of the model to facilitate individual teachers through the phases.

Firstly, the DEMONSTRATE, SHOW AND TRAIN phases of the model were accomplished by implementing and developing a large scale team teaching programme in the school to demonstrate first hand to the rest of the school staff the educational value of having a co-operative information skills approach integrated into the curriculum. This was done in the junior high school Science programme over a ten week period with the Science teacher and school librarian team teaching together. It was deliberately designed to be a showpiece, a basis for teachers to discuss, observe and question, and they certainly did so. It generated much enthusiasm and interest and particularly has encouraged many in the school "to give it a go". The outcome has been a solid and growing commitment in 1992 to a total school practice commitment to integrating information skills into the curriculum.

Secondly, we developed a planning and lesson sequencing model to TRAIN, HELP, SERVE and NURTURE teachers in the process. (Appendix C) This is a simple, adaptable way of bringing together the teacher and school librarian in a planning process that has students at the centre.

This model is a way of negotiating the lesson planning process to ensure that information skills are developed and integrated. It helps clarify planning and teaching roles and forms the basis for committed, successful teaching. It helps teaching sequences planned in programmes to be designed as integrated units. We have found that it can be applied to planning a single lesson as well as small / large scale units. Teachers have commented that it helps them over the perception that information skills are time consuming.

ACTION RESEARCH, 1992

In 1992 we wished to consolidate on the gains made in 1991. Of greater concern was our curiosity about the impact of information skills on learning. Does integrating information skills into the curriculum make a positive impact on student learning, and if so, what are the implications for teaching? Essentially this is an unexplored domain of learning, and became our focus this year.

Our objectives for 1992 were: to consolidate gains of 1991 and extend information skills into other curriculum areas in the school; to undertake some descriptive research in order to begin assessing the impact of information skills on learning; to identify variables that appear to be interacting in the learning process so as to form the basis for more controlled, systematic measurement in 1993; and to use preliminary findings as a basis for further extending information skills in the school

Methodology

Rather than specific research questions to answer or hypotheses to test, qualitative research techniques were used to gather data. In order to illuminate the inner dynamics of learning situations, we felt that participant perspectives and action could be best understood when observed in the setting in which they occur. Thus data was collected in actual classrooms. An open ended approach was used to enable students to answer from their own frame of reference rather than from one structured by specific, prearranged questions. Lengthy participant observation and indepth interviewing based on loosely structured interview guides were used so that students could freely express their

thoughts, yet focus and direction were kept. Written course evaluations, assignments, attitude surveys and test scores were also used. While it is recognised that there is controversy over qualitative procedures resulting in "soft" data rich in description but not easily handled by statistical procedures, there was a concern for capturing the subjects' own way of interpreting impact and significance as accurately as possible. The using of a range of sources of data was seen to enhance reliability and validity of the study. Observations took place over a six month period, and interviews took place over a two week period toward the end of that time. The outside researcher was known to the students.

Sample

110 students, both in class groups and small groups, were interviewed. All of these students, from Years 7, 9 and 11, had at least four months involvement in learning programmes where information skills were integrated into subject content, with teaching sequences taught by both classroom teachers and the school librarian. The method of sampling used was purposeful sampling. The students were chosen because they were believed to be able to provide the richness and complexity of data required to build up a descriptive picture and comprehensive understanding of the impact of information skills on their learning. Eight teachers involved in teaching information skills were also interviewed. This group included teachers very experienced with information skills as well as teachers new to the process.

Analysis of data

Rather than searching out evidence to prove specific hypotheses, we set out to build up abstractions from the data - essentially building up a picture of the impact of information skills on learning from many disparate yet interconnected pieces of collected evidence. Interpreting and making sense of the collected materials was a monumental task. Initially this involved a broad though careful analysis to identify focus areas and patterns. This generated several focus categories that formed the basis for analysing and synthesising the data. This was followed by scrutinising descriptions carefully and judging the category to which the materials pertained, recognising overlaps and adjusting focus categories.

IMPACT OF INFORMATION SKILLS ON STUDENT LEARNING: FINDINGS

The findings as presented here are preliminary, and represent an impact over a short period of time. They are encouraging, challenging, and perhaps a little frightening particularly in view of their bold implications for change at the teaching level.

Impact on perception of self as a person and as a learner

Students were not at all reluctant to convey their perceptions. The "adultness" and depth of their responses and their ability to articulate their feelings logically and confidently speak of a growing sense of personal worth and self-respect, and an improved self-perception.

- vehicle for self-expression and active participation. Students expressed greater confidence in asking appropriate questions, in answering questions with less uncertainty, and in listening and observing more carefully. In being able to respond more confidently, their contribution to teaching strategies was more open and active.

- mechanism for self-analysis. Students were more able to reflect inwardly on their own learning progress, to diagnose their learning needs in terms of the progress they had made with information, to express these needs more

confidently, and to strive to refining the skills where necessary. A commitment to "want to learn" and a respect for learning in its own right were expressed, and this was linked clearly to the ability to cope with learning difficulties.

- enhanced self-esteem. This was particularly expressed by one of the Year 9 Science classes. The Science classes are graded, and this one is the lowest stream. This group had been initially differentiated by their low motivation for learning, low achievement and low self-esteem. Their enhanced self-esteem was quite obvious - they were exuberant, excited and happy about their progress. Perhaps the most refreshing thing is that they were actually looking forward to their mid-term science test because they wanted to demonstrate what and how much they had learned. Their sense of pride and their believing in their own ability, and their recognition of themselves as acceptable students gave them new found freedom. They were liberated from a fear of failure to a keenness (that surprised even them) to demonstrate their success. The personal struggle with the stigma of being labelled "dumb" had hurt them considerably, and their growing freedom was a real joy to observe.

- sense of self-control. The Year 9 students in particular were willing to admit that their own behaviour in the past had been problematic; that their frustrations were linked to having neither the skills to make sense of and take control of their learning, nor the power or confidence to seek clarification. They willingly acknowledged that their classroom behaviour is much more positive now and that they are different students. Their self-control was also shown in the maturity of their responses. Without any instructions on our part to do so, they were careful to keep their comments about past teaching strategies anonymous and respectful, though frank.

- independence and self-reliance. One student expressed "I am more dependent on myself now". Information skills were seen to place emphasis on taking responsibility for learning, and learning from mistakes. Students admitted that this did not come easy, that there was some struggle: "We want to have answers fed to us because we are used to it, but we wouldn't be using our brains".

- positive attitudes. As well as having a more positive attitude to content areas, students projected an awareness that information skills enabled them to learn at a deeper level, and gave them confidence to explore the unknown. Coupled with this sense of discovery was a sense of achievement. In Year 9 where antagonism with learning tasks had been expressed prior to the skills programme, students concerns now were far more academic in terms of the process, and specifically in terms of refining their skills to keep on track with the content. The overall maturity of students' responses was quite extraordinary. Over the learning programme, students' attitudes shifted from one of overt blaming of others for their learning problems, to an inward acceptance of owning the responsibility of developing their own skills.

- honesty. The openness and honesty concerning their own learning are suggestive of an ownership of learning and a valuing of the information skills processes.

Impact on the process of learning

In all classes surveyed, students were aware that the skills of defining, locating, selecting, organising, presenting and evaluating information were being developed in the context of the curriculum content.

- charting learning progress. Students saw the skills as enabling them to map out more precisely what they already knew in order to more effectively decide what

they needed to know. One student expressed it in terms of enabling her "to need to know what I don't know".

- time. Students experiencing the process consistently claimed that they understood more subject content in a shorter time. This is in sharp contrast to the perspective of teachers who are reluctant to be involved in information skills - their expectation is that information skills are time consuming and do not enable content to be covered in the set time.

- more accepting of learning as a challenge. Students were able to identify the challenge that the process presents, and to accept the challenge rather than taking the easy way out. They viewed learning as "doing", and saw active participation as being critical to successful learning. The skills added a faith-dimension to learning - they were confident that they would manage the task, even though it initially seemed quite daunting.

- learning as a structured process. Students claimed that by breaking down tasks into information skills-related phases, and systematically applying these phases to the completion of the task, they were more able to effectively organise their ideas. They found that the skills gave them greater flexibility to their inquiry, and a greater focus on the task and on remaining true to it. They expressed a sense of control over the information and a sense of confidence in manipulating and rearranging the information. Some students even expressed the view that these processes were happening quite unconsciously now.

- vocabulary control. Students seemed to use information skills terminology with ease and understanding, particularly when attempting to clarify their immediate learning problem. Some could step into the information skills mode at word stimulus. There was a perception of unity in learning when teachers in other subjects used the same terms. Because all teachers were not using the same terminology, the inconsistency generated some problems: for example, some students were hesitant to seek clarification even though they recognised that they should have.

- responsibility for learning. There seems to be an emerging awareness that each information skill is important to the learning process, and the recognition that any difficulty with any skill requires that they are responsible for doing something about it.

- identifying learning weaknesses. The personal valuing of each skill as important to learning appears to have sharpened the students' ability to identify their weaknesses in applying the skills. Typical comments were: "I should do more work on defining because I have difficulty doing that"; "I need to work on listening because I block out very easily"; "I need speaking skills. I say things I don't really want to say if I could just get to the point but I can't without saying something else."

- managing the quantity of information. Students indicated that learning to plan all aspects of the task enabled them to deal more adequately with the quantity of information they were able to locate, and to manage their time accordingly. It also allowed them to work more effectively at their own pace.

Impact on view of information

- more global view of information. While students saw the school library and the school librarian as immediate sources of information, they did not equate

information solely with the school library. Information skills were not viewed as location-specific "library skills".

- lateral information seeking. Some students had become active seekers of information beyond the library, using people, realia, and a variety of community information agencies as sources. They also respected themselves as a source of information because they were learning to identify what they did know, and they were seeking information internally before seeking externally.

Impact on learning outcomes

It is recognised that systematic research is essential in order to demonstrate the impact of information skills on learning outcomes. Some clear trends emerge that indicate information skills add a powerful dimension to learning.

- meaningful learning. The less able group of Year 9 students consistently emphasised that they understood the subject content they were learning. Increased meaning, precision of meaning, and an improved ability to express what they had learned in their own words with greater clarity and understanding was motivational for them. They expressed greater interest in Science and a much more positive attitude to it. This change was dramatically apparent when compared to attitudes assessment test given at the commencement of the subject. Students saw that applying the skills helped them make sense of Science, and that they were actually "comfortable" with the subject.

- develop reflective thinking. Students indicated that the skills of selecting and organising information helped them separate trivial from significant information, and encouraged them to assess more critically the information rather than merely "copying it from encyclopedias".

- improved memory. The less able students expressed surprise at their ability to remember subject content. Improved short-term and long-term memory were evident in class tests and quizzes. As one student said: "we use our brains a heap more".

- increased concentration and focus on the task. Students saw this as a direct outcome of understanding what they were doing. Because they understood ideas, they were able to relate ideas, and to focus on ideas with greater clarity and for longer periods of time.

- develop skills of self-directed, autonomous learning. Students clearly associated the skills with sense making, giving them more control over what they were reading, and giving them a sense of confidence in manipulating and arranging information when they were working on their own without direct supervision or immediately available help. Some senior students were already applying the skills to the planning of work to be done during the school holidays.

- transfer of learning. There is some evidence of transfer of skills to other problem solving activities such as summarising skills used in English, to coping with examinations, and to experiences beyond the classroom. Year 11 students saw the application to the Higher School Certificate examinations and university study. Some students were able to identify specific applications beyond the subject content, for example, using key words and ideas mapping to solve problems in English. While there appears to be a growing sense of projected usefulness of these skills and valuing of their role, some students were not fully confident yet to transfer skills. "I'm reluctant to use these elsewhere depending

on the way teachers perceive me." There is an implication here that students act out roles to match teacher's perceptions.

- exchange of ideas. This has been one of the most obvious and encouraging outcomes, and especially so with reluctant learners. Students seem more willing to exchange viewpoints and to initiate class discussion where meaning is discussed, negotiated and applied. Students admit that they have acquired a certain boldness in identifying missing links and misunderstandings, though they are still reluctant to carry these skills over to classes where teacher-centred strategies are employed. This confirms our belief of the need for all teachers to be consistently using skills as a framework for subject content.

- improved test scores. Mastery of content is evident in some test scores.

Impact on the learning environment

Students were able to pinpoint their own role in creating a meaningful learning environment in the classroom, and to recognise that a productive, information-centred learning environment is a collaborative effort between teacher, school librarian and student.

- atmosphere of respect. Students sense that their responses are valued, and that they can challenge their learning without being fearful of the consequences. This motivates them to actively contribute to skills-oriented classes. In fact, one would assume that their responses have always been valued, but the important thing is that now that the students offer responses as ones of value.

- collaboration. Students in Year 7 drew parallels with shared learning and the concept of "Committee of Inquiry" they had been dealing with in subject content. There was a certain cohesion and collaboration evident in the classes; a respect for one another; brighter students were less condescending toward less able students; and there was a pastoral effect shown in a demonstrated caring for one another. This was particularly so with the less able students of Year 9 who were proud of the change in the classroom climate. The impact is supported by teachers working with information skills for the first time - they saw themselves as learners together with the students. Students perceived the teacher as a "helper", at the same time recognising their own role: "you have to identify your problems first before you can ask for help".

- identifying needs. Students stressed the importance of teachers knowing what skills they had acquired and what they needed to have to successfully complete learning tasks. What students seemed to be implying was that there is a danger in making incorrect assumptions about students' abilities because it has a negative impact on meaningful learning. Some students even indicated that some research tasks set by teachers not involved with information skills were inappropriate because they demanded skills they didn't have or that questions asked were inappropriate to the answers sought. Students were not in anyway setting themselves up as judges in this process; rather, they were expecting a structure to the tasks that would enable them to apply the skills and work through the tasks in order to learn.

- interest. All students indicated that a skills approach reduced boredom, and added greater vitality and interest to their classes.

- timing of skills. Students in upper classes emphasised the importance of having these skills introduced and supported by all classroom teachers early in their schooling. "If we had started earlier, it wouldn't be a shock now to make

decisions. We should be thankful you gave it to us now"; and interestingly, "if we were more equipped with these skills from a younger age. we could more easily deal with personalities."!

IMPACT ON THE TEACHING PROCESS: PERCEPTIONS OF TEACHERS

The following findings synthesise the views of teachers who have worked with information skills in the classroom.

- time. Teachers indicated that time is saved, both in preparation and in the time taken to deliver prescribed content in class. The process provides a "reusable" framework that can easily be transferred to other tasks in other classes. Essentially, information skills enables more effective use of time and speeds up the process of teaching and learning.

- responsive management. The process facilitates the handling of large groups of students while allowing for students to work at their own level of ability. Even in large classes, it enables the teacher to be more responsive to individual learning needs. The consistency of terminology across groups reduces language problems when dealing with multicultural groups.

- sequencing of content. Teachers indicated that they were able to more clearly sequence the subject content of individual lessons. It also provided more effective conceptualising of units of work and course programmes. The process is an in-built mechanism for ensuring that false assumptions about the students have not been made.

- presentation of content. With greater clarity and direction in the planning stages, there is more effective presentation at the level demanded by both the syllabus and ability of students. The process is seen as providing students with skills to discover and deal with new knowledge rather than "spoon-feeding" them.

- added vitality to teaching. Teachers found the process energising, keeping them on top of all student demands, and alert and focused on teaching. There seems to be a growing valuing of giving responsibility back to students for their learning, with roles perceived more in terms of helper or facilitator.

- professional rewards. With a more confident style of teaching, teachers felt that the process made them feel "good" as a teacher, promoting a higher enjoyment factor.

- more effective assessment. Teachers indicated that the process made devising assessment criteria for student tasks easier, enabled a clear differentiation of learning performance, and helped in providing clearer feedback to students in terms of what they know, how much they have learned, and how much they could learn.

- hard work. Initially teachers found information skills hard work in the classroom. As experience grows, implementing the process is easy, and almost automatic. Teachers indicated that one of the most difficult aspects was dealing with sceptical colleagues.

Not all teachers share the above enthusiasm for information skills. Understanding their perceptions is the starting point for maintaining a productive teaching and learning environment where viewpoints can be exchanged and discussed, benefits celebrated and misconceptions clarified. This will continue to be the focus of our work in 1993.

CONCLUSION

The findings speak for themselves. Information literacy brings together education and information resources in a dynamic way to guarantee meaningful student learning. It is an empowering force that gives students freedom to solve their problems and take action. It is a purposeful, sense-making approach to integrating books and other media into the curriculum. And as a force for educational excellence, it empowers school librarians and classroom teachers to focus on the larger issues of educating for lifelong information use. This is our future. We are on the threshold of a new era in education in which information literacy is the very heart. We believe that we can do anything we choose. In the book Cyrano de Bergerac, the Comte de Guiche reminds Cyrano that "windmills, if you fight with them, may swing around their huge arms and cast you down into the mire". A defiant Cyrano, maybe speaking for all school librarians, replies, "or up among the stars!" We want to be up with the stars, and indeed, we can be. It is up to us to seize the moment.

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The paper recognises the invaluable contribution to information literacy at Marist Sisters' College made by school librarian, Celeste McNicholas. Without her, it would be locked in the pages of the document rather than being a vital part of the College.

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THE INFORMATION PROCESS: SUMMARY

Steps in the process

Defining

What do I really want to find out?

- What is my purpose?
- Why do I need to find this out?
- What are the key words and ideas of the task?
- What do I need to do?

Locating

Where can I find the information I need?

- What do I already know?
- What do I still need to find out?
- What sources and equipment can I use?

Selecting

What information do I really need to use?

- What information can I leave out?
- How relevant is the information I have found?
- How credible is the information I have found?
- How will I record the information I need?

Organising

How can I best use this information?

- Have I enough information for my purpose?
- Do I need to use all this information?
- How can I best combine information from different sources?

Presenting

How can I present this information?

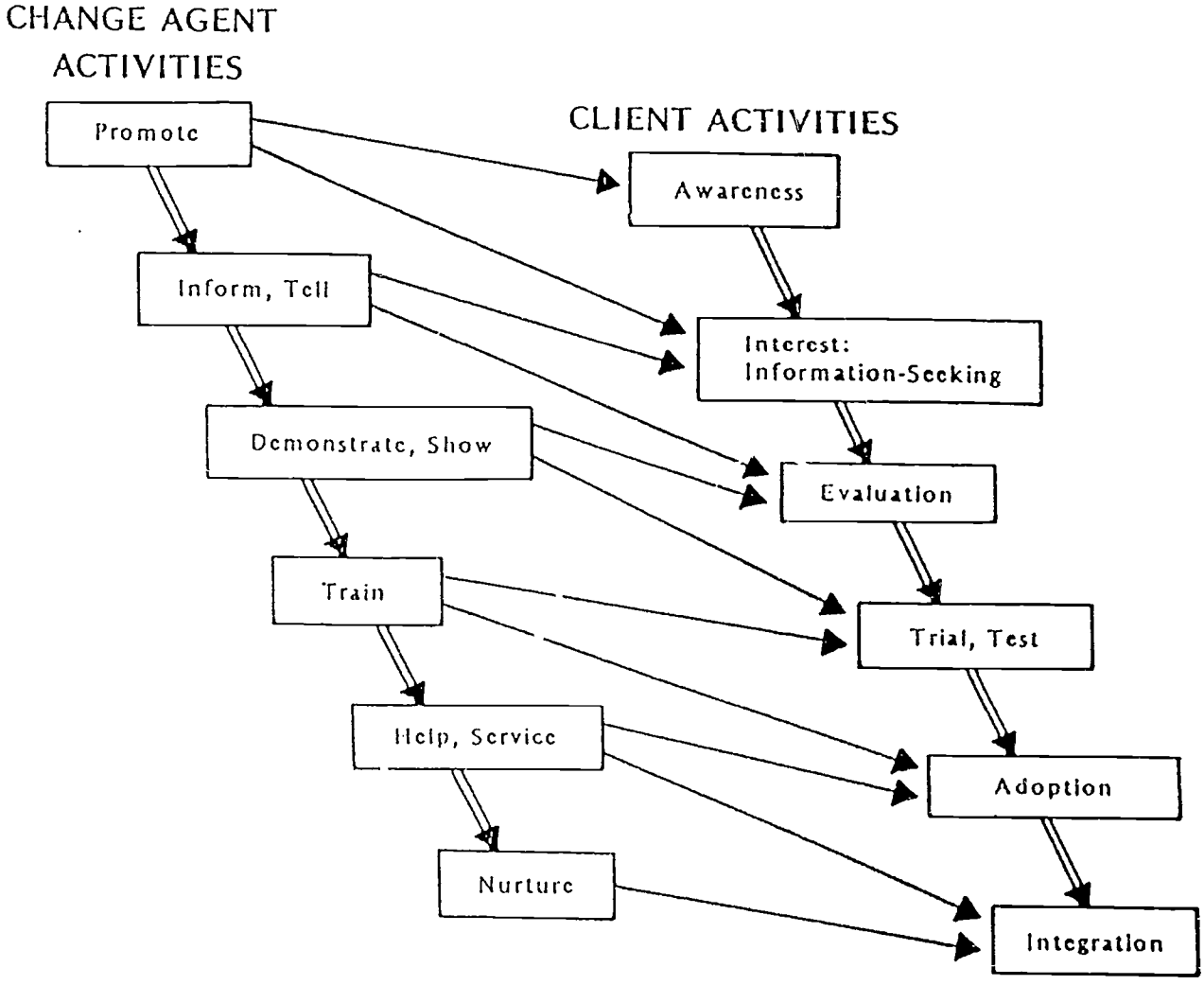
- What will I do with this information?
- With whom will I share this information?

Assessing

What did I learn from this?

- Did I fulfil my purpose?
- How did I go — with each step of the information process?
- How did I go — presenting the information?
- Where do I go from here?

APPENDIX B



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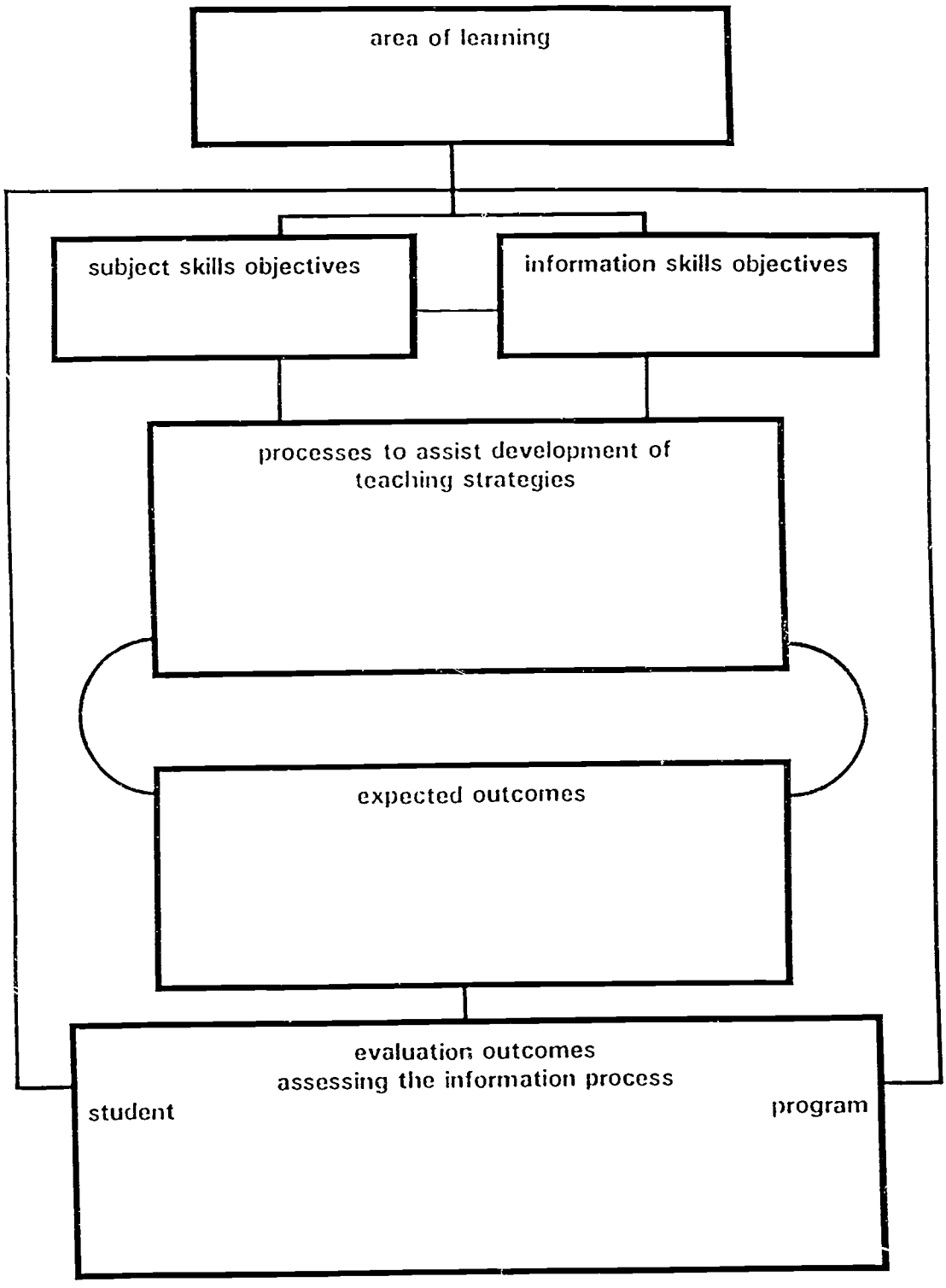
APPENDIX C

PLANNING MODEL



Model developed by C. McNicholas & R. Todd as an integrative mechanism for information skills.