First page

"Do You Read Me?"

29th Annual Conference
of the
International Association of School Librarianship

Malmö, Sweden
August 6-10, 2000

Developing Information Literacy
Key to the Future

Reading – Partnership – Information

Papers Presented at the
Fourth International Forum on Research in School Librarianship
And Proceedings of the Conference

Edited by
Eleanor B. Howe

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"Test scores increase as school librarians spend more time
collaborating with and providing training to teachers,
providing input into curricula, and
managing information technology for schools."

(*Education Week,* March 22, 2000)

"… a strong library media program helps students learn more and
score higher on standardized achievement tests
than their peers in library-impoverished schools….

"a school library media program with a full-time library media specialist,
support staff, and a strong computer network leads to
higher student achievement,
regardless of social and economic factors in a community."

(*School Library Journal,* April 2000)

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About the Editor

Eleanor B. Howe is the librarian at Washington Park School in Washington, PA, USA. In addition to serving as librarian, her responsibilities there have included presenting library story hour to kindergarten and first grade students and teaching computers and research skills to sixth grade students. For six years prior to this position, she was the librarian at the Shady Side Academy Senior School in Pittsburgh, PA where she also taught electronic search skills in the "Information Technology" segment of *Computer Literacy I*, a required course for ninth grade students. She earned a Masters of Education at Millersville University and a Masters of Science in Library Science at Clarion University where she has also taught.

Her interests as a practitioner focus on library programs that contribute to the learning of students especially through the development of skills in listening, literary appreciation, the research process, electronic searching, and the evaluation of resources. Her research interests, publications, and presentations have been related to developing library programs toward these goals at both the elementary and secondary levels. In addition, she has published articles and presented sessions at the local, state, national, and international levels on implementing technology and action research.

She has served on the IASL Research Committee and is currently chair of the IASL Research Special Interest Group. She was a member of the American Library Association's Global Awareness Team in 1997 and 1998, and she attended the Library Leadership Institute at Snowbird in 1998 and the Oxford Summer Programme in English Literature in 1999.

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Part I:

The 29th Annual Conference of the International Association of School Librarianship Malmö, Sweden August 6-10, 2000

Introduction

The 29th annual conference of the International Association of School Librarianship was jointly sponsored by the International Association of School Librarianship and the Swedish Library Association. It was hosted by Hans Persson, Director of Education for the city of Malmö, and Helle Barrett, Coordinating School Librarian for the city of Malmö. More than 325 school librarians, library educators, teachers, librarians, information specialists, and researchers representing thirty-nine countries attended the conference that was held at the Europorten center in Malmö, Sweden's third largest city.

The conference theme, "Information Literacy—Key to the Future," focused on three major strands: Reading, Partnership, and Information. Sessions included two opening addresses, two keynote addresses, four speakers, seven papers in the Fourth Annual Forum on Research in School Librarianship, more than thirty workshops and professional papers, and eleven poster sessions.

Highlights of the conference included the Flag Ceremony, the Assembly of Associations, the Annual General Meeting and awards presentation, the international book exhibit, the IASL auction, and the Nordic Children's Book Prize awarded by the Nordic Association of School Librarians to Bent Haller of Denmark. The social program included a Swedish smorgasbord at the opening of the exhibits, a reception at the City Town Hall, and a farewell party at the recently renovated award-winning Malmö City Library.

The conference included several optional educational tours: a study tour of BTJ, a Swedish knowledge-based company serving educational institutions; tours of public and school libraries in Helsingborg, Malmö, Lund, Astorp, and Denmark; a country-side tour of Osterlen in southern Sweden; and a "Round the Sound" tour of Sweden and Denmark that included Kronborg (Hamlet's castle), the art museum at Louisiana, historic sites in Copehagen, and a return to Malmö by the newly constructed Oresund bridge connecting Sweden and Denmark.

Part II

Keynote Addresses

Introduction

The presenters of the various opening and keynote addresses illuminated the important roles of reading, partnership, knowledge, and information to school librarianship.

Using the Internet to Improve Information Literacy: A New Role for the Library Media Specialist

Sheila Gersh

Division Director, Center for School Development
The City College of the City University of New York

No text for the keynote speech is available, but the following PowerPoint slides were used during the presentation.

Using the Internet to Improve Information Literacy: The New Role of the Library/Media Specialist

IASL Conference 2000, Do you read me?

Malmö, Sweden

August 9, 2000

Presented by Dr. Sheila Offman Gersh

City College of New York

sogcc@cunyvm.cuny.edu

The Need for Lifelong Learners

- 1998 – 70% of all jobs will require significant basic technology literacy
- 2010 – 100 % of all jobs will require significant technology skills
  - 80% of the jobs don't exist yet

What is Information Literacy

- The ability to evaluate information for accuracy and usefulness
- To transform data to information to insight

Essential Literacy Skills

- Text
  - to make meaning of electronic text
  - To discover relevant information
- Numerical
  - How to translate and analyze data, crunch numbers, think mathematically, and understand about relationships
- Visual
  - Strategies of advertising, emotions of paining, photography

What Librarian/Media Specialists Need to do:

- Provide services and technology to gain access to information
- Provide students with the skills to manage information resources
  - How to investigate, research and make meaning from data
- Show students how to navigate through the vast databases to locate information

Changes is using information

- Pre-modem – students "found out about" research projects
- Post-modem – "students are making answers" to information

Assumptions About Information

- What assumptions are made about accuracy, value, usefulness
- On what do they base the assumptions?
  - Ricky Lake
  - CNN
  - Talk Show Hosts
  - Newspapers
  - Magazines

Characteristics of an Information Literate Person

Recognizes that accurate and complete information is the basis for intelligent decision making

- Citing Resources
- Assessing Information
- News sites

Recognizes the need for information

- Locates information that can't be accessed elsewhere
- http://www.infosearcher.com/cybertours/tours/tour06/_tourlaunch1.htm
- http://www.SchoolNotes.com
  http://www.blackboard.com

Formulates questions based on information needs

- Students should be directed to sites to find the information
- http://www.homeworkcentral.com/
- http://www.schoollink.org/twin/searching_on_the_internet.htm
- Other sites: BlueWebn, Ask Jeeves for Kids

Identifies potential sources of information

- Searches on the Internet (kids sites)
- Picks the best search tools
- Bookmarks useful sites
- Presents information in a meaningful way
- Uses other sources also

Develops Successful Search Strategies

- Creates subquestions
  - List keywords, concepts, subject headings, descriptors
- Learns to use more than one source of information
- http://www.schoollink.org/workshops/search_tools.htm

Evaluates information

Scope

Authority and Bias

Accuracy

Timeliness

Permanence

Value Added Features

Presentation

Organizes information for practical application

- Solves information problems
- Summarizes information
- Draws conclusions
- Examples:
  - Projects
  - Keypal exchanges
  - Subject Matter Experts

Integrates New Information into Existing Body of Knowledge

Creates New Products

- WebQuests
- CyberGuides
- Web-Based Activities

Uses information in critical thinking and problem solving

- Reassesses the process for further study
- Creates an original product
- http://prwww.ncook.k12.il.us/LearningCenter/infolit/iladventpage/iladvent.html

Uses information in critical thinking and problem solving

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Ways to Use the Internet

- Accessing Information - research
- Communications- e-mail
- Publishing- web pages

Internet Orientation Should Include

- Using browsers
- Search strategies –
  - engines
  - directories
  - megaengines
- Citing resources- copyright
- Evaluating web sites- criteria
- AUPs – purpose, examples

Stages of Problem Solving

- Define the need for information-
  - Ask the question
- Initiating the search strategy
  - Query
- Locating the resources
  - Research
- Accessing and comprehension
  - Search

Stages of Problem Solving

- Interpreting the information
  - Synthesize
- Communicating the information
  - Web Pages, Projects
- Evaluating the product and process
  - Critique

http://www.big6.com/comparison_chart.gif

Curriculum Applications

- Collaborate with classroom teachers
- Find resources for teachers and students
- Communicate with specialists around the globe

Pitfalls in Teaching Information Literacy

- Size of the Internet
- Ease of setting up a web presence
- Lack of established WWW standards
- Lack of established WWW source documentation
- Limitations of search engines
- Infancy of Internet research
- Inadequate critical thinking skills

Conclusion:

- Information literacy is the key to a successful technology initiative

- Libraries should provide services and technologies needed to gain access to information in order to create an information literate community

THANK YOU

- QUESTIONS????

Children's Reading Habits and Their Use of the Media: How much do they read? What do they prefer to read? How do they read?

Torben Weinreich

Director
Centre for Children's Literature
Denmark

Stories are told in all cultures. And this has been so from the first time humans sought contact with each other. Stories have been a means of creating solidarity and a common context. There are a great variety of genres and forms of expression: myths, fairy tales, and fables. Common to all cultures also is the move from the oral to the written narrative and then later to the modern visual narrative in films, TV, video, and the computer.

Children and Reading

What I am concerned with in this lecture is children's and young people's relationship with the written narrative, in other words, literature as we know it from the medium of books. But I would also like to take a quick look at children's and young people's use of other media in the very closely interconnected modern world of media.

For many years, especially in the western world, we have increasingly observed doubts emerging about the printed text. Will the book survive as a medium? And will children continue to read books? Is it not a fact that both children and young people, and for that matter also adults, spend most of their free time sitting in front of a TV or a computer screen? Will people all over the world go straight from an oral to a digital culture and, so to speak, skip over writing and the book culture?

This doubt is, in fact, nothing new. At the end of the nineteenth century, when films and cartoons were emerging, there were those who that said that the book, and literature with it, were about to die. It didn't happen. Other media arrived in the twentieth century, to be precise, the electronic media: radio, TV, and then much later video, and then finally the computer with CD-ROM and Internet facility. Every single time we heard the old claims repeated: books will not be able to compete and survive.

But, in fact, books have competed and survived everywhere in the western world. The medium of the book has, so to speak, found its place in the collective array of media, for books have shown themselves to be an excellent technology among other technologies. In reality, books today are in many ways stronger than ever before. If we look at surveys of children's and young people's reading and media habits in the western world carried out in the last fifty years, the years when the big developments in the media have taken place, one can get a generally clear picture, and despite the variations from country to country, there are also some common traits. Children do not read quite so much as they did thirty to fifty years ago. There are about as many children reading, but altogether they do not read as much as before. Among children and young people the

many new electronic and digital media have, to an increasing degree, out-competed some printed media other than the book: the reading of cartoons has notably fallen.

There is a great deal of difference in how people react to this actual, if not overwhelmingly large, decline in children's and young people's leisure reading. Some see even a minor fall as not much short of a catastrophe, while others prefer to see the fact that the decline in reading, despite a completely new world of media, is not greater than it is. Some view the development as doomed and gesticulate in a defeatist way, while others see opportunities to maintain and perhaps even increase the level of reading and launch reading campaigns within schools and libraries and in the outside world.

Even if the figures for children's and young people's leisure reading are not particularly high in western European countries, it seems that the pessimism is greater in countries such as England and France, while the Scandinavian countries are rather more optimistic. An explanation for this could be that the library system in Scandinavian countries is more attuned to children and young people and that children's and young people's literature, also modern writing, has an important role to play in schools' teaching the mother tongue. Thus in these countries there already exist to a great degree the tools that are necessary to maintain or change developments. Common to Denmark, Norway, and Sweden is the fact that they regularly organise large campaigns and festivals for books for children and young people, and that individual schools make specific efforts.

A cautious preliminary conclusion could be that countries with a well-developed infrastructure for the book culture are better placed than other countries to maintain levels of reading. An essential element in such infrastructures is the children's library and the school library. Certainly school libraries should be mentioned in those countries where every school has its own library. And that is the case in Denmark, for example.

Children's Books in Denmark

There are just over five million people living in Denmark, of whom roughly one million are children and young adults up to the age of 15. It is this age group that primarily reads children's and young people's books or has them read to them. All Danish local districts have children's libraries, and all Danish schools have school libraries. Every year approximately 2,000 children's books are published, of which 1,600 are fiction. Of these, 40% are written in Danish and 60% are translations, particularly from English and American English. Of these books, children's and school libraries buy about 1.7 million copies a year. In all, there are 34 million books accessed in children's and school libraries. And children do borrow them. There are about 60 million loans a year, which corresponds to roughly 60 books per child per year.

The Survey

I am going to tell you about a large survey that was carried out in Denmark in January, 2000. The Centre for Children's Literature, of which I am the Director, was responsible for this survey. The survey, with a summary in English, can be found in the Danish book, *Børn læser bøger [Children Read Books],* published this year by Roskilde Universitetsforlag. The Danish market and the Danish infrastructure for children's books, described above, has some significance when one has to understand and interpret the results of the survey. At the same time I should, however, stress that most of the survey's findings also appear to have validity for other countries and cultures where there is a reasonably large production of children's books.

Participating in the survey were 901 children in the 9-to-12 year-old age range with a more or less equal division of boys and girls. Since there were similar surveys carried out with the same age range and the same questions in Denmark in 1978 and 1993, there is a basis for comparisons over time and it is possible to see some lines of development.

Four questions were of particular interest in this survey:

1. How often do 9-to-12 year-olds, grouped by age and gender, read books in their free time? I should emphasise that here we are talking about children reading voluntarily in their free time, not homework. That means that most of the children who say that they seldom or never read in their free time do read at school to some degree.

2. How well do children read in their own judgment, and is there a connection between reading ability and the amount children read?

3. How much were 9-to-12 year-olds read to at home before they came to school, and is there was a connection between being read to at home as a child and then reading independently later in life?

4. Finally, what books had children read the previous month, and what did they consider to be the best books they had ever read or had ever had read to them? We have thus been able to compile a children's top twenty list of the world's best children's books from a Danish child's point of view. I can tell you that there are many authors represented in this list, not only Danish ones. I will return to this later.

How Often Do Danish Children Read?

The answers to the first question, how often do you read books in your free time, are presented in Table 1.

Table 1
How Often Do You Read Books in Your Free Time?

	Seldom	Regularly	Often
All	**25%**	**20%**	**56%**
Boys	**32%**	**21%**	**47%**
Girls	**18%**	**19%**	**63%**
9 years	**22%**	**14%**	**65%**
12 years	**31%**	**25%**	**45%**

As you can see, 56% of the children read books often, that is, at least several times a week, and most of these read almost every day. At the other end, there are the 25% of children who seldom or never read (only 2% say that they never read books). And then there is the 20% in the middle who say they read regularly, that is, several times a month.

One can always discuss whether this is a good result. Many will certainly find it unsatisfactory that 25% seldom or never read. As far as this figure is concerned, one can only say that it has in fact fallen since 1993 and that there has always been in Denmark, as long as we have been doing this kind of survey, 25-30% of children and adults who do not read books in their free-time. Moreover, we also see the same percentage of those who seldom or never read in other countries where similar surveys have been carried out.

The survey revealed a difference between the extent to which girls and boys read. While the average for those who read often is 56%, the figure for boys is 47% and for girls it is 63%. This tendency was noted in earlier surveys and in surveys undertaken in other countries, including England and France. I will return later to give a more detailed description of the difference between boys' and girls' use of media. There are indeed very marked differences.

The development since 1993 is clear in the following overview in Table 2:

Table 2
How Often Do You Read Books in Your Free Time (1993 and 2000)?

	Seldom		Regularly		Often	
	1993	2000	1993	2000	1993	2000
All	**29%**	**25%**	**15%**	**20%**	**55%**	**56%**
Boys	**38%**	**32%**	**16%**	**21%**	**46%**	**47%**
Girls	**22%**	**18%**	**15%**	**19%**	**64%**	**63%**

From this you can see that the figures for 9-to-12 year-olds who read often are almost the same in 1993 and 2000. So there has not been much change in the last seven years despite the marked development of the media in Denmark, including several new TV channels, Danish TV channels, and above all the computer, which has arrived in earnest and has indeed made very great inroads. Roughly 80% of all Danish schoolchildren have a computer at home and increasingly in their own bedrooms.

It is, however, most interesting that the number of children, both girls and boys, who seldom or never read has fallen. Especially boys. In 1993 the percentage of boys who seldom or never read was 38%. In January 2000 the figure was only 32%. There has also been a decline in the figure for girls, but it is smaller. Conversely, the number of children who read regularly has risen since 1993.

If we go back to a similar survey from 1978, however, there were more 9-to-12 year-olds who read books often, at least several times a week. To be precise 64% read often in 1978 compared to 56% now, while the percentage of children who seldom or never read was the same. Here we see the same pattern that exists in other countries: there are still just as many readers, but the number of young people who read a great deal has fallen slightly. The pressure from other media has been too strong, despite everything.

It is worthy of note, however, that there has not been a further decline throughout the 1990s until now. On the contrary, more children are reading regularly and we seem to have got boys better in tow. The reason for this may be that there was a greater focus on children's reading abilities and reading habits in Denmark, particularly in the 1990s. A special effort was made in schools, and to a certain degree also outside schools, to improve children's reading; there was also a series of festivals focusing on children's reading.

An Early Dip. Returning to Table 1, may I ask you to focus your attention on the number of books that 9-to-12 year-olds read. A total of 65% of the nine year-olds read often, while only 45% of the twelve year-olds do. The figures for 10 and 11 year-olds are 59% and 54%. In other words, children have hardly learnt to read when the amount of reading they do declines. The decline starts at ten years of age. In Denmark this has led to a debate about whether we should teach children to read at an earlier age. I should point out that in Denmark we have a tradition of teaching children to read relatively late and of advancing relatively slowly, something that to some degree seems to be changing these days.

How Well Do They Read?

When we asked the 901 children in the survey how good they were at reading, they were very realistic in their judgments compared with new surveys of children's reading skills. We can, therefore, happily go on to ask whether there is a connection between how well one reads (or how well one thinks one reads) and how much one reads. The answer, unsurprisingly, is yes. Among those children who seldom or never read there are more bad readers than among those children who often read. And that is true for both boys and girls. It is noticeable, however, that 40% of the 9-to-12 year-olds who seldom read do, in fact, read well. So, these children (about 10%) have the reading skills but do not use them or seldom use them to read books in their free time. I should stress again that these children read both at school and when they prepare for school, in other words, when they do their homework.

Reading Aloud

Most children say that they had stories read aloud to them at home before they went to school, primarily by parents but also by grandparents and siblings. Of these, 66% say they were often read to (at least several times a week), 12% say that they were regularly read to but not often, while 22% say they were seldom or never read to. There is no big difference between boys and girls.

One question that is often asked in the debate about children's reading is whether someone reading aloud to children while they are small means that they will read more when they grow older. The answer the survey gives is clear: the more reading aloud there is at home, the more children read later in life. This is evident from the overview in Table 3:

Table 3
Reading Habits and Reading Aloud in the Home

Girls		Reading Aloud at Home		
		Often	Regularly	Seldom
READING HABITS	Often	**74%**	**9%**	**17%**
	Regularly	**65%**	**16%**	**20%**
	Seldom	**61%**	**8%**	**30%**

Although Table 3 gives data about girls, there are not such big differences between girls and boys in this particular respect. Of the girls who often read, 74% were often read to in the home. As for the girls who seldom or never read, the percentage is 61%. Note that 30% here, almost a third of the girls who seldom or never read in their free-time, were not read aloud to in the home before they went to school.

Perhaps some had imagined greater and more marked differences. That this is not the case is due to the fact that most Danish parents read aloud to their children. In addition, many Danish children who go to kindergarten before going to school also have stories read to them there. The figures can also be interpreted in this way: there is no guarantee that children will read a lot when they grow up, even if they have had stories read to them as small children. There is, however, a substantial risk that they will not read books in their free-time if they have not have stories had read aloud to them. The negative effect appears to be greater than the positive effect.

Preliminary Conclusions

We can, therefore, conclude that 9-to12 year-old Danish children read quite a lot of books in their free-time. To be absolutely precise, we are talking about 2.8 books a month: 3.3 books a month for girls and 2.4 books for boys. Over half of the children read at least several times a week and most of them read almost every day. At the other end of the scale, however, there is a group of children, about 25%, who seldom or never read, a percentage that has decreased throughout the twentieth century until now. Put simply, we have more children who read regularly and more boys who read. In addition, other surveys show that children who read typically spend four to six hours a week reading books. We can also conclude that girls read rather more than boys.

While we are on this subject, the very important point should be stressed that all the signs are that teachers, school librarians, children's librarians, and parents can have some influence on children's reading. Children whose parents read to them when they are small seem to read more books when they are older. And the fact that boys read more today is in no small measure thanks to schools' efforts.

How Do Children Read?

Many questions, however, remain unanswered. How do children read? What do they read? And what is the relationship between reading and children's use of other media in their free time? These are issues I want to address in the following section.

In the 1990s, with the aid of questionnaires and personal conversations with 100 children, I examined the circumstances under which children read in their free time. Most children said that they preferred to read on their own in their own room (93% of Danish children in the 9-to-12 age range have their own bedroom). To the question about what time of day they read, the children's answers were:

Table 4
What Time of Day Do Children Read?

	All
In the morning	**17%**
In the afternoon	**72%**
Around mealtimes	**19%**
In the early evening	**52%**
At bedtime	**83%**

As can be seen, the best times for reading for both boys and girls are at bedtime and in the afternoon. This is hardly surprising.

Where does this reading take place? Sitting or lying in bed. By far the most children praise the virtues of reading in bed. But the armchair and the sofa are also mentioned. By contrast, only a few children like to read while sitting on a normal chair, such as the chairs that are typically in schools.

And what else do they need? Most listen to music while they are reading, at least for some of the time, and no fewer than 80% prefer to have something to drink. Many also like to eat something while they are reading; food is fine but sweets are better.

In other words, a scene is set for reading. Children create what one might call a polyaesthetic universe in which many desires are satisfied at once via all the senses: the visual, the auditory, the sense of taste, and the sense of touch. In my personal conversations many children, especially girls, told me, for example, how important it was that the pillow and the duvet were in the right place before they could start reading.

These comforts associated with reading at home, of course, are a long way from what schools can offer. If we, in a desire to imitate leisure reading, were to absorb the full implications in schools, we would have to have bunk beds in classrooms. Every schoolchild would have to have their CD, Walkman, and their music. And the teacher would go round serving drinks and sweets. In some libraries, including school libraries, there has been an attempt to meet these desires by, for example, having soft chairs and sofas. But generally one has to say that it is a risky business for a school to try to compete with leisure reading. It would be better for the school to create its own identity in this area. Reading at school is different from reading at home but just as valuable.

And so, as far as setting the scene for reading is concerned, we can see that recent research gives us knowledge that will inevitably be a challenge to schools and libraries. It is important that this challenge is taken up and that we involve the children in the processes of change that we must set in motion. It is the children who know something about reading: they know when it is most fun and most important.

What Do Children Read?

And so to the next important question about what children read in their free time. Let me say right away, here and now, that there are quite big differences between individual countries with respect to the connection between what is read in school and what is read in leisure time.

In Denmark we have made an increasing effort in recent years to read children's and young people's books in the Danish 'folkskole', a school for children aged between 6 and 16. It is absolutely clear in the latest 'folkeskole' law of 1993 that we have to prioritise children's literature, especially in the first six grades. After that, one can move on from literature for young adults to literature for adults. In the whole process of schooling it is envisaged that pupils will read older literature, including Danish classics of literature for both adults and children. I am aware that in other countries children's literature may well play a more peripheral role in teaching, even at the lower and intermediate grades.

This does not mean that Danish children read exactly the same books at school as they do in their free time. There will, of course, be some crossover. At the same time I would like to insist and stress that school must be the place where children meet some of the books, also children's books, that they would not necessarily choose for their leisure reading. School has to take children's own reading material and their own experience of reading seriously while challenging children with the use of other literature. School has to take responsibility for ensuring variety. I will therefore make a further plea to schools to find their own stance, their own identity, while taking children's leisure reading as a starting point.

Back to children's out-of-school reading and what they read. In the latest survey we followed 901 children's reading habits and asked them to identify which books they had read the previous month and which three books were the best they had ever read or had read to them.

Let us look at what children read in the course of a month. First of all, I have to say that there is a great deal of variety not simply among children as a whole but also with individual children. The most prolific readers are, it seems, voracious. We found both quite short books, especially among the nine year-olds, and longer books such as Rowling's *Harry Potter* books and Pulmann's *Northern Light* books. Children read books written in both Danish and in translation. Popular authors of translated works are R.L. Stine, Phyllis Reynolds Naylor, Laura Ingalls Wilder, and Astrid Lindgren. To some degree Enid Blyton is also popular, even though her popularity fell considerably throughout the 1990s. The popular books come from a variety of genres.

It is noticeable that a large number of the Danish authors whom teachers and librarians consider to be the best are also among the most popular books with children. This is true for, among others, Bjarne Reuter who has been translated into several languages, especially his Buster books. While there was once, from the 1950s well into the 1970s, a big difference between the books children chose to read and those parents wanted them to read, there is today much more unanimity between the generations.

The range of books read by children today is wide, and the same breadth is evident when children identify the best book they have ever read or have had read to them. Let us take a look at the most frequently mentioned books, arranged in order with the most popular at the top:

1. Astrid Lindgren, *The Brothers Lionheart*
2. Dennis Jürgensen, *Love at First Hiccup*
3. R.L. Stine, *Goosebumps* (series)
4. Hans Christian Andersen, *Fairy Tales*
5. Joanne K. Rowling, *Harry Potter* (series)
6. Astrid Lindgren, *Mio, My son*
7. Phyllis R. Naylor, *The Witch Herself* (series)
8. Bjarne Reuter, *7.A*
9. Laura Ingalls Wilder, The *Little House on the Prairie* (series)
10. A.A. Milne, *Winnie the Pooh*
11. Ole Lund Kirkegaard, *Rubber-Tarzan*
12. Astrid Lindgren, *Pippi Long-Stocking* (series)
13. Astrid Lindgren, *The Robber's Daughter*
14. Astrid Lindgren, *Emil of Lønneberg* (series)

…

18. Daniel Defoe, *Robinson Crusoe*
19. Grimm Brothers, *Fairy Tales*
20. Enid Blyton, *The Famous Five*

Note that 13 of the top 20 authors on the list are foreign authors, among them authors of some of the classics of children's and of world literature. First and foremost is Astrid Lindgren who has five titles in total in the list. But there are also Milne, Defoe, the Grimm Brothers, and, of course, Hans Christian Andersen.

The list is a compilation of both boys' and girls' choices, but there are differences between the genders. On the girls' list we find several Danish and some Swedish socially realistic novels. Girls, and this is supported by other surveys, like reading about everyday situations and problems, just as they like reading about recognisable feelings. It is often said that girls read "inside themselves" while boys read "outside themselves."

Boys read more science fiction and more historical novels. In other words, they read forwards and backwards in time. They also read more thrillers, just as they read more classical adventure books such as Jules Verne, Defoe's *Robinson Crusoe,* and Pyle's *Robin Hood*. The boys did, in fact, put *Robinson Crusoe* in the top ten; the 12 year-olds put it into fifth place. It is often said that boys are not particularly interested in reading books and that they are not at all interested in their cultural heritage, but it is, in fact, boys who through their reading keep several of the great old classics of children's literature alive.

The previous list was organised by title according to the views of 9-to-12 year-olds. The following list is ordered by preferred author:

1. Astrid Lindgren
2. Dennis Jürgensen
3. Bjarne Reuter
4. Ole Lund Kirkegaard
5. R.L. Stine
6. Hans Christian Andersen

7. Joanne K. Rowling
8. Phyllis R. Naylor
9. Lars-Henrik Olsen
10. Laura Ingalls Wilder

…

13. A.A. Milne
14. Jules Verne
19. Enid Blyton

In the omitted places (11, 12, 15, etc.) there are a number of Danish socially realistic authors whom the girls have included on the list, in the same way that the boys include many titles by Jules Verne. The reason for Defoe's absence from the list is that he is represented by only one title whereas Lindgren and Reuter, for example, are represented by more than ten different titles. Again it is worth noting that there are many foreign authors on the list and that one would certainly find these authors on lists made in other countries. Children from many countries, perhaps not all countries but in any case many countries, have a common cultural base from the point of view of their favourite books. They can meet and delight together in the fact that all of them, or at least a good number of them, have read Lindgren, Milne, and Wilder, and the boys can add Daniel Defoe and Jules Verne.

Other Media

Many of the most read children's books can be found adapted in other media such as films, cartoons, TV series, computer games, musicals, and even opera. We live in a world with a high degree of intertextuality, and that is also true for the children's world. Generally, indeed, we live in a world characterised by great variety in the realm of media. And once again this is also true for children. Indeed, many children are much more sophisticated users of modern media technology than their parents or teachers, especially since many children have access to these media at home and even in their own bedroom. Again I should emphasise that there are great differences from country to country and from cultural community to cultural community. What I am talking about here today is Denmark, which I suppose may be considered in the same light as many other European countries.

In 1998 a group of Danish sociologists undertook a large study of the leisure habits of 7-to-15 year-olds. In connection with this, they also examined children's and young people's use of media, among other things, whether they had these media at home and in their own bedroom. Knowledge of this can give us a sense of children's and young people's competence at dealing with media technology. Let us look at this overview in Table 5:

Table 5
Media in the Home

	7-to-15 years		13-15 years	
	Home	Own room	Own room	
TV	100%	49%	71%	
Video	92%	18%	38%	
Computer	82%	18%	29%	45% 11%

You can see that there are various media technologies such as TVs, videos, and computers in most of the homes where there are 7-to-15 year-old children. The spread of the computer should be particularly noted. There may be countries where even more homes have computers, just as there are countries where there are, broadly speaking, no computers. But there is one thing we can be sure of both in Denmark and elsewhere and that is that the number will increase. The same development will occur in the majority of countries but perhaps on a different time scale.

Technology has also spread to children's own rooms. Almost half of Danish children have a TV in their own room, and about a fifth have a video as well as a computer. And for the older children in the 13-to-15 year-old age range, no fewer than 71% have a TV in their bedroom, while the percentage for the video is 38% and the computer 29%. The figures rise further for the 16-to-19 year-old age range. And the figures are rising year by year for all age groups. In the two years since the study was undertaken, the number of computers in children's bedrooms has reached close to 25%. At the same time there are more and more homes connected to the Internet, and children are also online in their own rooms.

Among the 13-to-15 year-olds, an average of 29% have a computer in their own room, but this figure disguises a great gender difference: 45% of boys have a computer in their own room, while only 11% of the girls do. Since girls dominate the statistics for reading books, as we saw earlier, there are indications that in a country such as Denmark there is a growing gender difference in which boys largely represent a modern digital media technology while girls to a greater degree represent an old technology.

We will have to get used to the fact that there will be more and more children in the modern information- and knowledge- orientated society who can master the new information and entertainment technologies. But while they increase their daily use of these media, they also hold on to the old technologies because they offer alternative and individual means of acquiring knowledge, experience, and insights. But we should also see this world in front of us as largely divided by gender.

Discussion

Children's Lives

Several questions about the impact of new media on children present themselves. Aren't we about to alter the conditions of children's lives totally, not least the chance for them to organise their own lives? And aren't we moving towards a reality that will inevitably redefine the role of schools, libraries, and school libraries, too? Certainly. Both daily life, with its direct experience, and school, with its structuring of experience and knowledge, have long lost their monopoly of providing information to children as a basis for creating insight. The culture of writing is still in the best of health, but it has new forms connected with the new media and technologies. The culture of the book, in other words the book as a medium, however, has lost its dominant role. The book is and will continue to be merely one medium among many. And it can hardly be called the dominant medium anymore. Although the great novels at the end of the nineteenth century and far into the twentieth century provoked important social debates and contributed greatly to changing society, this role has long since been taken over by television and the Internet is now becoming more and more influential in this area.

Has childhood simply vanished, as many purport? Have we simply stolen childhood from children, so that they no longer experience a child's life, learning from their own experience, but by contrast live in a world of second-hand experiences such as those delivered via TV, video, and the computer?

The answer has to be "no." Their childhood has neither vanished nor, for that matter, been stolen. It is just another world. Some may think that it has become a worse or poorer childhood and think back to earlier times when children played unsupervised games in the woods, by the water, in the fields, in the mountains, and in the towns away from the control of their parents, school, and other institutions.

It is certainly true that most children in the western world today do not enjoy that kind of childhood to the same degree as earlier. In our nostalgia for the past, we often forget, however, that that freer childhood existed in reality only during a very small part of the history of the western world. The great majority of Danish children, for example, did not have an especially free childhood until the beginning of the twentieth century for the sole reason that they worked either on the land, on their parents' farms, or in urban industries where the little money they could earn was a simple necessity for their family to survive.

The particular kind of leisure that the upper classes, and especially their children, had always been able to enjoy prior to 1900 was shared to a certain degree by all children for a period during the twentieth century, except that, of course, they had to go to school. In Denmark this period was from roughly 1920 until the 1970s. Two factors began to change children's lives situations and lives at this point. One was the new electronic and digital media that came to play a more and more important role in their lives, and another was that more and more children began to go to kindergarten because both parents worked in a society that needed their labour.

Children's lives, as a result, have in many ways become more institutionalised and thereby more structured and monitored. Incidentally, in Denmark there are now kindergartens with video cameras set up in such a way that parents can follow their children on the Internet. One could call this control disguised as care. If we look at children's media and leisure habits, we can, in Denmark, divide 9-to-12 year-olds up into various media profiles.

Timetable Children. This group, comprising 50% of the total, make considerable use of a wide range of media. While they watch some TV and video, they also make some use of other media. It is they, for example, who read most books. It is also typical for them to spend a lot of time doing planned leisure activities such as sports and music. These children have to manage so many activities that they need to have a calendar to organise what they do after school: there is football some days at 3 pm; on other days there are music, riding, or whatever at 4pm. And then there are the TV series they are following in addition to the videos they have planned to see one afternoon or evening together with some of their friends. They also use other media including the computer.

Media Children. These children, who make up 35% of the total, are also planned to a large degree, but their lives are not as structured as those of timetable children. It is characteristic of these children that they use predominantly one medium, such as the TV or video and then for several hours a day, or they sit at the computer. Bookworms make up a smaller group and read almost only books.

Play Children. These children, who make up 10-15% of the total, live a sort of life that is in many ways reminiscent of the life children experienced in the middle of the twentieth century, a less structured life in which play is central. This does not mean that timetable and media children do not play; they just do it far less than these play children. Play children are frequently free of the control of their parents and institutions. Some of these children, because of their experiences and habits, find it difficult to conform to institutional and especially schools norms that require, within reasonable limits, children to sit still on a chair and concentrate for longer periods on something that they themselves did not choose to work with.

Work Children. These make up just a small percentage, 0-5%, of the total in several Western European countries, not least the Scandinavian countries. These are children whose lives can recall the working lives of the majority of children before 1900. Today they typically contribute to a family's income, usually in agriculture. This small group of children is brought up knowing that they will take over their parents' property or work when they get older. We can meet these children not only on the land but also in the towns living with refugees from other cultures in which it was far more usual for children to help their parents with their work. Typically these are immigrants who have a small business of a type that had otherwise disappeared from the city scene.

Whereas play children, and to some extent work children, generally do not fit well into modern institutions for children and young adults, the timetable child, by contrast, is extremely well suited to school. They are used to concentrating on a great range of areas for shorter, limited periods. Their lives are, in reality, often more subject to timetabling than many modern schools.

That is why there is nothing one can say to schools and societies trying, via legislation among other things, to support this timetable for the modern child's life. It is, in a broader sense, these children that business also needs because they are flexible and have had varied experience with modern society's technologies. They are also often easier to control.

The Book in the Society of the Future

It is in this changing society, in more and more parts of the world, that the book has to find its place. And in fact it seems to have already found it. This is shown not only

by the Danish Centre for Children's Literature's survey of children's reading habits but also by other studies of general media habits.

This is, however, not the same as saying that the medium of the book will forever stay the same as it is today. There enormous technological changes going on not only outside the world of the book but also in book technology itself. I will point out some characteristic features.

First of all, we have seen for several years now examples of books being linked with other media products such as TV programmes, videos, and CD-ROMs. This is part of an overall packaging policy. The book is thus part of a greater media package.

Secondly, we have seen, also over several years now, a great many examples of the shape and presentation of the modern book differing from that of the traditional book, especially in the area of children's books. Some of these techniques with books are in fact very old. This is true for pop-up books, shaped books, and books with holes in which objects of various kinds are placed. Other examples are books equipped with a keyboard and a little speaker, or books supplied with a battery to light a bulb. There are many creative ideas.

Thirdly, and this has a great deal more fundamental significance for the development of the medium of the book, we are moving towards a technology called "print on demand." The principle is simple: the book is printed only when it is ordered via a bookshop or the Internet. The book is written and perhaps illustrated, but one waits for it to be produced. That means that publishing companies do not have to store books, which in turn means big savings. The technology also allows for the possibility that the same work can be printed with, among other things, different typography such as large type for the weak-sighted. One may also be able to order a different type of binding such as either the normal binding or a special present binding with the recipient's signature. There are a great many possibilities.

Fourthly, and this too has great fundamental significance, there is the development of the so-called e-book, the electronic book. With this technology, one needs, in fact, only to have one book on the shelf, or to be more precise a type of "book-receiver" in the form of a little computer that may appear in the shape of a book with a cover. In this "book" there is room for a floppy disk or a little CD-ROM that can hold one or several literary works; or, more likely, one can download the text from Internet, against payment. The method of reading will be getting the desired text on to the screen that is shaped like the page of a book, probably with a paper-like surface to please the many inveterate book lovers. One reads the first page and then continues by clicking the mouse. Of course, one can choose the typography and size oneself and whether one wants illustrations with the illustrated books. If the work appears in several different illustrated forms, as is the case with *Alice in Wonderland*, one can choose the illustrator. In addition, technology makes it possible for a completely independent type of art where the authors, illustrators, animators, musicians, and others create new works especially for this medium. For it will certainly be possible to combine the classic book with both film and music.

These are merely examples of new technologies that we already have or are well on the way. Some may lament this development, imagining that the good old book will disappear. For my own part I am sure that the good old book will not disappear. It will always have its fascination. And it will certainly be able to co-exist alongside the completely new medium, the electronic book, just as the book has existed alongside several other media for more than a hundred years.

So the book will survive, but in more forms than we are used to, among them the forms that I have spoken about today. There will always be something new. I believe we will enjoy this variety of media for the sole reason that perhaps it is exactly our need for variety that will ensure that the book survives.

In reality, however, the most important thing for the survival of the book as a medium and the survival of literature as an art form is our children's desire to read a good book and good literature. And they have that desire. Also required for its survival is the desire of the mediators of literature, the teachers and the librarians, to pass on literature to others. And they have that desire, too.

Children's understanding of literature, its qualities and its significance, is certainly as great as their love of reading. This is shown by a study undertaken by the Centre for Children's Literature in which a large group of children were interviewed about their attitudes to books.

The children also know what is going on. They know, for example, that there is a difference between boys' and girls' reading habits. They also know the essence of that difference. As one boy said to me: "Girls read more than boys, about love, among other things, because they mature more quickly… that's what they say themselves".

Children know what is good about books. One girl said, "The good thing about books is that they don't make any noise," and another girl said, "There are some people who have never read one single book …poor them."

Part III

The Fourth International Forum on Research in School Librarianship

Introduction

The Fourth International Forum on Research in School Librarianship was a featured component of the conference. The conference theme, Information Literacy--Key to the Future, focused on three major strands: Reading, Partnership, and Information. Each of the following peer reviewed papers accepted for the Forum on Research contributes to these topics.

The papers describe research related to school libraries and school librarianship that was undertaken by the presenter. They demonstrate a dedication to scholarship and research. Each places its research in the context of other professional literature; and each explains its goals, methodologies, findings, and conclusions. The authors have used various methodologies such as (a) case studies of reading aloud in an elementary school, a library research project in a middle school, and collaboration between pre-service teachers and in-service teacher-librarians during the practicum, (b) before-and-after studies of the impact of listening comprehension on reading comprehension and of a collaborative practicum experience on concepts of resource-based learning, information skills, and collaboration, (c) focus groups that discussed the implementation of knowledge management in schools, and (d) survey research among students, librarians, library educators, information professionals, pre-service teachers, and educational administrators on such topics as the use of research models in middle school, competencies to be developed in library education programs, the integration of the Internet into elementary and secondary schools, types of and satisfaction with Internet filters, and knowledge and information management. The researchers collected quantitative and qualitative data from pre- and post-experience scores, questionnaires, interviews, and discussions.

Included in this year's Forum on Research are large-scale studies and local action research studies, and both contribute to the knowledge base of the profession. The promotion and reporting of action research projects has been a goal of IASL since 1993. While action research is often undertaken to study and improve practice at one site, it can have broader implications. Local action research projects, such as the three case studies reported here, should also encourage professionals involved in school library services to carry out and report their own action research in order to improve library programs in their own arenas as well as elsewhere. It is important that each of the studies reported in the Forum, both large- and small-scale, has implications for the preparation and practice of school librarians. Once again, these papers demonstrate that research informs and improves the profession.

The research presented in the Forum addresses important issues in the profession such as (a) the competencies and education needed by school librarians and pre-service teachers, (b) the roles of school librarians in providing resources, collaborating with other educators, and contributing directly to student linguistic abilities and learning in the curricular areas as well as in information skills, (c) the implementation of new concepts and technologies, especially the Internet, and (d) the application of knowledge management as well as information management in schools.

It is interesting that two of the studies found that both pre-service and in-service teachers had little experience in resource-based learning or instruction in information skills during their education. This suggests that libraries may not have been well integrated into the curriculum of schools, colleges, and teacher-education programs. Such integration remains an as yet unachieved but important goal for the profession. When students, teachers, and educational administrators have used libraries in their own education, they will be more likely to recognize their contribution to learning.

Part 1. Reading

Eleanor Howe is concerned with the contribution of library programs to student learning, a major focus of the new standards delineated in *Information Power* (1998). Her paper explains how and offers evidence that reading stories aloud contributes to student learning in terms of improved listening comprehension, reading comprehension, and general linguistic ability as well as literary knowledge and appreciation. This case study in an American elementary school indicates the importance of indirect teaching strategies in story hour such as selecting appropriate pre-, during-, and post-listening activities that enhance comprehension without seeming to be a lesson. The findings of her before-and-after study are consistent with theory and research in listening and reading comprehension.

Howe's action research also demonstrates the roles of the school librarian as teacher and collaborator. Her paper offers evidence that the more skilled school librarians are in their knowledge of students, curriculum, children's literature, and teaching strategies, the greater positive impact they may have on student learning. The competencies of school librarians in these areas should be included in library education programs. Her approach to library story hour also encourages collaboration with teachers with regard to the grade-level language and literary skills as well as classroom curriculum so that library story hour may reinforce and extend age-appropriate learning and skills.

Part 2. Partnership

Abrizah Abdullah and Diljit Singh are concerned with communication among library educators around the world and among them, school supervisors, and teacher-librarians. They want to develop both an international framework of competencies and educational programs that address the needs of schools and school librarians in Malaysia. Their study, undertaken to supplement the current emphasis on physical facilities in Malaysian school libraries with the roles and competencies needed by the school librarian, may well reflect a changing emphasis that evolves as schools first establish libraries and then move toward greater integration of the library into the curriculum. Competencies perceived as essential, therefore, may well depend on the status of the school library program. Their survey of teacher-librarians, library educators, and supervisors from Departments of Education in Malaysia reveals not only an emphasis on the librarian as provider of well-managed collections but also some differences among these groups in terms of their perceptions of both the roles and competencies of school librarians.

While their findings will no doubt inform library education programs in Malaysia, this kind of study deserves to be replicated around the world because it is vitally important that school librarians, library educators, and supervisors each be aware of what the other deems important. Communication and collaboration among these three groups is essential to the creation and maintenance of effective school librarians and strong school library programs. This

communication is needed also because recent research, including papers in both the 1999 and 2000 Forums on Research, has indicated that neither teachers nor principals are aware of the newer roles of the school librarian proposed by professional associations and publications, roles such as instructor, instructional consultant, and collaborator in technology, teaching, and learning. If the profession is creating a new vision of the roles of school librarians beyond that of provider of resources, it must ensure that school supervisors and teachers as well as school librarians are also aware of and accept these new roles. Replicating this survey in developed countries, for example, would help to determine if supervisors there also perceive and deem important these new roles. If the response is less than positive, the profession should consider improving the presentation of its vision to other educators.

One of the important new competencies that need to be addressed in both library education and teacher education is the role of school librarian as a collaborator in teaching and learning. The action research by Asselin and Naslund indicates that both school librarians and teachers should become aware of and experience this role during their pre-service practicum. Since pre-service experiences and opinions inform and influence teacher performance on the job, this is a very important means of achieving the goal of collaboration between teachers and school librarians.

The case study presented by Marlene Asselin and Jo-Anne Naslund describes an authentic model of collaboration in which pre-service teachers at a Canadian university pre-plan a resource-based learning unit with the in-service teacher-librarian during their practicum. The findings of this before-and-after research indicate that the practicum experience changed the pre-service teachers concepts of resource-based learning, collaboration, the teacher-librarian, the school library, and information literacy to be more in line with the concepts envisioned by school librarians professional associations. This study, as well as one by Ray Doiron in the 1999 IASL Forum on Research, demonstrates that one means of accomplishing educational change in schools and school libraries, including the actualization of new roles for the school librarian, is to provide a model experience during the practicum of pre-service teachers and school librarians.

Their findings also revealed that post-baccalaureate pre-service teachers were not familiar with either library research or information literacy as a result of their college education. Is this a failure of both school and academic libraries and/or of the academic curriculum in schools and colleges? An important means of improving both information literacy among college students and their perception of libraries K-16 would be to require a library research project before graduation from high school, college, and teacher training programs. Only when students use libraries in their own academic career are they likely to value libraries when they become educators and to design assignments for their own students that include use of the library and its resources.

James Herring describes a case study of the collaboration between a school librarian and a physics teacher in England who used the PLUS model for a middle school research project. It is significant that his post-project survey of the students and interviews with the teacher and school librarian indicate that use of the PLUS model not only helped students organize their work during the research assignment but also resulted in a better product and increased curriculum learning for the students. Increased student learning through use of resource-based learning and research is the goal toward which the profession is striving. The findings of this action research also indicate that the use of the model and guided note taking during the research process yielded better results in terms of reduced plagiarism and better writing. These findings also support the pedagogical position held by many teachers that structure and clear expectations improve student products and learning. Other advantages of the PLUS model are its easily remembered acronym and its ability to be elaborated as needed for older and younger students.

Herring's action research also indicates that despite, or perhaps because of, the rapidly increasing amount of resources and information available to students, the school librarian has an important function in providing controlled access to information at a suitable level for the abilities of the students. The goal of collection development in any library is to provide appropriate resources and information for its community of users, all of whom have limited time to search for relevant resources. As Herring pointed out, the students had only three periods in which to identify, locate, and use relevant resources and information for their research project. The school library and librarian played an essential role in providing access to the most appropriate resources from among which the students selected what they needed.

Part 3. Information

Ken Haycock's study of the penetration of Internet filtering software in North American school and public libraries reveals that twice as many school libraries as public libraries use filtering software and that about three-quarters of the school librarians were satisfied with the decision to install filters, perhaps because of the age of the audience served in public schools and a concern for the safety of school-age children. Despite the high percentage of satisfaction, responses to the open-ended questions on the survey offered numerous reasons for dissatisfaction. Haycock concludes that school librarians' level of satisfaction and dissatisfaction was determined by their views of possible alternatives, student safety, software flexibility, the locus of decision-making, and personal or professional satisfaction.

The study and its findings are significant because providing student access to the Internet in school libraries poses a dilemma that results from two conflicting principles of librarianship and collection development: (a) providing expanded access to information and resources, and (b) providing collections of quality materials that are appropriate for the particular community served by the library.

The goal of collection development policies has been and is to ensure that libraries select materials that meet the criteria of authority, relevance, accuracy, and treatment appropriate for the intended audience. The traditional selection procedure has been for librarians to review, evaluate, and decide on an item-by-item basis. The vast amount and fluctuating nature of material on the Internet, however, make this procedure difficult to implement. Moreover, the vanity press nature of web pages raises questions of authority and accuracy that are not addressed by filtering software. Filters are an electronic attempt to deal with the vast amount of material available on the Internet, but they remove the professional evaluation and selection of materials from the school librarian and this is a source of dissatisfaction.

There is no perfect filtering software, but the findings of the survey suggest that school librarians want to (a) evaluate and select individual sites for linking to a school library home page, (b) provide different types of Internet access for elementary and secondary students, and (c) teach secondary students to independently evaluate resources before selecting them for curricular use. These proposals may not only resolve the dilemma of collection development but also offer opportunities for school librarians to improve school library programs, to collaborate with teachers, and to strengthen their role.

Dianne Oberg and Susan Gibson are continuing their investigation of the use and integration of the Internet in elementary and secondary schools in Alberta, Canada. Their most recent survey of principals and teachers indicates that while enthusiasm and interest among educators are high, their experience and knowledge of the Internet are relatively low. They conclude that educators in

Alberta are in the familiarization stage, the first of five stages, of implementing technology. Teachers and principals indicated little knowledge of Internet resources, Internet search strategies, and the limitations of the Internet as a reliable curricular resource. They also found that teachers reported higher confidence in using and teaching library skills than their exposure to libraries and library instruction would warrant. These findings are consistent with earlier findings that high school and college students express more confidence and knowledge in electronic searching than their actual skills demonstrate. Greater confidence than experience in technology and libraries among students, teachers, and administrators seems to be an indicator of the familiarization stage. That so many students and educators are in the familiarization stage with regard to both libraries and technology is another indicator of the need for greater curricular use of libraries in schools and colleges.

Although their findings did not indicate that school librarians in Alberta have played a role in introducing or integrating the Internet into their schools or teachers skills, Oberg and Gibson urge school librarians to play a role in both these arenas and they list possible avenues to achieve these functions. This assumes, however, that school librarians have the Internet skills, funds, equipment, and the time at work needed to perform this role. School librarians, especially those with inflexible schedules, are no less pressed for time than teachers in learning about and integrating the Internet into their expertise and the school. Current and continuing library education, including workshops and conferences, offer opportunities to achieve this necessary expertise among school librarians. As Oberg has noted, principals play a key leadership role in developing and integrating both technology and the library program, and they must have confidence in their school librarians in order to fund their continuing education and give them a role to play in introducing and integrating the Internet. The Internet offers yet another role and another arena in which school librarians may collaborate with teachers and demonstrate leadership within the school.

Ross Todd and Gray Southon explore their interest in knowledge management and its differentiation from information management through both a survey of a variety of information professionals and two focus group discussions among teacher-librarians in Australia. Knowledge management is the set of strategies used to enhance and share the knowledge of people in an organization. Although the concept developed in business management as a result of the increased knowledge, resources, and technology available, Todd and Southon demonstrate its applicability to schools. They found that the participants in their survey and focus groups could distinguish between knowledge management and information management, the management of collected published materials.

Their study identifies strategies for creating an environment for extending and sharing knowledge as well as the skills and understandings needed by all participants in the school community in order to achieve this goal. They believe that the knowledge management strategies identified in their study will help achieve the goals of schools in terms of increased knowledge and learning among both teachers and students. The school librarian and communication technologies can each play an important role in the management and sharing of knowledge within a school. This is yet another role of the school librarian and another example of the ways in which a school librarian collaborates with colleagues to achieve successful learning for students. A school that effectively manages the knowledge of its members is a dynamic and effective place in which to learn and work.

Each of the papers in the Fourth International Forum on Research demonstrates the interconnectedness among not only the three strands of the conference theme--reading, partnerships, and information—but also the various roles of the school librarian in addition to

those of provider of resources and instructor in information literacy. The papers also elaborate different competencies and roles: reading and research with students, collection development and library management, and the use and integration of knowledge and technology throughout the school. Each of these competencies involves the school librarian in collaboration with other educators to achieve the greatest possible student learning.

The papers in this year's Forum on Research also give a view of the state of education and the profession. The findings of three papers indicate that teachers, supervisors, and library educators may not yet be aware of the roles of the school librarian as a collaborator in teaching, learning, and technology. The findings of two papers indicate that, despite the widespread availability of the Internet and use of filters in schools, most educators still have much to learn about the Internet and most school librarians are satisfied with filters even though they raise important reservations. The findings of yet another paper indicate that when school librarians collaborate with teachers in student research projects, the students both improve their products and increase their curriculum learning.

If the goals of the profession are to contribute to student learning, implement new technologies, and provide resources, then these papers indicate that collaboration between school librarians and teachers is an important but as yet unrealized means toward these goals. The collaborative role, in all its manifestations, is one to be addressed both in library and continuing education programs and to other educators. Collaboration is an essential competency and an essential ingredient for student learning.

Professional Papers

Part 1:

Reading

The Relationship Between Listening Comprehension and Reading Comprehension: Implications for Reading Aloud and Learning

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This paper describes the listening and reading comprehension skills of elementary school students, presents a classroom action research project that concludes that listening skills may transfer to reading skills, and recommends indirect teaching methods to enhance listening comprehension and learning during story hour. The study was designed to test whether instruction in three listening comprehension skills improved reading comprehension using those same skills. The recommended generic lesson plan for story hour is based on theory and research in listening and reading comprehension as well as the suggestions of teachers and librarians. It can be used by teachers, public librarians, school librarians, and parents.

Introduction

One of the goals of the school library program is to contribute to student learning. This goal may be pursued with instruction in library, research, and information skills, but student learning may also occur during recreational reading and listening. Since story hour is often an important component of the elementary school program, those who read to children may justifiably ask how reading aloud contributes to student learning and, more particularly, to student reading ability. Will experience or instruction in listening comprehension skills improve reading comprehension? If there is a link between listening comprehension and reading comprehension, reading aloud may make a valuable contribution to student learning rather than be just a pleasant literary experience.

Researchers have noted that reading aloud correlates with children's success in school (Smolkin, Conlon, & Yaden, 1988; Strickland, Morrow, Feitelson, & Iraqi, 1990) and that "the single most important activity for building the knowledge required for eventual success in reading is reading aloud to children" (Anderson, Hiebert, Scott, & Wilkinson, 1985, p.33). It also creates "a pleasure connection between the child and print" (Trelease, 1995, p.46). Schools have encouraged parents and teachers to read aloud to their children every day, and articles in journals for librarians promote reading aloud in the library (Burns & Flowers, 1997; Cart, 1996; Freeman, 1992; Guardia, 1995; Hilchey-Chandler, 1997; Kids & reading, 1996; LeLoup & Stone, 1991; Mazzoco, 1993; Trelease, 1995; Wells, 1993; Wiley, 1996; and Wilson & Brown, 1999)

Underlying these views is an assumption that the listener and reader are similar. Since both are receiving messages through words, it seems that the intellectual component of comprehension would be the same once the words are individually understood. Improving listening comprehension, while avoiding the mechanics of reading, would therefore be likely to improve reading comprehension in the long run. If this is so, then improvement in listening comprehension would lead to improvement in reading comprehension and student learning.

Developing a testable question means analyzing and operationalizing the original question. First, while research has shown that instruction in reading skills can improve reading comprehension (Fitzgerald, 1989; Paris, Wasik, & Van der Westhuizen, 1988; Schmitt, 1988), can instruction in listening skills improve listening skills? This needs to occur before listening skills can be applied to improve reading comprehension. Second, which listening skills will benefit from instruction and can be tested? And finally, how can one confirm or disconfirm the transfer of comprehension skills learned in a listening mode to comprehension in a reading mode?

A Review of the Literature on Listening and Reading Comprehension

A review of the professional literature and texts in the field of reading and reading instruction supports the interrelation of listening and reading as well as the conclusions that listening comprehension and listening enjoyment of literature can be enhanced by reading aloud and direct instruction in listening skills (Boodt, 1984; Brownell, 1986; Choate & Rakes, 1987; Friedman, 1986; Hanks, 1988; Lundsteen, 1971; Pearson & Fielding, 1982; Ringler & Weber, 1984; Simpson, 1986; Smith, 1963; and Walcutt, Lamport & McCracken, 1974; Warren & Fitzgerald, 1997). Literacy research documents the benefits of reading aloud on vocabulary, general linguistic ability, concepts of print and books, sense of story structure and genre, world knowledge, reading comprehension, and positive attitudes towards books and reading (Burns & Roe, 1976; Cooter, 1991; Dennis & Walter, 1995; Elley, 1989; Fitzgerald, 1989; LeLoup & Stone, 1991; Meyer, Stahl, Linn, & Wardrop, 1994, 1994; Morrow, 1989; Rosenhouse, Feitelson, Kita, & Goldstein, 1997; Strickland et al., 1990; Trelease, 1995; Warren & Fitzgerald, 1997). This is consistent with Vygotsky's theory of literacy as developing in social contexts with modeling and guidance by adults (Morrow; Rosenhouse et al.).

Story time has been a secure component in the kindergarten and primary grade classroom curriculum over the years (Dennis & Walter, 1995; Hoffman, Roser, & Farest, 1988; Meyer et al., 1994). One study found, however, that reading aloud to students correlated negatively or not at all with reading comprehension in the first grade (Meyer et al.), and another found that simply reading aloud is not enough to develop the specific kinds of comprehension skills needed by third grade students (Warren & Fitzgerald, 1997).

Several questions present themselves. Is a story just read aloud or is it read effectively? Is the story read aloud quality literature or an excerpt from a basal reader? In what ways does a story read aloud contribute to student learning?

With regard to reading aloud effectively, Hoffman, Roser, and Farest (1988) found that teachers tended merely to read aloud and employed few read-aloud strategies. After training in seven read-aloud strategies, teachers incorporated many of them into their story hour with the result that the average time for story hour increased from 10 to 23 minutes. The researchers noted evidence of a greater level of student engagement and participation when these techniques were used, but they did not explore whether there was also enhanced learning (Hoffman, Roser, & Farest).

To determine which story-hour techniques may be effective in increasing learning in the listening mode, it may be helpful to examine which specific skills are part of the listening process and which may be improved by instruction. What is known about listening may suggest read-aloud techniques that can contribute to student comprehension and learning during story hour.

Brownell (1986) presents several models of the listening process, a synthesis of which reveals three underlying factors: hearing, cognitive processing, and responding. Hearing is dependent on interest, curiosity, concentration, and the absence of distractions. Included in the cognitive processing of messages received are selecting, understanding, interpreting, evaluating, organizing, assimilating, and remembering what is heard. The listener's response is the final phase of receiving a message.

Brownell (1986) believes that listening is "a learned skill" (p.2) that can be improved. Her book presents methods to improve each of the six facets of the HURIER model in order to become a better listener: Hearing, Understanding, Remembering, Interpreting, Evaluating, and Responding to messages. Those who read aloud can help improve children's listening skills by providing an environment, experiences, and indirect instruction that promote each facet of the model. Of greatest relevance for children's story hour are Hearing, Understanding, Remembering, and Responding since Piaget's model of cognitive development would indicate that Interpretation and Evaluation are more appropriate cognitive skills for the high school and adult listener (Elkind, 1994).

With regard to listening as a skill that can be learned in school, Hanks (1988) argues that listening comprehension skills should be practiced as listening skills in the listening mode. On the other hand, Pearson and Fielding (1982) say that cross-modal transfer of skills between listening and reading is possible but not likely before the time when students are mature readers, those whose reading comprehension is equivalent to or greater than their listening comprehension, which usually occurs in grades five or six. Reading stories aloud offers an obvious opportunity for both repeated practice in listening comprehension skills and possible cross-modal transfer to reading comprehension skills.

The many similarities between listening and reading would suggest that there may be some justification for assuming the possibility of the cross modal transferability of skills between them. First, the listener/speaker interaction is the same as the reader/writer interaction (Ringler & Weber, 1974); both the listener and the reader are receiving a message (Lundsteen, 1971; Burns & Roe, 1976), and for both the ultimate goal is comprehension of the entire text rather than individual words (Lundsteen; Paris, Wasik, & Van der Westhuizen, 1988; Ringler & Weber). Further, both listeners and readers tend to remember in the same order (first, last, middle) and improve their comprehension by taking notes (Lundsteen).

Second, there is in reading a connection between sight, sound, and meaning. Reading may indeed be the converting of written symbols into oral language that can then be understood. Auditory discrimination is needed for decoding written words; especially for beginning readers, mispronouncing a word prevents comprehension of the word. Pearson and Fielding (1982) make this point even more clearly when they state that the reader must infer prosody (the inflection, rhythm, and melody of spoken language) from the written text in order to comprehend it. Lundsteen (1971) concludes that oral vocabulary determines reading vocabulary because words in reading are the visual counterpart of words heard.

Third, the similarity between listening comprehension and reading comprehension is an implicit assumption held by those who argue for the use of reading comprehension skills to teach listening skills or vice versa (Aarnoutse, Van den Bos, & Brand-Gruwel, 1998; Choate & Rakes, 1987; Cooter, 1991; Cunningham, 1975; Fitzgerald, 1989; Hanks, 1988; LeLoup & Stone, 1991; Pearson & Fielding, 1982).

Fourth, research has verified that listening ability correlates with reading ability (Aarnoutse, Van den Bos, and Brand-Gruwel, 1998; Boodt, 1984; Burns & Roe, 1976;

Friedman, 1986; Smith, 1963; Walcutt et al., 1974). Others note that reading aloud to a child promotes reading readiness by enhancing comprehension skills and developing a sense of story structure (Burns & Roe; Fitzgerald, 1989; LeLoup & Stone, 1991; Morrow, 1989) and that poor listening ability is the cause of reading disability (Smith, 1963).

Fifth, the skills needed for extracting meaning from language may be the same for both listening and reading. The factors in listening comprehension presented by Lundsteen (1971), Freedman (1986), Hanks (1988), Pearson and Fielding (1982), Ringler and Weber (1974), Scollon (1988), Smith (1963), and Walcutt, Lamport and McCracken (1974) are the same factors as those in reading comprehension: schema, prior knowledge, linguistic ability, active engagement, structure of text, inferencing, summarizing, and evaluating (Duffelmeyer & Duffelmeyer, 1987; Fitzgerald, 1989; Gordon, 1989; Morrow, 1989; Mosenthal, 1989; Nelson-Herber & Johnston, 1989; Paris, Wasik, Van der Westhuizen, 1988; Rosenhouse et al., 1997; Schmitt, 1988; Scollon, 1988; Tobin & Pikulski, 1988). Others note that both listeners and readers of stories construct mental models of story structure to facilitate their comprehension (Bower & Morrow; 1990; Fitzgerald, 1989) and that retelling enhances the comprehension of both listeners and readers (Morrow, 1989). Chall's theory of the developmental stages of reading posits that once readers can easily identify written words, reading achievement is based on existing language skills and knowledge (Tobin & Pikulski, 1988). The similarities between listening comprehension and reading comprehension make explicit the reason for Pearson and Fielding's (1982) statements that once lower level reading skills are mastered, both reading comprehension and listening comprehension are controlled by the same set of cognitive processes (the unitary process view). Sinatra (1990) and Carlisle (1991) note that much research supports the unitary process view.

Pearson and Fielding (1982) believe that cross-modal transfer of comprehension skills between listening and reading is possible after students are mature readers if the training is effective in the mode of delivery. They conclude that in a mature reader what benefits the reader will benefit the listener and vice versa. More recently, Aarnoutse, Van den Bos, and Brand-Gruwel (1998) found, however, that cross-modal transfer from listening to reading comprehension occurred in their study of 9-11 year-old poor readers whose reading comprehension was less than their listening comprehension. Their research suggests that cross-modal transfer is possible before students are mature readers.

There are, nonetheless, some important distinctions between listening and reading. Most importantly, the reader has to decode written symbols into words, and this may account for the normally differing levels of listening and reading comprehension associated with different ages. Listening comprehension exceeds reading comprehension in early elementary school, begins to become equivalent with reading comprehension in the fifth and sixth grades, and finally is surpassed by reading comprehension in the seventh grade and beyond (Carlisle, 1991; Cunningham, 1975; Lundsteen, 1971; Pearson & Fielding, 1982). Differences from this pattern have been used as indicators of reading disability and general linguistic disability (Carlisle, 1991; Dymock, 1993; Miller & Smith, 1990).

Even after words are decoded, however, there remain important differences between listening and reading. First, the listener has abundant verbal and visual cues to aid comprehension whereas the reader has few (Carlisle, 1991; Pearson & Fielding, 1982; Ringler & Weber, 1984; Sinatra, 1990). The reader has to infer prosody (stress, rhythm, and pitch) and develop mental images. Second, there are differences in control and time pressure: the reader controls reading speed and can vary the rate, whereas the speaker controls speaking speed and the listener often cannot affect it (Cunningham, 1975; Ringler & Weber, 1984; Sinatra, 1990). On the other hand, the time lag between speech

and listening allows for more distractions to attention (Lundsteen, 1971). Third, written text is usually more complex than spoken, but text permanence allows the reader to review. On the other hand the listener can ask questions of the speaker. Fourth, the level of emotional involvement is usually greater for the listener because both parties are present (Lundsteen). And finally, there are also developmental differences: all children naturally listen to learn language but they must be taught to read (Sinatra, 1990).

These differences between listening and reading affect attentiveness, interaction with the material, and review--three of the most basic components of comprehension. Because some favor listeners while others favor readers and because circumstances differ, it is difficult to determine whether the reader or the listener has the net advantage. Sinatra (1990) notes that these differences have led some researchers to postulate separate cognitive processes for listening and reading (the dual process view).

The unitary and dual process views have important implications for reading aloud. If the process is unitary, then greater facility in general linguistic skills attained through listening will enhance reading once decoding is mastered and cross-modal transfer of comprehension skills between listening and reading would be possible. If the process is dual, then cross-modal transfer may not occur and improved listening may not lead to improved reading.

Cross-modality studies have explored the impact of information processed in listening on its processing in reading. Sinatra's (1990) study of processing at each of four levels (nonwords, words, nonsense phrases, good sentences) indicates that the listening and hearing processes converge at the lexical level. This research supports the unitary process view that once words are processed aurally or visually the cognitive process of understanding is the same. Her findings lend credence to the view that reading aloud improves general language skills that can be applied to reading once words are decoded.

The Research Question

Despite the differences between the listening and reading processes, both theory and research reported in the professional literature generally support the unitary process view and conclude that improved listening comprehension should lead to improved reading comprehension. The author designed this study to test whether instruction in three specific listening comprehension skills (sequencing, literal recall, and main idea) will improve reading comprehension using those same skills. If so, story hour may be not only a pleasurable experience but also one that contributes to children’s reading skills and learning.

Methodology

The subjects were a class of 20 fourth grade students of varying reading levels in an elementary school in a medium-sized city in Pennsylvania (USA). The author selected fourth graders as appropriate to test the possible impact of listening comprehension skills on reading comprehension skills because (a) these students have already mastered basic decoding skills and their attention has turned to using these skills for comprehension and (b) they are likely to have slightly better listening than reading skills since they are not yet mature readers in the fifth and sixth grades.

The basic research design consisted of (a) a pre-test of silent reading comprehension using the three specific skills, (b) a unit of instruction in listening skills including the same three skills in the listening mode, and (c) a post-test of silent reading comprehension using the same three skills. The author selected the three specific skills

(sequencing, literal recall, and main idea) because they are within the reading abilities of average fourth grade students. The author did not mention reading comprehension skills during instruction in listening skills and did not mention listening skills during the two tests of reading comprehension.

The classroom teacher divided the students into two reading ability levels (Group A and Group B), and each Group took its own silent reading pre-test of expository text from SRA reading materials on similar topics. The reading level of the text selected for the tests was below the instructional level for each Group so that the text would present no decoding difficulties and students could direct their efforts toward comprehension. The text content was similar in each Group to control for performance related to interest in the subject matter. The test questions, taken from SRA materials, were similar for each Group and for both pre-tests and post-tests. The test for each Group consisted of five multiple-choice questions: one sequence-of-events question, three literal questions asking for recall of detail, and one main idea question. Titles were brief and illustrations were omitted so as not to facilitate comprehension. The test was not timed and students could refer to the text while answering questions. The students were told that this was a diagnostic test that would not be part of their grade in school but that they should do their best; performance on the test was therefore not related to pressure for grades.

The author presented 17 lessons in listening comprehension, 30-45 minutes daily, over a period of four weeks. She developed a generic lesson plan, designed to achieve maximum listening comprehension, that was organized around pre-listening, during-listening, and post-listening activities. Each day the author presented a story that illustrated one or more listening comprehension skills. Materials used included nine SRA stories, each one followed by an orally delivered written SRA test of six multiple-choice questions and class discussion on all relevant skills. The SRA test questions dealt mostly with recall of detail, main idea, and some inferences; and class discussion tended to focus on summarizing and questions of a convergent, divergent, and evaluative nature. There were also two SRA taped stories followed by similar SRA tests and four stories from trade books followed by class discussion but no written test. Since there were no sequence-of-events questions on the SRA post-listening tests, there was one sequence-of-events writing assignment. At the end of the unit the class as a whole reviewed the listening skills and the relevant stories.

The post-test for each reading ability Group had similar reading level, content, and administration as the pre-test. The intervening instruction in listening skills was not mentioned.

Findings

The analysis of the pre-test and post-test scores was based on four parameters: reading levels (independent, instructional, frustrational), a comparison of the total number of incorrect answers to the total number of possible answers, the distribution of incorrect answers according to the type of question (sequence-of-events, literal recall, main idea), and the scores of individual students. The number of students included in the analysis of data was 19, since one student moved away during the project.

Pre-test Scores

Analysis of the total scores for each Group showed that 36% of Group A and 45% of Group B were reading at the independent level on the pre-test; 36% and 33% respectively at the instructional level, and 28% and 22% respectively at the frustrational level.

In comparing the total number of incorrect answers to the total number of possible answers (number of students times number of answers), each Group performed about equally well. In Group A 10 of 55 possible answers (18%) and in Group B 7 of 45 possible answers (16%) were incorrect. The distribution of incorrect answers according to the type of question, however, revealed differences between the Groups: on the sequence-of-events question, Group A made its most errors (40%) whereas Group B made its least errors (16%). On the three literal questions, each Group scored about the same over the three questions with Group A averaging 40% of its errors and Group B averaging 42%. On the main idea question, Group A made 20% of its errors and Group B made 42% of its errors. These pre-test results indicated there would be room for improvement in all three skills as well as in all parameters of analysis.

Post-test Scores

The results showed that 80% of Group A and 78% of Group B were now reading at the independent level, 20% of Group A and 22% of Group B were reading at the instructional level, and none were reading at the frustrational level. In comparing the total number of incorrect answers as a percentage of total possible answers, each Group performed equally well on the post-test. There were only two incorrect answers in each Group, making for 4% incorrect in each Group. In each Group, one incorrect answer was to a sequence-of-events question and one to a literal question. There were no incorrect answers to the main idea questions.

Comparison and Analysis of Pre-test and Post-test Scores

There was marked and similar improvement in each Group from pre-test to post-test in each of the skills and parameters of analysis. This is reflected in the distribution of grades: all but two students in each Group achieved a score of 100% on the post-test (see Figure 1):

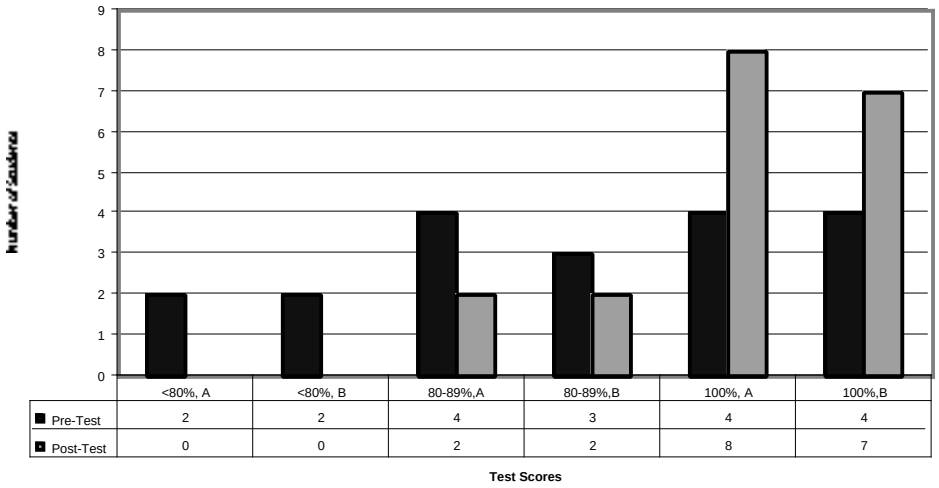
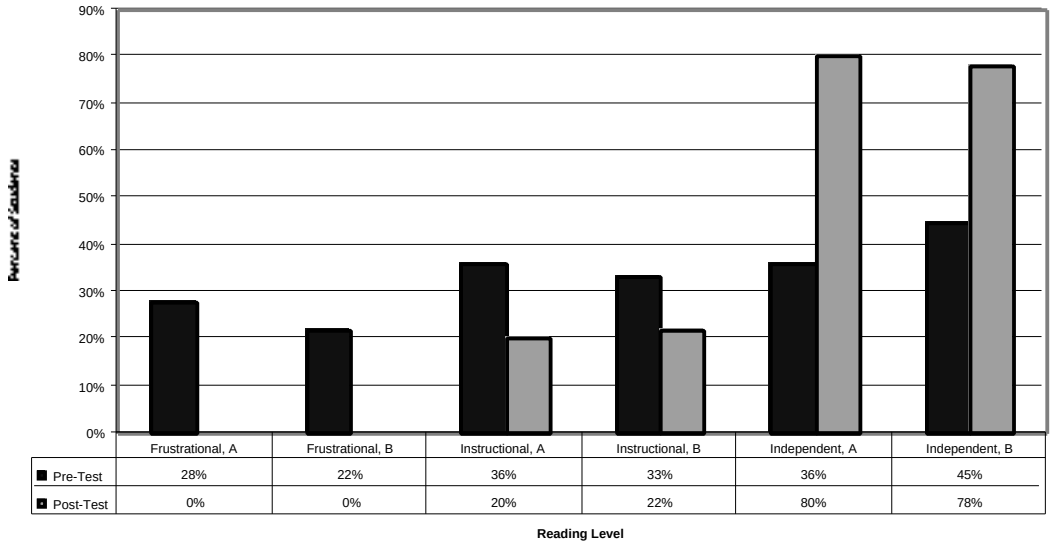


Figure 1. Student Scores on the Pre-Test and Post-Test

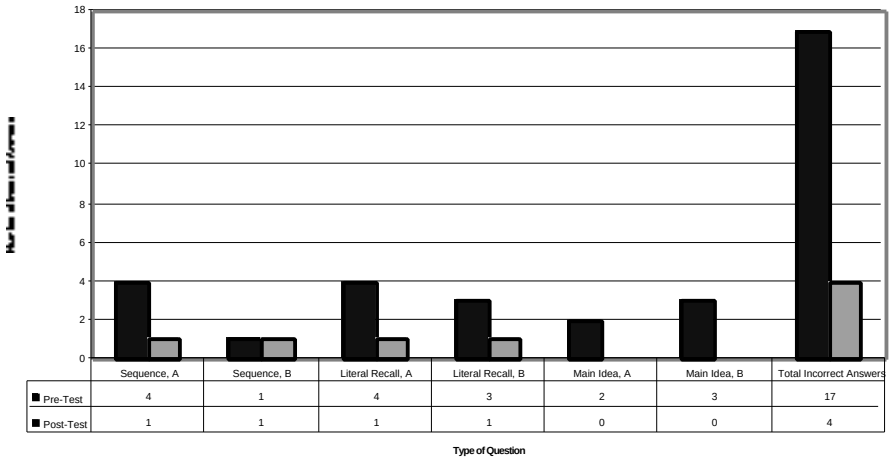
The class as a whole improved its reading ability levels. Individual students moved from the frustrational to the instructional levels and from the instructional to the independent levels. On the post-test no students were reading at the frustrational level and all but two students in each Group were reading at the independent level (see Figure 2):



	Frustrational, A	Frustrational, B	Instructional, A	Instructional, B	Independent, A	Independent, B
Pre-Test	28%	22%	36%	33%	36%	45%
Post-Test	0%	0%	20%	22%	80%	78%

Figure 2. Student Reading Levels on the Pre-Test and Post-Test.

The total number of incorrect answers declined from 17 on the pre-test to 4 on the post-test (see Figure 3):



	Sequence, A	Sequence, B	Literal Recall, A	Literal Recall, B	Main Idea, A	Main Idea, B	Total Incorrect Answers
Pre-Test	4	1	4	3	2	3	17
Post-Test	1	1	1	1	0	0	4

Figure 3. Number of Incorrect Answers on the Pre-Test and Post-Test.

Incorrect answers also declined for each type of question. On the sequence-of-events questions, the total number of incorrect answers declined from five to two. Four students improved their scores on this type of question, while one student's scores remained the same and another's scores declined. Group A also improved its performance on these questions. Although this improvement might have been related to general improvement over time, the intensity of presentation of sequencing skills during the listening skills unit may have also contributed. Sequence of events were discussed in seven of the stories and were the basis of one writing assignment although they were not included on the daily post-listening tests.

The total number of incorrect answers on the three literal questions declined from seven to two. Six students improved their scores on this type of question, while two students' scores remained the same and none declined. Each Group's marked improvement in answering literal questions on the post-test shows increasing attention, concentration, and willingness to review text to search for an answer. This could have been a result of attention and concentration skills developed during the unit: "tune-in" was the first step in how to listen, and the various pre-, during-, and post-listening activities encouraged attention and concentration. Moreover, the daily post-listening tests, while ungraded for the classroom grade, would also have fostered this increasing attention because the students could not review the text in order to answer questions.

The total number of incorrect answers on the main idea question declined from five to zero. Five students improved their scores on this type of question, while none remained the same or declined. Each Group's marked improvement shows greater ability to synthesize material read into one thoughtful conclusion involving relationships rather than just a single detail. This could have been the result of numerous class discussions emphasizing the difference between topic and main idea and plot versus theme, a distinction made in nearly all of the stories.

With regard to the improvement of individual students on each type of question, 15 students improved from pre-test to post-test, 3 remained the same, and 1 declined. Another way to look at the improvement of total scores from pre-test to post-test is to measure the improvement of the 11 students who did not score 100% on the pre-test. The improvement in these individuals' scores was dramatic: three students improved their test scores by two grade levels, and eight students improved by one grade level.

Conclusions

Data analysis shows definite improvements from pre-test to post-test in each of the four parameters: reading level, overall test scores, scores on the three specific skills, and the scores of individual students. The research design did not clarify whether any improvement in reading could be related to a particular teaching technique in presenting a listening skill. This, however, was not really part of the question to be tested. The improvement occurred in all parameters and all skills so it may be assumed that the teaching technique of using pre-, during-, and post-listening activities to improve comprehension was effective.

There were two unavoidable limitations in research design: the small number of subjects (n=19), and the lack of a control group to determine how much improvement would have been made over the same time in a group having no instruction in listening skills. Only one classroom was available for the research project, and there was no way to remove a group of students from the classroom in order to create a control group. The small number of students allows only limited generalizabilty from the case study. The lack of a control group prevents the drawing of definitive conclusions regarding the dramatic improvement from pre-test to post-test and the possibility of cross-modal transfer.

Nevertheless, the degree of improvement made in overall test scores, reading ability level, three specific skills, and individual performance on individual skills, when combined with the intensity and multiplicity of presentation of these same skills, strongly suggests that listening comprehension skills were utilized by both Groups A and B as reading comprehension skills in the following circumstances: (a) when those comprehension skills were not beyond the cognitive ability of the students to comprehend

in either mode, and (b) when the students were reading at an independent level or instructional level, as they were on the post-test. Moreover, support for the transfer of specific listening skills to reading skills comes from recent research that utilized a control group on a larger number of students (n=96) from several schools (Aarnoutse, Van den Bos, & Brand-Gruwel, 1998).

The author's study confirms the basic premise concerning the integration of the language arts and the unitary process view of comprehension in the listening and reading modes. In this study reading comprehension skills were used to teach listening comprehension, were effective in the listening mode, and were then apparently transferred and utilized as reading comprehension skills. It also confirms that cross-modal transfer may occur before students are mature readers in the fifth and sixth grades.

The final conclusion is that happy one that the students in this study enjoyed the unit of listening skills. Both the author and the classroom teacher observed increasing participation in class discussions over the course of the instruction, and the students noted at the end that they enjoyed and would miss the stories read aloud. That students realized that oral language is a source of enjoyment is an important result. That they could both learn from and enjoy the materials used for teaching listening skills was also a step toward understanding that learning itself can be both rigorous and enjoyable.

Implications for Teachers, Librarians, and Parents

While it may be both impossible and undesirable to replicate the rigor and intensity of this classroom study in the library or at home, those who read aloud can nonetheless use story hour as a means of improving students' listening and comprehension skills. The following recommendations flow from the study described above, from the professional literature and practicing librarians, and from the author's experience reading aloud in the school library. They can be used in the classroom, the school library, the public library, at home, and wherever adults read aloud to children.

Ensure That Story Hour is an Enjoyable and Literary Experience

Revisit and keep always in mind the goals of story hour in the school library: to develop a love of reading and literature, an appreciation for language, and a positive feeling for the library (Hilchey-Chandler, 1997). Treat each listener with dignity (Callison, 1999). Select age-appropriate quality literature that both the reader and children will enjoy. Exposure to quality literature helps develop general linguistic abilities as well as literary appreciation. Elements of enjoyment come from the topic, theme, style of writing, characters, plot, setting, illustrations, and humor. Develop a list of titles that illustrate each of the literary elements and a variety of genres such as fables, folk tales, legends, and poetry. Read several stories from a series that the children enjoy (Rosenhouse et al., 1997).

Provide an Environment That Promotes Active Listening

A stimulating but warm and comfortable physical environment enhances both listening comprehension and participation (Brownell, 1986; Burns & Flowers, 1997; Freeman, 1992). Personal warmth results from eye contact, a positive expression on the face, a relaxed and open body posture, attractive attire, and positive words (Brownell). Remove distractions (Brownell).

Develop an Age-appropriate Topic for Each Story Hour

A topic for each story hour provides structure to the whole program and unity to the individual session that may include a variety of genres. Topics may support the curriculum when the reader selects stories related to what the students are studying in the classroom. This offers school librarians an opportunity for collaboration with teachers.

Pre-read Every Selection Before Reading It Aloud

This enables the reader to decide how to introduce and read the story aloud, which literary and/or curricular elements to emphasize, and which post-listening activities are relevant (Burns & Flowers, 1997; Cooter, 1991).

Develop a Generic Lesson Plan That Enhances Listening and Comprehension

Research provides some general recommendations about activities before, during, and after reading aloud (Rosenhouse et al., 1997). What appears to be significant for listening comprehension during story hour are (a) expressive reading that encourages attention to and interaction with the material (Morrow, 1989; Scollon, 1988) and (b) activities that encourage interest, review, and analysis (Morrow; Rosenhouse et al.). Merely reading aloud may or may not be effective (Morrow; Strickland et al., 1990; Warren & Fitzgerald, 1997). This research project and another study (Warren & Fitzgerald) suggest that if improvement in specific comprehension skills is desired, the reader must model and discuss those skills during story hour.

The author developed the following generic lesson plan of activities for use during the study. It includes Brownell's (1986) recommendations for improving listening skills with the HURIER model, and it uses indirect teaching techniques that encourage the attention, interaction, and review that are essential to both listening and reading comprehension. It is also consistent with the pre-reading, during-reading, and post-reading activities used by expert readers (Callison, 1999). Those who read stories aloud can adopt and model some of these same activities for listeners in order to enhance their comprehension.

Pre-listening Activities. Get the children’s attention and get rid of distractions (Brownell, 1986; Burns & Flowers, 1997; Freeman, 1992). Then stimulate their interest by (a) referring to previous stories, personal experiences, or knowledge, (b) generating curiosity about the current topic or title, or (c) setting a purpose (Callison, 1999; Rosenhouse et al., 1997). These activities get the attention and activate the prior knowledge and interest necessary for comprehension.

During-listening Activities. Present the story in ways that sustain attention and enhance listening comprehension: maintain eye contact, read with expression, infer and model prosody, and define new or unusual words as you read them (Brownell, 1986; Callison, 1999; Cooter, 1991; Elley, 1989; Freeman, 1992; Rosenhouse et al., 1997). Optional activities include (a) making paragraph summaries and predictions at key points (Cooter, 1991; Hoffman, Roser, & Farest, 1988), (b) encouraging students to visualize by giving them the time and purpose to close their eyes (Brownell, 1986), (c) providing a few props that represent characters, themes, plot, or setting (Cooter, 1991; Wilson & Brown, 1999), and (d) encouraging students to participate in repetitive story language (Freeman, 1992; Tompkins & McGee, 1989; Wilson & Brown, 1999). At least one experienced pre-school story reader prefers not to allow any interruptions to the story itself (Mazzoco, 1993), and the omission of illustrations and props may even have a positive effect on children's imaginations (Strickland et al., 1990). Pre-reading the story

will help you select those optional activities most appropriate for each title. While these activities keep children attentive and develop their linguistic abilities, it is important not to let the number or duration of such activities break the continuity or enjoyment of the story.

Post-listening Activities. These include a discussion of the story and an age-appropriate related creative activity. When posing a question, be sure to allow adequate wait-time so that several children have time to complete their thoughts before calling on one (McKay, 1988). Enhance comprehension by asking the children to (a) consider literary elements and structure such as character, plot, setting, style, and mood (Gordon, 1989; Nelson-Herber & Johnson, 1989; Schmitt, 1988); (b) identify the topic and main idea (Brownell, 1986; Callison, 1999; Duffelmeyer & Duffelmeyer, 1987; Paris, Wasik, & Van der Westhuizen, 1988; Rosenhouse et al., 1997; Warren & Fitzgerald, 1997); or (c) summarize or retell the story (Brownell; Dennis & Walter, 1995; Morrow, 1989; Paris, Wasik, & Van der Westhuizen; Rosenhouse et al.; Schmitt). The goal of these activities is to develop a sense of story structure and main idea through a brief review. One discussion topic may be enough for each story, especially with primary students, and sometimes they may be omitted so as to avoid over-analyzing (Guardia, 1995; Nelson-Herber & Johnston). Although analytical discussion facilitates comprehension, story hour should remain fun and not become an obvious lesson (Freeman, 1992).

A creative activity related to the story encourages personal expression and improves the retention of what is heard (Brownell, 1986). The educational benefits of artistic activities include the development of eye-hand coordination and small motor skills, following directions, and learning geometric shapes. Written creative activities enhance the understanding of literary elements and reinforce skills in vocabulary, spelling, and grammar.

Select an age-appropriate number and type of these pre-, during-, and post-listening activities that are most relevant for each title, for the particular students, and for improving listening comprehension by increasing vocabulary, identifying the main idea, and understanding the organization and literary aspects of the story. School librarians may collaborate with teachers on the selection of these activities. The use of different pre-, during-, and post-listening activities provides variety within a structure that enhances listening comprehension. The goal for story hour is the introduction or reinforcement of listening skills with a few questions rather than direct instruction (Gordon, 1989; Nelson-Herber & Johnston, 1989).

Enjoy the Stories, the Experience of Reading Aloud, and Being With Children

The reader's enthusiasm for literature and children is contagious!

Conclusions

In order to contribute to children's learning during story hour, readers should employ effective indirect teaching strategies. The preceding recommendations are based on teaching and learning strategies that improve listening and reading comprehension, and they are consistent with what researchers and theorists have learned about listening comprehension, reading comprehension, pedagogy, constructivist learning, and cognitive development. They also offer an opportunity for the school librarian to collaborate with teachers to improve student learning and enjoyment of story hour.

Although teachers, librarians, and parents may not see the results of such a program of enhanced listening skills in the absence of research, they may nonetheless feel

assured that they have contributed to the increased literary appreciation, linguistic ability, listening and reading comprehension skills, and cognitive and affective development of their students while the children think they are just listening to a story!

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Professional Papers

Part 2:

Partnership

Competencies for Teacher-Librarians: The Malaysian Perspective

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Teacher-librarians need specific competencies, knowledge, and skills in order to perform their roles effectively. Very few guidelines and standards exist, however, in developing countries for these competencies. The primary goal of this study was to determine the competencies needed by teacher-librarians in Malaysian secondary schools to effectively perform their roles. The study employed a survey methodology using a population of professionals directly involved in the field of teacher-librarianship: teacher-librarians, library educators, and supervisors. The findings present a Malaysian perspective on the roles and competencies for teacher-librarians and will also be useful in working towards an international framework of competencies.

Introduction

School libraries need trained teacher-librarians who can perform their roles effectively. A competent and effective teacher-librarian is the key to good school library service. As schools change from passive learning environments into active ones, the role of the librarian has to change as well. Teacher-librarians also have an important function in helping administrators to formalize the role of the school library. They create an awareness of the value of the school library in the community and support efforts to promote its use as an educational tool as well as a recreational facility.

The published literature indicates that the current and emerging roles of the teacher-librarian include those of a resource information specialist, a collaborator with teachers, and a designer and implementer of effective learning programs, especially those that encourage resource-based inquiry learning. In short, the position of teacher-librarian has the potential to be one of the most valuable resources in a school: an agent of change impacting all levels of school organization and the provider of rich and interesting learning environments and opportunities.

Most school library associations in developed countries have maintained that in order to perform these roles, teacher-librarians need specific knowledge and skills that must be emphasized in their training and qualifications. While such guidelines and competency requirements have been produced in developed nations, little research has been done in developing countries. Malaysia, a developing country that is beginning to place emphasis on the development of school libraries, has many teacher-librarians that are in need of training in school librarianship. Surveys in the early 1990s showed that many teacher-librarians had either minimal or no such training. As the country develops its training programs for teacher-librarians in an era of changes resulting from the use of information technology, there is a need for local guidelines on the attributes needed by teacher-librarians.

Review of Literature

A constant theme in the literature by leading school library thinkers and practitioners is that the person responsible for managing the school library can make it successful or otherwise. The literature also emphasizes the roles of teacher-librarians and the importance of core competencies to perform the roles. It is significant that in those countries where school libraries are well established, there is a steady flow of research and reappraisal of these institutions. Studies of school libraries in Malaysia concentrate more on (a) documenting and suggesting improvements and (b) providing guidelines to improve the physical facilities and management of school libraries. Very little has been said about either the roles or the competencies for teacher-librarians in Malaysia.

National guidelines and the professional literature in various countries promote an active and high role for teacher-librarians. In the American context there have been numerous studies that support the importance of the role of the teacher-librarian as an information specialist. The teaching role, relating to instruction in library and information skills, has been widely discussed by Walter and Montgomery (1983), Turner (1985), Kuhlthau (1987), Eisenberg and Berkowitz (1988), Vandergrift (1994) and Putnam (1996). The importance of the instructional consultation role of the teacher-librarians has been emphasized by Walker (1988), Putnam (1996), and *Information Power* as well as more recent publications. Many writers also have specified the changing roles of teacher-librarians due to computer-related technologies in the schools (Barron, 1995; Boardman, 1994; Burnett and McNally, 1996; Eisenberg and Berkowitz, 1988; Putnam, 1996).

A review of the research literature on competencies for teacher-librarians indicates that relatively little research on this topic has been conducted. Professional organizations have published several excellent guides to competencies in school librarianship that have been used by researchers in their studies of competencies. Pfister (1981) used the school library media competencies proposed by the Florida Council on Teacher Education (C.O.T.E) Task Force in his efforts to discover the essential competencies for school media preparation programs. Other studies by Schreen (1987) and Schon, Helmstadter and Robinson (1991) investigated the competencies in professional areas that teacher-librarians should have. Jowkar and Kinnell (1991) conducted a study of competencies that resulted in the development of a competency-based education programme for teacher-librarians in Iran. In his later attempt to establish a single library education programme for the education of teacher-librarians in developing countries, Jowkar (1992) utilized the competencies suggested by librarians from other regions.

Research Question and Methodology

The primary goal of this study was to determine the competencies needed by teacher-librarians in Malaysian secondary schools in order to effectively perform their roles. The research question was to determine the perceptions of practicing teacher-librarians, school library supervisors, and library educators about the competencies required for teacher-librarians in Malaysia.

The study employed a survey methodology to elicit information from the respondents about their attitudes concerning the roles of teacher-librarians and the competencies they need to perform these roles. The population chosen for this study was focused on the professionals who are most directly involved in the field of school librarianship and who generally have first-hand knowledge of the roles and competencies required by a teacher-librarian: teacher-librarians as the practitioners, library educators as the trainers, and supervisors from Departments of Education.

A mail questionnaire was used for data collection. The questionnaire was developed, pre-tested, revised, and then sent to a randomly selected sample of 20 teacher-librarians from Malaysian secondary schools, 20 library information science or educational technology educators in teacher training colleges and universities, and 20 supervisors from Departments of Education or State Education Resource Centers. The teacher-librarians, library educators, and supervisors that comprised the three groups of samples are considered representative of the population and relevant to the inquiry of the study. After one follow-up mailing, a total 47 usable questionnaires (78.3%) were received and analyzed. The respondents included 17 teacher-librarians, 12 library educators, and 18 supervisors.

The initial section of the 13-page structured questionnaire sought the views of the respondents about the roles of teacher-librarians in Malaysia. Respondents were also asked if they believed that teacher-librarians played important roles within the school and if they agreed that the teacher-librarians needed to have specific skills to perform the roles.

The next section focused on the competencies for teacher-librarians. The items in this section, grouped under five broad areas of variables being examined, comprised 70 competency statements that teacher-librarians should perform. The competency statements covered the three areas of librarianship, management, and education, and they were adapted from the American Library Association's guidelines for the basic preparation of the school library media specialists (*Curriculum*, 1989) and *School Librarians: Guidelines to Competency Requirements* (Hannesdottir, 1996). These statements were refined and adapted to the Malaysian situation. The authors added a fourth area of competency for teacher-librarians, technology, since it is expected that teacher-librarians will play a leading role in applying information technology within the school and should therefore be familiar with the full range of educational and information technology. They also developed the fifth area, personal competencies, from suggestions in the professional literature with regard to the personality of teacher-librarians.

Respondents prioritized the role and competency statements using a five-point Likert-type scale. They also indicated the level of each competency (i.e., high, intermediate, or basic) that the teacher-librarians must meet in order to perform their roles. The authors used SPSS 7.5 for Windows to analyze the data collected.

Findings

Roles of Teacher-librarians

It was found that at least 75% of the respondents agreed with the published literature on the roles of teacher-librarians. There was a high agreement among the three groups of respondents that the primary role of the teacher-librarians was to assist students in the traditional and electronic methods of identifying, assessing, and retrieving information. A high majority of the respondents strongly agreed that teacher-librarians played important roles and needed specific skills to perform these roles within the school.

Table 1 presents the roles of teacher-librarians in ranked order compared by sub-groups.

Table 1
Roles of Teacher-librarians in Ranked Order

Statement of teacher-librarian roles:	Rank order		
	TL*	LE*	S*
1. Assist students in traditional and electronic methods of identifying and assessing information in the school library.	2	1	1
2. Assist students in interpreting information.	4	6	10
3. Inform teachers, students and administrators of new material /equipment / services.	2	1	1
4. Instruct students in locating information.	1	6	1
5. Instruct students in evaluating information.	8	9	7
6. Instruct students in communicating information.	10	10	9
7. Provide teachers with in-service opportunities (e.g. introduction to new technology, use / production of media)	4	1	1
8. Teach with a variety of modes and media, thus modeling instruction techniques for other teachers.	4	6	1
9. Participate in school and district curriculum development and assessment.	8	1	7
10. Consult with teachers about incorporating information materials and skills into the classroom.	4	1	1

(*TL = Teacher-librarian; LE = Library Educator; S = Supervisor)

Competencies for Teacher-librarians

To determine the essential competencies for teacher-librarians, the returns were examined and each competency that met the C.O.T.E. standard (Pfister, 1981; Curriculum; 1989) was considered essential. That standard requires that "85% of all respondents must consider the competencies very important (very useful) with 51% considering it essential" for it to be regarded as an essential competency. An overview of the findings is presented in Table 2.

Table 2
Competencies Considered Essential and Non-essential

Essential (17 of 61)	Rejected overall but thought essential by one or more sub-groups (12 of 61)	Rejected overall and rejected by every sub-group (32 of 61)

Based on the C.O.T.E. standard, only 17 of the 61 competencies from the literature were considered to be essential by at least 51% of the survey respondents. The 85% requirement was not met at all, unlike the study conducted by Pfister (1981). Twelve of the remaining 44 proposed competencies were thought to be essential by one or more sub-groups. Thirty-two competencies consistently received rankings at the lower end of

the scale. These competencies were considered non-essential in that they were rejected overall as well as by all three sub-groups. The 17 competency statements that met the C.O.T.E. definition of essential, and their frequency and percentage responses in ranked order, are presented in Table 3.

Table 3
Competencies Rated Most Frequently as Essential (n=47)

Competency: The ability to	Freq	%
1. Utilize classification principles and organize the materials according to standard classification scheme.	37	78.7
2. Apply appropriate standards and guidelines to develop and evaluate library collections.	35	74.5
3. Prepare and maintain catalogue of the collection according to appropriate standard cataloguing principles.	34	72.3
4. Index the available material and make the information sources in the collection fully available for subject/author/title searching.	32	68.1
5. Co-operate with teachers in the development and evaluation of resources.	31	66.0
6. Utilize automation for major library functions (cataloguing, acquisition, circulation, etc.).	31	66.0
7. Use information technology in student-learning activities across the curriculum.	29	61.7
8. Design, plan and produce specific resources for instructional purposes where appropriate resources are not available.	29	61.7
9. Develop procedures for ordering, receiving and processing the learning resources.	27	57.4
10. Organize and develop collections, facilities and services to achieve objectives.	27	57.4
11. Apply advanced technology in the storage, handling, search, retrieval and use of information.	26	55.3
12. Effectively search CD-ROMs and the Internet.	26	55.3
13. Outline school library policy, and design a program to implement the policy.	26	55.3
14. Apply appropriate principles to weed and inventory materials and equipment.	25	53.2
15. Develop guides to sources and bibliographies that assist teachers and their students in their search for appropriate information.	25	53.2
16. Develop appropriate services for teachers and students according to goals and objectives.	24	51.1
17. Evaluate and use computers and related IT technology for instruction.	24	51.1

Of the 17 essential competencies, 12 were in the area of librarianship (Table 3, Items 1,2,3,4,5,6,8,9,11,12,14,15), three were management-oriented competencies (Table 3, Items 10,13,16), and two were technology-oriented competencies (Table 3, Items 7 and 17). Education-oriented competencies were not rated high enough to be considered essential overall.

Analysis of the competencies rated essential revealed some variations among the sub-groups (Table 4). It was found that library or technology educators' ratings are more apt to differ significantly. This could be have been brought about by their academic qualifications and experience in librarianship. The library educators emphasized the use

of information technology in learning and management skills while the teacher-librarians and supervisors stressed practical library and management skills. Teacher-librarians focused on the need to apply standards and guidelines for collection development. Supervisors focused on the need to apply standard principles in the organization of materials. Library educators focused on the ability to apply information technology to major library functions. It is interesting to note that two competencies highly rated as essential by the library educators (Table 4, Library educators – Items 2 and 3) were not considered essential overall by the other two sub-groups.

Table 4
Competencies Rated as Essential by Sub-Groups

Competency: The ability to	%
Teacher-librarians (n=17)	
1. Apply appropriate standards and guidelines to develop and evaluate library collections.	82.4
2. Utilize classification principles and organize the materials according to standard classification scheme.	70.6
3. Prepare and maintain catalogue of the collection according to appropriate standard cataloguing principles.	70.6
4. Index the available material and make the information sources in the collection fully available for subject / author / title searching.	70.6
5. Co-operate with teachers in the development and evaluation of resources	70.6
Supervisors (n=18)	
1. Utilize classification principles and organize the materials according to standard classification scheme.	83.3
2. Prepare and maintain catalogue of the collection according to appropriate standard cataloguing principles.	75.0
3. Apply appropriate standards and guidelines to develop and evaluate library collections.	75.0
4. Design, plan and produce specific resources for instructional purposes where appropriate resources are not available.	75.0
5. Co-operate with teachers in the development and evaluation of resources.	66.7
Library Educators (n=12)	
1. Utilize automation for major library functions (cataloguing, acquisition, circulation etc.).	88.9
2. Establish long-term and short-term goals for the development of the library.	77.8
3. Study and assess the information needs and interests of teachers and students.	72.2
4. Effectively search CD-ROMs and the Internet.	72.2
5. Use information technology in student-learning activities across the curriculum.	66.7

The results of this study in terms of personal competencies are similar to those of Jowkar (1992). The respondents indicated that the most important personal competencies needed by teacher-librarians were a commitment to excellence, the ability to communicate, and an enthusiasm for information resources and communication media. The respondents in this study gave high value to the category of personal competencies, indicating the serious need for this type of competency among teacher-librarians (Table 5). Some respondents also suggested additional personal competencies that they felt were needed by teacher-librarians such as integrity, patience, responsibility, initiative, willingness to learn, and self-motivation.

Table 5
Personal Competencies Expressed as "Needed" or "Somewhat Needed"

Personal Competencies	Needed (%)	Somewhat needed (%)	Mean score on 5-point scale	S.D.
1. Be committed to service excellence.	87.2	12.8	2.8723	0.3373
2. Have the ability to communicate effectively in writing reports, proposals, and correspondence.	87.2	12.8	2.8723	0.3599
3. Have an enthusiasm for books and reading, and for other media of communication.	87.2	12.8	2.8723	0.3373
4. Have good communication skills.	85.1	14.9	2.8511	0.6226
5. Be IT / computer-literate.	85.1	14.9	2.8511	0.5878
6. Be able to provide leadership.	76.6	21.3	2.7324	0.3373
7. Have administrative ability.	76.6	19.1	2.7021	0.6509
8. Have a good or reasonable command of the English Language.	51.1	48.9	2.5106	0.5053
9. Have many cultural, intellectual, and recreational interests.	48.9	46.8	2.4255	0.3599

Level of Skills for Essential Competencies

The survey also aimed to determine the level of competency that teacher-librarians must meet in order to perform their roles. The results focused only on the 17 competencies that met the definition of 'essential' by the C.O.T.E. standard. About 90% of the respondents felt that the level of skills for the 17 essential competencies should be at least at the intermediate level, and half of them chose a high level of skill for these competencies. Analysis of the levels of skills for essential competencies revealed some differences among the sub-groups. More than 50% of the supervisors rated all 17 competencies as requiring high level of skill. At least 50% of the library educators rated 15 of the 17 essential competencies as requiring high level of skill. However, only nine competencies were viewed as requiring high level of skill by at least 50% of the teacher-librarians. Table 6 shows the responses to the 17 essential skills by the three sub-groups. A majority of each sub-group perceived that the competencies requiring a high level of competency were those that related to librarianship. The results also show that more library educators and supervisors than teacher-librarians perceived the competencies as requiring a high level of skill.

Table 6
Essential Competencies Requiring High Level of Skill by Sub-group

Competency: The ability to	Teacher Librarians %	Library educators %	Supervisors %
1. Utilize classification principles and organize the materials according to standard classification scheme.	82.4	91.7	94.4
2. Apply appropriate standards and guidelines to develop and evaluate library collections.	64.7	91.7	83.3
3. Prepare and maintain catalogue of the collection according to appropriate standard cataloguing principles.	82.4	91.7	83.3
4. Index the available material and make the information sources in the collection fully available for subject / author / title searching.	64.7	66.7	88.9
5. Co-operate with teachers in the development and evaluation of resources.	58.8	91.7	66.7
6. Utilize automation for major library functions (cataloguing, acquisition, circulation, etc.).	64.7	50.0	72.2
7. Use information technology in student-learning activities across the curriculum.	47.1	66.7	77.8
8. Design, plan and produce specific resources for instructional purposes where appropriate resources are not available.	23.5	58.3	77.8
9. Develop procedures for ordering, receiving and processing the learning resources.	47.1	66.7	50.0
10. Organize and develop collections, facilities and services to achieve objectives.	52.9	83.3	61.1
11. Apply advanced technology in the storage, handling, search, retrieval and use of information.	35.3	50.0	61.1
12. Effectively search CD-ROMs and the Internet.	41.2	50.0	66.7
13. Outline school library policy, and design a programme to implement the policy.	29.4	83.3	66.7
14. Apply appropriate principles to weed and inventory materials and equipment.	58.8	33.3	61.1
15. Develop guides to sources and bibliographies that assist teachers and their students in their search for appropriate information.	47.1	58.3	61.1
16. Develop appropriate services for teachers and students according to goals and objectives.	52.9	100.0	78.8
17. Evaluate and use computers and related IT technology for instruction.	35.3	41.7	72.2

Significance of Findings

The researchers believe that the information and knowledge generated from this study are essential for effective operation of school libraries. Since the study has identified key areas of knowledge and skills considered to be essential for teacher-librarians, library educators and school library supervisors may use it to develop or upgrade programs for the comprehensive preparation of teacher-librarians. Training institutions, such as colleges and departments of education, now have a basis for discussing the competencies required for teacher-librarians and can use the findings as a starting point for reviewing training requirements. The study will also help practicing and potential teacher-librarians to recognize the necessary competencies and will serve as a basis for self-assessment and improvement of skills.

At this point in time when Malaysians are rapidly entering the information society and getting connected to the information superhighway, especially in the light of the Smart Schools project, it is important that teacher-librarians have technological competencies and be prepared for the challenges presented by new and emerging technologies. Empirically determined competencies should lead to better preparation of school library manpower for future schools.

It is hoped this study will also be a stimulus for studies in other countries regarding the competencies for teacher-librarians. The findings will also be useful in working towards an international framework of competencies, especially for developing countries. More input and research is still needed to achieve this, including input from teachers, principals and students. It is hoped that the findings of studies like this can eventually form the basis for teacher-librarian training programs internationally.

Conclusion

This study has presented a Malaysian perspective on the competencies needed by teacher-librarians. It supports the view that teacher-librarianship requires specifically defined knowledge and skills. Based on this study, it is also clear that competencies in specific areas other than traditional librarianship, such as management and information technology, need attention in library and information science education programs so that teacher-librarians will be better able to carry out their responsibilities.

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A Case Study of Partners in Educational Change: Teacher-librarians and Pre-service Teachers

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This case study aimed to clarify the role of the teacher-librarian and the nature of the school library program to pre-service teachers. Nineteen pre-service teachers collaboratively planned curriculum with teacher-librarians in their practicum schools. Data consisted of pre- and post-experience concept maps and interviews with all participants. Results showed pre-service teachers (a) significantly increased their knowledge of collaboration, resource-based learning, and information literacy, and (b) learned that collaboration helps refine and extend their teaching ideas. Teacher-librarians identified flexible scheduling and collaborative culture as conditions for curriculum-based library programs. Authentic experiences with teacher-librarians appear to be a promising means of preparing new teachers as partners.

Introduction

> *It's not the way teaching is done, unfortunately. We don't collaborate with each other. It's an individual craft that you do in the privacy of your own room with the door shut usually, and you don't have opportunities to have conversations about the same kids on the same assignment with two professionals looking at the work at the same time.* (Clark et al., 1996, p. 217)

> *Today, as the library media specialist's role becomes even more closely linked with the curriculum, the significance of collaboration throughout the learning process is increasingly important. Collaboration is essential as library media specialists work with teachers to plan, conduct, and evaluate learning activities that incorporate information literacy.* (American Association of School Librarians & Association for Educational Communications and Technology, 1998, p. 50)

Voices of teachers and voices of teacher-librarians; how will the two ever meet to work together to support student learning? This paper describes a project that educates pre-service teachers about collaborative planning with teacher-librarians for the purpose of developing resource-based units of study and integrated information literacy instruction.

Visions of learner-centered libraries are grounded in partnerships with all members of the educational community and school library programs fully integrated with curriculum (American Association of School Librarians & the Association for Educational Communications and Technology, 1998). While teacher collaboration is a characteristic of effective schools (Taylor, Pearson, & Richardson, in press) and a focus of school reform (Fullan, 1991,1993), less than one-third of teachers collaborate with teacher-librarians (National Center for Educational Statistics, 1994). Haunting many current practices are historical conceptions of the school library program and teacher-librarian that separate them from the school's curriculum and its teachers (Jackson, Herling, & Josey, 1976). Even a recent article in a professional literacy journal claims, "whereas in the event of an emergency, a school's library and librarian could be done without, few schools could exist without classrooms or teachers" (Dressman, 1997, p. 267). The American Library Association's Presidential Committee on Information Literacy (1989) recognized that the information age is divorced from most teaching styles and recommended that "teacher education and performance expectations should be modified to include information literacy concerns ... a portion of the practicum or teaching experience of beginning teachers should be spent with library media specialists" (Committee Recommendations #5).

While there have been advocacy efforts aimed at in-service teachers, pre-service teachers remain a sorely overlooked group of partners (Haycock, 1996; Oberg, 1999). Doiron (1999) advocates that educators in positions with Ministries of Education and universities, with their unique perspectives, take a more active role in developing new partnerships with our school libraries. The project described in this paper is an example of one way faculties of education are preparing new teachers for the Information Age.

In 1998 the Information Literacy Project was established in a large Canadian teacher education program to the support the development of learner-centered, curriculum-based school library programs through the formation of partnerships between pre-service teachers and teacher-librarians. The goal was to introduce pre-service teachers to inquiry-based integrated unit planning and information literacy pedagogy through collaboration in school library programs. Specific objectives of the project were to increase pre-service teachers' knowledge of (a) the role of the teacher-librarian as instructional partner, (b) integrated collaborative school library programs, and (c) information literacy skills. Pre-service teachers learned about these concepts and skills through first-hand collaborative experiences with teacher-librarians.

Collaboration, Resource-based Learning, and Information Literacy: A Brief History of School Library Programs

Initial attempts to broaden the mission of the school library to include more than circulation of materials and provision of reading guidance occurred during the 1960's. With the introduction of resource-based learning and cooperative planning and teaching, the school library and teacher-librarian moved to an integral position within the school's instructional program, and Canadian and American publications designated a new mission for school libraries: to ensure that students and staff are effective users of

information (CSLA, 1988; AASL& AECT, 1988*)*. In subsequent years, a growing body of research demonstrated that student expertise in accessing, evaluating, and using information positively influence student learning (AASL & AECT, 1998, pp. 1 – 7). The current guidelines in the United States explicate information literacy standards and encourage the teacher-librarian to collaborate with teachers (AASL & AECT, 1998).

For nearly 40 years teacher-librarians have been promoting and implementing collaborative models of resource-based learning. In this method, teachers and teacher-librarians coach students and actively engage them in structuring meaningful inquiries and constructing knowledge through the use of multiple resources. It is a method recommended for both teachers (Short et al., 1996) and teacher-librarians (AASL, 1999). Resource-based learning is also the primary means by which students' information literacy is developed. When teachers and teacher-librarians collaboratively plan and teach resource-based units that are grounded in core curriculum, they address the skills and strategies students need to use information resources effectively. The Canadian document, *Students' Information Needs in the 21st Century: Competencies for Teacher-librarians* (ATLC & CSLA, 1997) states, "The teacher-librarian provides leadership in collaborative program planning to ensure both physical and intellectual access to information and commitment to voluntary reading." Similarly, the American Association of School Librarians (1999) highlights both the collaboration between teachers and teacher-librarians, and the integration of information literacy skills in authentic learning contexts.

Teacher Knowledge

Teachers' beliefs are central to how they teach (Shulman, 1987) and starting points in learning to teach (Richardson, 1997). Research in pre-service teachers' beliefs shows that their past experiences with teaching, learning, and curricular areas have a significant influence and act as filters for their coursework and practicum experiences (Borko & Putnam, 1996). Teacher education is seen as a "critical period" for the development of alternative beliefs consistent with current views of teaching and learning (Powell, 1996). What most effectively guides reformulation of pre-service teachers' beliefs is explicating their entry beliefs alongside learning and supportive practice. Constructivist approaches to teacher education assume that each student must construct their own understandings by identifying their own personal beliefs and modifying those as they work with new experiences and information.

Given the influence of teachers' past experiences, it is not surprising that teacher knowledge about the role of the teacher-librarian and library program appears to reflect past notions of the teacher-librarian as provider of resources or instructor of decontextualized library skills and of the school library as warehouse (Craver, 1986). In a recent survey of 40 elementary teachers, Moore (2000) found that teachers are unclear about the meaning of information literacy and equate information literacy with older

notions of library or research skills. The results of Moore's survey also revealed teachers' undeveloped understandings about how to effectively plan resource-based learning. Finally, Moore found that teachers were unsure about the role of the school library program in student learning.

Pickard (1993) noted that teachers have had few opportunities to see strong models of instructional partnerships. The results of this state-wide survey showed that although library media specialists understand the importance of the instructional consultant role, only ten percent carry out the role at Loertscher's (1988) higher level where joint planning, teaching, and evaluating of resource-based curriculum units occur and where leadership in curriculum development is evident. Similarly, McCarthy (1997) found that implementation of *Information Power* was constrained in many schools by such factors as budget, scheduling, and lack of administrative support. These findings imply that teachers are exposed to limited models of effective school library programs.

In the province where this Information Literacy Project was implemented, a number of political factors have been threatening the existence of school libraries and the morale of teacher-librarians. Positive developments, such as new Ministry requirements during the past two years, have been reversing this trend and have increased the need for education about the school library in pre-service programs.

The Research

The case study reported in this paper is an extension of the Information Literacy Project that initially started within the context of a required elementary language arts course for pre-service teachers (K-8) during the second term of their post-baccalaureate teacher education program. In this project, pre-service teachers learned first-hand about the role of the teacher-librarian and how to collaboratively plan a resource-based unit of study for use in their practicum. Learning environments during the first two years of the project were the university classroom and two of its libraries where teacher-librarians at the university and volunteer teacher-librarians from the community came to work with pre-service teachers. Effects of these experiences on pre-service teachers' understandings of the school library program and the role of the teacher-librarian were tracked both years. Results reported for the first two years of the project showed positive effects on pre-service teachers' understandings (Asselin, 1999).

Despite this success, questions remained. Were pre-service teachers enacting the new knowledge they had gained in real school settings? And if so, how were they enacting this new knowledge? During the third year of the project, the basic structure of the project was adapted to meet two purposes: (a) to increase authenticity of the planning periods, and (b) to support transfer of the course-derived learning to application during school practicum. In these adaptations, pre-service teachers collaboratively planned their resource-based units with the teacher-librarian in the schools where they would be doing their spring practicum. Four extension projects were conducted in four school districts. This paper reports a case study of one of the four extension projects.

Methodology

Participants

The pre-service teachers were members of one cohort (n = 19) enrolled in the required elementary (K–8) language arts course in one of Canada's largest teacher education programs. All pre-service teachers held bachelor degrees and spoke English as their first language. There were six males and thirteen females. The pre-service teachers lived in or near the school district associated with the cohort, and most hoped to get a job in that district upon completion of the program. Dr. Asselin served as both course instructor and researcher; such a dual role was seen in other studies of pre-service teachers' knowledge (Finke & Edwards, 1997; Wolf et al., 1996).

Four female teacher-librarians participated in the study. All had at least two years teaching experience, and their experience as a teacher-librarian ranged from less than one year to more than ten. Three held part-time positions and one held a full-time position. All four were involved in district professional development to upgrade their teacher-librarian qualifications. This program, in its second year, consisted of six diploma courses in teacher-librarianship. During the first stage of the study when the collaborative planning sessions occurred, the teacher-librarians were taking their fourth diploma course, a course on information technology in the library program.

Research Setting: The Schools

The schools in which the pre-service teachers did their practicum were located in a rapidly developing rural community approximately 30 miles from a major urban center. The district has become the eighth largest district in the province, with 34 elementary and 8 secondary schools and a combined city-township population of 97,750. With increased urbanization a few schools, including one in this study, have been designated as community schools with extra support for families living in low-income housing. The four elementary schools in this study ranged in age from 2 to nearly 20 years. Their school populations were 258, 285, 368, and 430. With new Ministry requirements some teacher-librarian positions were enlarged and created; many of these had previously been cut throughout most of the 1990's. An emergency hiring situation exists in the district, and despite new legislation teacher-librarians remain uncertain about how long this new security will be in effect.

Information Literacy Project Experiences

The term before the project started, Dr. Asselin held a meeting at the district resource center to explain the purpose and procedures of the extension project. In attendance were a district consultant, the district head of library services, two district senior administrators, the university faculty advisor for the 19 pre-service teachers, and two of the participating teacher-librarians. Dr. Asselin then met with the four teacher-librarians before the pre-service teachers came for their collaborative planning sessions to provide all the supporting documents the pre-service teachers were expected to use, including books on inquiry-based learning (Case & Daniels, 1996, 1999), an information literacy curriculum from a local school district (Bens, 1999), a copy of the full assignment on developing an integrated resource-based unit, and Ministry of Education criteria for evaluating different types of resources. The teacher-librarians were also given the topics that the pre-service teachers in their schools had selected for their unit plans. Thus when the pre-service teachers arrived for the collaborative planning sessions, the teacher-librarians had already pulled numerous resources for them and constructed bibliographies. All planning sessions were held on one day, and teacher-librarians were given release time to work with the pre-service teachers. Because of course schedules, most of the pre-service teachers had only one time to work with their teacher-librarian. To ensure that they accomplished as much as possible, Dr. Asselin, a teacher-librarian from the university who had worked in the project for three years, and a graduate teaching assistant who worked in the project this year each went to one of the three sites to help during the planning sessions and to facilitate the group interviews. Some pre-service teachers did return on their own time to work in their school library, and the teacher-librarians followed up with calls to Dr. Asselin when they found additional resources for particular students.

Research Instruments and Procedures

Data was collected from the pre-service teachers using pre- and post-experience concept maps and structured group interviews. Teacher-librarians also participated in the group interviews with the pre-service teachers in their schools.

Prior to the school experiences, the pre-service teachers, as part of their language arts course, composed a concept map representing their understandings of three major concepts: collaborative planning and teaching, resource-based learning, and information literacy. These three concepts were selected as the key cognitive anchors of the experiences that would follow and the concepts that would best prepare these future teachers to work as instructional partners with teacher-librarians. The pre-service teachers were already familiar with concept maps as a strategy for organizing and representing knowledge. They were given a blank sheet of paper and directed to use as few or as many maps as they needed to represent their understanding of the three concepts. They were given ten minutes of class time to complete the task. The same procedure was repeated at the end of the course.

There were two interviews with the pre-service teachers, one upon completion of the planning sessions during the course term and another during or following implementation of their unit plans in the schools. To date the first session of interviews has been completed and follow-up interviews have been scheduled for early June. Group interviews were conducted with both the pre-service teachers and teacher-librarians in the four schools where the 19 pre-service teachers had been placed. The following open-ended questions guided the initial interviews:

1. What understandings about collaboration, resource-based learning, and/or information literacy have been confirmed, extended, and/or revised?
2. What new understandings have begun to develop?
3. What questions do you wish to pursue?

Questions for the second interview focused upon:

1. Development of understandings and practices related to collaboration, resource-based learning, and/or information literacy,
2. Conditions facilitating or impeding implementation of collaboratively planned units, and
3. Observations of effects of collaboration on student learning opportunities and outcomes.

Findings

Data Analysis

A strike by university support staff prevented 4 of the 19 pre-service teachers from completing their pre-experience concept maps, and analysis was based on maps from the remaining 15 pre-service teachers. Pre- and post-experience concept maps were analyzed quantitatively and qualitatively by adapting concept-mapping techniques (Trochim, 1989). Adaptations included the elimination of the sorting task by participants, the use of non-statistical methods to categorize data, and the use of t-tests to examine pre-and post-experience knowledge differences. Analysis of the pre- and post-experience concept maps included counting the total number of "branches" directly off each of the three target concepts (primary branches), the total number of sub-categories for each of these branches (secondary branches), and the number of linkages among the three concepts. Figures 1 and 2 show examples of pre- and post-experience concept maps and designations of primary and secondary branches, and linkages.

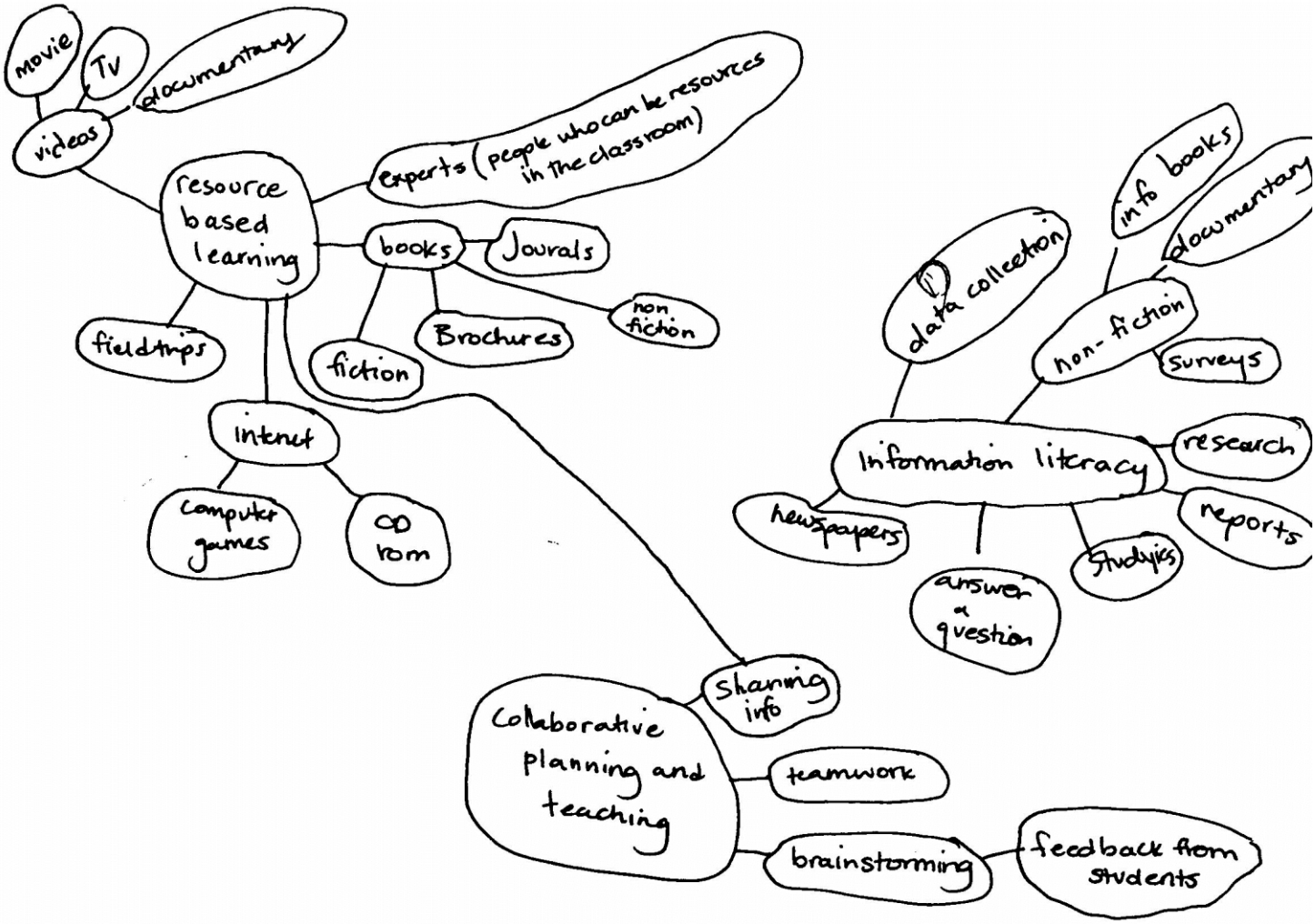

Figure 1. Pre-Concept Map representing primary and secondary branches.

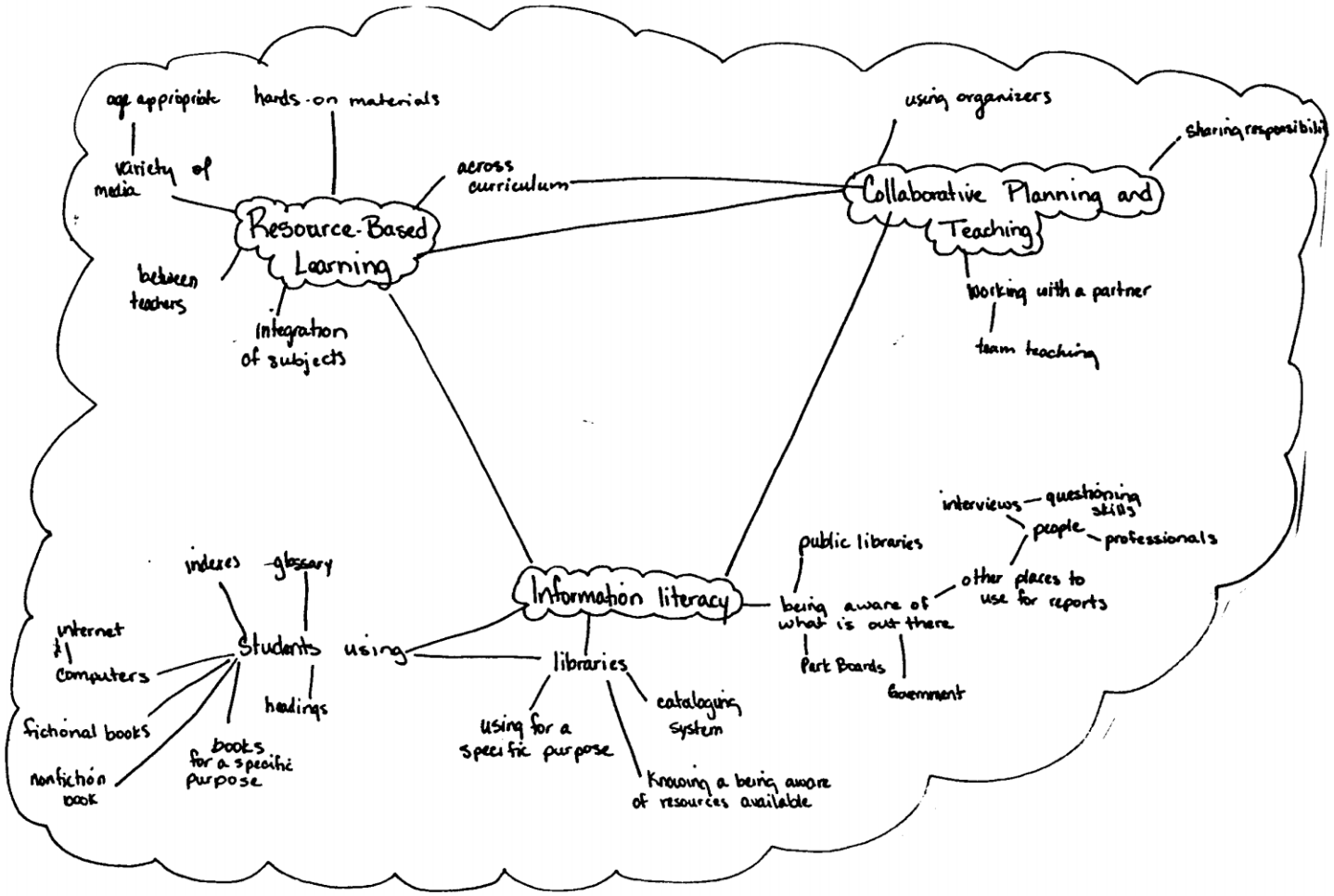

Figure 2. Post-Concept Map representing primary and secondary branches, and linkages.

Descriptive analysis of the total number of primary and secondary branches and linkages was followed by one-sample t-tests with two-tailed to determine changes in the amount of pre-service teachers' understanding of each of the three major concepts.

All 19 pre-service teachers and 4 teacher-librarians participated in the first session of group interviews. One school was new and had only begun to develop a library collection. The pre-service teachers and teacher-librarian from that school joined those from another school where there was a well-developed collection and computer resources. The three group interviews following the initial collaborative planning sessions were transcribed with text segments coded according to the three major concepts. These were then coded and re-entered into the computer and connected to the major concepts. The two researchers then independently read the data looking for themes within the three major concepts, and they compiled with representative evidence other categories and themes that emerged. The researchers discussed and resolved any coding differences. Finally, the researchers reread the data for further insight and disconfirming evidence about the themes that arose during initial analysis. When agreement was reached, the researchers independently re-read the data to ascertain the validity of the revised themes and then discussed and resolved any remaining discrepancies.

Results reported in this paper are limited to analysis of (a) pre-service teachers' pre- and post-experience concept maps, and (b) initial group interviews with pre-service teachers and teacher-librarians.

Pre-service Teachers' Concept Maps

Table 1 lists the results of the descriptive analysis of pre-service teachers' pre- and post-experience concept maps representing their understanding of collaborative planning and teaching, resource-based learning, and information literacy.

Table 1
Total Number, Mean, and Range of
Primary Branches, Secondary Branches, and Linkages Among
Concept Maps Representing Pre-service Teachers' Understanding of
Collaborative Planning and Teaching, Resource-based Learning, and
Information Literacy

	Primary Branches		Secondary Branches		Linkages	
	Pre	Post	Pre	Post	Pre	Post
Total	228	362	28	50	12	29
Mean	15.2	24.1	1.8	3.3	.08	2
Range	1-29	10-41	0-5	0-11	0-3	0-5

N = 15

Note: Primary branches are those directly linked to the concept; secondary branches are those connected from the primary branches; and linkages are connections drawn between any two or more of the three major concepts. Numbers of primary and secondary branches, and linkages refers to total for all three concepts.

The total number of primary and secondary connections to all three concepts increased from 256 to 412, or 62%. Although the number of linkages among concepts was low overall, pre-service teachers did more than double their ability to see connections among the key concepts.

Table 2 displays results of t-tests used to investigate significance of the amount of understanding between pre- and post-experience concept maps.

Table 2
T-Test Analysis of Pre- and Post-experience Concept Maps

Connection Level	df	Mean	SD	t-value	p
Primary	14	9.07	9.1	3.54	.003*
Secondary	14	1.60	2.95	2.10	.05
Linkages	14	1.27	1.22	4.01	.001*

N = 15, * Significant at $p < .05$, two-tailed.

At the .05 level of significance, the results of t-tests show that there was a statistically significant increase in pre-service teachers' knowledge of collaborative planning and teaching, resource-based learning, and information literacy at the primary connection and linkage levels. The increase in amount of secondary branches approached (.05) but did not reach significance.

Group Interviews

Results from the first session of interviews are summarized in Table 3 and show the emergent knowledge about the three target concepts plus an additional concept that arose regarding learning and teaching conditions for integrated information literacy instruction.

Table 3
Knowledge of Collaboration, Resource-based Learning, and Information Literacy: Teacher-librarians and Pre-service Teachers

Concept	Knowledge about Concept
Collaboration	Method for extending, enriching, and focusing ideas Teacher-librarians' knowledge of resources and student abilities makes planning more realistic Teacher-librarians can be mentors Collaboration process as problem solving
Resource-based Learning	Available resources influence teaching ideas and objectives
Information Literacy	Composed of concrete skills
Learning and Teaching Conditions	School culture of collaboration Flexible scheduling

N = 19 students and 4 teacher-librarians

Pre-service teachers appeared to gain the most new understandings about the concept of collaboration from their first experiences in collaborative planning. They spoke about collaboration as a way of extending and enriching ideas:

> *All of sudden we had a whole bunch of things we could go from rather than just a small set of ideas we had on our own.*
>
> *[The teacher-librarian was able] "to give us different teaching strategies and ideas that maybe we've never used or seen.*
>
> *It leads you to a new place you might not have thought about—gives you a whole new perspective.*

Teacher-librarians confirmed these insights: "I find that in school, people do collaborate because you are going to make that unit much more rich if you can work with someone rather than just try it alone."

In addition to extending a person's ideas, pre-service teachers also noted that collaboration helped them focus ideas that were initially too vague or large to actually write down. One pre-service explained that "rather than my first idea . . . I'm going to have them do research on what I've taught them in government…." One student found the collaboration experience to be "more realistic—just to be able to say, 'this is what I'm thinking—is it too much? Too little? Am I heading the right way?' "

The pre-service teachers learned that the teacher-librarians' knowledge of both the resources and the abilities of students in their practicum classes made the assignment of planning an integrated unit more realistic:

> *... you have the background knowledge of the children.*
>
> *... within five minutes, I had two tables filled with books that were exactly what I needed and wanted.*

Although the pre-service teachers did not directly refer to collaborative planning as a problem solving process, the teacher-librarians did. Referring to the collaborative planning experiences with the pre-service teachers or their past experiences with other teachers, the teacher-librarians described this process as negotiating a fit between available resources and ideas or between contrasting perspectives on teaching and learning:

> *That's part of collaboration—finding a solution.*
>
> *... a journey into collaboration because you may be coming at things from totally opposite points of view ....*

While the pre-service teachers revealed new insights about collaborative planning related to the teacher-librarian's ability to focus and extend ideas as well as customize teaching ideas to available resources and students' competencies, the teacher-librarians also demonstrated how they support new teachers. During one of the interviews, one pre-service teacher revealed her concerns about integrated learning units as an approach that might actually bore students because of the breadth and depth covered about a single topic. The following exchanges represent how teacher-librarians assisted these less experienced pre-service teachers (words in parenthesis added for clarification):

> TL-1*: I have done this (the integrated unit) before (as a teacher). Every afternoon was whales. I incorporated everything: science, math, art, language arts, reading, silent reading—everything we did was around it and it was exciting. The kids really enjoyed it.*
>
> S-4*: They didn't get bored? . . . They didn't always hate you for making them study whales?*
>
> TL-1*: No, they like whales, they like dolphins.*

Resource-based Learning

Although the pre-service teachers had been involved in short practicum experiences in term one and during the first two weeks of term two, this was the first time they had spent any time in their school library. This experience seemed to impress upon them the different resources available in their schools and at the university and the role of available resources in unit planning. One pre-service teacher exclaimed, "There's just so much information out there …. This is like taking the information you have and making it so much more useful."

Although the pre-service teachers had been introduced to the district resource center the previous term, they did not have a specific context for its use at that time. During the collaborative planning sessions, the teacher-librarians showed students how to access and navigate the district resource database. One pre-service teacher explained that "realizing that not only are there supporting resources, but basically a whole class set of novels there—whenever they want—that's really, really helpful." Another remarked that seeing the resources in her school changed her unit focus:

> *Rather than my first assignment on parliament, there's not enough books for all students on parliament, so what I'm going to do is most of my unit on government, politics, and the law.*
>
> *Now we can have a look here and see what's available. It really helps me direct my brainstorming into more concrete ideas of lessons ….*

One of the teacher-librarians concluded from the pre-service teachers' discussion of the role of resources in planning that "it is much easier to go from resources to plan than from plan to resources…"

Finally, pre-service teachers commented that becoming familiar not only with the resources in their school library but also their organization was helpful. Two teacher-librarians confirmed how important this was, adding they were finding that "there is a whole generation of teachers out there that aren't really library literate."

Information Literacy

Although pre-service teachers commented least about information literacy, they noted that the collaborative planning experience helped them begin to understand what information literacy actually is: "The whole idea makes a lot more sense after you work one on one." Another pre-service teacher discovered that "there is actually a library skills book that you can use to kind of keep yourself on track."

Finally, a few pre-service teachers remarked on specific aspects of information literacy they had learned from the planning sessions such as search engines for children and teaching tools for helping students to evaluate web sites.

Learning and Teaching Conditions for Integrated School Library Programs

As the teacher-librarians responded to the pre-service teachers' queries and explanations of their emergent understandings, they identified two factors that support strong library programs: a school culture of collaboration (Oberg, 1999), and time for teachers and teacher-librarians to collaboratively plan and teach.

All four teacher-librarians pointed to the importance of a collaborative school community. One teacher-librarian had worked in contrasting school environments over her career and saw her present situation as most desirable: "This is a really good school in

terms of support…. Everybody's very encouraging, very helpful." Another teacher-librarian explained that collaboration "grows in a school … where you get to know people, you get to collaborate." She described the different degrees of fit that teacher-librarians have with their schools' teachers and how "what you do in your unit depends on your philosophical basis and your thoughts about learning."

The teacher-librarians also unanimously identified time as a central issue in carrying out what they would really like to be doing: "This is something I wish I could do, you know, all the time; it's hard because of all the extra time. Similarly, another teacher-librarian explained that "ideally it would be nice …. it depends if there is time set aside for that; the situation in most libraries in schools is that you have back-to-back prep; there are classes in all day." She went on to explain that teaching information literacy collaboratively with teachers is "a new thing …." Time was not always such a critical factor in this district as one teacher-librarian reflected on her many years of experience: "We really notice the years that there hasn't been the time or even the opportunity to teach information literacy and it hasn't been taught in the classroom."

Discussion

Analysis of both the pre-service teachers' concept maps and the group interviews with teacher-librarians and pre-service teachers together suggest that pre-service teachers see the school library as more than a warehouse and the teacher-librarian as having some valuable roles to play in the success of their own teaching. Teacher-librarians appeared to rekindle their beliefs about their preferred roles as partners in curriculum design, implementation, and evaluation.

Preliminary analysis of the pre-service teachers' concept maps indicates that when pre-service teachers work with teacher-librarians in authentic contexts, they significantly increase their understandings of resource-based learning, information literacy, and collaborative planning and teaching--the three concepts underlying current school library visions in both Canada (ATLC & CSLA, 1997) and the United States (AASL & AECT, 1998). Knowing more about these concepts may better prepare the pre-service teachers in this study to form instructional partnerships with teacher-librarians in their future schools. Qualitative analysis of concept map data is needed to reveal the particular ways that pre-service teachers expanded their knowledge about these central aspects of school library programs.

Analysis of the first interview session data indicates that even at this early stage of the process, the authentic experience of working in their practicum school libraries with the school's teacher-librarian made abstract notions begin to come to life:

> *I understand more and how collaborative planning would be to me.*
>
> *I can't say I would have thought to have the teacher-librarian as a resource in a way that it is possible to.*

The interviews suggest that pre-service teachers were moving towards conceptions about collaboration, resource-based learning, and information literacy that are consistent with the professional literature. They talked most about what it means to collaborate with teacher-librarians because that was a salient feature of the planning sessions and something completely new to them. The pre-service teachers had previously worked with their school advisor during an earlier two-week practicum, but collaborative planning had not been explicitly addressed at that time. From the planning sessions they appeared to gain insight into the teacher-librarian's collaborative role as builder and focuser of ideas as pertinent to resources and students' abilities, competencies identified in current guidelines (AASL & AECT, 1998; ATLC & CSLA, 1997).

Teacher-librarians, on the other hand, echoed the professional literature on the implementation of curriculum-based school library programs (McCarthy, Zweizig & Hopkins, 1999) when they spoke about critical variables for successful collaboration such as flexible schedules that provide time to plan and teach and, by implication, teacher commitment. They likely stressed scheduling or time because of the lack of these conditions in their own working environments. Webb (1999) describes these conditions (fixed schedules) as contrary to supporting constructivist approaches to teaching and learning; fixed schedules mean that when students are dropped off at the library once a week, teachers use the time for their own planning or grading rather than instruction and students use the time more for checking out books than for learning. By contrast, flexible scheduling, where classes are scheduled for instruction based on instructional need rather than a fixed calendar, significantly affects the amount of collaboration and information literacy instruction (VanDeusen & Tallman, 1994).

The extension of the Information Literacy Project into the schools seemed to bring out both frustration with the present and a reminder of what should be for the teacher-librarians in this study:

> *Just sitting here planning stuff—that's what I want to be doing--not covering preps! I do teach the Dewey decimal system and research skills and how to use an encyclopedia, and all that which is very important. But this makes it more realistic.*

Conclusions

Student learning is at the heart of all current educational reforms. Collaboration is a key factor of effective schools (Taylor et al., in press) and a focus of school reform (Fullan, 1991, 1993). Collaborative planning, teaching, and evaluating with teachers for the purpose of supporting students' learning in curricular areas and in developing those information literacy skills required to become independent lifelong learners have been the center of school library programs for most of the latter half of the 20th century. The extension of the Information Literacy Project described in this paper was designed for new teachers so they could experience this kind of collaboration before becoming acculturated to view teaching as "an individual craft" (Clark et al., 1996, p. 217). True collaboration is the goal and ideal:

> *The principles in a true collaboration represent complementary domains of expertise. As collaborators, they not only plan, decide, and act jointly but also think together, combining independent conceptual schemes to create original frameworks. Also, in a true collaboration, there is a commitment to shared resources, power, and talent; no individual's point of view dominates, authority for decisions and actions resides in the group, and work products reflect a blending of all participants' contributions.* (Minnis, John-Steiner, & Weber, 1998, p. C-2)

There are several limitations concerning what pre-service teachers in this project came to understand about the teacher-librarian as instructional partner and the nature of an integrated school library program. First, their collaborative experiences were limited to the planning of instructional resource-based units. Other collaborative experiences with teacher-librarians such as selecting a collection of learning resources, teaching and evaluating specific lessons, and developing an overall school library program were missing. Second, inequities between the collaborating partners in the project—pre-service teachers and teacher-librarians--existed with respect to their experience and status. This made true collaboration unlikely. However, evidence of a mentoring relationship between pre-service teachers and the teacher-librarians was gleaned from the interviews, and this could be an effective strategy for supporting new teachers' professional development. Finally, conditions in the districts did not support the likelihood that the integrated, collaboratively planned units would be fully implemented or that the pre-service teachers would see collaboration with the teacher-librarian as part of their school cultures (Pickard, 1993).

Further studies could examine the nature of the collaboration during the project and the conditions that best bring about the ideal complementarities described by Minnis et al. (1994). More attention should be paid to factors ensuring (a) ownership of the collaborative process by all participants, (b) balancing benefits of collaboration with intensification of teacher and teacher-librarian work, and (c) authentic as opposed contrived models of collaboration (Gitlin, 1999). Other topics to investigate about teacher's pre-service and in-service years include the effects of teacher and teacher-librarian collaboration on student learning opportunities and outcomes (Kuhlthau, 1999; Lance, Welborn, & Hamilton-Pennell, 1993), and teaching satisfaction (Clark et al., 1996).

The extension of the Information Literacy Project into the schools represents a professional development program not only for pre-service teachers but also for in-service teacher-librarians, teachers, and administrators. Such a project maximizes the potential of universities to participate in educational change through professional development (Doiron, 1999; Loucks-Horsley, Herson, Love, & Stiles, 1998). Plans are underway to continue the types of partnerships described in this study between teacher education programs and school districts to prepare new teachers for instructional partnerships with teacher-librarians. One improvement would be to increase the continuity of university support of the language arts course and practicum term. Hectic schedules for all the participants meant that the researchers were not able to return to the schools for follow-up until several months after the collaborative planning sessions. It would be valuable for this to evolve into a true action research structure for the teacher-

librarians with more ongoing connections with the university. Teachers need to be invited into the partnership from the early stages as well. Although the partnership in this study was originally planned as a triad between teacher-librarian, pre-service teachers, and school advisors, scheduling difficulties left the teachers out this year. Finally, this study needs to be replicated in other districts where populations, resources, political climate, and other variables exist.

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Theory into Practice: Using the PLUS Model to Teach Information Skills and Support the Curriculum in a Secondary School

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This paper examines the use of PLUS, a four-step model of information skills, in a secondary school in England with 28 Year 8 pupils doing a physics project. The pupils completed a questionnaire relating to their use of the PLUS model and their attitudes to brainstorming, keyword selection, evaluating resources, reading for information, taking notes, and writing. The teacher and librarian were interviewed. Findings showed that pupils responded favourably to using the PLUS model in all areas and that the teacher and school librarian noted improvement in the pupils' learning, writing, and information skills as a result of using the model.

Introduction

There has been a significant increase in the attention paid to the process of pupils' learning in secondary schools in recent years, and the importance of providing pupils with the necessary information skills to enable them to use effectively a range of print and electronic sources of information is now recognised in many countries across the world. This paper briefly reviews the literature on information skills (the term information literacy is also used) and identifies a number of models that exist in this field, particularly the PLUS model. The paper then describes a small-scale research project undertaken in Ripon Grammar School, Yorkshire, England that focuses on the use of the PLUS model within the physics curriculum and that seeks to evaluate the views of the pupils, the teacher, and the school librarian on the applicability of this model within the secondary curriculum. The conclusions of the study identify the advantages and limitations of using a model such as PLUS in a secondary school's information skills programme and provide pointers for school librarians and teachers in other schools who seek to improve pupils' learning skills within the school curricular subjects.

A number of models have been proposed for school librarians and teachers to consider when implementing an information skills programme in their school. Marland (1981) presented the nine-step approach that identifies a series of questions that pupils might ask themselves when completing assignments. Eisenberg and Berkovitz (1990) offered the *Big Six* model that contains " six broad skills areas necessary for successful information problem solving." Kuhlthau (1994)

developed a model that identifies how pupils feel during the assignment process as well as what they do, and Wray and Lewis (1995) presented a ten-stage model (EXIT) that focuses on pupils "interaction with the text."

The PLUS model (Herring, 1996) incorporates the key aspects of previous models and categorises information skills into 4 interrelated steps: *P*urpose, *L*ocation, *U*se, and *S*elf-Evaluation. The PLUS model provides a framework for pupils and teachers to use, but it is not seen as being only a linear model in which pupils work through each stage sequentially when completing an assignment. The PLUS model encourages pupils to identify purpose (e.g., brainstorm and map concepts), to locate relevant sources (e.g., search for and access print and electronic information resources), to use effectively the ideas and information found (e.g., read for information, take notes), and to reflect on their own information skills through self evaluation (e.g., evaluate their original plan or range of sources used).

Research

The research project in Ripon Grammar School was based on a Year 8 (age 13) science project in which pupils explored an aspect of sound technology by using their knowledge of the topic gained from classroom-based work with the science teacher as well as library resources such as books, journals, and CD-ROMs. Pupils had some limited access to the Internet, but using the Internet was not a requirement for this project. Working with the school librarian and the science teacher, the pupils were encouraged to use the elements of the PLUS model to

- plan their assignment with brainstorming and concept mapping,
- locate and evaluate relevant sources of information,
- read for information on their topic and take notes, and
- choose a form of presentation for their project.

The pupils worked in pairs on the project and used guides to key information skills in the form of handouts given to them by the school librarian.

Questions and Methodology

The methodology utilized a questionnaire (Leedy 1993; Silverman 1997) to answer the following research questions:

1. Did pupils find benefits in using brainstorming and concept mapping in their project?
2. Did pupils find that evaluating resources was a useful step in the process?
3. Did pupils find the identification of keywords useful when reading for information?
4. Did pupils find the PLUS model useful in structuring their approach to the project and in improving the quality of their work?

The views of the science teacher and the school librarian were elicited through semi-structured interviews (Moore, 1983; Slater, 1990).

The discussion includes conclusions relating to the research questions, the limitations of the research with regard to its size and methodology, the relevant existing literature, and further possible research.

Findings

Pupils' Opinions

With regard to planning their work by brainstorming, selecting keywords, and forming questions, the pupils overwhelmingly (26/28) agreed that the PLUS model helped them to focus their work. The reasons given were varied, but the key factors identified were that planning with PLUS helped in

- searching for and finding information ("Because it helps you to actually find good information and to limit you to certain information.").
- identifying and organizing information ("I was able to sort out what I knew from what I didn't and find out what I needed to research"),
- forming questions ("Using keywords helped us to form questions and find the information"), and
- organising their work ("Because it helps you organize your work better; It made it easier later on.").

Two pupils did not agree, and one commented, "It didn't because we had to change it all after because we didn't get the right keywords".

All pupils agreed that "the initial planning made it easier to identify useful information" for their project. The pupils' comments were related to the ease with which they could identify relevant information when using books and other resources:

Because you only had useful information instead of non-useful.

Because you knew what to look for and not worry about what information to use.

The planning also helped them to use the keywords that they identified at the planning stage:

The keywords helped me find books.

Because you knew what words to look under.

Pupils also commented that the planning helped them quickly identifying subject headings in the library catalogue and that this saved them time.

In the project, pupils were asked to evaluate library resources before using them to take notes for their report. In the past, pupils had often complained about this step as an unnecessary hurdle to cross during the project. It was clear, however, that when the pupils looked back on this process at the end of the project, they overwhelmingly agreed that it was very useful for them to evaluate and choose resources before collecting information. One of the key reasons given was that this saved time at the next stage of the project:

When it came to writing up you knew exactly where to look, so you didn't waste time.

It saved time looking at useless information.

These remarks demonstrate that pupils could identify the links between the different stages of the project as well as the benefits they gained in terms of saving time and not reading

irrelevant information when taking notes. The pupils also noted that this stage helped them to clearly identify relevant resources that related to the keywords they had previously chosen: “Because I saw which [resources] had the most information and understandable words that connected with my keywords." The pupils also found this process helpful in rejecting resources on the basis that they were not of the right standard: "Because some of the books were too simple and some were too complicated."

Pupils selected among different methods of recording information when they took notes from the resources: note cards, a grid, A4 paper, and "other methods" such as a concept map/spider diagram. Most pupils (16/28) favoured the grid method with note cards being the second most popular method (9/28). Four pupils used A4 paper and two used spider diagrams. Three pupils used more than one method. When asked why they preferred their chosen method, the pupils gave a wide variety of reasons. The main benefit to be seen from using their preferred method was that the information gathered was easy to read and find: "Because you can just skim over it to find the information you find useful." Pupils also agreed that, particularly with regard to the grid, the methods brought all the information together, and this facilitated both retrieval and organisation of notes:

Because you know where all the information is [grid].

Because you can see all your ideas at once [grid and A4 paper].

Using these methods, the pupils found it easier to organise the information they had gained from the resources:

Because I could put them [note cards] in a suitable order for my topic.

Because you have questions and answers all organised.

One pupil saw taking notes as a key step in the project process: "The note cards gave us the general idea and a grid really helped because it was the foundation for our project.” Other comments related to pupil preferences, and one pupil stated that she used a spider diagram because that was the method she most liked. Another pupil found note cards the most useful "because they are small and handy; they keep all your information on them neat and tidy." Another pupil liked the grid "because you can cut it up and arrange your information." Thus the methods used by pupils varied, and it is clear that the pupils' reflection on their use showed an awareness of the process of doing a project as well as the subject content covered.

Pupils were encouraged to use a mental map to organise their ideas and notes before starting to write their project, and they were asked if using the map was useful. Most pupils (22/28) used the map and found it to be very helpful. Six pupils did not use a mental map, but only two commented on the non-use, stating that they used an alternative method "because we decided to do it differently." The key benefit identified by pupils was that the mental map helped them to arrange their ideas effectively before writing:

Because I knew what order to put the information in.

Because you could plan all the information before you actually wrote it up on the computer and changed your mind.

Because I would have written the wrong things in the wrong place.

Thus pupils were aware of the possible consequences, through previous experience, of *not* classifying and organising their ideas before writing. Other comments included "Because if I didn't [use the map] I would miss things out" and "Because it helped the presentation." There is clear evidence here of pupils being aware of the links between the different stages of the process of project work in that they are able to identify possible consequences if they fail to plan and organise their thoughts and their notes.

Pupils were asked whether they enjoyed using the PLUS method in their project, and most pupils (20/28) stated that they did. The reasons given were varied but did demonstrate the pupils' ability to review their methods of working and to draw conclusions from their experiences. The main reason for liking the PLUS model was its ease of use: “Because it's easy to use and you don't forget things." Pupils put equal value on the fact that the model allowed them to identify clear stages in the project process and this helped them to carry out their project in a logical manner:

Because you knew what to do next.

Because it meant that I did everything in the right order.

Because you do the project in stages rather than doing it all and getting mixed up.

One pupil stressed the importance of linking the different stages: “Because you can change it and make mistakes on your plan and you're not just looking for information and writing it up straight away." Another pupil recognised the value of the planning stages of the PLUS model: “Because there is quite a lot to do but it is a challenge and if you work hard at the beginning you are likely to get a reasonable mark." Those pupils who stated that they did not enjoy using the model had different reasons. One pupil found the model laborious: “I would have prepared most of it in my head.” Two pupils found it boring and two other pupils preferred their own methods:

I found it too restrictive.

It isn't bad, I just like taking notes my own way.

Nevertheless, these pupils later stated that it did help them produce better work.

The pupils were then asked whether the PLUS model had helped them "produce better quality work," and the great majority of pupils (24/28) agreed. As above, there was a wide variety of comments from pupils, but most pupils agreed that using PLUS enabled them to be more organised in their approach to project work:

It's a more organised way of producing work."

Because I concentrated more because I had guidelines.

Pupils also appreciated the fact that using the model broke the process into stages and encouraged them to plan ahead:

Because we can think it through more instead of rushing into the project.

It helped me because it made me do a step-by-step project.

Other pupils noted improvements in their own performances:

Because so far I have had better work using this method.

Because so far I haven't got that high a mark on a project.

Of the pupils who did not agree, two stated that other methods could have been used ("No, I think it would have been the same whichever way."), one pupil found the model confusing, and another stated, "No, the planning is better but I didn't make enough final notes." The latter pupil at least did learn from the self-evaluation part of the model.

Asked whether they would have made any changes in the way in which they worked during the project, 14 of the 28 pupils stated that they would not make changes. Of those who would have made changes, some argued that they would have found or included more information in their project:

I could have added more information.

Work a little faster and collect more information.

Other comments included a preference to work alone, a need to spend more time in the library, and a change of topic.

The Teacher's Perspective

The physics teacher thought that the PLUS method offered simplicity and flexibility and allowed the pupils to achieve successful learning outcomes and to develop their independent research skills. The teacher stated that while many pupils can access large quantities of information they lack the expertise that will allow them to differentiate resources according to relevance and suitability. The structure of the PLUS method provided younger pupils with controlled access to information and helped to ensure that it was at a suitable level for their abilities. Careful lesson planning helped pupils to remain on task since many of the activities took less than 20 minutes. The structure becomes less teacher-driven as the pupils progress through the school, and they show a willingness to adapt the PLUS model into their own user-friendly version.

The teacher stated that it was essential to undertake pieces of research that are of manageable length within curricular time constraints. Many of the finished projects were shorter and less complex than those previously produced, but there was little doubt that plagiarism and cut-and paste projects were reduced to a negligible level. Moreover, the pupils understood the topic they had researched, and this had not always been the case with previous groups of pupils.

According to the physics teacher, information skills were now working their way through the school and all pupils were feeling the benefits of good research practice. The PLUS method could be adapted in the school by pupils and teachers without compromising the basics of the technique. Using the model had resulted in the pupils producing work that demonstrated how independent learning can serve their needs and talents in a world rich with information.

The School Librarian's Perspective

The school librarian thought that the PLUS method incorporated the same general processes as other research models, such as Marland (1981), but that its strength lay in its simplicity. Pupils found the acronym PLUS and the steps for which the letters stand easy to understand and to remember. The school librarian believed that because it is easily remembered there is a much greater chance that the pupils will use PLUS in situations outside of the structured research lessons.

According to the school librarian, pupils used to working in a formal educational environment are often unsure of doing their own research, particularly when working in groups. The PLUS method's simplicity demystified the process of research and provided " a manageable roadmap that in our experience even the least confident pupil find accessible". The basic PLUS model can also be easily differentiated to match ability or age groups and has been used successfully in this school from Year 7 pupils (age 11) to Sixth Formers (age 17).

Pressure of the curricular timetable and demands upon the library mean that pupils do not always have a great deal of time in which to conduct their research. The PLUS method provided both pupils and staff with measurable targets to complete, and this encouraged efficient use of time and resources. The normal pattern for research was for three sessions in the library that correspond to the first three steps of PLUS. The final step of self-evaluation was completed in the classroom.

The school librarian argued that the use of any structured approach to research encourages pupils to produce their own work rather than merely copying facts with little or no understanding:

> *Since we have incorporated the PLUS method into the project work done in the library what we have found is that the work produced is often less complex than previously produced but is based more firmly on the youngsters' own understanding of the material.*

This evidence of enhanced learning was the greatest testament to the success of the PLUS method in our school, in the school librarian's opinion.

Conclusions

It is clear from this study that the pupils doing this project greatly benefited from using the PLUS model. The pupils improved the way they planned their projects by brainstorming and identifying keywords. They evaluated resources before choosing which ones to use for their project. They identified clearly the links between the stages of the model; and they showed a good understanding of the way in which planning, location, use, and self-evaluation were integrated within their project work. The pupils constantly used the terms "sorting," "organising," "order," "ideas," and "information" ; and they demonstrated the ability to think about how the stages of the project related to each other while they were doing the project. Having completed the project, the pupils showed an ability to reflect on their own practice and that of their group. For most of the pupils, the PLUS model was seen as something that helped them in their approach to this project and provided a structure that enabled them to be, in their own words, "more organised"; and it is clear that the pupils saw the need to have an organised or structured approach to the project. This was partly due to the demands of the project, in that they had to complete a

number of tasks, but this was also something that was stressed by both the teacher and the school librarian.

It is clear that a model such as PLUS does not suit all pupils, that some prefer their own methods, and that some pupils need much less guidance than others when completing a project. It is also clear, however, that the pupils benefited from being given a structure to work with. Whether some pupils would have imposed their own structure and still successfully completed the project was not investigated. Also, this investigation has examined pupils' use of the PLUS model, and the same pupils were not offered the opportunity to use other models. Thus the authors are not claiming that the PLUS model is superior to other models but rather that pupils do benefit from being given some model to work with. The other limitations to this research are that the research relates only to one school and one project with one group of pupils. Thus there is no attempt to generalise about either the usefulness of PLUS in other subjects in this school or in other schools. It should also be noted that this is a highly structured project, with pupils given much guidance from the teacher and the school librarian, and therefore no conclusions can be drawn in relation to other, perhaps less structured, projects which pupils might complete in the school.

Further research is being undertaken in the same school with Year 7 pupils (age 11) who also used the PLUS model while completing a science project, and it will be interesting to compare the results of the two projects in terms of the pupils' approach to the planning of projects and their use of information skills when using a range of information resources in the school. Another area of research that would be fruitful to investigate is the extent to which pupils learned from using PLUS in this project and applied the same skills when completing other projects in the school.

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Professional Papers

Part 3:

Information

Blocking Access to Information and Ideas: The Use of Internet Filtering Software and Levels of Satisfaction in North American Schools

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A primary purpose of the school library program is to enable young people to access and make effective use of information and ideas. This role has been enhanced through access to electronic resources. The Internet, however, is not a pre-selected menu of information sources deemed appropriate for children and young adults. Therefore, some libraries employ software to block or filter unfettered access to information. The purpose of this study was to measure the penetration of this filtering software in North America, to ascertain which types of software are used, and to determine librarians' levels of satisfaction.

Introduction

The school library, through its teacher-librarian and collaborative program, enables students to access and make effective use of recorded information and ideas. Teacher-librarians take seriously their professional responsibility for selecting and making available a wide range of current, accurate, relevant, and appropriate resources.

The advent of the Internet and access to Internet resources in school libraries has led many teachers, administrators, parents, and teacher-librarians themselves to question the right of young people to unfettered access to information, particularly through the Internet. Inappropriate pornographic or obscene sites on the World Wide Web are most commonly cited as problems along with Internet Relay Chat rooms frequented by pedophiles. One alternative becoming more common is to employ the use of blocking or filtering software that purports to prevent users of equipped computer terminals from accessing such sites or protocols.

Purpose and Method

This research was funded through a contract with Cahners Inc., the publishers of *Library Journal* and *School Library Journal*. As the initial purposes of the study for the researchers and for the contractors were not identical they were subject to negotiation.

For the researchers, the initial broad purposes of the study were to investigate the following questions:

1. Who uses Internet filters in Canada and the United States of America, and are there differences in use dependent on geographic location, gender, qualifications, years of experience, or size of budget?
2. Who decided that the library would use Internet filtering software, and was the decision made at the school, district, or provincial/state level by educators or by politicians?

3. How widely are filters used in a district (i.e., in all schools in a system or in only some schools such as the elementary school)?
4. Is the filter located on or off site with a client or proxy servers, or an Internet Service Provider (ISP)?
5. Does the filter work use key words/phrases, access/denial lists, or Platform for Internet Content Selection (PICS)?
6. What alternatives to filtering were considered or are now employed, and is the emphasis of the overall program on preparing students to deal with sources of information beyond their interest or maturity or on protecting students from inappropriate sources of information?

For the contractor, the initial purposes of the study were to determine which Internet filter programs are used in schools and public libraries and the level of satisfaction with them.

As a result of several discussions, the purpose of this study was to:

- Measure the penetration of Internet filtering software in the school and public library markets.
- Ascertain which software brands are used and what they feature
- Determine librarians' levels of satisfaction with the software and the vendors.

Each of these research areas met the contractor's needs while enabling the collection of additional data of interest to the researchers. For example, while it was not possible to study demographic profiles in detail, as this would invade the publishers' relationship with subscribers, it was possible to answer technical questions about how the filters work and where they are located through the data collected about software features. Similarly, it was possible to assess where the decision was made and which alternatives were considered through open-ended questions related to satisfaction levels.

A literature review was conducted with graduate students Betty Barton Chapin and David Bruce to identify the issues related to filtering Internet-based information for young people, alternatives to filtering, the software currently available, and their strengths and limitations. This review was reported as follows:

Haycock, K., Barton, B. & Bruce, D. (1999). Information age dilemma: Filtering the Internet for young people. In D. Bogart (Ed.), *The Bowker annual library and book trade almanac*. (44th ed., pp. 235-265). New York: R. R. Bowker.

See also:

Bruce, D. (1999). Filtering the Internet for young people: Products and problems. *Teacher Librarian: The journal for school library professionals, 26* (5), 13-17.

Chapin, B. (1999). Filtering the Internet for young people: The comfortable pew is a thorny throne. *Teacher Librarian: The journal for school library professionals, 26*(5), 18-22.

Drs. Ann Curry and Ken Haycock developed the survey questionnaire with graduate student Myfanwy Postgate. The survey was reviewed three times by the contractor, revised for content, approved by both researchers and contractor, and mailed on April 24, 2000 to a random sample of 2,000 school librarians and 1.000 public librarians who subscribe to *School Library Journal.* The field closed May 26, 2000.

There was no notice for the survey sent in advance of the mailing, nor a follow-up reminder, but respondents were invited to select a charity of choice for a donation of US $1.

This preliminary report provides a summary of the school library component and makes comparisons to public library responses only when they are substantially different and of general interest. Drs. Curry and Haycock are preparing a report to the profession in *School Library Journal* and its 43,000 subscribers. Further interpretation and dissemination is anticipated.

Results

Profile of Population

Seven hundred and thirty-one surveys were returned for a response rate of 24%, comprising 465 school librarians (23%) and 266 (26%) public librarians. Thirty-one percent of the schools included elementary level grades (K-5), 51% included middle/junior high school grades (grades 6-9), and 44% included high school grades (grades 9-12); the percentages do not add up to 100% as many libraries serve schools with more than one level of schooling.

It should be noted here that the sample was not representative of the standards of support typical of school libraries in the United States and Canada. It was also not representative of the profile developed in *School Library Journal*'s own biennial surveys of levels of support in school libraries.

For this study the elementary schools had a mean population of 543, the middle/junior schools 702, and the high schools 945, with a mean for all schools of 775 students. The job titles used most frequently were media generalist (55%) and librarian (32%). The schools, stated in means, were staffed with (full-time) 1.6 library media specialists (or teacher-librarians, the term used in this paper), 1.1 clerical staff, 3.2 volunteers and 4.5 student assistants. The per capita expenditure last year for print and electronic resources was US $18.65 per year.

Policies

It has long been standard practice to encourage schools to develop policies on the selection of library materials so that the school community understands why and how materials are selected and the means by which they might be reconsidered. In this study 91% of the schools had such a policy, 96% had a policy on Internet access, and 96% had a policy on acceptable use of the Internet. The figures were somewhat higher for larger schools and high schools.

Of course, it is useful to have such policy statements only if students and community members are aware of them. Most schools (59%) inform students and parents through the student handbook, 56% require that students and parents sign Internet use waivers, 39% require that students sign up before use, and 37% provide informal instruction. Perhaps surprisingly, only 25% post the policy (higher in high schools), only 24% offer integrated instruction in Internet use, and only 21% provide formal training sessions.

These additional services are provided for Internet guidance:

- links to age-specific commercial databases (51% of the schools)
- links to pre-selected web sites (50% of the schools)
- links to age-specific search engines (37% of the schools; 50% of elementary schools and 20% of secondary schools)
- links to age-specific research tools (37% of the schools).

Slightly more than one-fifth (21%) of the schools provide none of these additional services.

Use of Filters

Currently, over twice as many school libraries (53%) as public libraries (21%) use Internet filtering software. An additional 11% of school libraries and 9% of public libraries have investigated using Internet filtering software and are considering installing it. Nearly seven out of ten public libraries (69%), however, do not plan to use Internet filtering software.

School libraries also embraced filtering software earlier than public libraries, with 46% having installed software prior to 1999 compared to only 33% of public libraries. The leading Internet filtering software system in the school library market is *Bess* (N2H2), with 36% of those using a filter using *Bess*. Next are *Surfwatch* (11%) and *Cyberpatrol* (10%). Many other systems are used by smaller percentages of schools. Interestingly, and disappointingly given the differences in maturity levels and interests, there is no difference in levels of filtering Internet access in elementary, junior high, or high schools.

Types of Filters

Systems work in quite different ways, however, and choice of blocking software should consider the methods of filtering best suited to one's situation.

Location of the Software. The Internet filtering software can be located on a client server (the individual computer) or on a proxy server (serving more than one computer terminal), and it can be on-site (in the library or school) or off-site (typically in the school district office). The library's Internet Service Provider could also manage the blocking or filtering.

School libraries are most likely (59%) to have their filtering software based on an off-site proxy server, while two in ten (21%) have their filtering handled through the Internet Service Provider. On-site proxy servers are used by 14% of those using filtering software. Interestingly, more than half of the public libraries in the sample (59%) have their filtering software installed on individual computers (client-based), while this is true of only 5% of the schools.

Methods of Blocking Access. Some systems block access based on words or phrases, while others have an approved access list (those web sites one might specifically access) or an approved denial list (those sites one specifically cannot access). Either the purchaser (the library, school, or school system) or the vendor might determine the method.

Almost half (47%) of the school libraries using Internet filtering software use vendor specified words or phrases for keyword blocking, while nearly three of ten (29%)

use specific words or phrases that they specify. There is some confusion here, however, as a surprisingly greater percentage of school librarians (35%) say they don't know what type of keyword blocking their library employs, compared to only 19% of public librarians.

Of the types of site blocking possible, the most frequently mentioned (43%) were vendor-specified denial lists with specific URLs or web sites blocked. Library-specified denial lists were mentioned by 24% of the teacher-librarians. Vendor-specified access lists were mentioned by 21% of the schools. Again, a significant percentage (44%) were unable to answer the question, perhaps explaining why the total of the reported methods exceed 100%.

Whether the filtering software employed a web rating system, such as the Platform for Internet Content Selection (PICS), could not be answered by seven out of ten (69%) of teacher-librarians.

What to Block. An important question for teacher-librarians is "who decides what is blocked?" Is it the library or the vendor? And if it is the library, does that mean the teacher-librarian, the school (whether the teachers, administrators, or parents), or the school district itself for all of the schools? All of these are possible in different situations.

Similarly, who controls changes to the filtering program? If, for example, the blocking software prevents access to a useful site on "breast cancer" or "Babe Ruth," can the teacher-librarian change the program to enable access? If so, is the change made quickly and with relative ease? Some programs offer the ability to change access immediately while other vendors and school systems can require several days wait.

The most frequently mentioned protocols blocked in schools by Internet software filtering are Internet Relay Chat (IRC) in 43% of the schools and e-mail in 31% of the schools. Disturbingly, in terms of advocates for student rights to freedom of expression and intellectual curiosity, 40% of the teacher-librarians in the study did not know what was blocked in their situation.

About half (54%) of the teacher-librarians surveyed did not know if the vendor would give them access to the list of blocked sites. Of those who asked the vendor for the list, only 61% were provided with it. *Bess* users were more likely to say that they can't have access to the list (73%). Nearly half of the teacher-librarians had made a request to change a blocked site; 85% said that the vendor honored the request (this was true also for *Bess*). Over half of the teacher-librarians had not asked the vendor a question about the software. Among those who had asked a question, the vendor was somewhat or very helpful (88%).

Decision to Install

It will be no surprise that school superintendents were the most influential group in deciding to install Internet filters: 73% of teacher-librarians rated Superintendents in the top three influential groups. Ranked second in terms of mentions are school board members (59%), followed by principals (36%). Also influential are school and school district Technical Committees (33%) and teacher-librarians themselves (28%). It seems likely that the influence of principals was lower than expected because the majority of school libraries use filters that are located on off-site proxy servers, most likely installed across the system as a result of a district-wide decision.

Levels of Satisfaction

Just over three-quarters (76%) of those who installed filtering software were satisfied with their decision; nearly one quarter were not. Elementary school librarians displayed a somewhat higher level of satisfaction than did high school librarians: 81% were satisfied versus 74% respectively. The majority, 87%, felt that the software met their expectations for filtering sites at least "somewhat". Teacher-librarians were also satisfied with the particular choice of software.

The extent of one's satisfaction or dissatisfaction with filtering software seems determined by one's view of each of the following five criteria, which resulted from examination of the qualitative responses to open-ended questions: (a) program alternatives, (b) student safety and control, (c) software flexibility and vendor response, (d) locus of decision-making, and (e) personal/professional satisfaction.

Program Alternatives. Clearly, teachers and administrators are capable, with parental involvement, of developing appropriate programs of effective and ethical Internet use.

> *I would prefer non-filtering software and extensive teaching of appropriate Internet behavior accompanied by intensive teacher involvement in selecting specific sites for student use.*
>
> *The job our school was doing in teaching the correct procedure of using the Internet was satisfactory.*

At the primary level there is no educational need for students to be searching the Internet. The classroom teacher or teacher-librarian can capture the sites appropriate for the topic of study and "bookmark" them for student use; indeed there are software programs available to assist with this process. The students can then use pre-selected and pre-screened sites for their inquiry.

> *Hasn't been a problem. Don't get blocked from too many sites. In our elementary school, we do more searching of pre-selected sites rather than free searching with key words.*

At the early intermediate levels, students could search together with their teachers or be taught basic search strategies such as Boolean logic. Some school districts taking a more broadly-based approach to resource management and information technology have found that students use their school library, commercial on-line databases, and CD–ROM sources, when they are available, for their information needs far more than the Internet because the information is more accurate, reliable, and complete. There is also an increasing range of both commercial and not-for-profit search engines available for these age levels that screen sites for age appropriateness. These can be added to a graphic user interface for school terminals for ages 8-12. This allows for positive selection of age-appropriate sites rather than random censorship of information for all ages.

At the intermediate/junior level and up schools might offer short "courses" in Internet ethics and appropriate use and perhaps provide a "driver's license" or simply add relevant additions to our schools' already comprehensive codes of conduct. A common example is:

> *I respect equipment, software and materials; I respect other student's work; When I quote or copy others, I give credit; I realize that all e-mail may be public information; When I find something inappropriate, I exit immediately; I don't give out my name or personal information over networks.*

These could of course be modified and can be supervised. Occasionally, the school may need to "suspend" a license to ensure compliance.

> *It is more responsible to teach cyberethics than use filters.*
>
> *I didn't support filtering. The Internet use guidelines and consequences for deliberate misuse should have been sufficient.*
>
> *Times change so quickly that filters are unable to keep up adequately. Adult supervision and strongly worded Student Responsibility Contracts should be enough.*
>
> *We do not want to block sites except for free e-mail programs. This was our main concern—students sending inappropriate e-mails. Otherwise, close supervision and our AUP and disciplinary action are our means of controlling Internet access.*

Further, instead of investing in blocking software schools might develop more appropriate navigational front ends to useful sites and guided interfaces for schools. Students should be taught to be effective navigators, capable of turning information into knowledge, acting as their own filters.

Essential in all of this is parent education. Parents need to be assured that their child's own teacher or at least the teaching staff at the local school have the competence and confidence to provide appropriate programs for young people, and this should be done through school-based parent advisory council meetings.

Students at the secondary school level can be taught more advanced searching and acknowledge that their use may be monitored through checking History of use. They too sign appropriate use agreements. Indeed, a high percentage of schools, as indicated earlier, have appropriate use policies and signed waivers.

Almost all schools (99%) monitor the sites that young people view in some way. For schools not using filtering software this is typically (86%) done through staff monitoring use and "tapping the users' shoulder" if he or she accesses an inappropriate site. About one-third (34%) monitor access visually in some other way as well but there is no consistency in approach. Most common, at 43%, is checking the user's history and sign in sheets.

Through these approaches schools endeavor to teach students appropriate use rather than suggest that a computer program might do this. Philosophically, an emphasis on teaching programs seeks to prepare students for the adult world, while an emphasis on filtering software seeks to prevent their access to that world too early. Both approaches have the concern of the student uppermost:

> *The students' favorite expression has become "Bess won't let me in."*
>
> *I would prefer placing responsibility of appropriate use with the user.*
>
> *The "best" filtering is teachers monitoring.*
>
> *Filtering tries to enforce morality externally. We should be teaching internalized morality.*

Those who were highly satisfied with Internet filtering and the software program in place mentioned the teaching program as an alternative or supplementary approach less

than those who were highly dissatisfied. Those who were highly dissatisfied were concerned with the message being given to students about a computer program filtering their information, were concerned about the library's role in access to information and ideas being impaired, and believed that the teaching program in place at the time of installation of the filtering software was generally serving well the school and community.

Student Safety and Control. The over-riding concern of teacher-librarians using filtering software, who are satisfied with the decision to install, is student safety:

> *Our number one concern is for the safety of our students.*
>
> *Just a safety net for elementary grade students…*
>
> *All inappropriate and other selected sites blocked well. Librarians and teachers do not need to worry about whereabouts of students on Internet.*

Some believe that the installation of filtering software, and its inherent inability to block all of the inappropriate sites, offers parents a false sense of security:

> *Besides the freedom of access issues, it only provides false security to parents and novice teachers. It undermines trust we should have in students.*
>
> *The Internet filtering lets parents and others "think" that the inappropriate sites are blocked; they are not all; in reality, it's impossible; it's mostly symbolic!*
>
> *It's a political gimmick and a way for clever entrepreneurs to make money by creating fear.*
>
> *Sites/names change often, making it tough to keep track.*
>
> *Reassures parents that students won't have access to inappropriate sites. However, the filter is not always adequate or it blocks good sites.*
>
> *It has stopped 90% of pornography and 75% of game playing. Also, a chat filter stopped 70% of chatting.*
>
> *It caused a tremendous public reaction that far exceeded the reality of problems with Internet access.*

Some teacher-librarians are confident that it would be difficult to disarm the software, with 26% believing that it would take a hacker or couldn't be done (21%). However, 41% don't know if the software can be disabled. Those who believe that the filtering software can be dismantled by students seem to have experience in this area:

> *Too many kids can hack through.*
>
> *Students are able to manipulate.*
>
> *Students bypass all blocking.*

Working in a school does offer its own set of constraints for teacher-librarians according to some:

> *A school library must filter the Internet to block pornography.*

Being a school library, we have a duty to provide appropriate materials.

A public school takes the part of a parent. Full intellectual access is not our role.

One does wonder whether the staff too need this level of protection, as 20% of school libraries that employ blocking software for students also filter staff access:

Some sites I want to use are blocked.

I would like to see different levels of blocking one for students and one for staff.

Software Flexibility and Vendor Response. Teacher-librarians recognize the obvious: an adult eighteen-year-old high school student does not have the intellectual, emotional, and social developmental level of a six-year-old; surely they should be treated differently. A school district filter, however, applied across the system, will provide the same level of access to information and ideas for the eighteen-year-old as for the six-year-old unless options are possible within the computer system and the school system.

The filter is the same for K through 12. Ridiculous. That is the problem with filtering images.

Consequently, the level of satisfaction with the software and vendor was very much dependent on whether the program tended to block too much or too little, whether the filtering was done on-site or off-site, and whether the teacher-librarian had any control and ability to override the system.

Consider this level of satisfaction:

Our Technology Administration is able to make changes quickly to what is available. I am glad that I don't have to spend all my time looking over students' shoulders.

The filter helps me in guiding students to avoid inappropriate material, much like I do in selecting educational materials for our library. Having the ability to override blocked sites enables us to get sites necessary for their research.

It is very easy for library staff to turn off filter when classes are researching STDs or other health topics, drugs, and so on. In fact, we have it turned off more than 50% of the time. If there is unacceptable behavior, we just turn it on for a while, without making a big deal about it. It takes 20 seconds to turn it off if a student researcher is denied access to a useful site.

Conversely, one can imagine this level of frustration:

I don't have disable-authority. It literally takes days.

Subject headings are filtered even for online catalog.

Sometimes it will pull up a list of titillating sites (to middle school students), but the actual site is blocked. Other times it blocks completely innocuous sites.

It's a pain when it blocks a useful site simply because it reads what it believes to be a bad word.

Gives some help in monitoring, but keeps out many sites students need to use. Unblocking system is slow and cumbersome.

It does help with "in loco parentis" problem in school libraries. BUT it is inflexible and arbitrary. WE need ability to modify at the local level.

We are shut out of sites that would be beneficial and necessitate unnecessary time and effort to seek access permission. By that time the need for material retrieval has passed.

When students cannot get college information because they are asked for "sex," or can't go to sites needed to complete work, something is wrong.

There are also concerns about the degree of helpfulness of the vendor's staff, whether the program slows access, and whether it works consistently.

Locus of Decision-Making. Whether one supports filters and their use is dependent as well on where the decision was made, and by whom, where the filtering software is installed, and the degree of involvement one had in the decision-making process. Although the level of frustration is higher, the further from the school and library that decisions are made, there is also considerable dissatisfaction at the school level where the teacher-librarian does not have any sense of control over access to information that students require.

At the school level, teacher-librarians are both satisfied and dissatisfied depending on these factors, as illustrated by these comments:

Software was selected, installed, and maintained by network guy. I cannot modify it. Some sites are not blocked.

I cannot override the system to allow sites such as sexually transmitted disease.

Lock overrides are needed.

Decision made by administration. Librarians were informed AFTER the fact.

Does not allow for me to get to blocked sites.

Having some computers filtered and some unfiltered has been very successful.

Similarly, at the district level:

In this elementary school setting, the parents requested and it became a Board of Education policy.

The school district technology coordinator installed filtering software. I do not have access to an unfiltered computer.

This is a school district policy ad I have no control over any of it.

The parameters are set in the School Board Office where the server is located. People in schools can't make any changes.

With central office control, we find that sites we need are blocked. But we, locally, cannot change the status. By the time the central office changes it, we don't need it anymore.

Not able to access filtering system at this site. It always requires time and paperwork.

The library media specialists are not given access to overriding passwords when "good" sites are blocked.

A district technology committee makes the decisions with no suggestions from us "in the trenches."

I wish it had been a building decision instead of the technology department deciding for everyone.

I'm opposed to Internet filtering. Its only purpose in our district is to cover the district's derriere if someone goes somewhere they are not supposed to.

Filtering is a necessary pain to put up with in a school, even high school. Our community and superintendent are very conservative.

In some jurisdictions it is at the state level that filtering decisions are made regarding specific content:

Action taken at state level and we had no input. Sites often blocked for no apparent reason. When we e-mail and ask for review, we usually get a prompt response. They either unblock or explain why it's blocked.

We had no voice in the decision. The district has no control over the filter to modify it. Too many useful sites are blocked: Holocaust sites, breast cancer, teen suicide, AIDS, and so on.

It is done at the state level. Local control for entire district is left to the superintendent.

Personal/Professional Satisfaction. For some, the issue of filtering comes down to whether it makes the job easier and eliminates hassles, while others see it as an issue of professionalism, of appropriate roles and responsibilities. One could, of course, argue conversely that saving time does open up possibilities for more professional work.

Saves a lot of hassle.

Less time spent closely monitoring students.

It makes my job easier because I really do not have to worry about inappropriate sites.

It's no guarantee, but it does make my life simpler.

For professional teachers and librarians there are role issues:

It leads to complacency on the part of the staff. I agree that there are sites that should not be accessed.

We should not give our supervision over to a filter.

School personnel should be allowed status of professionals. Students should be supervised.

They are useful in situations like labs where close supervision is difficult. But I am opposed to keyword blocking because of research conflicts.

In the case of filtering software one's values can come up against local realities:

I believe in free access to all users.

Of course, at times one values comes up against one's job.

Perhaps for some, the bottom line is:

> *Intellectually I object to it; conversely, I like my job.*

Conclusion

The purposes of this study were to measure the penetration of Internet filtering software in the school and public library markets, ascertain which software brands are used and what they feature, and determine librarians' levels of satisfaction with the software and the vendors.

Drawing on the returns of 465 school librarians in North America in May, 2000, it was determined that Internet filters are used in more than half of the schools. School superintendents and boards of education typically made the decision. There was no difference in use among elementary, junior, and high schools. Most schools had Internet access and appropriate use policies and made these known to students and parents in a variety of ways. Many provided additional services to guide students in their use of the Internet.

Filters varied in type and approach. Most schools had their filtering software located off-site on a proxy server, i.e., serving more than one terminal. It would appear that the use of specific words or phrases and access/denial lists are typically determined by the vendor. Many teacher-librarians were unclear about this, however.

Level of satisfaction or dissatisfaction with filtering software was dependent on one's view of the importance of these factors: program alternatives; student safety and control, software flexibility and vendor response, locus of decision-making, and personal/professional satisfaction.

Teacher-librarians are concerned about student safety and appropriate use of Internet resources. Some believed that safety was enhanced by filtering software while others preferred a planned, integrated teaching program rather than filters to teach appropriate use of Internet resources. Such a teaching program does not prevent inappropriate use so much as it informs students how to handle that use. On the other hand, use of filtering software applies the same standard of control to eighteen-year-olds as to six-year-olds across a school system and offers parents a false sense of security: there are innumerable examples of pornographic or obscene sites being accessed through filtered computer terminals. Conversely, there are also innumerable examples of appropriate information being blocked due to a word, phrase, or syllable that may be interpreted in more than one way. Further, some teacher-librarians believed that students routinely disabled the software.

There is no perfect solution or perfect software for providing access to Internet sites for young people. Although generally satisfied with blocking software, there was a high level of dissatisfaction with the filters' (in)ability to let good sites through (e.g., breast cancer information). There were similarly high levels of dissatisfaction in the software's capability for allowing the school's librarian to modify the "block" list. Dissatisfaction increased when the decisions to block access or make modifications were made outside the school by other educators, administrators, vendors, or politicians; and these decisions were difficult to change.

Professional values and appropriate professional roles and responsibilities each were considered by teacher-librarians in assessing their level of satisfaction or dissatisfaction with blocking access by students to information and ideas on the Internet.

Internet Use in Schools in Alberta, Canada: Implications for School Librarians

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The findings of this quantitative investigation of the use of the Internet in Alberta schools confirmed the findings of earlier studies. The survey asked teachers and principals about their preparation for using the technology and the provision of adequate hardware and software and opportunities for professional development. The majority of respondents felt positively about the Internet as a teaching and learning tool, and many were exploring its use through trial and error. The findings also suggest that there is need and opportunity for school librarians to take a stronger role in supporting Internet use in schools, and the authors offer useful strategies for this goal.

Introduction

A number of initiatives coming from the provincial and federal governments have encouraged schools in Alberta, Canada to connect to the Internet and to use the Internet. The provincial government has funded access to the Internet in schools as well as a professional development program for teachers, the TELUS Learning Connection (see, http://www.2learn.ca).

This quantitative study is one phase of a long-term research program examining Internet use in schools and the factors that facilitate and limit that use. It extends research that began in 1997 and has now been expanded to a national study. In the initial phase of the program of research, January-April 1997, a case study approach was used to collect data on how six elementary and secondary schools were using the Internet and how teachers were learning to use it, as well as data on the perceptions of educators and parents of its value as an educational tool (Gibson & Oberg, 1997). The teachers interviewed for these case studies, no matter what their experience level with the Internet, were frustrated by the vast amount of information available and by their lack of search skills and strategies for dealing with it (Gibson & Oberg, 1998a). The researchers continued their work in these schools through collaborative research partnerships in which individual teachers, both novice and experienced Internet users, were paired with graduate students trained in Internet use. The focus of these research partnerships was to examine ways to improve the teachers' search skills and to assist them in integrating the Internet into their teaching (Gibson & Oberg, 1998b; Gibson & Oberg, 1998c).

The Research Questions

The overall program of research on Internet use in Alberta schools has been guided by three overarching research questions:

1. What is the extent and nature of Internet use in Alberta schools?
2. How have teachers and principals learned about the Internet?
3. What factors influence the extent and nature of Internet use in Alberta schools?

Design and Methodology of the Internet Use Survey

The quantitative investigation was designed to test on a larger scale the findings of three earlier small-scale qualitative studies. It used computer-scored questionnaires that were based on the findings of the earlier studies. The questionnaires consisted of 72 items, including Likert scale rating items and yes/no items. Participants provided data related to the size of their school, the nature of their school community, their educational background and work experience, and their Internet knowledge, access, and use. The questionnaire packages were mailed to 300 elementary and secondary schools in Alberta in March 1998. The sample was generated from a listing of Alberta's operating schools for the 1997-1998 school year. The questionnaire package was mailed to the principal who was asked to have the surveys completed by a principal in the school, by a teacher who was an experienced Internet user, and by a teacher who was a beginning Internet user. Postage-paid addressed return envelopes were provided for each of the survey participants.

Questionnaire data were computer scanned and analyzed using SPSS 6.1, version 8.0. Chi-square testing was used to establish levels of significance of findings. In this report of the findings, demographic data were reported in percentages. Responses to Likert scale rating questions were collapsed from a five-point to a three-point scale. For example, the Never and Rarely responses and the Frequently and Regularly responses were combined from the scale Never/Rarely/Sometimes/ Frequently /Regularly. This approach was used because these response pairs are conceptually very similar and because the number of missing cases from a five-point scale would preclude valid chi-square testing for significant difference. Only significant differences at $p<.001$ are reported here. This very conservative p value is being used because of the multiple comparisons that were completed; this should have minimized the Type I error rates in the analysis.

Survey Responses

The results of the survey are summarized here; for a fuller report of the findings, readers may want to consult an article recently published on this study (Gibson & Oberg, 1999).

Participant Demographics

The overall response rate was 52%: 166 principals and 300 teachers returned the questionnaires. Generally, the participants and their schools (the achieved sample) appeared to be a representative sample of Alberta educators and their schools. Survey responses were received from 11% of Alberta's elementary schools, 11% of schools serving both elementary and secondary students, and 9% of the secondary schools. Of the 166 principals who responded to the survey, 36% headed elementary schools, 34% headed mixed elementary-secondary schools, and 25% headed secondary schools; 5% did not complete this question. There was no under- or over-representation of schools at particular grade levels. Most (82%) of the survey participants worked in schools with 500 or fewer students.

The participants appeared to be fairly typical of Alberta's teaching force. In 1998, Alberta's educators had an average age of 41.01 years and had an average of 14.97 years of teaching experience. Most of the survey participants were in their 40s and had 15 or more years of experience in education. The principals were mostly males (68%) in their 40s (44%) with more than 15 years experience in education (76%). The teachers were mostly females (56%) in their 40s (35%) with more than 15 years experience in education (42%).

Participant Responses

The majority of the teacher participants indicated that they believed that the Internet is an important tool for teaching (78%) and for student learning (76%). The principal participants were slightly more positive about the importance of the Internet for teaching (86%) and for student learning (83%).

Personal interest was the primary motivating factor for learning about the Internet, and trial and error was the most frequently reported approach to learning. Principals were more positive than teachers about the adequacy of school and district support for Internet use. Principals used the Internet mostly for e-mailing colleagues and for accessing district and ministry information, while teachers used it mostly for finding instructional materials. Fewer than 40% of the teachers engaged their students in Internet use for more than one hour a week.

The participants were evenly divided between experienced and novice users. Experienced and novice users differed significantly mainly on how they used the Internet in their professional work and in their personal desire to learn about the Internet. Principals who were experienced Internet users were more likely to use e-mail to access district information and professional development information. Teachers who were experienced Internet users were more likely to search for lesson information and teaching materials on the Web and more likely to engage their students in searching for information on the Web, in going on virtual field trips, in communicating with others by e-mail, and in creating multimedia projects.

Principals reported that they facilitated teacher learning about the Internet through providing access to staff in-service, designating information and technology specialists for their schools, conducting staff in-service, and providing financial support and release time for teacher learning. They also provided other kinds of support such as ensuring that hardware was maintained, allocating funds to upgrade hardware and/or software, and supporting the development of a school website. The majority of teacher participants viewed their principals as supportive of Internet use.

Teachers indicated the extent to which various obstacles limited their use of the Internet. The most frequently reported obstacles were limited time available for using the Internet, pressure to cover the curriculum, lack of school funds to purchase or upgrade hardware and/or software, and limited access to computers connected to the Internet. Teachers viewed problems related to the Internet itself or to their skills in using the Internet as less limiting factors. Less than a quarter of the teacher participants identified concerns related to relevance of information, reliability of information, the nature of information on the Internet, and limited skills in using search engines and/or search strategies on the Internet. This suggests that most of the teacher participants were in the early stages of technology implementation. Their concerns were how to use the technology of the Internet rather than how to integrate the Internet into the curriculum and how to use it to benefit student learning.

The results of this survey, as well as the case studies conducted in earlier phases of the research, suggest that teachers need time to learn the intricacies of the Internet but that time alone will not address all of the learning issues. Guided exploration, collegial sharing of integration strategies, and one-on-one support from information specialists such as school librarians are some of the approaches to learning that will maximize teacher learning time. In-service programs for teachers must be carefully planned to allow for hands-on practice and discussion both during and following the sessions. Principal and district support for learning is as crucial as providing easy access to the technology.

Relationship to Other Research

The body of research addressing Internet use in education remains quite small. The research that has been done to date suggests that the benefit to students of using new technologies such as the Internet is greatly dependent on the technological skill of the teacher and the teacher's attitude to the presence of the technology in teaching (Grégoire, Bracewell, & Laferrière, 1996; Peha, 1995). Other factors influencing effective use of the Internet include the availability of sophisticated technology in terms of hardware and software (Maddux, 1994), the support for teacher learning (Hack & Smey, 1997; Honey & McMillan, 1993; Woodrow, 1991), and the adoption of new models of teaching and learning (Hooper & Rieber, 1995; Follansbee, Gilsdorf, Stahl, Dunfey, Pisha, & Hughes, 1996). Although the use of the Internet can change teachers' attitudes towards the computer as an instructional tool and can encourage them to restructure their classes, continued and effective use requires ongoing training, technical support, home access, and time to learn how to incorporate it into teaching (Gallo & Horton, 1994; Honey & McMillan, 1993). Contributing to the intricacy of the Internet as a learning environment for teachers are factors such as the ambiguity, unpredictability, lack of structure, lack of selectivity, and variable information quality that characterize the Internet (McNicholas & Todd,1996; Todd, 1996). A technology such as the Internet places demands on schools in terms of infrastructure development and teacher learning, and schools and teachers need time to address these demands. The research literature suggests a five year implementation period for any major change of this nature (Fullan, 1991; Robinson, 1995).

The findings of our program of research on Internet use in Alberta schools were consistent with the research cited above. There was little evidence of schools and teachers having adopted the changes in teaching and learning that support more student-centered learning with technology. Hooper and Reiber's five-stage model of technology implementation (familiarization, utilization, integration, reorientation, and evolution) provides a useful framework for analysis of data from the program of research. Many of the teachers in our case study/research partnership schools were in the familiarization

phase that involves initial exposure to and experience with a technology or innovation. They were interested in the Internet and its potential but they had not attempted to use it in their teaching. Others were in the utilization phase; these teachers were trying out the Internet and expressing concerns about "making it work" in their teaching. As was evident in our case study/research partnership schools, difficulties with using the technology and/or disruptions of classroom routines had resulted in abandonment of Internet use for some teachers. A few teachers were involved in the integration phase; they were using the Internet in purposeful ways to achieve particular teaching and learning tasks but not making any real changes in the traditional roles of student and teacher. A few teachers were aware of the potential for a reconsideration and re-conceptualization of classroom tasks and teacher roles (reorientation phase), but none appeared to have moved into this phase in their Internet use. There was no evidence of the development of a change in classroom environment as a result of the ways in which a new technology had been used (evolution phase).

Many teachers were frustrated by the vastness of the Web and were unaware of much of what was available on the Internet. Teachers, even those who were experienced Internet users, had little knowledge of the search engines and search strategies needed to make efficient use of Internet resources. Factors within the school context that influenced the teachers' willingness to learn about and use the Internet included the location of Internet access in the school, the capabilities of available computers, the vision and support of the administration, and the support of the community. The teachers' level of Internet knowledge and amount of prior experience influenced their willingness to use it. Although teachers were assisted in learning to use the Internet by collegial sharing, their learning was limited by a lack of both time and suitable in-service opportunities. For the teachers in our studies, learning about the Internet was a highly individualized activity that took place on the edges of their teaching lives. Rarely did we find evidence of effective staff development for teachers' learning about Internet use. For example, only one of our six case study/research partnership schools was characterized by the kind of school-based teacher learning support that is identified in the effective schools research.

This survey of principals and teachers in Alberta schools confirmed with quantitative data most of the patterns identified in the case studies and research partnerships. One pattern that was not confirmed by this quantitative data was teachers' concerns about the Internet itself or their skills in using it. This might be attributed to their early stage in technology implementation. Two studies looking at Alberta teachers' use of conventional library resources found the same puzzling phenomenon (Oberg, 1993; Oberg, 1996). Teachers, both novices and veterans, had received little library-related instruction, but they reported high confidence levels in relation to the knowledge needed to provide their students with library-related instruction. Many appeared to be quite confident that they had sufficient knowledge to be able to teach their students how to evaluate materials for use (52.6%), how to locate library materials (77.2%), and how to use library materials in research projects (81.8%) even though they had completed no courses in resource-based learning or library instruction or had, in only a few instances, received course-related library instruction on a regular basis in university (18.2%) or in high school (3.1%).

Less than a quarter of the teacher participants in the Internet use study identified concerns related to relevance of information, reliability of information, the nature of information on the Internet, and limited skills in using search engines and/or search strategies on the Internet. Could it be that they have quite a different understanding from that of the researchers and that of teacher-librarians of the sophisticated information skills that are required to use the Internet and to teach their students how to use the Internet for learning? Could it be they do not yet recognize the complexity of the Internet and that

they do not see the need for the specialized library and information knowledge of the school librarian?

Implications for School Librarians

Ready access to technology is a necessary but not sufficient condition for teachers' learning about and increased use of the Internet with students. Teachers need the collaborative support and information-seeking expertise of school librarians if they are to use the Internet in ways that support and enhance student learning. School librarians who are knowledgeable about the Internet, professional development, and the curriculum can play an important role in addressing teachers' concerns about Internet use. School librarians new to the Internet and the issues it raises can find useful information and advice in resources such as the books by Clyde (1997), MacDonald (1997), and Berger (1998) and the proceedings of the ITEC and ISIS virtual conferences (see, for example, Hay & Henri, 1996; Hay & Henri, 1997).

The authors have drawn on the literatures of research and practice for the suggestions provided below and in earlier articles (Oberg & Gibson, 1998; Oberg & Gibson, 1999). These strategies for supporting more effective Internet use in schools are offered for consideration:

Building Support for Using the Internet

School principals are key to implementation initiatives including those related to information literacy (see, for example, Oberg, 1999). The Internet use studies showed that the attitude and support of school principals directly affected teachers' enthusiasm for Internet use in the school. Therefore, school librarians should discuss their support of teachers with the school principals and encourage them to give visible encouragement for Internet use. Because teachers' use of the Internet in school was highly correlated with home use and because Internet skill and comfort levels tended to be much higher among teachers who were online at home, principals and districts should consider programs that support teachers' having access to computers at home. To encourage community support, school librarians might also work to offer in-service programs for parents that show them how to use the Internet and that demonstrate how it is being used as educational tool in the school.

Increasing Access to and Availability of Internet

School librarians need to work with their school administration and/or technology planning teams to establish the most efficient and effective ways of organizing access to the technology. School librarians, experienced with flexible scheduling and providing access to resources, can help teachers and principals to create large blocks of time for teachers and students to use Internet computers in ways that are effective for learning (McKenzie, 1998). Schools need to provide Internet hookups that are consistent with best opportunities for student learning, and, as McKenzie points out, many different technology configurations can provide for student learning. School librarians need to work as members of a collaborative school team to develop action-specific long-range technology plans that include resources for maintaining and upgrading computers.

Enhancing Levels of Internet Skills

School librarians need to help teachers to understand the nature of the Internet and to develop time-saving search strategies. This is the opportunity to teach Boolean search strategies that are essential to information retrieval in other electronic environments such

as the OPAC. School librarians should not assume anything about teachers' Internet knowledge and skill. They should conduct needs assessments before planning small group and focused in-service sessions for teachers because teachers in any one school are likely to vary greatly in Internet knowledge and searching skills. If only large group in-services are possible, school librarians might begin with an overview of important search skills and then provide opportunities for experienced users and non-users to work and learn together. Schools need to develop a vision for how the Internet might enhance teaching and to emphasize integration strategies rather than tools.

Ensuring Information Quality and Relevance

School librarians can support the integration of Internet resources into instruction by searching for and sharing with teachers the websites that are relevant to their work with students. These websites might be shared by means of a library web page or diskettes of bookmarks to be loaded on computers in classrooms or labs. School librarians can encourage teachers to share bookmarked sites with each other. This reduces teachers' search time, keeps teachers abreast of what's new on the Internet, and encourages non-users to begin using the Internet. Because teachers are often pressed for time but welcome new resources to enhance student interest and involvement, school librarians should begin by finding Internet resources that enrich teaching units that are already in use.

Increasing Opportunities for Learning to Use the Internet

School librarians need not only to take the lead in providing in-service on Internet skills but also to work with the school principals and teachers to find time for teacher exploration in addition to school level and district level in-services. Having a well thought out long-term technology plan with considerable staff input tends to move a school closer to implementing the goals of information literacy. Team members need to be aware that 30% of any technology budget should be allotted for staff development and that it takes from three to six years for teachers to integrate a new technology into their teaching (President's Committee of Advisors, 1997).

Conclusions

Teachers and principals in Alberta express a great deal of enthusiasm about the potential of the Internet for enhancing teaching and learning. From the perspective of knowing what the Internet offers and how to utilize the Internet for enhancing teaching and learning, however, most of the teachers and principals were really at the familiarization stage of Internet use. They were still trying to discover what was out there and how to negotiate their way through the maze of information. While the use of the Internet has the potential to encourage them to rethink approaches to teaching, that potential has only begun to be realized. School librarians can have a major role in helping schools realize that potential but they will need more than their specialized library and information knowledge. They will also have to be aware of the complexities of implementing change in schools. One of those complexities might be the extent to which teachers and principals are unaware of the need for the specialized expertise of the school librarian.

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Knowledge Management: Key to Partnerships, Learning Outcomes and Resourcing a Learning Community

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This paper provides an understanding of the concept of knowledge management and its role in the creation of an integrated information environment for effective learning in schools. It presents findings from a research project being undertaken at the University of Technology, Sydney that seeks to identify from the perspective of librarians, including teacher-librarians, the significant dimensions of knowledge management, the key understandings and skills required for effective knowledge management, and the role of librarians engaging in knowledge management processes in libraries and information agencies. The implications for teacher-librarians are examined in this report.

Introduction

If we always see as we've always seen,
we'll always be as we've always been,
and always do as we've always done.
(Author unknown)

The practice of teacher-librarianship has changed dramatically over the last five years, particularly with developments in networked information technology, access to information, and the shift from a paper-based to a more digital information environment. Each of these developments has significant ramifications for the school as a constructive learning community, for teaching-learning programs in the school, and for the infrastructure and provision of resources. In this rapidly changing environment the notion of knowledge management is a significant concept for schools and one that is relevant for teacher-librarians and school executives.

This paper explores the concept of knowledge management in schools by looking at its key dimensions, definitions, and frameworks as well as its roles, requirements, and strategies. It also identifies how knowledge management initiatives and processes might contribute to a more integrated and resource-intensive information environment in schools, more effective resource-based teaching and learning partnerships, and a more receptive environment for the development of both school-wide information literacy programs and enhanced learning outcomes. In addition, this paper clarifies the essential understandings and competencies required for effective knowledge management in schools and the role of teacher-librarians in this process.

Background

Knowledge has always been important in organizations. In education, teacher-librarians manage and make available an important part of that knowledge, that which is codified and published. Knowledge management has recently become a prominent concept in business and other organizations as a result of the rapid growth in

publications, web sites, conferences, and consultancies. Newly developed technologies include systems for the storage and access of many different types of knowledge, increasingly intelligent systems for automated indexing and linking, and cooperative work- and knowledge-sharing environments (Davenport & Prusak, 1998; Nonaka & Takeuchi, 1995; Myers, 1996).

The knowledge management discourse is diffuse, complex, and characterised by multiple definitions and perspectives as well as a proliferation of strategies for its implementation in organisations. There is also considerable skepticism that it is a passing fad or a temporary management flavour. Little of the literature provides significant explication of the theoretical rationale or conceptual exploration of what "knowledge" actually is, how it relates to or differs from "information," the dynamics of knowledge and its management, and the relationship between information management and knowledge management. Nor does this diverse literature give significant attention to the role of the library and information professionals in relation to knowledge management. In general the literature deals with knowledge superficially, overgeneralises about organisations, and ignores cultural issues. The recent attention to e-commerce appears to be deflecting attention and further confusing the scene.

The question of defining knowledge management is a vexed one, and there is generally an emphasis on breadth of the issues involved. According to Broadbent (1997), knowledge is thinking about information in its broadest sense, that which has potential to inform the organisation including tangible information resources and services as well as the intangible knowledge of people. She argues that knowledge management is “a form of expertise management which draws out tacit knowledge making it accessible for specific purposes to improve the performance of organisations” (Broadbent, 1997, p.6). Some take a very technical focus: “blending a company's internal and external information and turning it into actionable knowledge via a technology platform" (DiMattia & Oder, 1997, p.3), and

> *opportunity to maximise the return on investment in information and communication technology; to leverage the intellectual capital locked up in key staff; to learn from and benefit from sharing information, processes, best practices, skills and competencies; to exploit the wealth of information in corporate records, reports, databases.* (Nicholson, 1997, p.2)

There is also the instrumental approach that treats knowledge as a "thing": “[It] must involve capturing the internal knowledge generated by a firm - its best thinking on products, customers, competitors, and processes - and sharing it" (DiMattia & Oder, 1997, p. 3). On the other hand, Southon, building on the work of Davenport, takes a more holistic, environmental approach of "conceptualising the organisation as an integrated knowledge system, and the management of the organisation for the effective use of that knowledge" (Southon & Todd, 1999).

It is only in the last three years that knowledge management has captured the attention of records managers and professionals working in the library and information sector including public, school, and academic librarians. The field is now beginning to see the emergence of a body of literature that explicitly addresses knowledge management from the perspective of librarians and gives particular attention given to its definition, dimensions, processes, and benefits to the organisation (Broadbent 1997; Southon & Todd 1999; Nicholson, 1999).

There has also been some recent attention given to knowledge management in school environments. Traditionally the role of knowledge has been recognised in the

imparting of an understanding of various disciplines as well as the personal and social development of students. The management of knowledge as a whole, however, has not been explicitly addressed. Little attention has been given to an holistic appreciation of the human knowledge that exists in a school, and indeed in the wider community of the school, that can contribute to this.

Tanner (1999) examines the "intellectual capital" and "organisational intelligence" frameworks through which knowledge management might be viewed in schools. According to Tanner, undertaking knowledge management in schools "presupposes a strong sense of community, democratic governance, high participation, open communication and a climate of high trust--characteristics that do not readily come to mind as features of most of the organisations we work in" (Tanner, 1999, 331). Todd (1999a, 1999b, 1999c, 1999d) explores conceptual, definitional, and practical aspects of knowledge management practices from the standpoint of improving learning outcomes, and he posits that schools, as learning communities, can derive considerable benefit from effective knowledge management practices. Hanson (1999) views knowledge management as fundamentally about interactions of people rather than transactions between people and focuses on four basic knowledge processes: developing new knowledge, securing new and existing knowledge, distributing knowledge, and combining available knowledge. Todd and O'Connell (1999) explore how knowledge management practices can underpin the effective professional development of teaching staff in relation to the integration of information technologies into classroom teaching and learning activities. Richer (1999) documents the implementation and evaluation of a knowledge management that focuses on teaching staff expertise across a wide range of personal and professional interests. She argues:

> *We must be prepared to look beyond our traditional roles and seek new and innovative ways to best gather the contextual knowledge relevant to each and every inquiry, mining not only textual or digital formats but the inherent knowledge of our co-workers, opening up valuable information through knowledge management.* (Richer, 1999, p.v)

The central ideas raised in the above discussion imply that schools, as learning organizations, have much to benefit from knowledge management initiatives.

Research Aims

The findings on which this paper is based are drawn from a research project undertaken at the University of Technology, Sydney from November 1999 to February 2000. The research focused on conceptualisations of knowledge management and the role of information professionals in managing knowledge environments. This study is significant in that it represents one of the first research projects undertaken in Australia that explores knowledge management from the perspective of library and information professionals. This research had several aims:

1. To explore librarians' conceptions of knowledge management,
2. To examine the relationship between knowledge management and information management,
3. To identify the role of librarians in knowledge management,
4. To identify the knowledges and skills that librarians perceive to be required to implement knowledge management,
5. To identify knowledge management activities and processes being undertaken in a range of information provision contexts, including schools, and
6. To identify the challenges, conflicts, and needs of the library and information sector as it embraces the knowledge management movement.

This study serves as a substantive benchmark for the emerging arena of knowledge management in relation to library and information professionals and provides some clear research directions for exploring the field. While these research projects explore knowledge management in a variety of information provision contexts, this presentation will focus on data emerging out of these studies that are relevant to schools as learning communities.

Methodology

Participating in the study were 56 library and information professionals who were non-randomly selected through a voluntary process. The participants worked in a range of library and information agencies including school, public, government, and academic libraries and were employed as teacher-librarians, library managers, managers of specialised information services within libraries, records managers, and information management consultants. The average reported professional experience in the library was 16.5 years.

Data were collected in two ways. Participants received in the mail a printed questionnaire that posed open-ended questions to tap into a range of perceptions about knowledge management, its key characteristics, its relationship to information management, knowledge management activities, and the key skills and understandings perceived to be required to effectively implement knowledge management practices in libraries. The second set of data came from two focus groups, one with 6 participants and the other with 8 participants, that probed in greater depth the ideas, patterns, and issues emerging out of the questionnaire and generated further insights into the implementation of knowledge management in information organisations. Both quantitative data and qualitative data were collected.

Key Findings and Their Implications for Schools

The librarians in this study clearly identified differences between knowledge management and information management, and the central dimensions of each of these, as well as differences between the fundamental concepts of “information” and “knowledge.” The key differences, as expressed by the librarians in the study, are delineated in Table 1. The bullet points represent specific examples of ideas expressed by the librarians.

Table 1
Key Differences Between Knowledge Management
and Information Management

KNOWLEDGE MANAGEMENT	INFORMATION MANAGEMENT
Central focus: people • Based on people and relationships • Deals with people: how people know what they know • A process of involving various people in organisations	**Central focus: information infrastructure** • Process centric • System based • Library systems / resources • More a systems approach • Information source is central
The object of attention: human knowing - intangible and subjective • Intangible information in people's minds • What staff of an organisation thinks • Internal knowledge held within a firm's expertise • Intellectual capital	**The object of attention: information products - tangible and objective** • Traditional sources of information such as books, journal articles, and records • Printed and published works • Information as a commodity
The object contains: tacit • Tacit knowledge • Informal knowledge • Organisational experience • Knowledge of customers, markets, and processes • Expert's knowledge	**The object contains: explicit** • Tangible information • Facts and figures • Documented case histories • Published business intelligence • Discreet pieces of information • Evidence of the transaction
Key processes: sharing, creating • Knowledge mapping • Mechanisms for experience transfer • Exchange of understanding • Culture of sharing knowledge • Analytical ability • Knowing how to make links / connections between disparate sources • Involves interpretation and analysis • Communicating to intended audience • Creating intelligence	**Key processes: organising** • Acquisition, storage and accessibility • A routine process of classifying and identifying information so that it can be recalled subsequently • Knowledge of data and information in large quantities stored in a logical order. • The capture, storage and retrieval of" physical data, "e.g. date, documents, voice, video, photo's etc. Emphasis on "capturing"
Organisational purpose and outcomes • Knowledge as productivity • Interpreting information for clients • Aggregation of knowledge to provide value-added qualities • Ability of an organisation to perform to its maximum potential • To gain some type of advantage: competitive edge • Reward focus	**Organisational purpose and outcomes** • Tailoring information solutions to needs of particular clients • Providing information to the right person • Timeliness and accuracy of retrieval • Making information available • Protocols to ensure accuracy and integrity of information • Greater access by customer base
Practice perspectives • More outward approach • Broader focus	**Practice perspectives** • Very do-able • Practical, controllable

• More in-depth management • Holistic management of data, information, and knowledge. • Much more difficult to do than Information Management • It's a futile attempt • Sounds more controlling • Less normal process – people rounding up "bits" of knowledge • In fact, I doubt you can	• Accountable • Library based • Easier to define, store and retrieve
Enablers • Culture of sharing information and experience • Technology enables new approaches to KM • Organisational co-ordination	**Enablers** • Information must then be processed by hand or machine to be valuable • The image of the librarian.

The majority of participants in the study acknowledged that knowledge management is not just a new label for information management, which is the long-standing role of librarians in providing published information products. Knowledge management focuses instead on the use and value of individual human knowing, what is in a person's head so to speak, and it is variously expressed in terms of the wealth of the accumulated knowing, wisdom, experiences, skills, and competencies that reside within the mind of a person. Its focus is people; it is a group or collective focus that gives emphasis to linkages to ensure the maximum flow and utilisation of this knowledge in the organisation. The essence of knowledge management is conceptualising the organisation as an integrated information-knowledge infrastructure that results from the synergies of organisational and personal practices. Knowledge management effectively engages and utilises human competencies, experiences, expertises, skills, talents, thoughts, ideas, intuitions, commitments, innovations, practices, and imaginations and integrates them into the information resources an organisation uses to achieve its goals. From the perspective of the librarians in this study, knowledge management conceptualises the information environment more holistically and recognises that human knowing is an important part of a rich information environment. This was also expressed by the librarians in the focus groups:

> *[Knowledge management] encompasses a broad range of perspectives and a process that involves various people in an organisation. This means collaboration and sharing and covering ideas for managing the process of managing and organisation effectiveness.*
>
> *I see knowledge management as a combination of the corporate plan, cultural milieu, information management, technology, change management and collective experience all being used to manage and access intellectual capital.*

Table 1 indicates that the different emphases of knowledge management and information management, people and information product, also reflect the different processes underpinning the management responsibilities. Knowledge management highlights sharing, interpersonal relationships, and intellectual competencies. On the other hand, the central focus of information management is the development of management and infrastructure systems and technical processes for the control and organisation of information sources such as books, journals, records and electronic

products. The use of technology, particularly the application of knowledge management software, was seen as a key enabler of knowledge management in order to enhance the organisation, access, flow, and uses of knowledge in the organisation. In essence, knowledge management is perceived to go beyond the technical processing and management of traditional information products to include the understanding of the organisation much more holistically and of the processes by which people create, utilize, and share their knowing and develop approaches to organisational effectiveness and improved organisational performance.

Opportunities for Knowledge Management in Schools. The study identified a substantive range of knowledge management initiatives and strategies that might be applicable to school environments. These include:

- Creating a knowledge management infrastructure. For example, schools can establish an organisation-wide knowledge management team and ensure that knowledge management processes are embedded into the organisation's policy and information technology strategic plan.
- Establishing integrated systems and networks to share knowledge. For example, schools can use the Intranet as a mechanism for sharing knowledge, install simple knowledge management software on the technology network, and use the chat room as a mechanism to record a debate on an important issue.
- Fostering organisational participation and sharing of ideas. For example, schools can encourage reporting on conferences attended, brainstorming at meetings to solve issues, and setting up collaborative approaches to ideas generation and problem solving.
- Creating a knowledge sharing community. For example, schools can create an inventory of personal information resources that people are willing to share, develop a database of classroom best practices and/or creative learning activities, list approaches to fund raising, involve community groups, create a staff yellow pages which lists the expertise of staff, and map professional networks.
- Information capture and consolidation. For example, schools can establish a system for staff to notarise documents; map work and decision flows; attach guidance notes to documents that capture senior expertise; gather information about how people do things; provide teaching and training programs, conference papers, published articles, subject handbooks and workbooks, and field guides; and create flow charts that illustrate the wide ranging informing and decisioning processes and structures in the organisation.

Benefits of Knowledge Management in Schools. The study provided evidence that librarians see benefits that can be derived from their engagement in knowledge management activities. In addition to the survey research described above, a focus group of 14 teacher-librarians, gathered from a knowledge management workshop held in May 2000, identified eight categories of benefits to schools. These provide a rich opportunity for further research as well as an evaluative framework for examining the effectiveness of knowledge management activities in schools.

Teacher-librarians in particular perceived that effective knowledge management would:

- Offer opportunities for extending and enriching the information resource base of a school. It provides more resources as well as a stronger and wider resource base for effective learning and achieving the learning objectives of the school.

- Add value to learning. Greater and easier access to knowledge increases the motivation to tap into this knowledge and to integrate it into daily teaching-learning activities, thus enriching the learning opportunities for students. This is an adding-value process that enhances learning effectiveness.
- Prevent "reinventing the wheel". Making available relevant staff expertise, experiences, and skills that are usually hidden can encourage more effective reuse of existing information rather than constantly having to start from the beginning. This means there will be savings in time, effort, and energy, and consequently there will be more effective use of limited school budgets.
- Facilitate more effective decision-making. Knowing what expertise is available, who has it, and where it is located can enable faster responses and improve decision-making processes in schools.
- Help improve the image of a school. Knowledge management provides the opportunity to develop a school as a place where all staff and the wider community are truly engaged in learning as knowledge construction and working together to provide the best learning opportunities and resources for students.
- Facilitate more effective learning from one another, a characteristic of an effective school. Providing mechanisms for the accessing and sharing of this human knowing can provide a stronger motivation for people to create, transform, share, and act more effectively together to achieve the learning outcomes of the school.
- Break down the knowledge fiefdoms that often exist in the school. Learning opportunities may not be maximized when various faculties, departments, staff rooms, or library jealously guard resources and do not share ideas, resources or even technologies.
- Prevents the loss of expertise, knowledge and skills when a staff member leaves the school.

Knowledge Management: A Role for Teacher-librarians? The study identified a range of skills that were perceived to be important for effective knowledge management. The bullet points in Table 2 represent specific examples presented by librarians in the study.

Table 2
Skills for Knowledge Management

People skills • Team work and networking • Perseverance and motivation • Co-operation with other kinds of professionals • Interview skills • Alliance building • Advocacy • Building trust relationships • Conflict resolution and negotiation	***Cognitive skills*** • Thinking skills • Analytical skills • Synthesis • Judgement • Evaluation • Ability to define the scope • Oral and written communication • Presentation skills
Information Processing skills • Packaging of information • Recording information • Methods of storage and retrieval • Organising information • Distributing information • Content management • Cataloguing and classifying	***Information technology skills*** • Database design • Information systems • Web publishing • Internet publishing • Use of groupware software • Computer software skills
Management skills • Change management • Research and research management • Project management • Database management • Human resources management	***Organisation and business skills*** • Marketing • View bigger picture • Policy formulation • Business acumen • Able to link outcomes to organisation • Crystal ball gazing

It is clear that skills relating to the technical processing of information resources and information technology skills, skills that librarians already possess, are important. These skills provide a framework for the capture, organisation, structuring, access and retrieval of knowledge in the organisation. However, the study identified a raft of additional people-centred skills that are perceived to be critical to effective knowledge management such as teamwork, co-operation with other kinds of professionals, interview skills, building trustful relationships, and conflict resolution and negotiation. In addition, knowledge management was seen to demand higher-order thinking skills such as analytical skills, synthesis, judgment, and evaluation as well as strong oral and written communication and presentation skills. The study also identified a range of skills related to the integration of knowledge into the organisation and the development of a knowledge sharing culture: change management, research and research management, project management, human resources management, policy formulation, and business acumen.

Table 3 identifies some of the understandings deemed essential for librarians to actively engage in knowledge management initiatives. The bullet points represent examples of ideas explicitly stated in the study.

Table 3
Understandings Required for Knowledge Management

Knowledge • Nature of knowledge • Creation of human knowing • Acquisition of knowledge • Typologies of knowledge • Knowledge dissemination • Knowledge utilisation • Knowledge trends: globalisation, convergence	***People*** • Needs analysis • Group and organisational dynamics • Psychology of people in groups • Strategies for creating a knowledge sharing culture • Ways people learn, think, absorb ideas • Learning styles
Organisation • Understanding of organisational culture • Role of knowledge in the organisation • Understanding how organisations work: purpose, function, vision, mission • Cost / benefits of knowledge management • Understanding customer requirements • Office procedures	***Information*** • Information management principles • Indexes and catalogues • Understanding how information is utilised • Synthesis of information • Holistic view of information theory • How to integrate knowledge and information into management systems
Technology • System specification and applications • Understanding the Internet • Search engines / algorithms • Impact of technology on the organisation	

While understandings of information management and information technology applications are considered relevant in a knowledge management context, the librarians in the study also identified a range of essential understandings related to knowledge, people, and organizations. Understandings of the very nature of knowledge, how it is generated and created, how it is represented and structured, and how it is accessed and utilised were seen as fundamental to effective knowledge management. Also perceived to be important were understandings drawn from cognitive science, information user behaviour, and cognitive psychology. These centre on understanding people dynamics and interactions, how people learn, and how people connect with, interact with, utilise and share ideas within an organisational framework. Strongly stated were a range of understandings linked to organisational behaviour, such as organisational culture, politics, structure, values, and its customers.

Conclusion

There is real potential for knowledge management to extend and enrich the resource base of a school and to widen the boundaries of intellectual and economic access. Deploying the strategies of knowledge management provides unparalleled opportunities for creating the school as a holistic information-knowledge-learning environment, for developing a stronger infrastructure for effective learning, and for ensuring that the learning objectives of the school are met. The rapid integration of computer information technology into teaching and learning and the development of networks and school intranets provide new opportunities for the sharing and utilisation of

knowledge. Knowledge management recognises that people are an integral part of the information environment and the information chain, not as mechanisms for the transmission of information but as an important information source of knowing in achieving the learning outcomes of the school.

The teacher-librarian, as the information-resourcing-learning specialist in the school, has a key role to play in knowledge management in schools. Some teacher-librarians may want to put a fence around knowledge management and claim it is "theirs"; others will say "enough is enough, forget it"; others will be committed to other key priorities in the school. Knowledge management is not, however, the sole responsibility of the teacher-librarian. It is rather the whole school that is empowered and enabled to work together in creating a culture that uses and shares knowledge and in providing the management infrastructure to enable this to happen.

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IV.

Professional Papers

Introduction

The professional papers at the conference contributed to the theme of Information Literacy: Reading, Partnership, and Information. Criteria for the acceptance of proposals included relevance to the theme and audience, intellectual significance, originality, and relationship to theory and/or practice. Among the professional sessions presented at the conference are the following papers that were submitted for inclusion in the proceedings.

European Schoolnet (EUN): Internet Platform for Collaborative Educational Networking

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The European Schoolnet (EUN) is a network of networks. The objective of the EUN is to promote the use of information and communications technologies (ICT) among schools in Europe, aiming:

- to strengthen collaboration between schools
- to foster a European dimension in education
- to develop the use of ICT in schools

The EUN is a unique initiative, a framework organisation for Collaboration between European Ministries of Education that brings together national and other education networks. The users are the schools, the teachers, the learners, and others who want to be part of the collaborative efforts to develop education in a European and global perspective.

The EUN web site, www.eun.org, is a multilingual platform for teachers, pupils and others that offers the following main areas: resources, innovation, and teacher training.

The Virtual School is one of the main initiatives in the resources area. In the Virtual School you can find resources and services for learning activities structured by subject areas (departments) and also cross curricular places like the School Library and Special Needs Education. The concept of the Virtual School is teachers meeting teachers and colleagues having discussions on everyday-problems and exchanging materials, ideas and experiences. Virtual School will help schools and teachers to find quality resources in the Internet.

Visit the European Schoolnet: www.eun.org.

Information Literacy as a National Agenda: A Case Study of Singapore

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Introduction

Singapore is a small country in South East Asia with a population of some 3.7 million. It achieved independence from Britain in 1965 and since then has made remarkable progress as a nation, so much so that other countries are now looking closely at its policies with a view to discovering its secrets of success. While the policies attracting attention range from Singapore's national pension scheme to the way in which traffic flow is controlled, the major area of interest here is to investigate the country's promotion of information literacy.

Singapore is largely devoid of natural resources, so there has always been an emphasis on seeing people as capital. As in many Asian countries, cheap labour was at first the basis for building strong manufacturing industries to earn revenue by exporting goods to richer nations. Economic growth would occur as long as inputs of labour and of capital investment went on growing, but eventually this would slow because the sources of these inputs are finite. Krugman (1994) described this as the "perspiration theory": success was based on working harder, not working smarter. Krugman's writings aroused hostile reaction in many Asian countries, but even he did not predict the extent of the economic crisis in the region during the late 1990's. By this time, though, Singapore's leaders were working on the problem and laying the foundations that would produce a workforce with something more to offer than perspiration.

Vision and Programs in Singapore

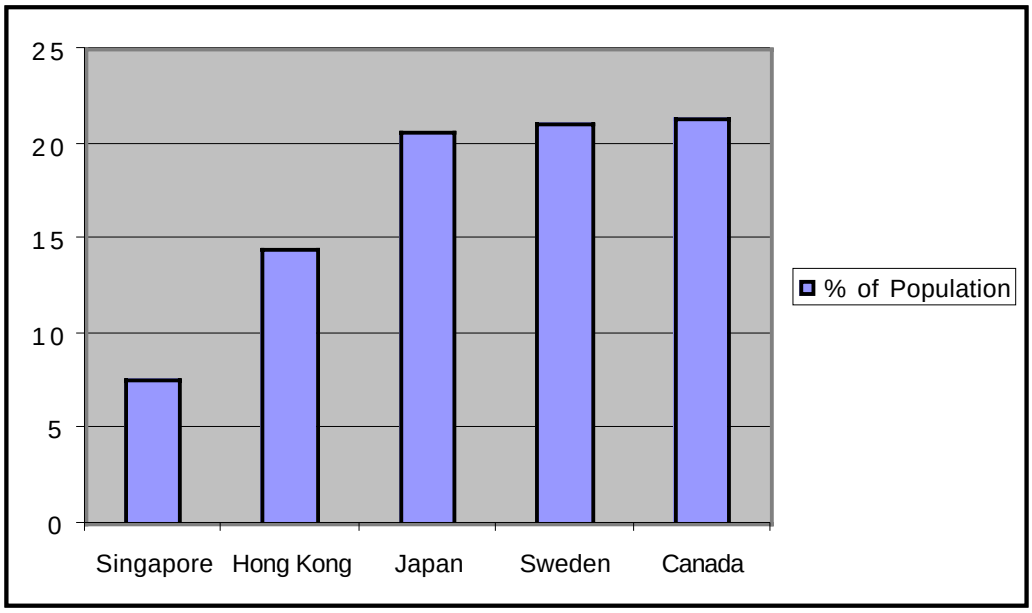
Singapore was one of the first countries to produce a coherent information policy. In 1993 Prime Minister Goh Chok Tong noted that “the future belongs to countries whose people make the most productive use of information, knowledge and technology. They are now the key factors for economic success, not natural resources”(Goh, 1993). Member of Parliament Ho Kah Leng offered another example of government rhetoric dwelling on the same theme: “Our continued competitiveness is dependent on a population which makes a conscious effort to learn throughout their lives” (Ho, 1996).

This type of speech has been heard many times as politicians encourage their citizens to improve themselves. It is a notion that none of their opponents can disagree with. But it remains a politically neutral statement as long as there are no resources to allow real implementation. What makes Singapore different is that a governmental statement of this sort is in effect a mission statement that is closely followed by a blueprint for action and a budget commitment. This is because there is a clear rationale. The country cannot afford inaction: information literacy is linked to future economic success.

Economy

Singapore, whilst still keeping a manufacturing base, has chosen to concentrate upon "high-end" manufacturing such as disk drives, semiconductors, silicon chips, and other areas that have the most value-added content. "Low end" enterprises such as clothing manufacture have been driven offshore, predominantly to the Indonesian Rhiau Islands to the south. In addition, Singapore is actively engaged in expanding into new service industries such as biotechnology, financial services, media, entertainment, and e-commerce. These have two things in common: they both require a substantial initial investment and they need a highly adaptable workforce capable of being retrained.

In reality, Singapore has a population that, in the main, left school early and without adequate qualifications for the types of industry envisaged by the government. The percentage of the population aged over 25 with post-secondary education is very low compared with other developed countries (see Figure 1 below):



Source: UNESCO Statistical Yearbook, 1998.

Figure 1. Percentage of Population Aged 25+ with Post-Secondary Education

This problem is being addressed. By the end of 1999 about 60% of those leaving school continued their education, some 21% attending university and 40% going to polytechnic. For some years to come, however, a large section of the population will remain without formal educational qualifications and will therefore continue to require special attention in developing information literacy skills.

Strong Financial Base

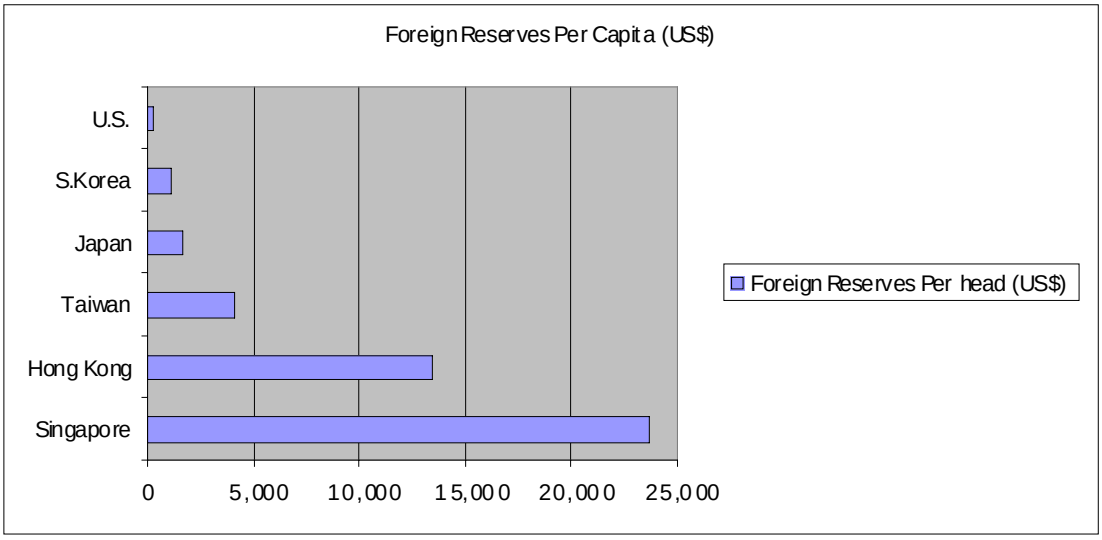
It is important to not that Singapore is in a very strong financial position when it comes to implementing its policies. The

island state has one of the largest stocks of foreign reserves in the world, larger even than the United States in absolute terms, as Table 1 shows:

Table 1
Foreign Reserves

Country	Per Capita (US$)	Total (US$m
Singapore	23,685	74,928
Hong Kong	13,475	89,610
Taiwan	4,144	90,341
Japan	1,714	215,471
S.Korea	1,120	51,975
U.S.	262	70,710

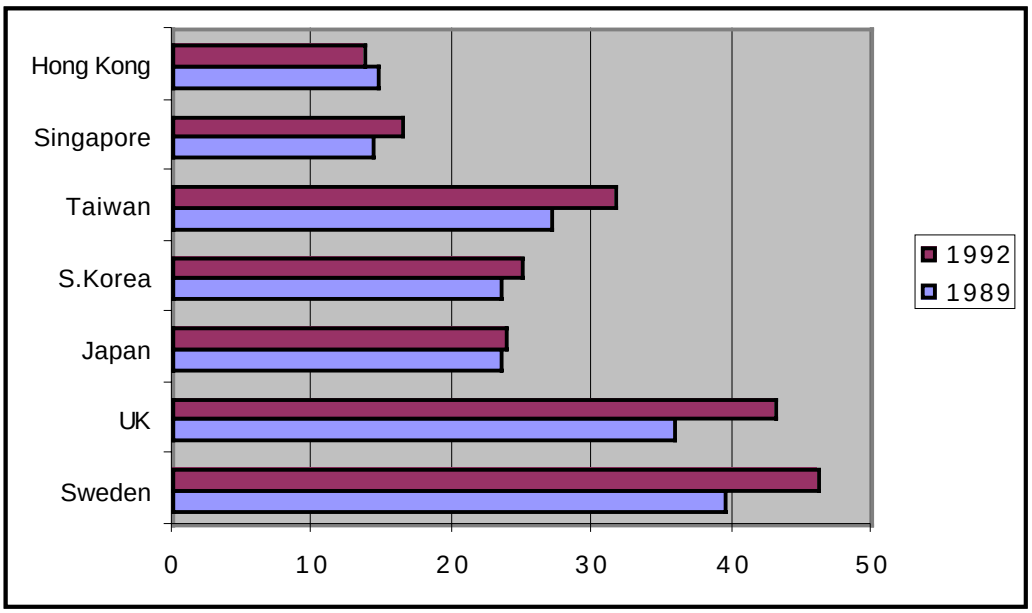
Figure 2 measures the situation in terms of foreign reserves per capita:



Source: Economist Intelligence Unit. Country Report: Singapore, 1999-2000.

Figure 2. Foreign Reserves

These reserves are largely the product of the compulsory national superannuation scheme, known as the CPF (Central Provident Fund), to which employees contribute 20% of their earnings and employers currently contribute 12%. There is no state pension as such. Indeed all welfare payments are kept to a minimum. In the years following independence, Prime Minister Lee Kuan Yew's policy was to provide the social infrastructure, in the form of housing, education, and healthcare so that the stable conditions and the disciplined, industrious workforce would attract foreign investment. There were to be no transfers of cash or services to a social underclass. An ethic of self-reliance, resting on family support, was emphasised from the start. Indeed the term "welfarism" had pejorative overtones when comparisons were made to traditional western welfare states. Public expenditure was kept fairly low and grew only slowly as the country became more affluent, as shown in Figure 3:



Source: Kwon, 1998, p. 28.

Figure 3. Central Government Expenditure as a Percentage of GDP

Singapore, then, is well-placed to build infrastrucure, but this is always done with careful planning and a certain parsimony based upon a reluctance to squander the reserves. In addition, the country finds it necessary to maintain a large defence force as protection against its powerful Islamic neighbours, and this takes a significant proportion of government expenditure.

Singapore's Information Policy

Singapore's information policy is encapsulated in three documents: *IT 2000: A Vision of an Intelligent Island, Library 2000,* and the *Masterplan for IT in Education.* The first document, *IT 2000,* was one of the earliest national information plans and the most clearly articulated. Published in 1992, it set the framework for a National Information Infrastructure that would touch the lives of all citizens. It bears some of the hallmarks of a Delphi study in that it tapped the practical and visionary experience of some 200 senior executives representing 11 eleven major economic sectors in Singapore. It described a range of areas in both the public and private sectors where information technology (IT) could be pervasively applied to improve both economic performance and quality of life. By the year 2000 it was expected that Singapore would, indeed, have become an intelligent island with electronic transactions replacing manual and paper processes and with a computer network linking virtually every home, school, office, and factory. A critical appraisal of *IT 2000* is provided by Soh, Neo and Markus (1993) who found that the planning process was rather top-down, with the bulk of work being carried out by personnel of the National Computer Board. A more favourable comment came in a comparison of Singapore's information policy with others in the region (Moore, 1995) that concluded that Singapore's integrated approach to planning was the most effective and was already showing demonstrable results far ahead of other countries.

Computerising an Island

The NCB (National Computer Board) tackled the task of computerising an island by making the civil service the most automated in the world. Subsequently, the focus changed to promoting an IT culture in the country as a whole, as this 1999 extract from its webpage shows:

> *To be successful in our* IT2000 *vision, we must be able to bring IT to the man in the street. Our priority target group is the school-going children. The NCB will work with government agencies, the industry and the mass media to bring about greater IT fluency among Singaporeans. Comprehensive educational and promotional campaigns will be introduced to improve IT literacy. These initiatives include organising IT roadshows and exhibitions aimed at the masses, accelerating the use of IT in schools and developing new programmes to reach out to the workforce.*

The linchpin for attaining these objectives is *Singapore ONE* (One Network for Everyone), a multimedia broadband cable network that reaches every home on the island. Using the latest digital technologies, it delivers information to subscribers at 100 times the speed of normal Internet dial-up via a modem and the phone lines. This means that users can enjoy richer and more interactive content, including near broadcast quality video, CD-quality sound, and interactive 3D graphics for entertainment, distance learning, online shopping, or interaction with government departments (http://www.s-one.gov.sg). The cabling is now complete and Singapore has become the first country in the world where every home and office can connect to broadband. The service, however, has been slow to take off. One commentator describes it as "a big pipe with water trickling through it" (Ang, 2000). At its launch in mid 1998, the government expected to have 100,000 users by the end of 1999. By that date only 25,000 of Singapore's 710,000 Internet users had signed up. This is partly explained by the high cost ($20 for 10 hours per month), whereas regular Internet access costs a fraction of this and some providers are now offering free access. Furthermore, the benefits of high speed are available only when linking to Singapore sites, while the connection to America is still limited to conventional channels. Although government agencies, such as the Ministry of Education and the National Library Board, are under pressure to participate in the venture, Singapore content is not regarded as the most exciting since the small customer base does not encourage commercial development. The tepid response to *Singapore ONE* indicates that whilst government intervention is important, it cannot compensate for the lack of an entrepreneurial private sector in this type of enterprise. Meanwhile, the National Computer Board, so influential in the early success of Singapore's information policy implementation, has now been re-named the Infocomm Development Authority of Singapore in recognition of the changing information landscape and its dependence upon telecommunications.

Expanding the Public Library System

When the second key document, *Library 2000: Investing in a learning Nation*, was published in 1994 it marked a watershed in the history of public library development in Singapore. The document was both a dispassionate assessment of the status quo and a blueprint for change. Most importantly, it was a signal of intent, a statement made at the very highest level that libraries and information were to play an important part in national development. It can also be regarded as a SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) in its assessment of factors inherent in the library system at that time and in the environment in which they operated. As such, it provides significant documentary evidence that places the subsequent changes in context.

The report was produced by the *Library 2000* Review Committee, which began work in June 1992, charged with the following brief:

> *• to formulate a masterplan for developing library services over the next ten years, defining the services, infrastructure and target audience, which the libraries in Singapore must address;*
> *• to determine how information technology can be fully exploited to facilitate libraries to play a relevant role in the emerging information society;*
> *• to review library manpower and the skills needed to implement library development;*
> *• to propose an organisational strategy for the National Library*. (*Library 2000,* p. 122)

The subtitle of the report, *Investing in a learning Nation*, has significance. A key objective was to "promote a well-read and well-informed society", (ibid, p.122). The planners clearly recognised the role that libraries play in collecting and disseminating knowledge, in encouraging self-improvement, in acting as repositories for the nation's cultural heritage, and in providing gateways to global information sources. In effect, libraries would complement and reinforce the nation's education system and skills upgrading programme, which was seen as vital for maintaining Singapore's competitive edge in the region. The word *investing*, which appeared in the subtitle, not only indicated that a considerable injection of funding would be needed but also implied that a pay-off was both expected and assured.

The report recommended six strategic thrusts:

- An adaptive public library system
- A network of borderless libraries
- A co-coordinated national collection strategy
- Quality service through market orientation
- Symbiotic linkages with business and community
- Global knowledge arbitrage.

These thrusts would materialise in the form of a vastly improved public library system with a new National Reference Library, including specialised business and arts reference libraries, and a three-tier lending library system of five regional libraries, 18 community libraries, and 100 neighbourhood children's libraries. The intention was to provide easy access to books in all residential areas of Singapore by ensuring that there would be a public library outlet within walking distance of all Mass Rapid Transit (MRT) stations and bus interchanges.

As well as improving physical access, a great deal of attention has been paid to developing innovative library services, which depend upon electronic, access. By bringing reality to the term "virtual library," a whole new audience could be targeted, an audience which may not have used traditional libraries before. The basis for the borderless library network envisioned in *Library 2000* became known as TIARA (Timely Information for All in a Relevant and Affordable manner). "Ask TIARA" is a facility whereby users can pose reference questions that are routed to the National Reference Library. There is an SDI (Selective Dissemination of Information) service, known as "Hot Topics," that alerts registered users to the latest news and articles on trends and developments in areas such as business, education, health and medicine, management, science and technology, information technology, and intellectual property. There is even a facility known as "Tiara's Children" that provides access to selected and safe Internet sites for students who need information for homework or project work. Furthermore, contracts were signed with the large information providers (i.e., Dialog, Elsevier, Reuters, Gartner, Faulkner, and Engineering Information) that allowed their

databases to reside on the system. This allows anyone in Singapore with Internet access to register as a TIARA user and then to access all these databases free of charge. Foreigners may not register, as the system only accepts Singapore ID numbers.

TIARA was always envisioned as a fee-paying service. The publicity in 1997 stated that the service would remain free only until the end of that year, as a trial period. At the time of writing in July 2000, however, the service is still free, which indicates that uptake has been much lower than anticipated. In the absence of any definite statements, one can only assume that the marketing effort has been weak and that a greater awareness-raising campaign is necessary to convince Singaporeans that database access is beneficial to them, even when it is free. The university libraries already provide such access to their staff and students, although they have never strongly promoted online literature searching. Clearly, the borderless library concept needs better marketing to both librarians and users and will require a longer lead-time to accomplish.

Other innovative library products have allowed patrons to explore the electronic information environment. *InfoXpress* is a database of frequently asked reference questions about Singapore which can be accessed in branch libraries and forms the basis of a distributed reference service without staff intervention at the point of use. Secondly, Virtual Communities have been created on the library website that allow particular user groups, such as students or the business community, to interact and obtain information of particular interest to them. A third example is E-Station. This commercial venture, situated in Suntec City and described as an "edutainment center," consists of 400 terminals with broadband access to the National Library's electronic services as well as other facilities for education, training, and multiplayer computer games. It is hoped that this mix of business and pleasure will attract wide usage and promote the Internet "as a focal point for both work, education and entertainment pursuits," (NLB Press Release, 29 January 2000).

Finally, attention has been given to Singapore's heritage and the National Library Board (NLB)'s responsibility both to preserve and to make available key historical documents. One means of allowing greater public access to these is a CD-ROMs series known as "Fact Finders," a collaborative effort between the NLB, the National Archives of Singapore and the Ministry of Information and the Arts. To date, two CD-ROMs have been produced. *Transition to Nationhood* is a resource guide to the events of Singapore's merger with and separation from Malaysia at the time of gaining independence from Britain. The contents are derived from a range of resources including newspapers, official documents, speeches, photographs, and sound recordings. The second CD-ROM, *MITA Campaigns*, recognises that there is great interest both at home and overseas in Singapore's national campaigns such as Courtesy, Speak Mandarin, and No Littering. The content is based upon posters, ephemera, photographs, videos, and sound recordings spanning the twenty years from 1979 to 1999. One interesting aspect of this exercise is that the NLB has decided not to sell these CD-ROMs because it regards the electronic content as a valuable asset that might be "pirated" after sale. Instead they will be made available to schools and other institutional libraries as well as throughout the public library system, where their use can be monitored, (Salleh, 2000).

Masterplan for IT in for Education

Reforming the Educational System

The third aspect of Singapore's strategy to increase information literacy involves a major reform of the education system. The *Masterplan for IT in Education*, published in 1997, is underpinned by a desire to ensure that schools move from a content-based curriculum dependent upon rote learning to a system that produces creative thinkers. This is a response to a realisation at the highest levels that, although Singapore is now proficient at producing high-tech goods, not enough effort is being directed to creating new technologies. The *Masterplan* relies heavily on competencies in IT and Internet usage, and teachers are being re-trained to integrate these into all learning areas. A target is in place for a pupil:computer ratio of 2:1 by the year 2002. There appears to be an assumption that creativity will follow from this and that allowing students greater access to the Internet will make them into independent learners.

A weak link in the chain is that Singaporean schools lack dually qualified teacher-librarians with a full time commitment to the library. For too long, the school library has been seen as an extra-curricular activity and has not been given adequate staffing. In countries such as Australia and Canada, teacher-librarians have acted as change agents who are able to promote research skills on a school-wide basis. One local librarian turned educator has noted the problem (Choy, 1998): the net result will be smart schools in which pupils have access to as much information as teachers. There is a danger, though, that the whole system could explode from an over-stimulated overload, to put it in engineering terms. What is required is some means of selecting and organising the information input and passing these discriminatory skills onto pupils.

Singapore is relying on pilot projects in a few selected schools. These act as testbeds for new ideas so that good practice can develop at one location and spread outwards. In Stage One there were 22 demonstration schools (ten primary schools, ten

secondary schools, and two junior colleges) set up to enable "experimentation at the frontiers of IT-based learning" (*Masterplan*, section 42). Their task was to provide the rest of the school system with concrete local models of innovation in teaching, learning strategies, and school administration. Earlier pilot projects incorporated into the plan included the Students' and Teachers' Workbench (STW) that experimented with a fully IT-based curriculum in Secondary One Science, a curriculum area that lacks sufficient specialist teachers, and provided a central repository of educational resources and lesson packages for teachers. Whilst the reforms in Singapore are too new to see results yet, it will be easier to achieve computer literacy than to achieve creativity (Nye, 1999). Nevertheless, there is a general feeling that positive outcomes will arise from a concentration on adequately resourced change in the educational sector.

Conclusion

Singapore is often accused of having a top-down approach in both the way the country is governed and the way large institutions are administered. There is no lack of effort, however, in providing the public with detailed information about policies, and the media are willing partners here. This might be described as raising awareness by some and as propaganda by others. The other noteworthy feature of the measures described above is the fact that government first builds a solid infrastructure. It then relies upon the synergy created by public/private collaboration to amplify the effect.

There is no doubt that information literacy should be on all national agendas. Bundy (1999) described it as the "twenty-first century smartcard. Although programs to develop the educational attainment of all citizens will pay off in the long term, politicians in many countries refuse to go beyond rhetoric and allocate adequate resources to this. In Singapore, implementation of programs has been made easier by virtue of its being a small country with no viable political opposition. This means that policies are more quickly implemented and more readily available for evaluation by observers and commentators. It is an ideal case study for the rest of the world.

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School Libraries Online: Exploring Issues and Developments Through the IASL Website

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Background

In Internet terms, the origins of the Web site of the International Association of School Librarianship are shrouded in the mists of antiquity. Way back at the beginning of 1995, I established IASL-LINK as an Internet listserv for the Association. Dr Jean Lowrie, a founder of IASL and then retiring as Executive Secretary, wanted a home page for IASL. I, too, thought we should have a home page and probably a full Web site. Others doubted that the Association had the resources to do this – or even that it should be done at all. Those of you who know Jean will know that she is persistent, and in this case she focused that persistence on me. I felt that establishing a Web site was a job for a bright young member of the Association, and so I kept hoping that "someone else" would do it. In the end, I lost patience just at the time Jean became *very* persistent. In November 1995 I created a home page for IASL, with eleven supporting pages, just to prove that it could be done. Thus it was that I found I was the Webmaster.

The original pages were very simple in design so that they could be viewed through any of the Web browser software that was available in schools and libraries at the time and so that they would occupy little bandwidth and come through fairly fast even for users on slow Internet connections. As browser software has improved and more IASL members have fast connections, these two considerations are not as important now as they were in the beginning, though I am still aware of them when I create new pages.

In November 1998, the Web site underwent a major redesign, at which point it was re-named "School Libraries Online." An immediate result of these changes was that usage of the site doubled in December 1998, and it has continued to grow at an increasing rate ever since.

There are now more than 360 pages of information on the system, but this does not represent the total number of pages created. Some pages, such as the one created early this year for the nomination of new IASL Board members, have a fairly short life span, while other pages, such as the one that covers the history of IASL, have been on the system since the beginning. On average, six or seven new pages are created each month.

At the moment, the Web site is based on a mainframe computer at the University of Iceland. By the end of the year, however, it will have been moved to a computer in Vancouver, Canada, where our new domain name is registered and where it is close to the IASL office.

Online Demonstration

The "School Libraries Online" home page serves as the main point of access to the resources and services available through the Web site, and reflects the general structure of the site. There are two main components of the "School Libraries Online" home page. One is the "Site Directory" that leads users to information created by the Association. The other is a collection of icons surrounding the directory that leads users to information resources and services of various kinds on the Internet and to some special services on "School Libraries Online" itself. While the site directory remains relatively stable as an overall guide to the site, the icons change frequently, since they highlight resources and activities that change throughout the year.

The Site Directory

- **"**About the Association**"** (with objectives, activities, office-bearers and directors, history of the Association, the *IASL Handbook of Organization* and related documents, annual reports, and the Association's Policy Statement on School Libraries)

- The *IASL Newsletter* (with the full text of selected articles from the print newsletter 1995-2000)

- *School Libraries Worldwide*, the IASL professional/research journal (with contents lists and abstracts of articles provided by the Editor of the print journal, Dr. Dianne Oberg of Canada)

- Professional Reviews (coordinated by the IASL Review Coordinator Peter Genco of the United States)

- The Annual Conferences (with information about forthcoming conferences, reports of past conferences, and the contents pages of the volumes of conference proceedings and/or selected papers)

- Committees and Special Interest Groups of the Association (I wish I could say more about this!)

- The IASL Noticeboard (with current deadlines, information about conferences, and other activities)

- IASL-LINK: The Association's Listserv (with information about subscribing and participating)

- IASL Publications (with a list of publications and ordering information)

- The IASL International Awards Programme (with information about previous winners and application information)

- "How to Join the Association" (with application form)

- School Librarianship Documents (with links to the full text of documents such as policy statements, articles, conference papers, and bibliographies)

- Links to School Library Resources on the Internet (with more than 20 pages of annotated links to evaluated resources in categories such as "educational resources," "information skills resources," "school library automation resources," "resources for reading promotion," and "resources for professional development")

Other Resources and Services

In July 2000, the resources and services available through the icons on the home page included the following:

- "Current News" related to school libraries (the full text of articles, provided through a search of more than 300 current news sources and services)

- "Today is…" (a collection of Web-based services to support school library displays and activities, including "Today in History" and "On This Day")

- "Did You Know?" (a "daily factoid" and collection of evaluated links to curriculum-related Web sites dealing with a topic of the week, from Barbara J. Feldman, author of the syndicated column "Surfing the Net With Kids")

- International Year for the Culture of Peace 2000 (a page of links to selected Internet resources for this special year)

- Resources related to the Sydney 2000 Olympic Games (provided by the Victorian Department of Education)

- International School Library Day (IASL's Web pages to support International School Library Day, plus International School Library Day projects)

- The IASL/Concord School Library Web Page Award (the pages through which this monthly and annual award is administered)

Search services available through the home page include a site search engine, an option for searching Encyclopaedia Britannica online, a link to the *Blue Web'n* searchable database of educational resources on the Internet, and a link to the *Yahoo!* search engine and directories.

Foundations

Different ideas, documents, theories, and discussions have informed the development of the IASL Web site at different stages. When work commenced in 1995, the relevant professional and research literature was sparse. In this situation, the best approach seemed to be to work from the emerging technical standards (to ensure that the Web site would be accessible from a range of different computers running different browser software) and to use a strategic planning process that emphasized objectives and meeting user needs. These considerations continue to drive Web site development. However, as the professional and research literature has matured over the five years, "School Libraries

Online" has incorporated ideas from professional practice, findings, and theories from research as well as the results of ongoing monitoring and evaluation of the Web site itself.

The mission statement and objectives of the Association provided a foundation for the early work on the Web site: "The mission of the International Association of School Librarianship is to provide an international forum for people interested in promoting effective school library media programs as viable instruments in the educational process." The mission statement also describes the members of the Association:

> *Membership is worldwide and includes school librarians, teachers, librarians, library advisers, consultants, educational administrators, and others who are responsible for library and information services in schools. The membership also includes professors and instructors in universities and colleges where there are programs for school librarians, and students who are undertaking such programs.*

These various different groups of members all have information needs, some of which are common to all or most of the groups and some of which are unique to a particular group.

The objectives of IASL state that, amongst other things, the Association will promote the development of school libraries throughout all countries, foster a sense of community among school librarians in all parts of the world, promote the professional development of school librarians, encourage research in the field of school librarianship, promote the adoption of research results in practice, disseminate information about programs and materials, and initiate and coordinate activities such as conferences and projects. Thus the Association's work is international and based on communication, creation and dissemination of information, and coordination of activities and projects to meet the needs of a diverse membership that nevertheless focuses on many common interests and concerns.

In keeping with this, the Web site was initially designed to serve three main purposes:

- to provide information about the Association and its activities for members and non-members

- to provide information and services for school library personnel, including information about projects and activities, professional development opportunities, current developments in the field of school librarianship, articles and papers, research reports, news, and opportunities to participate in Web-based activities; and

- to help school library personnel to explore the Internet, and particularly to help them to find resources and services that are relevant to library and information services in schools.

To these, a fourth purpose was subsequently added:

- to provide a basis for the management and/or operation of Association projects.

This last reflects two different trends during the five years: the increasing level of access to the Internet, even in developing countries, so that more IASL members can take part in

Internet-based projects; and the increasing availability of software that assists the operation of such projects.

Initially, the Web site had a very simple structure of menus leading to information created by the Association and to collections of links to Internet resources in the field of school librarianship. Over the last two years, however, "School Libraries Online" has been developed further with the aim of creating a fully-fledged "portal" or "subject gateway" to the Internet for school library personnel, which is in line with the ideas of Koch (2000) and Dempsey (2000) as implemented in the Electronic Libraries Programme (eLib) in the United Kingdom. In addition to original content created by the Association, the Web site provides a subject gateway to "support systematic resource discovery," quality-controlled and classified links to resources (documents, objects, sites or services), and value-added features.

Over the five years, work on the Web site has been influenced by books such as Roger Black and Sean Elder's *Web Sites That Work* (1997), David Siegel's *Secrets of Successful Web Sites* (1997), and Molly Holzschlag's *Web by Design* (1998). Louis Rosenfeld and Peter Morville's ground-breaking book, *Information Architecture for the World Wide Web* (1998), was as important for me as it was for many other Webmasters. Research that has provided useful insights includes the work of Virginia Cano and her colleagues on municipal Web sites in the United Kingdom (Cano & Prentice, 1998), a national study of school Web sites in the United States of America, Helge Clausen's work on academic library Web sites in Denmark (Clausen, 1999), and my own international studies of public and school library Web sites (Clyde, 1996; Clyde, 1999).

Keeping Up

Various sections of "School Libraries Online" are designed to provide current information related to issues and developments in school librarianship and/or to provide links to Internet resources that will help school library personnel to keep up to date. Among these are the "Current News" button on the home page, the reviews section (which reviews professional materials for school library personnel), and the section of links to school library resources on the Internet.

Current News

The "Current News" button leads to a service that is offered in conjunction with the Internet search engine *Excite*. When users click on this button, the search engine initiates a search of more than 300 news services internationally for current stories related to school libraries. News sources covered include newspapers from the United States, Canada, Australia, Norway, and other countries; magazines such as *PC World;* and news services like PR Newswire, CNET, and Business Wire. An additional "photo search" and/or an additional "audio/video search" can be carried out from the bottom of the search results page. Topics covered by the "Current News" service include, among others, policy and legislation, funding, censorship, use of technology, personnel issues, and school and public library cooperation. The results of the search are presented as a day-by-day listing going back one week, with the possibility to go back a further week. Users can see the full text of all articles retrieved by the search engine. This service is useful for those who require up-to-date information on developments such as challenges to school library materials, or for those who are tracking a particular issue through the news media over a period of time.

The Reviews Section

The "Reviews" section of "School Libraries Online" is the result of an international collaboration. Peter Genco, IASL's Reviews Coordinator, is a school library media specialist and technology team leader at a secondary school in Erie, Pennsylvania, USA. Peter takes delivery of new professional publications (books, software, CD-ROMs) from publishers in several countries. He assigns the materials to reviewers worldwide, collects and edits the reviews, and then sends them to the Webmaster by email. He also provides notes about any links that should be made (for example, to the Web site of the publisher or author). The reviews are then added to the Web site, using a page template to speed up the process and to ensure that all review pages are in the same format. The review indexes are updated as each new review is added.

Each review has a "hot link" to the Amazon.Com Web site, so that users of "School Libraries Online" can go direct to Amazon to purchase a copy of the book or resource. Users of the IASL Web site also have access to the reviews on the Amazon Web site, so that they may have more than one opinion about any book. IASL is an Associate of Amazon, which pays the Association a small fee for every book that is purchased as a result of a link from the "School Libraries Online" Web site. The Association will use this money to support a member in a developing country, something that is particularly important in terms of the Association's objective to promote the development of school library services throughout the world.

Links to School Library Resources on the Internet

The section of "Links to School Library Resources on the Internet" is one of the most frequently-accessed sections of "School Libraries Online"; it is also the most time-consuming to maintain. This section provides annotated links to hundreds of Internet sites of interest to people who are involved in school librarianship. In keeping with the aim of helping school library personnel to explore the resources that are available on the Internet, this section provides links to the best resources available.

The listings are selective rather than comprehensive, and resources are evaluated before links are made. Selection criteria include relevance of the resource to the work or professional concerns of school librarians, currency, timeliness, authority, organization of the resource, and coverage. Many of the resources have been chosen because they lead to further lists of resources (index sites or directories or "meta-sites"); some of them are general; and some of them relate to particular aspects of librarianship, school librarianship, or education. The exceptions to the latter include the Web sites of professional associations in the field of school librarianship, sites with information about a particular school library automation system or information skills resource, and sites that contain useful information for school librarians that is not available elsewhere.

In addition, there are links to some lists of resources that have been created especially for IASL, for instance, IASL's own collection of documents related to school librarianship around the world. There are more than 20 pages in this section, organized under the following headings:

- Library Associations
- School Library Associations
- School Libraries and School Librarians on the Internet

- Resources for School Librarians
- Educational Resources
- Information Skills Resources
- School Library Automation Resources
- Children's Literature Resources
- Internet Resources for Reading Promotion
- Internet Resources for Storytelling
- Research in School Librarianship – Resources
- Resources for Professional Development
- Internet Resources for Kids
- Other Useful Resources
- School Librarianship Documents
- Electronic Journals Related to School Librarianship
- Creating a Web Page for Your School Library – Resources

Some of the pages in this section contain important collections of links. For example, the page for "School Library Associations," organized by country, has links to all school library associations that are known to have a Web site, while the page of links to "School Library Automation Resources" has an alphabetical listing of links to the Web sites of vendors/developers of school library automation systems.

School Library Websites

There are two international directories of school library Web sites, one maintained by Linda Bertland and one by Peter Milbury (both in the United States); both show that the number of such sites is increasing. One of the early pages on the IASL Web site highlighted the Web pages of Association members. One of my personal hopes for "School Libraries Online" was that it would be a catalyst for the development of school library Web pages, that it would encourage IASL members to become actively involved in building the Internet. With this in mind, I proposed to the IASL Board that a new award be approved for a school library Web page and found an enthusiastic sponsor in a fellow Australian whose company creates and markets school library automation software that includes a Web interface.

In late 1999, the Association established the IASL/Concord School Library Web Page Award with sponsorship from Concord Australia. The aim of the award is to promote the involvement of school librarians in the development of the Web and to promote excellence in school library Web sites by highlighting "best practice." This award is made to a school library Web page, from any country, that meets the selection criteria. Web pages may be nominated by any IASL member or by any member of the Selection Committee. In addition, members of the Selection Committee actively seek out potential award-winning Web pages. Both the award itself and the activities of the Selection Committee are coordinated through the IASL Web site and by email. The selection criteria are available through the Web site, and there are links to the Web sites of previous winners of the award.

The IASL/Concord School Library Web Page of the Year Award takes the form of a cash grant, a plaque for the winning school library, and the award logo that the school library can download to its Web site to show that it was the winner of the IASL/Concord School Library Web Page Award for that year. A School Library Web

Page of the Month is announced each month, and the annual winner is selected from among these 10 to 12 school library Web pages before the IASL conference each year. The winners of the monthly awards are able to download an award logo for their Web site to highlight their achievement. All the School Library Web Page of the Month Award winners are reviewed again by the Selection Committee before the conference to make sure that they are still in existence and still of an appropriate standard as well as to assess any changes. The winner of the IASL/Concord School Library Web Page of the Year Award is announced at the annual conference.

International Activities

In the last two years, more and more members of IASL have gained access to the Internet. At the same time, some Internet costs have decreased while both browser software for users and page creation software for page developers have become more sophisticated. This has meant that it has been possible to extend the applications of the Association's Web site beyond the primary applications of information dissemination and communication. In particular, we have been able to develop the Web site as the basis for some of the Association's projects and activities. Two important examples from 1999/2000 are the use of "School Libraries Online" as the basis for activities for International School Library Day and the coordination of the IASL/Concord School Library Web Page Award through the Web site. The latter has already been mentioned; the former will be discussed here.

Early in 1999, the IASL President, Dr. Blanche Woolls, formally proclaimed that International School Library Day would be held on the third Monday of October each year. The first International School Library Day was celebrated on 18 October 1999, with the theme "A day in the life…". The day focused on the many activities and issues that make up the daily life of school library personnel around the world. The first International School Library Day was organized in conjunction with a special issue of the IASL journal, *School Libraries Worldwide*, edited by Dr. Dianne Oberg. The IASL Web site was used to present stories, anecdotes, photographs, and other material submitted "on the day" by people involved in school librarianship. Members of the Association and others were invited to read the stories of their colleagues and to submit their own stories in words and pictures. The stories could be short or long; they could comment on the submissions of others; but the aim was to collect reflections on school libraries from some of the variety of people who work at many levels for the provision of school library programmes and services. Stories and other material could be submitted by email or via a special Web page on the site.

In all, more than 30 people submitted stories, photographs, and URLs during the day; all appeared on the "School Libraries Online" Web site. They included submissions from South Africa, Australia, Canada, New Zealand, the United States, Scotland, Russia, the Republic of the Seychelles, Malta, and Namibia. The Queenslanders contributed a series of photographs of "a night in the life…" of teacher librarians celebrating at a professional function. The special issue of *School Libraries Worldwide* (which also had the theme "A day in the life…") appeared in January 2000. It included not only stories written specially for the journal by people who are active in school librarianship in different countries but also a section that drew together the stories from the Web site (Oberg, 2000). This means that although much of the International School Library Day activity took place on the Web site, there is also a formal printed record of the contributions. The October 2000 celebration of International School Library Day will also be based on the Web site with other activities, too.

It is my hope that we will be able to use "School Libraries Online" as the basis for more Association activities in the future, and I will be talking to various people at this conference with a view to involving more members in this work.

Discussion

In any project, formative evaluation is important to ensure that user needs are being met and that account is being taken of new developments. At the same time, the IASL Web site is essentially the spare-time work of one person, the Webmaster, with some content created by others, including the Review Coordinator, the Editor of *School Libraries Worldwide,* and the IASL office. This reality governs what is possible, but it also highlights the necessity for ongoing evaluation so that the work that is done is relevant and appropriate.

As indicated earlier in this presentation, the membership of the Association is diverse and encompasses all people who are involved in the provision of school library services at the local and national levels as well as within schools. It also includes educators of school library personnel in universities and colleges as well as students who are studying to become school librarians. It does not include school children. The needs of all these people are monitored and considered in the development of the Web site. In addition, the objectives of the Association provided and continue to provide a framework for development. These factors are important in the organization and development of the Web site as well as in ongoing evaluation. They provide a basis for the selection of materials and services for inclusion in the Web site and for the way in which those resources are organized and indexed. Other factors that have to be taken into account include new developments in school librarianship (which can be identified through the news service on the site as well as through research studies and conference papers) and new developments in Internet technology and browser software. In particular, new software developments sometimes make it possible to offer new services or to do things in a better way.

Ongoing evaluation of "School Libraries Online" is carried out through a number of formal and informal strategies. Some of the monitoring and evaluation strategies are based on the use of technology while others are more traditional. Strategies based on Internet technologies include trackers/counters on the Web site and log files on the mainframe computer on which the site is based. In addition, the "link to" feature of the *AltaVista* search engine is used to track the number of sites that have linked to "School Libraries Online" as an indicator of popularity with other site developers. Strategies based on more traditional methods include, for example, keeping a record of responses to the Web site (both favorable and unfavorable) and submitting the site for formal evaluation by services such as *Encyclopaedia Britannica* and *The Scout Report*. There are plans to survey users of the Web site through a Web-based form. Non-users of the site present a greater challenge, especially since it is known that some non-users do have Internet access.

"School Libraries Online" has changed and developed a great deal since it was established five years ago, and changes are likely to continue. Not only do needs change with time, but new developments in technology enable the Webmaster to meet more needs. Another consideration is that any Web site that remains static will soon find that users move elsewhere. Consequently, at any one time there are usually several new features under consideration or under development for the Web site.

And now, over to you, the users. What would *you* like to see on "School Libraries Online"? How would you like to see the site developed? What potential sources of content would you like us to tap into? What contribution could *you* make to the Web site?

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Evaluating Your Collection to Facilitate Literacy

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How can we evaluate a library collection to facilitate literacy? Before we can effectively answer this question we first need to look at the terms "collection" and "literacy." The meanings of both of these terms, particularly as they relate to school librarianship, have evolved in the past several years.

What Is a Collection?

Traditionally a collection has referred to print items that were housed in a single site, the school library. In the past several years, however, school libraries have added other formats of information, including both print and non-print items. Print items are not only books but also newspapers, magazines, and pamphlets; non-print items may include videocassettes, audiocassettes, CD-ROMs, kits, picture files, computer software programs, websites, and DVDs. Thus, the variety of formats included in a library collection has grown significantly.

Not only have the formats themselves increased but now our means of accessing the resources have also become greater in number. The school library collection is no longer just those items that are housed within the four walls of a room; we can now reach out to access materials that are housed in other local, state, and international libraries as well as other types of information centers or sites. Through interlibrary loan, cooperative agreements, and the use of electronic access, those who use a school library can obtain a huge number of materials in numerous formats. When we evaluate our collections to facilitate literacy, we must also consider the evaluation of both on-site and off-site materials, particularly the items accessed through the Internet.

What Is Literacy?

The term "literacy" has changed even more than "collection." One hundred years ago literacy referred to the ability to sign one's name and to recite from familiar texts such as the Bible or a school textbook. Even twenty years ago literacy was primarily linked to the reading of print materials. Today, the concepts of literacy have been applied to so many areas that the term has become extremely confusing. Functional literacy, basic literacy, environmental literacy, business literacy, cultural literacy, and information literacy are just a few of the literacy-linked terms that we hear. It is probably safe to assume that laypersons outside a particular discipline have little understanding of these concepts. Even persons within a discipline may not even have a common understanding of a certain term referring to literacy. This is particularly true of "information literacy," which is the term in school librarianship. Although school librarians themselves are beginning to understand the many facets of "information literacy," it does not necessarily follow that school administrators and teachers have similar understandings.

We all want our students to be information literate, but what does that involve? Information literacy means having the skills to

- Recognize the need for information
- Identify and locate information sources
- Access information in those sources
- Evaluate the quality of information obtained
- Organize and synthesize the information
- Use the information effectively
- Produce new information

Information literacy is thus a process. Carol Kuhlthau's studies (1985, 1987, 1988, 1993), which deal with the cognitive and affective stages that students follow to solve a problem or to research a topic, have contributed greatly to the understanding of the process involved with becoming information literate. Her studies also point out the need for students to use information in constructing their own knowledge.

How Do Standards and Policies Address School Library Collections and Information Literacy?

Almost all library standards and policies written in the past several years have addressed the concept of information literacy and the expanded concept of a library collection. In preparing for our presentation, we looked at some of these standards, and we will share brief statements from three such documents:

- *Information Power: Building Partnerships for Learning* (the national school library guidelines produced by the American Association of School Librarians and the Association for Educational Communications and Technology)

- "Libraries in New South Wales Government Schools Policy Statement" (a department of education school library policy from New South Wales, Australia)

- "IFLA/UNESCO School Library Manifesto" (a document produced by the International Federation of Library Associations and Institutions)

A Book: Information Power: Building Partnerships for Learning

This book is perhaps the most widely cited document dealing with information literacy, particularly as it relates to student learning. It addresses a school library collection in the section that deals with the mission and goals of a media center:

> *To provide a physical access to information through*
> *1. a carefully selected and systematically local collection of diverse learning resources that represent a wide range of subjects, levels of difficulty, and formats;*
> *2. a systematic procedure for acquiring information and materials from outside the library media center and the school through such mechanisms as electronic networks, interlibrary loan, and cooperative agreements with other information agencies; and instruction in using a range of equipment for accessing local and remote information in any format.* (American Association of School Librarians 1998, 7)

Nine information literacy standards for student learning are described. The three that deal directly with the concept of information literacy are

> *Standard 1: The student who is information literate accesses information efficiently and effectively.*
> *Standard 2: The student who is information literate evaluates information critically and competently.*
> *Standard 3: The student who is information literate uses information accurately and creatively.* (American Association of School Librarians 1998, 8)

A Policy Statement: "Libraries in New South Wales Government Schools"

This general policy provides a basis for school libraries in New South Wales to develop more detailed descriptions of their individual services and programs. The school library collection and its relationship to student learning is described as follows:

> *School library collections should contain materials and equipment in a wide variety of forms suited to learning processes. Materials are those processed items that contain data and information and typically include audiovisual items, models and games as well as books, pamphlets, newspapers and magazines. Increasingly, materials now include computer software, toys and artefacts [sic]. Publications of the New South Wales Department of Education such as curriculum documents, journals and serials must be accessible through the library and be available for loan.* (New South Wales Department of Education 1999, 4)

Information literacy and its relationship to student learning is addressed in the following section of the policy statement:

> *The purpose of the school library is to enhance teaching and students' learning within the total school program by …*
> - *providing opportunities for students to develop information skills and use them competently and confidently*
> - *extending and enlivening students' learning experiences and enriching their lives through the effective use of resources*
> - *providing experiences to stimulate reading and develop in students a desire to read.…* (New South Wales Department of Education 1999, 2)

A Document: "IFLA/UNESCO School Library Manifesto"

This document, which was ratified by the 30th United Nations Educational, Scientific and Cultural Organization General Conference, describes the mission, the goals, staffing, and the operation and management of a school library. It also contains a statement dealing with funding legislation and networks. Plans include translating the publication into as many languages as possible.

The relationship of a school library collection and learners is described in the Manifesto's mission statement of the school library: "The school library offers learning services, books and resources that enable all members of the school community to become critical thinkers and effective users of information in all formats and media" (International Federation of Library Associations and Institutions 1999, 15).

The mission statement also addresses information literacy, relating it to student achievement: "It has been demonstrated that, when librarians and teachers work together, students achieve higher levels of literacy, reading, learning, problem-solving and information and communication technology skills" (International Federation of Library Associations and Institutions 1999, 15).

How Is the Collection Evaluated?

What is the bridge between literacy and evaluation of the collection? There are several. First, the school library collection should support the school's literacy efforts. Second, research has shown a correlation between students' literacy achievement and the quality of their school libraries (Hamilton-Pennell et al., 2000). Third, "information literacy" covers a wide range of behaviors of interacting with collections. And fourth, we are increasingly being asked to justify the need for school libraries.

Although each person will have their own unique reasons for evaluating their collections, the same process should be followed. The first step is to determine your goals or to define the problem you are trying to solve. The second step is to ascertain the kinds of data that need to be collected to make judgments about those goals or problems. The third step is to identify a method to collect that data, and the fourth is to analyze the data you collect. Finally, it is important to convey the results to the appropriate party.

Various methods can be used to evaluate a collection, but they all break down into two major types of measures: quantitative and qualitative measures. Quantitative evaluation measures how many. Qualitative measures how good is the collection or whether the collection is appropriate for the users. There are forms in the handouts that address both types of techniques.

Size of the Collection

A simple way to evaluate the collection is by size. How many items are in the collection? Most automated circulation systems have a reporting option for the total number of items that have been entered into the system. If you do not have an automated system you can use the "holdings estimation worksheet" included in the handouts. Use a ruler, your shelf list, and the form. Take ten 1-inch samples from various parts of the collection. Count the number of cards per inch and the number of volumes per card. Average the samples together to get the average number of cards per inch and average number of volumes per inch. Follow the steps on the form to determine the total library holdings.

The advantage of using collection size as an evaluative criterion is that the data is straightforward and easily understood. But does quantity indicate quality? Sometimes it does, but not always. It is possible to have a large collection of useless, old, and worn materials. Which is more useful, unique titles or number of volumes? Absolute size or rate of growth?

After you collect this data you can compare it to various guidelines. One example in the handout is from the Pennsylvania Department of Education for minimum, average, and exemplary sizes of collections. Notice that the guidelines state "currently useful volumes."

Usage of the Collection

Circulation is the most common statistic kept in school libraries. It is meaningless to use circulation measures for evaluation, however, if you limit how many items students can check out in conjunction with a fixed schedule; the numbers will never fluctuate.

In the handouts, there are some statistics that use circulation measures, but interpret them differently. The "relative use factor" is the ratio of circulation to holdings, and it is a good way to compare the usage of various areas of the collection. A relative use of 1.00 indicates that a given area of the collection is being used in direct proportion to the number of items available. A relative use of less than 1.00 indicates that there is less usage, and more than 1.00 means more usage in that area of the collection. Areas of the collection with high relative use factors can be strengthened and those with low factors more heavily promoted. The relative use factor can be calculated manually but is more readily available with automated systems.

Circulation per student and turnover rate are measures that are easily understood by administrators and can capsulize your circulation for a year. Circulation per student indicates the number of items the average student takes out per year. It is calculated by dividing the total annual circulation by the total number of students in the school. Turnover rate indicates how many times each item was used. To determine turnover rate divide the annual circulation by the total library holdings.

Keep in mind that these figures are averages. There will be students who take out many materials and those who take out none. There will be books that have high circulation and those that have none. Is there an absolute number to aim for with either measure? None have been determined. The value of the measures are to compare your library over time or maybe to compare your library to similar libraries in your region.

Percentages of the Collection Found in Standard Sources

If a high percentage of the library's titles are found in standard sources, it may be assumed the collection is of high quality. What are some of these "standard sources?" Best books lists (some are listed in the bibliography) and selection sources such as the *High School Catalog* and *The Elementary School Library Collection* qualify. The advantages of this type of comparison are that such lists are readily available and areas of the collection needing development can be identified. Disadvantages are the use of arbitrary samples, quickly outdated sources, and the irrelevance of the titles listed to the library or its users. It also assumes a "core collection" for every library. It is not necessary to check every item in the collection when using this method. You can sample every 10^{th}, 20^{th}, or 30^{th} book against the source. For small "best books" lists you can review the entire list.

Examining the Collection Directly

Why not just go to the shelves and evaluate what is there? There are advantages: it is practical, you get immediate results, it is useful for assessing condition, and it is good for examining accessibility. The disadvantages are that it often requires a subject expert in certain areas, it is more subjective than scientific, and it can be time consuming. Van Orden (1995) and Everhart (1998) provide guidelines for direct examination, which is often used in conjunction with weeding a collection.

User Opinions of the Collection

Students and faculty are the users of the school library's collection. There are numerous ways to get their opinions: interviews (good for children), focus groups (a representative sampling), and surveys. In the handout are sample surveys for students and faculty that focus on collection. These were taken from Everhart's (1998) book. Advantages of user opinion are that users are often knowledgeable about specific areas and you can get to the heart of the matter being studied, especially with interviews. The disadvantages of these methods are that they can be time consuming, they may provide primarily impressionistic responses, and users' interests and opinions may be too narrow to reflect the library's complete collection development policy.

In-house Use of the Collection

Materials are often used in the library, but this use cannot be recorded with traditional circulation measures. Some methods of measuring in-house use are examining or scanning materials left on tables and desks, interviewing patrons, observing, and leaving survey forms in books.

The use of electronic resources is a major concern in all types of libraries because traditional circulation is going down. As students increase their use of electronic sources it becomes ultimately more important to evaluate how well the "library collection," whatever that definition might entail, meets particular needs rather than how many items reside on the shelves in a particular subject. Since electronic sources won't be checked out you have to use alternative evaluation techniques such as observation, computer reporting options, and examination of student work.

One of the major problems with circulation statistics is that there is no way of knowing whether or not the materials taken out actually reflect what the user wanted or if electronic sources are being used to satisfy a need. In order to ascertain this, users must be interviewed to see if they found what they wanted. The resulting statistic, called the "fill rate," is defined as the percentage of successful searches for library materials in any part of the library collection, and it is calculated by dividing the number of successful searches by all searches. Sample fill rate survey and tabulation forms are included in the handouts.

Conclusion

There are numerous methods of evaluating a collection. The most effective evaluation uses a combination of qualitative and quantitative methods. Once an evaluation is completed, it is important that you use the data obtained to make both short- and long-

range plans and that you report the results to the appropriate people. We hope that through this presentation you have obtained some helpful ideas to evaluate your collection to facilitate literacy and improve opportunities for student learning.

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www.nla.gov.au/libraries/help/guide.html

Best Books of the Year: A Roundup of Annual Book Lists Published on the Web (Children's Literature Web Guide)
www.acs.ucalgary.ca/~dkbrown/bestbooks.html

International Reading Association - Choices Booklists
www.reading.org/choices/

The Internet Public Library Book Lists & Awards Reference
www.ipl.org/ref/RR/static/hum6200.html

Recommended Book Lists (Children's Literature Web Guide)
www.acs.ucalgary.ca/~dkbrown/lists.html

YALSA Booklists
www.ala.org/yalsa/booklists

HOLDINGS ESTIMATION WORKSHEET

	Cards per inch	Vols. per card
1. Take ten one-inch samples from the shelflist.	1a _____	b_____
	2a _____	b_____
For each sample count:	3a _____	b_____
(a) cards per inch	4a _____	b_____
(b) volumes per card	5a_____	b_____
	6a_____	b_____
	7a_____	b_____
	8a_____	b_____
	9a_____	b_____
	10a_____	b_____
2. Average together the ten samples to get:	2c_____	d_____
(c) Average number of cards per inch		
(d) Average number of volumes per inch		
3. Measure the entire shelflist for total shelflist inches	3_____	
4. Multiply the average number of cards per inch (2c) by the total shelflist inches (3) = Estimated number of cards in shelflist	4_____	
5. Multiply the average number of volumes per card (2d) by estimated number of cards in shelflist (4). Result is estimated number of volumes in shelflist.	5_____	
6. Enter number of items for any materials not included in the shelflist.	6_____	
7. Add (5) + (6) for TOTAL LIBRARY HOLDINGS	7_____	

PERCENTAGES OF THE COLLECTION IN STANDARD SOURCES

Source Title
_____

a. Number of books in sample _____
b. Number of these titles found in source _____
c. Percent of titles found in source (bX100)/a _____

QUANTITATIVE MEASURES OF BOOK COLLECTION

(Pennsylvania Department of Education)

Minimum	**Average**	**Exemplary**
10 currently useful volumes/ pupil or 2,000 volumes, which-ever is greater	15 currently useful volumes/ pupil or 8,000 volumes, which-ever is greater	20 currently useful volumes/ pupil or 14,000 volumes, which-ever is greater

USAGE OF THE COLLECTION MEASURES

Relative Use Factor = Percent of Circulation
Percent of Collection Responsible for that Circulation

Percent of Collection Responsible for that Circulation = Number of Items in That Class / Total Number of Items in Collection

Circulation Per Student = **A**nnual Circulation
Number of Students in School

Turnover Rate = **A**nnual Circulation
Total Library Holdings

STUDENT LIBRARY MEDIA CENTER COLLECTION SURVEY

RATE THE LIBRARY MEDIA CENTER COLLECTION IN THE FOLLOWING AREAS:

	Excellent	Good	Fair	Poor
Non-fiction books	4	3	2	1
Fiction books	4	3	2	1
Paperbacks	4	3	2	1
Newspapers	4	3	2	1
Magazines	4	3	2	1
Encyclopedias	4	3	2	1
Reference Books	4	3	2	1
CD-ROMs	4	3	2	1
Online/Internet Resources	4	3	2	1
Audiovisual Materials	4	3	2	1
Computer Software	4	3	2	1
Vertical File	4	3	2	1
Microfilm/microfiche	4	3	2	1
Materials for school assignments	4	3	2	1
Materials for personal interests	4	3	2	1

INDICATE YOUR LEVEL OF AGREEMENT WITH THE FOLLOWING STATEMENTS:

It is easy to locate materials in the media center.	Strongly agree	Agree	Disagree	Strongly disagree
The media center collection is up to date.	Strongly agree	Agree	Disagree	Strongly disagree
The media center collection is attractive.	Strongly agree	Agree	Disagree	Strongly disagree
Materials in the collection are interesting.	Strongly agree	Agree	Disagree	Strongly disagree
There are enough materials in the media center.	Strongly agree	Agree	Disagree	Strongly disagree

The library media center should buy the following:

What improvements in the collection or access to information would you find most useful?

FACULTY LIBRARY MEDIA CENTER COLLECTION SURVEY

RATE THE LIBRARY MEDIA CENTER COLLECTION IN THE FOLLOWING AREAS:

	Excellent	Good	Fair	Poor
Non-fiction books	4	3	2	1
Fiction books	4	3	2	1
Paperbacks	4	3	2	1
Newspapers	4	3	2	1
Magazines	4	3	2	1
Encyclopedias	4	3	2	1
Reference Books	4	3	2	1
CD-ROMs	4	3	2	1
Online/Internet Resources	4	3	2	1
Audiovisual Materials	4	3	2	1
Computer Software	4	3	2	1
Vertical File	4	3	2	1
Professional Collection	4	3	2	1
Microfilm/microfiche	4	3	2	1
Materials for my teaching areas	4	3	2	1
Materials for my personal interests	4	3	2	1

INDICATE YOUR LEVEL OF AGREEMENT WITH THE FOLLOWING STATEMENTS:

I have adequate input into collection purchases.	Strongly agree	Agree	Disagree	Strongly disagree
There is adequate publicity about new purchases.	Strongly agree	Agree	Disagree	Strongly disagree
There are enough materials in the media center.	Strongly agree	Agree	Disagree	Strongly disagree
Materials in the collection are interesting.	Strongly agree	Agree	Disagree	Strongly disagree

The library media center should buy the following:

What improvements in the collection or access to information would you find most useful?

FILL RATE SURVEY

Form # _____

1. How old are you? _____

2. Were you looking for anything special in the library? YES NO

Please tell what you were looking for:

a. _____

Did you find it? YES NO

b. _____

Did you find it? YES NO

c. _____

Did you find it? YES NO

3. If you were just browsing and not looking for anything special, did you find anything interesting? YES NO

4. Is there anything else you want to tell us about the library? You may write on the back of the page if you want to.

Thank you for answering our questions. Please leave this form with the library media specialist today.

LIBRARY FILL RATE

TABULATION AND CALCULATION FORM

TITLE, SUBJECT, AUTHOR (1)			**BROWSING (2)**	
Form Number	Found (a)	Not found (b)	Browsers (a)	Found Something (b)
TOTALS				

1. Title/subject/authors sought (total of columns 1a and 1b) _____
2. Title/subject/authors found (total of column 1a) _____
3. Title/subject/authors fill rate (line 2 divided by line 1) _____
4. Number of browsers (total of column 2a) _____
5. Number of browsers finding something (total of column 2b) _____
6. Browsing fill rate (line 5 divided by line 4) _____
7. Total fill rate (total of lines 2 and 5 divided by total of lines 1 and 4) _____

Note: Form should be extended to include additional form numbers and results.

Information Literacy? Seeking Clarification

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This paper begins with a brief overview of the concept of literacy. It then focuses upon a series of definitions that deal with an expanding notion of literacies and finally refocuses on information literacy.

Introduction

Information literacy! One should be forgiven if one becomes confused when confronted with educational writing and discussion on information literacy. Research in the area of information literacy is plentiful if one accepts the multiplicity of terms that could define this phrase. However, one could just as easily come through the research and still be asking, "What is it I am trying to understand, let alone teach?" A plethora of writing and lectures about conceptualising, developing, and implementing information literacy fills whole conferences, and whole books and, indeed, adds significantly to the information traffic on the Internet.

Yet it is apparent that, like the elephant in the Indian parable about the blind men, information literacy is defined differently by various schools of thought. From where did this term emanate to occupy so much discussion? Is it a transfiguration, a concept that is age-old but given new clothes to fit in with the educational speak of the Information Age? Is information literacy merely an embellished view of the traditional understanding of literacy? Or has it become a full transformation of an educational tenet in the light of evolving understandings in learning theory?

Is it a concept or a process? Is it an embodiment of essential skills that have only had name changes over the decades? Or is it a new literacy that has been transformed from existing literacies to complement the emerging technologies for which the Information Age students must be skilled?

Why have not the understandings and skills that inform information literacy become embedded into the classroom practices of teachers and educational systems? Is it because information literacy is understood as something that is teacher-librarian oriented and not part of the general curriculum?

There is a growing body of literature on information literacy in its own right and as a pedagogical twinning to other educational topics such as preservice teachers (Candy, Crebert, & O'Leary, 1994; Bruce, 1996; Dow & Geer, 1996; Wright & McGurk, 1996), the information literate school community (Henri, 1988; Cooper & Henderson, 1994), independent learners (Stephenson, 1995; Mayer, 1996), and information technology (Johnson & Eisenberg, 1991; Eisenberg & Johnson, 1996; Mitchell, 1996; Mobley, 1996). The tying of information literacy as a concept to such educational issues should

alert all stakeholders in the education arena that a shift in educational thinking has occurred in that literacy is more than the ability to read and to write. It may also imply that information literacy is firmly embedded in the practices and outcomes of education in the Information Age. If this is so, then, intuitively, the concept of information literacy should be part of the natural discourse of teachers as they design and develop curriculum units or discuss pedagogical issues. However, it would seem that information literacy is capricious, defying a universal definition, and acceptance, of a place in the essential learning areas of compulsory education.

Perhaps its nature is more consequential, transforming as educational processes shift to acknowledge and incorporate emerging technologies? Holloway (1996:32-35) would agree with Lincoln (1987:6) and Henri (1995) in that the label (information literacy? information skills? study skills?) is fuzzy and that the teachers are not clear about what is meant by this term or how it relates to classroom practice. Holloway argues that the product, information literacy, is positive but that the process is unclear, which could result, at worst, in its being dismissed as a transitory trend in education. One could justifiably argue that the product is also unclear as evidenced by the variations (no matter how slight) in information literacy outcomes (Eisenberg & Berkowitz, 1990; Mayer, 1992; Behrens, 1994; Candy, Crebert & O'Leary, 1994; Doyle, 1994; Bruce, 1995; Owens, 1996).

Whatever information literacy reveals itself as, the literature is replete with a sense of urgency that essential learning areas include outcomes that ensure that all learners (be they in a workplace or in an educational institution) become information literate.

Information Literacy in the Education Arena

If one of the main aims for students is to gain control over the vast amount of information in its myriad forms and registers, then so too must we, as professionals in the information game, become literate in the field of information. Yet another term, information literacy, is thrown into the sea of educational change, along with critical literacy, or functional literacy or even environmental literacy. The list goes on! In secondary schools, teaching often becomes subject based, and changing approaches to teaching and learning tend to be taken up within specific disciplines. There is also an understanding that schools must develop literate and numerate students, emphasizing the importance of reading and writing skills at a functional level. Therefore, domains of teaching are unwittingly set up and when new ideas percolate through, they are often sectoralised. For example, the literature abounds with the idea that teacher-librarians are significant stakeholders, and sometimes infers the teacher-librarian as sole stakeholder, in the development of information literacy in students. On the other hand, schools of thought discuss whole language approaches to education and integrated teaching of skills (information skills) towards lifelong learning. Are we, as teacher-librarians, responsible for some distinct concept referred to as information literacy or are we a part of a whole, promoting literacy through the development and encouragement of an array of skills, which include information, and thinking?

Literacy: A Short History

John F. Kennedy (Vickers, 1988) avows that “the one unchangeable certainty is that nothing is certain or unchangeable.” If we concur that literacy is central to education, and therefore a certainty, then we must also accept that literacy, as a concept, is changeable.

Historically, literacy was interpreted as a basic ability to read and write and comprehend. The arrival of print technology, centuries past, heralded the need for skills in reading, writing, and comprehension. Unfortunately, as information was perceived as knowledge and knowledge was power, an elite group developed, a literati of society! However as society's needs evolved, literacy became a universal right. The world view endorsed UNESCO's 1950s interpretation of literacy as being the ability required to use print to function in everyday life (Harris & Hodges, 1995, p.142), and in 1959, the United Nation's Declaration on the Rights of the Child: Principle 7, in part, declared that "the child is entitled to receive education which shall be free and compulsory, at least in the elementary stages." Consequently, school curriculum concerned itself essentially with developing literate and numerate clients. Breivik (Booker, 1993, p. 26) reminds us that at one stage in human endeavour, "if you could just write your name you were considered literate." Certainly there is no doubt that literacy, in the first instance, defined the process skills of reading and writing, a signature (Kaplan, 1995) or alphabetic (Diepenbrock, 1997) literacy!

Transformation of literacy

The needs of society at any point in time determine how a society interprets a concept. Breivik and Gee (1989, p. 22) affirm that just as the "social and individual purposes that literacy serves have broadened" so has the scope widened "from the religious and scholarly elite to include the whole population." They confirm this ideal through their reasoned belief that literacy is in an evolving state that "mirrors the expanding information needs of society." Thus, by extension, literacy has become a dynamic concept.

Carol Collier Kuhlthau (1995) supports Breivik and Gee. She reminds us that, even as late as the 1970s, the library media program was well recognised as reading incentive programs and library skills, that is, how to use the library through the concepts and principles of bibliographic instruction (Doiron, 1992, p. 9-16; Lenox & Walker, 1994, p. 61). Through her concern for her students' unease with research, she challenged the rather pragmatic interpretation of literacy by introducing the importance of attitudinal behaviours towards information seeking. She affirmed that to be literate was to not only recognise when information was required but involved the ability to construct one's own knowledge through a process that gave meaning and self-interest to the notion of learning throughout a lifetime.

This idea that literacy is connected with expressing the thoughts and attitudes of people is reflected in Ross and Bailey's (1994, p. 32) understanding of literacy as literacies. They defined four eras of literacy and referred to the third era as bibliographic, that is, the era that was heralded by Gutenberg's technology, through to a world consciousness that endorsed the basic human right to read and write, or as Ross and Bailey (ibid) state "to code and decode symbols....to translate symbols into meaningful messages." Candy (1993, p. 281) strengthens Ross and Bailey's notion of eras of literacy. He supports Breivik and Gee's assertion when he argues that the definition of literacy 150 years ago and even fifteen years ago will not be satisfactory any more: the concept of literacy really depends on the information needs of the society of the time. Indeed, the International Literacy Year ended with a policy paper (1990) that defined literacy as a functional literacy. Functional literacy was revealed to be the ability to read and use written information, to write appropriately in a range of contexts, and to recognise numbers and basic mathematical signs and symbols, demonstrating support for the age-old definition that informed school curriculum. However, this same policy statement widened the accepted view to include in the definition the integration of speaking, listening and critical thinking (skills) within reading and writing and to state that literacy

develops throughout a person's lifetime. The world view of literacy broadened to accept that literacy was evolving, that there was a continuum of skills associated with literacy, and that literacy itself was taking on differing forms, in fact transforming from a functional literacy through to a set of literacies tied to advances in technological society.

Literacy or Literacies

For a learner or a teacher, this defining and redefining of the concept of literacy could result in a state of confusion or frustration or scholarly indifference. The literature reveals statements and discussions about emerging literacies such as technological, critical, business, traditional, network, basic, scholarly, environmental, library, electrographic, cultural, moral, e-literacies, digital, information and even new basic literacy. It is easy to sympathise with Philip Candy (1993, p. 280) as he testily observes that we are being "bombarded by other concepts of literacy: functional, visual, media, computer, political, information." On the other hand, scholars like Chloe Diepenbrock (1997) maintain that literacy is an act of semiosis. Therefore, if literacy is merely an act of semiosis, then every act that records symbols of human communication outside of the human body is a type of literacy. Every act of communication evolves around the encoding and decoding of information in its many and changing forms and registers, be it textual, visual, gestural, social, or digital. One could deduce from this that literacy is fuelled by information and hence all literacy is information literacy! Diepenbrock develops this notion of the changing concept of literacy, thereby giving support to Ross and Bailey's pluralisation of literacy, by stating that literacy once referred to the act that was dominated by the chief technologies of literacy: that is, the written word/symbol. She refers to this as alphabetic literacy or the ability to read, write and understand. She categorises literacies according to an hierarchy which includes, not only those listed, but literacies such as personal, multicultural, academic, ethical and electronic (and this she further divides into two kinds!).

It is little wonder that Candy (1993, p. 280) asks the question, "Is this simply lexical inflation, or do all these terms betoken something new and important?" In a similar vein to Candy, Cavalier (1993, p. 19) candidly criticises the term literacy as an all purpose noun, "a hurrah word, which denotes that the inherent is well-versed in the adjective attached." Breivik (1993, p. 26) deepens the argument by reflecting on the frustration felt by the American Library Association Presidential Committee during her defense of the notion of information literacy: "We are going to change the term, we hate this term, it is no good. There are all these other literacies..." She continues by supporting the fact that the definition of literacy has changed over the decades and that the Australian definition of literacy may, in fact, be the best: to be able to function well in society. This entails the ability to read, use numbers and to find information and use it appropriately. Breivik (1993, pp. 6-18, 26-7) strongly believes that literacy, as an Industrial Age concept, has transformed to include affective as well as cognitive understanding, within the culture of the Information Age.

More confusion occurs! Bill Wresch (1997) simply states that the "concept of information literacy is relatively new" while Henri (1992, p. 5) considered information literacy as the "buzz concept in education" throughout the 1980s. Todd (1996a) understands, from Lazarus and Lipper's report on America's children and the information highway: a briefing book and national action agenda, that information literacy has outlived its buzzword status and is now part of the status quo. In a later paper, he affirms Wresch by stating that information literacy is an emerging field of intellectual inquiry (Todd, 1996b)! Practitioners in professional dialogue on OZTL_NET have referred to information literacy as a philosophy, a phenomenon, and a mere frolic with semantics. Candy (1996, p. 141) sums up this confusion when he states, "...there are several different

and...incommensurable understandings of information literacy...yet we use the same term in our communications with one another."

Despite some scholarly tilting, or lexical inflation, of the nomenclature revolving around literacy, there is considerable support for viewing literacy as a continuously evolving concept allowing for a more liberal understanding, and hence development, of the initial ideal of the universal right to be able to read and to write. Literacy depends on information. Information is expanding at exponential rates. The mere ability to read and to write is being translated into the ability to read, write, and to develop the capacities to understand, absorb, assimilate, and digest the images being transmitted electronically with the added capacity to communicate these images electrographically (Ross and Bailey, 1994, p. 32-3).

The various hurrah words exploding within the information literacy scene attest to the multifarious nature of literacy itself. The question is begged. Just how is information literacy defined? In terms of skills (Taylor, 1979), behaviours or attitudes (Kuhlthau, 1993; Doyle, 1994; Bruce, 1995)? Is information literacy about learning library or research or study skills (Irving, 1985; Kirk, 1987) or perhaps learning to think critically (McGregor, 1995; Lenox & Walker, 1994)? Is it process or content-oriented? Pinned to a methodology such as resource-based learning or inquiry learning or the Big Six (Gawith, 1991; Eisenberg & Berkowitz, 1995)? Does it relate to an isolated subject such as social education or is it an isolated subject in itself? Is it an independent notion? Is it an umbrella phrase with many parts which, when meshed into a pedagogical framework, contributes to the holistic development of an individual? Does it provide a pathway for the individual to function well in society, to be empowered to learn independently and interdependently (Owen, 1996; Kuhlthau, 1994)? Is it a new literacy tied to changing technologies (Ross & Bailey, 1994) or is it still the basic literacy mirroring the expanding information needs of society (Brevik, 1994)? Judging by the variation in definitions, information literacy appears to be defined depending on what part of the elephant one is experiencing.

A Working Definition

This confusion reveals the complexity of this notion within educational circles. Christina Doyle (in Booker, 1996, p. 40), Professor of Technology in Learning at Northern Arizona University, realised that the ideas and practices of developing in her students an independence in defining and solving their information problems could be drawn together under an umbrella concept referred to as information literacy. Information literacy appears to be a relational idea (Bruce, 1997), and, according to Doyle (in Booker, 1996, p. 39-48), requires an educationally sound contextual base from which educators can develop the understandings and skills within a framework that has national acceptance and validation. Following on from her research, Doyle developed a set of rubrics for information literacy. She integrated the ALA's (1989) analysis of the concept to define information literacy as the ability to access, evaluate, and use information from a variety of resources, to recognise when information is needed, and to know how to learn.

If the benchmark for understanding information literacy is Doyle's (1994) set of rubrics then other definitions can be analysed in reference to this standard. In the first instance, Doyle is careful to establish that information literacy is a concept that has been shaped by academics, business, and government. Certainly the Australian Federal Government (Finn/Mayer Reports, 1992) was instrumental in developing a set of key competencies expressed in educational outcomes, some of which parallel Doyle's rubrics in terms of information literacy. Doyle further develops the definition of information

literacy to acknowledge that inherent in this concept is the attainment of skills which relies on a process; that is, information literacy is an applied concept, one that takes on many approaches depending upon what part of the curriculum is in focus. This then takes the notion of information literacy and lays it at the feet of all educators, at all levels!

Doyle finds support in Australia for her definition through Candy's (1993, p. 297) affirmation that "all forms of literacy have assumed a central place in the process of skill formation." It is an applied concept. Christine Bruce's (1996) reflective article parallels Doyle's notion in that she asserts that information literacy concerns itself with the mastery of processes, is a learning tool, and is also something to be learned. Bruce endorses Doyle's list of attributes of the information literate individual by describing these attributes as behaviours. Candy also sees the attainment of information literacy as not only an educational goal, but also a lifelong goal. It would appear then that information literacy is a goal, which can be attained through a process that relies on the continuous learning of specific and evolving behaviours.

It is a cluster of abilities that the individual can employ “to cope with, and to take advantage of, the unprecedented amount of information which surround...us in our daily life and work”(Candy, 1993, p. 284). It is not library skills, nor computer skills nor even information-problem solving skills (Eisenberg & Berkowitz, 1990), but all of these are necessary enhancers of information literacy. One needs to be able to locate and access information, in all its forms and registers, or to solve information problems through enlisting a set of behaviours that develop competencies in the techniques and skills necessary to survive in the Information Age. As these techniques and skills strengthen, so too does the individual's metacognitive processes (Eshpeter & Gray, 1988), thereby affirming Doyle's belief that information literacy involves critical thinking behaviours, that is, knowing how to learn.

Owen (1996), although he finds agreement with Eisenberg and Berkowitz, Breivik, Doyle, and ALA's articulation of information literacy, provides a critical focus as a means of defining information literacy by examining what he considers myths regarding this concept. He acknowledges that information literacy is demonstrated through our capacity to confidently challenge ideas because of our ability to access and use information effectively, but he goes on to expand information literacy to include:

- that, beyond improving study and research skills, it serves to empower: to find out and act on information;
- it is a means of personal empowerment for all, not just young students;
- besides independent and self-directed learners, interdependent learners; and
- enrichment and enlivenment... of lifelong learning.

He strongly advocates that the understanding of information literacy be broadened to be inclusive, and that it becomes the key competency for individual and societal development in Australia, bringing the argument full circle. If information literacy is to be as Owen recommends, then teachers must be talking the language of information literacy. It must be a natural and inclusive part of the educational process in any curriculum, any unit of work, in any discipline.

It would appear then that information literacy is but a means to an end. What that end is depends on what the individual or community wants, that is, what the information needs are for that society, at that time. This notion also reinforces the ideal that has continually linked learning with information literacy: the paradigm of lifelong learning.

Whose Responsibility

An attempt has been made to bring together the many ideas, and interpretations surrounding the term information literacy and to accept a definition that is understood clearly by all stakeholders; a definition that can be interpreted universally in terms of process and outcomes. But questions still must be posed.

Attempts to advocate information literacy as a conceptual and process-oriented continuum of skills into system-wide outcomes continue to be thwarted in the various Australian school systems. Academics and teacher-librarians have a handle on information literacy within their terms of reference as does the business community and the community at large. Teachers' perceptions, as well as parents' perceptions and perhaps more importantly principals' perceptions, of information literacy are determined by their confrontation with information problem solving. Are teacher-librarians really in the most favourable position to be the leaders in developing an information literate community? Is it more appropriate to see this concern as a fundamental issue for all learning communities, whereby each facilitator works towards aspects of the prime goal, literacy, through an understanding of information construction and deconstruction, and the attendant skills of higher level thinking and problem-solving. Once again do we harp back to the notion that information literacy is but one way of articulating the many facets of literacy that is a whole school concern?

If the underlying principle of compulsory education is to develop the individual to be literate and if inherent in that concept are the skills or processes that foster lifelong learning or self-directed inquiry (cornerstones of information literacy?), then so be it. What needs to occur, though, is a continuous development within educational circles and/ or institutions to shape and deeply instill the pedagogy of information literacy as essential for the information society and hence the learning society. At this point in time, it is teacher-librarians who are carrying most of the burden in terms of guiding future generations in becoming lifelong learners, one accepted outcome of the process of becoming information literate. Papers are written, conferences organised, national bodies develop plans and international associations support theories, but what is missing is the link that takes all this intellectual activity and re-forms it into effective and considered change. Certainly all this activity fuels the interest and debate in information literacy, but information literacy appears to be synonymous with libraries, and not with essential learning areas for success in an information-based society demanding continuous learning as technical and social changes continue to reinforce a type of chaos. It is even further removed from everyday classroom practice! Perhaps it is time that we look seriously at redefining literacy (and hence information literacy) in terms of what Ross and Bailey call new literacy: one that is electronic, is image-driven, appeals to many senses, is emotional, communicates over distance, is multicultural, collaborative, artistic and interactive.

What appears to be the genuine concern is a need to look hard at the big picture of education. No matter how information-rich or information-poor a learning institution, the stakeholders in the goal towards lifelong learning - the one accepted and unchallenged outcome of information literacy - is everyone.

At the school level, this means working together within the same understandings, perceptions. It means working towards the same outcomes within an understood framework which is free from jargon, transferable from subject to subject, and a part of the natural discourse of educators: a move from pedagogic knowledge (conceptual) to standardised knowledge (process tool). The theory may eventually settle into something that becomes a part of all teaching practice as a learning community. In the interim, we,

as academics and teacher-librarians, talk about information literacy but it is a sad indictment that it is not an embedded practice in our learning institutions. Despite some research by Todd (Booker, 1995, p. 17-26) to establish why information literacy is having such a trying childhood, school communities are still grappling with the concept, often see it as an add-on and not a genuine part of the business of education. There appears to be a gap in the literature in terms of the theory of information literacy and the everyday classroom practice. Some research has been documented in terms of tertiary students, including preservice teachers, and information literacy (Daniel, 1997; Wilson, 1997), but there remains a real need to explore ways in which the concept of information literacy becomes the natural or the basic practice of teachers. Whilst teacher-librarians know about information literacy from their perspective, and are well versed in the methodologies and frameworks that promote and extend their understanding of information literacy, classroom teachers and principals generally are not. Research is needed in exploring the attitudes and behaviours of classroom teachers and school leaders in the implementing of pedagogy that allows for the inclusion and development of information literacy as common practice.

We know that lifelong learning is more than a lofty ideal; it is the outcome of an information literate society. However, the very people responsible for empowering students to become lifelong learners appear to not understand the information process, let alone information literacy, well enough to be truly effective learners themselves. We need to understand why this is and how we can change existing practices. Research into working out ways in which classroom teachers can develop a belief, along with ensuing behaviours, in the teaching of enabling skills to permit our clients' to construct their own knowledge and learn through their independent and interdependent manipulation of information is long overdue.

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Information Literacy and Web Based Teaching: Teachers Untangle the Web with Online Learning and Information Literacy Skills

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Introduction

The Centre for Information Studies at Auckland College of Education has delivered a range of courses to primary, intermediate and secondary teachers throughout New Zealand since 1991 using distance delivery methods. The courses have focused on designing strategies, frameworks and learning experiences that enhance information literacy in classrooms. These papers credit to one of three specialist diplomas: the Diploma of Teacher Librarianship; the Diploma of Information Studies; or, the Diploma of Information Technology. The course referred to in this paper is called Telelearning. It was converted to web-based delivery in 1999. The main considerations in the conversion of the course were to maintain the original course aim and objectives, to ensure adequate support for the students in their use of the technology, and to make sure that the use of the technology actually added value to the learning process.

Literature Review

A review of the current literature in the field of web-based learning and teaching revealed several main themes. These were as follows:

- the importance of professional development for staff teaching in this mode.
- the effectiveness of web-based learning compared with more traditional environments
- the extent to which a paradigm shift in thinking is required to work in this delivery mode.
- problems with access for students to web-based learning.
- time management issues for staff and students.

Todd (1998) suggests that the Internet is a indiscriminate and ambiguous mix of factual, false, misleading, potentially dangerous, poorly organized and seemingly useless information. Yet it is posited as one of the primary mechanisms of access to information in the 21st century. If he is right, the need for teachers to upskill in accessing and using information is urgent. The Internet is now not only an information tool, but also a communication tool. Todd (1999) further highlights the urgency for teachers to adopt a pedagogical framework that does not leave learning in electronic environments to chance. There is much literature to suggest that to integrate new technology effectively, a grounding in information literacy is essential (Gawith, 1998; Probert, 1999; Todd, 1999; McKenzie, 1999).

Collis (1996) uses the term telelearning to mean, "making connections, between persons and stored resources, via communications technologies, for learning related purposes." She suggests that in order to engage in online learning, teachers and students must access and effectively use computer-mediated communication (CMC) that is email and Internet functions such as chat rooms, listserves and conferences either synchronistic or asynchronistic. The literature suggests that participation in online learning communities offers interesting possibilities for teachers. Online learning communities are formed when a group of like-minded people with similar aims form a group and communicate using the Internet. Selby and Ryba (1999) reported that the peer communities of practice, as described by Lave and Wenger (1991) provide a context for teachers, both newcomers and old timers, to share their knowledge and practices. They then gain knowledge and skills in using the Internet and other applications to create better conditions for learning. Williams (1997) also suggests through her work in Australia, that online communities of practice are becoming an important environment for modern teachers, and learning how to participate in and use such communities is important professional knowledge. McKenzie (1998) recognizes that the delivery system of choice for corporations, as well as schools, could well be the online mode.

Students participating in the Telelearning course not only had the opportunity to become competent users of email and the internet as part of their own professional development, but they also had to engage with their classes in web based projects.

The Course

Aim

The participants will gain an understanding of what constitutes telelearning and computer mediated communication (CMC) and how these can be used to enhance teaching and learning both in the classroom and as part of their own professional development.

Objectives

Participants will:

- become confident users of email, internet and the world wide web
- identify ways in which web-based learning projects can support their students' learning
- evaluate the use of CMC when used for teacher professional development
- involve their own students in a particular online learning project
- understand the meaning of telelearning and how it relates to learning in the classroom

Delivery

The environment for the delivery of Telelearning was provided through WebCT™. It was recommended as the best platform for web-based delivery by colleagues because it provided an environment that was conducive to good teaching practice. It provided a platform for delivering courses on the Internet, which did not require a high level of technical expertise from staff or students. It provided a range of environments for course delivery –at its simplest it provides for the co-ordination and management of learning and it can act as a point of communication for staff – at a sophisticated level it can provide a virtual learning environment that facilitates the entire

learning process. Within the WebCT™ platform, nine tools were selected as the most appropriate for this course. It was expected that these WebCT™ tools would provide easy access to allow the students to communicate and get course information and develop a successful online learning community. Because this was the first paper offered entirely on the web from our institution, it was considered important to conduct a major research project to measure the effectiveness of the WebCT™ teaching and learning environment. The purpose of this paper is to present the findings of that research and to make some recommendations for future web based teaching.

Examples of Student Projects

Course members were partnered with each other to plan, implement and evaluate an online project with their classes. They had to demonstrate that the planning of these projects contained underlying principles of interactivity, reflectivity, and scaffolded opportunities for students to turn information into knowledge. Some examples of the projects were:

The Travel Buddy Project. Two teachers who lived in Auckland and Dunedin involved their classes in a travel buddy project to find out about the main tourist attractions in their respective cities. A soft toy called George McHighlander traveled around the main attractions in Dunedin with the students who sent photos, emails, faxes, videos and web-based material to the Auckland students. The toy was then sent to the Auckland students who reciprocated. Both groups of students were also involved using the web for searching and displaying photos and information.

Antarctica Project. Two teachers took the same context and explored it through different curricula - one class studied landforms through the science curriculum while the other studied how living in Antarctica affected peoples' lives from a social studies perspective.

Designing a Toy Project. Two teachers in different parts of the country engaged their students in a joint project to design a toy. Each class drew up the specifications for the other class, checked their design progress and evaluated their final product.

Myths and Legends. Two teachers engaged their Year 2 & 3 students in a joint study of Maori myths and legends. The students studied a number of myths and legends sharing the reading, pictures and captions, using email, fax, phone and audio conferencing. They then made up their own legends to share with the other class.

Methodology

Data were collected from pre and post course questionnaires, from an analysis of web-based discussions and from an analysis of student responses to questions about the strengths and weaknesses of web-based learning. It was, therefore, a combination of quantitative and qualitative methodology.

Research Questions

The questions guiding the research were:

1. To what extent did the teachers taking the course use email and Internet to enhance their teaching practice?

2. How did teachers design, implement and evaluate effective web-based learning experiences for themselves and their own students?

3. In what ways was the online learning community successful in supporting teachers in this course?

The participants were fourteen currently practicing teachers from different parts of New Zealand. This cohort of learners had not only considerable strengths in classroom practice over many years (the average age group was 35-45 years), they also had some experience with other forms of distance education. Twelve of the fourteen students were women. They were all primary and intermediate level school teachers teaching the full range of age levels from new entrants to year eight.

Results

The Questionnaires

Email and Internet Use. A comparison of the data from the pre and post course questionnaires showed some significant differences. The group showed a significant increase in their use of email. Before the course started 64 per cent of the group used email. After the course 100 per cent of the group reported using email confidently. Most students preferred to access their email from home. At the beginning of the course students were using email less than twice a week and by the end of the course they were using email 2-4 times a day. A significant change occurred in how this group viewed their IT skills. Before the course they saw themselves with either none or very few skills in the use of IT, however, after the course they showed they felt extremely or very confident in their use of these functions.

Increased Confidence and Problem Solving Ability. Students were asked to rate their confidence on a 5 point scale before and after the course. The most significant improvement was noted in the respondents self rating of confidence and skill levels using email, listserves, forum discussions, the Internet, and web-based projects. In all areas they reported increased confidence in their ability to use the functions of the technology. They used words like "definitely" (5), "lots" (4), "100 per cent" (1). One respondent said she felt as though she had experienced "a crash course and gained heaps of confidence" while another observed that her confidence "had sprung from the increased skills and frequent use made of IT on the course." Students reported increased ability to solve problems. Significant differences were reported with regard to solving problems on their own by the end of the course.

Experience with Using Web-based Projects in the Classroom. Few of the respondents had been involved in any web-based projects so it was hardly surprising that all respondents answered this point positively in terms of their increased confidence and competency. Eighty per cent of the respondents stated that the ideas that they shared about specific web-based projects were invaluable while one respondent noted that it was "a kick start in finding out what was available." Another respondent observed that it was the context of working with a partner and having to communicate online that greatly contributed to her learning. Another saw the experience of working with a partner as an opportunity to try out ideas within a supportive framework and an informed community of professionals.

Enhanced Teaching and Learning for Themselves and Their Students. All respondents noted that they had gained lots of experience. One respondent recognized a direct correlation between her learning and that of her students. Another student focused on the improved ways she had found to manage the use of computers to enhance learning, while another felt she had a greater appreciation of how the internet and email could be used to support learning and teaching.

The use of the Internet and email were the most common responses to the question in the post-course questionnaire, "*What IT activities have you implemented in your teaching as a result of this course?*" Four respondents referred specifically to an increase in the use of email, while six respondents made reference to increasing their access to the Internet and web searching for information to support curriculum units. One respondent had followed up on her course experience by setting up email communication between her class and another class in a different town to compare activities and environments as part of a social studies unit. In response to the question, "*If you believe that your skills and understanding of CMC and IT have increased over the last 3 months to what extent has this been as a result of this course?*" nine respondents recognized that the necessity to use the technology to fulfill the requirements of the course was a large part of enabling them to learn so much in such a short time. One respondent said, "Assignments meant we had to learn by doing. It was one of the biggest learning curves of my life."

Other comments revealed that the context of the course provided an element of compulsion for participants to use and apply their skills and to build on them. One admitted that she could not have come so far without the obligation of having to use the IT ("Mostly due to the course I had to know what to do and then to use the skills on the course - the course provided the opportunity to practice the skills before using them with students.").

In answer to the question, "*What advice would you give to teachers enrolling on this course next year?*" the majority of the respondents (eight of the ten) emphasized that having Internet access at home as well as at school was crucial for the successful participation on this course. Issues concerning the management of time were the next most mentioned. Again eight respondents advised that the course needed a considerable amount of time, one student suggested that no other course should be taken at the same time, on top of a full time teaching load. One student described the time factor as being "a heavy commitment." Another suggested that although the course was short and intensive she wondered if there was not a case to be made for the course to be longer "giving the online community more time to develop and mature." Four respondents pointed out that using the Internet could be an extra cost on the household accounts although no one gave specific amounts. Other respondents gave advice related to the active participation in the online learning community. They advised that this was done most successfully if students logged on regularly to the course site and maintained communication with their partner. There were some idiosyncratic comments regarding access to technical assistance and the possibility of feeling lonely in this new learning environment.

The Forum Discussions

Use of the Course Web Site. The WebCT ™ system provided the environment for the teachers to learn from each other and be supported by the web-based learning community. They found the forum discussions extremely valuable. As in a traditional classroom, the group introduced themselves in the welcome forum. They exchanged information about their families, hobbies, holidays, teaching situation and favorite sports. They asked questions about colleagues and made connections with people when they

exchanged the location of where lived. They asked questions about the use of the technology. Because all questions were answered promptly and taken seriously they quickly realized that there was no such thing as a dumb question. Some examples of the questions raised:

> *I know this may sound a bit dumb but how do you get into the using web based projects forum? Or am I in it?*
>
> *Can anyone tell me how to make the site address turn blue? I think that is a hot link?*
>
> *Can you tell me how to get into other search engines?*

Sometimes one of the students would ask a question and be affirmed by someone else admitting they wanted to ask the same question: "How do you download a PDF file? Sorry if this is a silly question!" ; "I don't think this is a silly question at all. I would like to know too please."

They shared useful websites, listserves, tools, and resources. Even the most inexperienced Internet user was making recommendations and suggestions by four weeks into the course. The lecturers used the forums to facilitate discussions on the specific chapters of the set text for the course. They also used the forum discussions to share their delights in their own children's learning. This is illustrated by the following quotes:

> *What has staggered me is that although we have officially finished our project the children are continuing to research their interests.*
>
> *We found the children quickly gained confidence in using IT and valued the opportunities made available to them.*
>
> *As for the knowledge gained, it was not so much through using the technologies but in the supporting activities like reading, discussions and reporting back to the class members.*
>
> *I guess the main benefit is that it has made the children aware of a world outside their classroom.*

Integrating IT with very young children's programmes was a challenge especially using email and the Internet. The teachers working in the junior school were delighted with their experience and some of the strategies they put in place to ensure success as illustrated here:

> *With very young children the more real you can make it the better. One of the first things we did was exchange photos of the children they were communicating with. This gave them a visual point of contact. They used the photos to make connections when they were writing. We also used drawings, cartoons and illustrations to highlight our own learning.*

Access to ICT. Students commented about the difficulties concerned with access to the appropriate technology. Whether the problem was at home or at school there were similar issues. Some of the students had easy access at home and at school both for themselves and their students while others worked in very difficult circumstances. However, in general, the students overcame barriers of access both for their own participation in the course and for their students participating in web-based learning.

Some of the following quotes indicate the nature of the problems:

The students I was working with had no computer in their classroom.

We only have one computer in the whole school with email access and that is in the Principal's office.

Internet access is only in the library and is very difficult to get past timetabled classes.

I cannot find a computer that can read the message when it does arrive.

The computer in the library is not equipped with a printer.

Competing with other members of my family also needing to use the home computing for their own study has been a difficulty.

Emails can only be accessed at certain times of the day because of the computer being in the school office.

Competing with other classes needing the Internet is a huge problem.

Not having a computer at home and with only two computers at school with Internet access it has been hectic for me and the children.

Time Management. Because all the participants in this study were full time practicing teachers, time was the greatest enemy. Everyone in the course expressed the frustration of "never having enough time." Many students mentioned the competing elements on their time and the difficulties of learning at the same time as teaching. Following are some typical examples:

Many of us did not recognize the huge amount of time commitment involved. This is not only working with our classes but also searching on the net for information and trying to get a handle on everything.

I love to read our discussions but do not get much time with meetings after school, student teachers etc.

All I need now is a few days of peace and quiet to have the time to get through it all. I am finding the time commitment huge.

One of my main issues with browsing the net is TIME. But the holidays are coming up so hopefully there will be some time there.

It is quite daunting given our already full workloads and no release time components to our day.

There are a lot of apprehensive teachers out there who need the opportunity to do this sort of staff development. Many are scared away by the perceived workload and their concerns about a lack of technical support.

The Portfolio Assignment

Strengths of Web-based Learning and Teaching. The students' comments were about the user friendly nature of the WebCT _ environment, the opportunities that the environment provided for student centred learning, the importance of active participation in the discussion forums and the opportunities for collaboration with colleagues. Students also reported that not having to travel distances to attend courses was a huge advantage. They liked being able to work at their own pace and have control over their own learning.

Weaknesses in Web-based Learning and Teaching. The weaknesses as reported by the respondents were concerns about classroom management issues with students working on web-based projects, technical and access issues, the cost of working online, and the difficulties of time management.

Discussion

The results of the research project show that by linking information literacy and web-based teaching it is possible to create and sustain an online community of learners. Lecturers and course participants discovered that web-based courses, underpinned with information literacy theory and practice, have great potential for improved student participation and interaction in the learning process. They can provide opportunities for the development of critical reflective thinking and practice and the opportunity to actually change and improve the way we teach. There were three questions that underpinned this study, but it was the second question that provided the most information about the role of information literacy skills. This question was: "How did participants design, implement and evaluate online learning for themselves and their students?" For the participants to design, implement and evaluate online learning they had to up skill in their technical skills and confidence and also in their application of information literacy skills.

The Action Learning model (Gawith, 1987) provided a framework in six stages for the students to pursue an online project scaffolded by the information literacy skills inherent in this model for learning. Students were able to acquire new knowledge from information while maintaining a student centred, teacher guided and question driven approach. This cohort of students had experience with information literacy skills using this model with their children through other courses provided by the Centre for Information Studies at Auckland College of Education. Infolink: Information literacy skills is the foundation course for all diplomas. In this course students learn to apply the Action Learning model (Gawith, 1987) with their classes. They therefore knew and understood the importance of information literacy skills and the relevance of the learning process when integrating technology. As McKenzie (1999) points out, information literacy is mainly about developing understanding and insight and about the interpretation of information guide decisions, solving problems and steering through uncertain, complex futures.

As Probert (1999) suggests, students become information literate when they have sufficient authentic opportunities to work through the whole process using various information skills and ICT and then to come up with decisions, answers, options, reports or recommendations. The teachers who participated in the Telelearning course worked alongside their students prompting them to think, analyze, question, synthesize, and learn from the information they were studying. They used an authentic context - their classroom programme and student learning needs - to source suitable websites and relevant strategies for learning. In doing so they experienced and shared the joys and

success of collaborating not only with their partners and their children but also with the community online. They also experienced the frustrations of trying to implement an online learning project in their classrooms where the systems and procedures impeded the easy access and effective use of the technology with their students. There was wide variability in accessibility to the technology. The stress this caused in expended energy to circumvent such difficulties took its toll on teachers.

Just as Gawith (1997) had reported on her experience on the previous course, the success was not dependent on the teachers' skills with technology, but their ability to plan, coach and manage this type of learning with and through information literacy skills. Telelearning offered the opportunity to work with the technology and the information skills so that the process drove the need to learn and to use the various technical applications as tools to enhance the learning.

Todd (1999) emphasised the need for students to practise the learning process to improve their own self efficacy. He highlighted the urgency for teachers to adopt pedagogical frameworks and strategies that did not leave learning in electronic information environments to chance. He went on to suggest a constructivist approach was needed to underpin the learning. This course was based on constructivist theories of learning in terms of interactivity of students and teachers, transforming information into knowledge and an emphasis on reflectivity, all key components for creating a successful online learning community.

Conclusion

The *Telelearning* course has all the hallmarks of a successful professional development experience for teachers in which they not only became successful users of the technology, but they were able to transfer their knowledge and skills into classroom practice. Participants were dropped into the new technology but they were able to gain support in the technical aspects of getting connected, and they could feel supported in an environment of colleagues who had all at some stage started at the periphery and moved toward the centre of the learning activities. Another key factor was that this all took place in a meaningful and practical context, for example, researching useful web-based projects that added value to students learning experiences and email discussion groups that meant instant answers were available for problems teachers were experiencing. The web-based community of teachers became at times a vibrant and active meeting place in which students could be assisted in their learning by communication and involvement with more skilled members of the group. The results of this research project shows that web-based courses, underpinned by information theory and practice offer great potential for improved student participation and interaction in the learning process.

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Information Literacy and Outcomes-based Education in South Africa in the 21st Century: The Challenges of Disparities

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Introduction

In the six years since South Africa's first democratic election, there have been fundamental changes in our educational policy. An outcomes-based approach to education was introduced to Grade 1 in 1998. This paper will sketch some of our progressive, timely educational policies and the challenges of implementing them. It will examine the multilingual nature of South African society and its effects on publishing learning support material for outcomes-based education. This paper purports that information literacy as a cognitive concept was an idea ahead of its time in South Africa. With the low percentage of school librarians, how can we be positive for the future of school librarianship? The possibilities are there, and we have to grasp them with both hands. Information and communication technologies (ICTs) are making inroads into our sites of learning. Information literacy is, in fact, emerging with strong links to the ICT world. Where are school librarians in all of this?

Outcome-based Education in South Africa

The policies of the new outcome-based education (OBE) in South Africa are truly forward-looking, radical departures from the Apartheid education of our recent past. The envisaged outcomes echo curricula of first world standing, as it draws heavily on the Australian, New Zealand and North American models. Core principles include:

- Learner-centredness
- An anti-biased approach
- The holistic development of learners
- Integrating teaching and learning
- Emphasizing cognitive skills like critical and creative thinking
- Community participation
- Accountability and transparency
- Flexibility in approaches to teaching and learning
- Importance of the learning context
- Emphasizing learning how to learn

Central to our OBE philosophy is the notion that we act as citizens of the world in an inextricably interrelated way. Curriculum is always a contested terrain, and in South Africa this is no different. Presently it is being reviewed. The OBE approach encapsulates active learning, independent thinking, learning from the environment, and it will continue to remain at the heart of our curriculum. The Minister of Education, Kader Asmal, emphatically proclaimed this in a press interview.

Learning Support Material

Unfortunately achieving implementation of our new policies is proving to be more complex than simply declaring them. The OBE pedagogy implies moving away from the notion of teacher as fount of knowledge to the learner interacting with an array of information sources. At the very root of our educational challenges, however, is a dire lack of learning support material. A further complicating factor in provisioning such material is the multilingual nature of our society. A *Language-in-Education Policy* stipulates that learners have the right to be taught in their mother tongue. Producing texts in all eleven languages has not been economically viable for the publishing industry. The unpredictability of curriculum implementation over the last five years also has had devastating consequences for the local publishing industry. The latest blow is the revision of *Curriculum 2005*, which was introduced only three years ago, and the implications for textbooks already printed.

According to the latest *South African School Library Survey*, an audit completed in 1999, a dearth of information texts (non-fiction) in African languages exists. This will surely disable the learner-centred approach required by OBE and information literacy. The audit also revealed that budgets for library-based learning support material are either hopelessly inadequate or non-existent. While interventions from non-governmental organisations such as READ and BIBLIONEF, rotary club, embassies, and UNESCO are admirable, an educational budget for sustained library-based material development is required.

OBE succeeds best in an information-rich environment, but such an environment is prevalent in only a minority of our schools. To this end the *Report of the Review Committee Report on Curriculum 2005* (2000) recommended very strongly that reading material be made available at the foundation phase, kindergarten-grade 3, so that children can develop higher levels of reading and writing at the very onset of their formal education. The Minister of Education, Kader Asmal, is passionate about improving the literacy levels of our country. Tackling illiteracy forms one of his five priority programmes. At the launch of the *Implementation Plan* for the Tirisano "Call to Action" he announced the establishment of a National Literacy Agency to co-ordinate and manage the national literacy campaign. The year 2001 is to be the "South African Year of Reading."

The *Four Year Implementation Plan of the South African Policy Framework for School Library Standards* (2000) spells out precisely the funding formulae needed to get the school library programme on track. The National Department of Education is to provide a core collection to schools without libraries; a total of 100 schools in nine provinces throughout the country will be targeted out of the 27,188 schools in South Africa. Provincial Education Departments have the responsibility to fund public school libraries. Budgets for schools now take into account the poverty index of individual schools. Those that were historically disadvantaged by a lack of running water, electricity, and toilets for learners are allocated more funds in terms of the redress principle. But the backlog is tremendous and schools have so many basic infra-structural priorities that libraries are considered a luxury.

The concept of site-based management of schools exists in two provinces. This means that schools are given the power to decide how to use their allocated budgets. Learning support material is the umbrella term in the budget for all textbooks, library material, models, posters, etc. Experience has shown that when funds are not ring-fenced for library-based material, the likelihood that libraries will be prioritised is low. Library

advocacy programmes in the two provinces with school management are going to be of utmost importance.

The *South African School Library Survey* (1999) revealed that, although 42.28% of schools have a library or a library collection/box, they are concentrated in three of the nine provinces. For the rest, 60-70% of schools are without a library service. The historical legacy of apartheid has determined that the majority of schools without services are black and rural while those with libraries are predominantly white and urban. Even with preferential funding for the neediest 40% of schools, the backlog is overwhelming. Simply providing schools with money, however, will not necessarily change the school. A more holistic approach to change incorporating systemic change has been identified so that all aspects of change are addressed from school ethos to management to educator competency.

Information Literacy in Our New Curriculum

Information literacy, as a natural extension of the learner-centred approach, is present at the very core of our new curriculum. The information literacy definition I endorse comes from Kirk, Poston-Anderson & Yerbury (1990), which sees it as a "holistic, interactive learning process encompassing skills of utilizing information from sources, being able to consider it in the light of current knowledge, adding it to existing knowledge, and applying this knowledge capably and confidently to solve information needs." Information literacy is embodied in our generic cross-curricular outcomes, called critical outcomes, particularly in the following outcome statement: "learners collect, analyse, organise and critically evaluate information."

Every broad subject discipline, which is called a "learning area" (natural science, mathematics, arts and culture), has an outcome statement unequivocally linked to information literacy skills. The outcome statement of the languages learning area has the most explicit statement that resembles the problem-solving/ information literacy skills models of Gwen Gawith's *Information Skills Framework* (New Zealand), the "Big 6" of Eisenberg and Berkowitz (United States), and the "PLUS" model of James Herring (Great Britain). The languages learning area statement states that "learners access, process and use information from a variety of sources and situations."

In 1996-97, when our new curriculum was being written, information literacy was an unknown concept. The school library and information service sector in the Western Cape manoeuvred to place the outcome strategically both in a generic way and a specific way. Our generic cross-curricular outcomes, called critical outcomes, of which there are twelve, underpin the first democratic South African constitution (1996). Critical outcomes will ensure that learners gain the skills, knowledge, and values that will allow them to reach their full potential and participate fully in society. See Table 1.

Table 1
Critical Outcomes

CRITICAL OUTCOMES	DESCRIPTION
1. Problem-solving skills	Identify and solve problems in which responses display that responsible decisions have been made using critical and creative thinking
2. Teamwork	Work effectively with others as a member of a team, group, organisation or community
3. Self-responsibility skills	Organise and manage oneself and one's activities responsibly and effectively
4. Research skills	Collect, analyse, organise and critically evaluate information
5. Communication skills	Communicate effectively using visual, mathematical and/or language skills in the modes of oral and/or written presentation
6. Technological & environmental literacy	Use science and technology effectively and critically, showing responsibility towards the environment and the health of others.
7. Global outlook	Demonstrate an understanding of the world as a set of related systems by recognising that problem-solving contexts do not exist in isolation.
8. Learning strategies	Reflect and explore a variety of strategies to learn more effectively
9. Citizenship	Participate as responsible citizens in the life of local, national and global communities.
10. Cultural and aesthetic literacy	Be culturally and aesthetically sensitive across a range of social contexts.
11. Career exploration skills	Explore education and career opportunities
12. Entrepreneurship	Develop entrepreneurial opportunities.

The student competencies delineated in the information literacy standards (*Information Power,* 1998) emanating from the United States overlap fairly extensively with the general competencies of an OBE learner. For example, both competencies require that a student be able to (a) reflect on learning and apply strategies to learn more effectively, (b) identify and solve problems, (c) use creative and critical thinking skills in the process, and (d) most importantly for the school library programme access, evaluate and use information effectively and efficiently.

Cognition and Information Literacy

Information literacy is a concept embodying cognitive skills. As a notion it has been mainly implied in educational, educational ICT, and school library policy documents until now. There is no categorical policy detailing what information literacy entails and how to make it explicit to educators. In both the United States and Australia a strategic move has been the declaration of information literacy standards and outcome statements.

Information literacy is an elusive concept in South African education circles. Essentially it was a concept ahead of its time in South Africa. In the Western Cape Education Department cognitive education has been pinpointed as neglected mainly because the majority of our educators themselves are not trained and educated to recognise and apply cognitive principles. Studies corroborating this conclusion are Genevieve Hart's (1998) study of information literacy amongst primary school teachers, the Pile and Smythe (1999) study of language in the social science classroom, and my own informal study (Zinn, 1999) of the information literacy levels of teachers at 65 historically disadvantaged schools in Cape Town.

The Western Cape Education Department has begun a pilot programme that seeks to immerse trainers and educators in the understanding and tools of cognition so that they can play an increasingly meaningful role in promoting cognition during in-service training. Most of the critical outcomes in our OBE curriculum embody cognitive concepts: critical thinking, problem-solving, analyzing, and evaluating, to name but a few. The challenge is to train teachers in the methodologies to make cognition explicit to their learners. School librarians who could be information literacy advocates can become pioneers of the cognitive aspects of the new curriculum.

School Librarians: Realities and Possibilities

There are no school librarians within most of our schools. During the early 1990's many trained school librarians in the more fortunate schools (mainly white, coloured, and Indian) quit education with the first cutbacks in the civil service. Those who did not leave were absorbed into the teaching core as classroom/subject teachers. The specialized post of school librarian was eventually withdrawn with the last wave of cutbacks in 1995. black schools, which constituted the majority, were never afforded the privilege of the post of school librarian. Those schools that currently have full-time librarians are either independent schools or schools exacting high fees from learners (more than R1 000-00 per annum). The school library audit of 1999 revealed that a minority of schools have trained personnel in the library (average of 14.8%). This situation is unlike the countries from which OBE hails where school librarians are an unquestionable requisite at a school.

The effect of the cutbacks on the tertiary institutions that train school librarians was immediately felt. Applications for training in school librarianship dropped dramatically. Ironically, OBE has necessitated access to resources at schools and a resulting need for trained personnel to organise and manage collections. Under the guidance of Genevieve Hart, the Library and Information Science Department at the University of the Western Cape has devised a new certificate programme for teachers to train as school librarians. It consists of intensive modules to be run in block weeks during school vacations.

The information literacy aspects of our curriculum should be fertile grounds for the trained school librarian to work cooperatively with educators. The *National Policy Framework for School Library Standards* (1999) "Discussion Document" makes frequent reference to the information literacy aspects of a school librarian's role. If we had trained school librarians, they could play an important part in collaborative teaching practices. Their expertise in resource-based learning and information literacy skills complement the educator's expertise of learning area "content".

Information Literacy in the School Library Programme

The *South African School Library Survey* (1999) tried to establish the number of schools in which information skills were formally taught. It indicated that between 80% and 90% of schools are not teaching information skills. Even that statistic may be misleading because elsewhere in the survey form the term "book education" is used which cannot be equated with information skills. Also, when educators were asked how often information skills are taught per week, the clarification for information skills given is "structured library periods." Even the latter does not signify that information skills were being taught because the period could have been used to exchange books, do book talks, or read. There is confusion on the part of the authors of the report because they talk about "information studies" and how it could be "facilitated by the availability of computers in the school." Here again information skills is equated with information technology. The assumption is that access to computers will facilitate information skills.

School librarians who trained before 1996 in South Africa will not have heard of the concept of information literacy from their studies. Training prior to 1996 focused on library organisation and the teaching of book/media education. As South Africa increasingly moves into the electronic age, a focus on information-handling skills limited to the print medium will not suffice. This must not detract from the ability/competency of school librarians to mediate information literacy in diverse contexts of resource provision.

Those school librarians who have kept abreast of developments in international school librarianship are most often the ones who have either completed a library course/degree recently, had access to an information-rich environment generally, or had access to ICTs specifically.

Information and Communication Technology (ICT) in South African Schools

The educational ICT sphere has developed separately from the school library arena. When computers are introduced into schools, they will be used first for administrative purposes, secondly for computer literacy and lastly as an information search tool in the school library. At a June 2000 ICT workshop in Cape Town 99% of the attendees representing 200 schools were not school librarians. This artificial division between ICT and libraries has resulted in ICT project developments, intended to leapfrog South African learners, being placed under the custodianship of Information Technology educators.

The most up-to-date information about ICT in South African schools is the *Computers in Schools* (2000) national survey published this year. First, some statistics: 13% of schools (i.e., 3,670) have one or more computers while 87% of schools (i.e., 23,518) are without computers. Dare we talk about an ICT culture in South African schools? Most schools with computers are historically white (*Computers* …, 2000). The most important factors preventing schools from acquiring computers, in rank order, are absence of electricity, lack of funding, insufficient building space, lack of staff, and poor security. The survey also revealed that private sector initiative to assist schools without computers was marginal (*Computers* …, 2000). In terms of access to the Internet the overwhelming barrier is the cost of the service provider and telephone line usage.

All is not doom and gloom in the ICT arena. In 1996 an estimated 2,311 schools had at least one computer. Within two years there has been a growth rate of 59%! New initiatives and projects are constantly under way targeting those schools without computers. Within the Western Cape, for example, 1100 of the 1540 schools will have at

least one computer system, which includes an Internet connection by the end of the year 2000. This total is more than 50% of all schools in South Africa with connectivity.

There is no budget for getting computers into schools. Everything works along the lines of special projects with funding from abroad in the main. After Gauteng Province, the Western Cape Province is considered the most well-resourced in the country.

Information Literacy: The ICT Link

After being bandied about for the last five years, information Literacy has finally come into its own. It is emerging with very strong links to ICT. Although the National Department of Education's 1996 "Technology Enhanced Learning Initiative" (TELI) on-line strategic planning document mentions a generic information literacy course for use in schools, it has only recently started receiving attention at national level. Last year's "Millenium Minds" ICT conference in the Cape had a special strand devoted just to information literacy. Perhaps through pressure or sure timeliness, a National Framework for Information Literacy for Teachers has begun. The deadline for the framework is March 2001. The focus of information literacy within our education system is the capacitation of teachers first. Even the *Implementation Plan for School Library Standards* has as one of its strategies a curriculum that offers basic information skills for educators and school librarians.

An encouraging sign is the incorporation of several modules addressing information literacy in the proposed Educator Development for ICT's flexible learning programme of the NGO SchoolNet. Included in the learning strategy modules for ICT are questioning and thinking skills, project-based learning skills, and information skills explicitly.

Another encouraging sign is the Western Cape Education Department's education technology initiative, the "Khanya Project," due to begin in April 2001. One of the educational goals of the project is to equip learners with information skills to participate in the global knowledge economy. Within the information technology (IT) arena there has been a shift in thinking from focusing mainly on teaching isolated computer skills, such as word processing or spreadsheets, to the educational integration of ICT.

Most of the research on South African educational ICT to date has not examined information literacy per se. Czerniewicz' (1999) report for the InfoLit Project quotes Neil Butcher's (1996) observations of how educators use conservative, traditional methodologies in conjunction with the new information and communication technologies. The *Computers in Schools* (2000) national survey indicated that where schools used computers extensively, the likelihood was greater that computers were used as sources of information and as tools for independent work and thinking; the proportion of schools that use computers in this way, however, is negligible (13%).

Conclusion

Despite the formidable difficulties facing education in South Africa we can be optimistic knowing that for the first time in the history of our country we have a single education system operating to the benefit of all citizens. We also have a National School Library Policy for the first time in our history. We cannot deny, however, that there are seemingly overwhelming challenges confronting us:

- The lack of learning support material to effectively implement an outcomes-based approach
- A dearth of texts in African languages causes a hindrance to the access of information literacy skills
- The small extent of a culture of reading and library usage
- The pedagogical inadequacies of most of our trained educators, which prevent them from engaging with OBE in an effective way
- The few schools (only 14.8%) that have trained librarians
- The majority of schools (80-90%) that are not teaching information skills
- The few schools (only 13%) that have one or more computers

As a self-critical and resilient nation, we acknowledge our blunders and false starts as we identify our pitfalls and gaps and resolve to change them. For all of the above challenges we have a plan of action.

The *Report of the Review Committee on Curriculum 2005* (2000) recommended very strongly (and it was accepted by the heads of provincial education departments) that textbooks and reading material be made available to ensure the success of OBE. Reading and literacy is high on the agenda. The year 2001 is to be "The National Year of Reading." The *Implementation Plan* of the *School Library Standards* (1999) is another step in the direction of breaking the back of illiteracy and encouraging a library culture. The *Implementation Plan* also addresses the pre-service training of school librarians and teachers as well as the in-service development of school librarians. It is intended that National and Provincial Departments of Education be instrumental in setting education development curriculums and qualification standards. Another initiative to combat the inadequacies of our educators is the Western Cape's Cognition in Education Project.

Finally, information literacy is receiving attention at several levels:

- At the national level there is a drive to establish a framework on information literacy for educator development.
- At the non-governmental organisation level it is part of the educator development for ICTs.
- At the provincial level, in the Western Cape, it is a focus area in educator development for educational technology.

All we can do is "press on," cognisant of the inequities in education and having the will to change the situation. In the words of an anonymous author, "persistence and determination alone are omnipotent".

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