MOVING INTO THE FUTURE WITHOUT LOSING THE PAST: CHILDREN'S SERVICES IN THE INFORMATION AGE[†]

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What the Information Age Means to Children

For the past ten years or so, we have been talking about the new information age and the way in which new technology will change our established patterns of publishing and distributing information. The children who come to our libraries have, of course, been brought up with these new technologies. Instead of seeing them with wonder and surprise, they accept them as part of everyday modern life. What then does the information age mean to children?

New technologies. Perhaps the most pervasive of the new technologies is television. In North America, where television has been widely available for thirty years or so, it has now reached virtually every home in every community. Almost all children watch television long before they learn to read, and continue to watch it for more hours a day than they spend in reading, even after they have learned how to read. Even in families where parents or others spend time reading books to children, much less time is spent in reading than in watching television. An average of less than half an hour a day as compared with three

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or four hours a day of television viewing. This means that children are spending much more time absorbing stories and information by watching and listening than by decoding print.

Librarians have been very much concerned with this change seeing it for the most part as a shift away from an intellectually demanding activity into one which requires far less attention or mental effort. I will come back to this issue l ter.

The other technological development which promises to change all of our lives is the availability of inexpensive, compact computers. Although this development has been much more recent than the development of television, it has also swept through the more affluent segments of society. Families which can afford them, provide home computers with which children play games, work out programs, and solve problems. Even for children who do not have computers at home, the videogame arcades which have been opened in shopping malls and in store-fronts have made them familiar with some of the possibilities of computer terminals and computer graphics. School systems, too, are introducing microcomputers for use in mathematics, English and other classes. Many educators feel that computer literacy will be as important to today's children as print literacy has been for the past fifty years.

Other technological developments which have entered children's lives are the pocket calculator, the cassette recorder, video cassette recorders, and compact radios. All of these offer new possibilities for broadening children's experiences, and all of them demand new skills while making less important some of the traditional skills of the past.

New intellectual demands. Librarians and teachers have tended to emphasize the decreasing importance of the skills of reading and calculating, and have deplored the fact that children today do not seem to want to read the same kinds of materials that previous generations of children enjoyed. There has been for less emphasis put on the new intellectual demands which are

being made upon children. The sophisticated visual techniques of television and movies, for example, make the films and television of twenty years ago look slow and plodding. Twenty years ago, few adults could have understood the fast cutting, the flashbacks, the dissolves and juxtopositions of scenes which today's children take for granted.

Similarly, most adults who have worked with children and computers have noticed that children learn quickly to interact with a computer terminal and to master the intricacies of computer programming. Many children who start by using the computer only for playing games, are become fascinated with how the machines work, and learn to do programming and to develop their own games which may be even more complex and fast moving than the commercially produced ones.

It is important for those of us who provide service to children not to underestimate these new intellectual demands upon children even while we work to preserve and develop their ability to meet the traditional demands for literacy and understanding.

Increased sophistication and pressure on families. Another, and more troubling aspect of the information age is the pressure that these sudden changes have brought in social terms. Children who are exposed to television, sophisticated films, and graphic presentations of news, seem to grow up very quickly—at least they develop a knowledge of grown up life which was hidden to children in earlier years. Because they are growing up in a world that is quite different from the world in which their parents grew up, there are increasing pressures on families. Many parents feel uncertain about how they should raise their children. They no longer know what kind of toys to buy them or books to read to them. They worry about how much television they should allow and whether television is damaging their children. They find it difficult to guide their children into the kind of education needed to prepare them for careers in the 21st century.

What Do These Changes Mean for Children's Librarians?

Television and computers have been seen chiefly as alternatives to print media—the traditional books and magazines that librarians provide for children. These new technologies have joined the older audio-visual forms such as recordings, films and filmstrips as adjuncts to book collections. Now it is time for librarians to assess the impact which these media have had on the books we collect and the impact which they have on the children who use them. There are fundamental ways in which the use of visual rather than printed materials, and computers rather than linear texts affect the way in which people find information and experience literature. Research in this area has been, for the most part, occurring outside of the library fields, but it is important for librarians to be aware of it.

While computer software can serve a variety of needs, perhaps its essential characteristic—the one which makes it different from other media—is that it is interactive. In the words of Seymour Papert, whose book *Mindstorms* offers insight into the way that children use computers:

> Many children are held back in their learning because they have a model of learning in which you have either 'got it' or 'got it wrong'. But when you learn to program a computer you almost never get it right the first time. Learning to be a master programmer is learning to become highly skilled at isolating and correcting 'bugs,' the parts that keep the program from working. The question to ask about the program is not whether it is right or wrong, but if it is fixable.

Children who learn to work with computers tend to develop an attitude toward learning which is different from that of children who are educated solely through books. the computer invites participation and exploration. Children working with the com-

puter language LOGO for example, try to design graphics, including geometrical forms. The computer enables them to modify the way in which they approach the problem and to go beyond the mistakes they make on a first run. This attitude toward learning should encourage children to have faith in their ability to solve problems and to create new solutions. It discourages the acceptance of an 'authority' by which to measure the correctness of what they have done. This change in attitude will affect the way in which children use books and other media.

Changing Print Materials

Within the past few years there has been an increasing number of information books produced which integrate pictures and text in a new and lively fashion. The information is given in a series of small segments. The reader is not expected to start at the top of one page and work methodically through the text until coming to the bottom of the second page. Instead, the author invites the reader to skip around the page, absorbing the information from text and pictures shown as small clusters. This format does not require the length of attention which a more conventional book requires. It seems to be a format especially appropriate to children familiar with the short segments of television programs. Each bit of information is presented in a bright colour with small amount of text and is absorbed separately from other pieces of information on the page. This is a real video-age book.

Another type of book which is enjoying great popularity in North America is the chose-your own adventure story. The story in these books does not start at the beginning of the book and proceed in an unbroken sequence until the end. Instead, the reader is invited to make choices at each dramatic turning point in the story. One choice leader to a specific page further on; the other choice leads to another page. In this way, the story

which begins on page one can end in a variety of different ways.

This type of book is designed not so much for a child of the video age as one of the computer age. It uses the branching technique of video games or computer programs and translates them into print form. This is a startling example of the way in which the new technologies are influencing the older standard forms of print. These books have been tremendously popular. The first ones were designed for children from about the ages of 8 to 12. Now there is a series designed for younger children, and I understand that a new set of books of this type for adults is about to appear.

Because the branching of the story requires a great many more pages than one straight-forward story would, the stories tend to be short in relation to the number of pages in the book. They are quick to read and popular with children who do not care much for reading. Whether they develop into better stories or whether they turn out to be only a passing fad remains to be seen.

There are two other noticable effects that technologies have had on print. One is the updating and simplifying of classic stories to make them shorter and easier for children to read. Because so many children want short books, these too are popular.

Another change is the print book as a secondary form—the book based on a popular television show or even a popular videogame. These books have really become subservient to the newer technolgies.

Maintaining the Values of the Past While Moving Into Technology

Audio visual materials are far more glamourous than print ones. They engage our attention immediately by attracting eye, ear and mind at the same time. It is important for librarians to consider whether in moving into the use of these newer technologies we might be losing some of the values which are vital to

the continuation of library service to children.

There has been considerable talk about the fact that reading is becoming less important–that in the future communication will be oral. Cassette tapes and computer terminals will hold all the accumulated wisdom of humanity. When we hear this kind of talk, it is important to remember the role that reading plays in the development of cognitive skills.

Young children learn language by a process that seems so natural that no one ever has to teach them. Any child of normal physical and mental ability learns to understand the language spoken about him or her and to speak it by the age of four. Children do this by listening to the stream of language around them, eventually identifying significant sounds, practicing them, receiving feedback–having people react to them and talk back to them–and gradually learning the rules that govern the language which they are learning.

Children need then to *hear language,* to *try to speak, to receive some reaction to what they say,* and *to practice some more.* The kind of language which is most useful for children to hear, is language at a level just a little bit more complicated than the language that they can speak. One of the reasons why television does not seem to help children to learn language, is that the children have no control over the rate at which the language is spoken, or the difficulty of the language. They are not expected to respond to television and so they get no practice in producing language of their own.

The situation is very different when children are read to from books. A variety of books on very different levels of difficulty are available. Studies have shown that children who have books read to them are likely to develop language which is richer and more complex than the language developed by children who are not read to.

Why does this difference in language development matter so much? The biggest reason is that there is such a close relation-

ship between the development of language and the development of thinking. As experiments have shown, children need to learn words in order to talk to themselves and to direct their actions. In one experiment in Russia, children of about two years of age were given an opportunity to find a piece of candy hidden under one of a group of coloured cups. The candy was placed under the red cup each time. Those children who knew the names of the colours, learned how to find the candy after a few trial, which for those children who did not know the names, it took twenty or thirty trials for them to remember to look under the red cup. Apparently, those children who can talk to themselves and name the colour were able to remind themselves about what they were looking for and thereby learn more efficiently.

Although the relationship between language and thought is not well-understood, and there are still many psychologists working on the complexities of the problem, it does seem clear that *language is an aid in thinking.* Young children who receive most of their input visually—through television, for example may not develop the language skills which would enable them to remember and structure what they have seen. Studies indicate that young children see television as a series of vivid scenes, but have difficulty in perceiving the narrative structure. If they do not have a chance to meet stories in books, where the language structures the story for them, they may not develop the skills which enable them to follow longer and more complex stories and arguments as they grow older. The fact that print materials are now sometimes following the television format and presenting information in short, disconnected segments may indicate this trend. Although these materials are no doubt useful, children also need written material which contains longer structures so that their ability to understand complex ideas and narratives will grow.

The idea of having a non-print library with all information stored in visual or tape form seems to me not only impractical but also undesirable for children's learning. Print forms offer

many advantages:

1. Stories are available on many different levels of language from simple picture books which enable children to grasp the idea of what a narrative is, to more complicated forms which enable older children to think about the complexities of ideas and situations.
2. Stories are available for repetition. We are all familiar with the way in which children like to hear a favourite story told—or have it read to them—over and over again. This repetition is important to give the child time to think about the concepts in the book. Some children want more repetition than others. A book can be read, or examined, as often as is necessary by each individual child. Most nonprint forms—especially films and television—move at a regular pace which disregards the amount of repetition needed by the individual child. If the child misses something, he or she does not have a chance to go over it again.
3. Print forms offer a stable text. Children can discover whether or not they understand and remember the ideas by referring back to the text. Children can talk about the ideas, or think about them over a period of time and then go back to the original for confirmation. This stability allows for greater precision in handling concepts. The child becomes aware of how close they are to the original or how far they have wandered. All of these values of print materials are aids in developing a child's ability to think and handle increasingly complex concepts. Books, then, are of importance to young children because they offer a practical and effective way of developing language and thinking.

As children grow older they are able to handle increasingly

complicated narratives and ideas in both visual and print form. Many children seem to choose nonprint whenever possible–films or television rather than books. What difference does it make if a child reads a book or watches a version of the same story? While the story itself does not change, the experience is quite a different one.

One difference is the addition of auditory and visual clues. A book, even an illustrated one, presents its story mainly through carefully chosen words. Each detail that is presented is important. The author does not need to include anything which does not help in the development of the sotry. There is very little extraneous detail, and the reader absorbs the language which is presented and understands or experiences it in an individual way. Most people say that they see pictures of the story in their heads, they imagine what the characters look like and the way in which events take place. The printed story, then, is a minimum text to which the reader adds visual and auditory embellishments. Interior information about the characters, on the other hand, is presented by the author. The reader can enter the mind of a character and understand the feelings, thoughts and reactions which the various events bring about.

A visually told story, on the other hand, presents the viewer with recreations of the characters. Whether a character is tall or short, handsome or ugly, is immediately obvious to the viewer. The voices of the characters are also explicit in a dramatization. Music is usually added to build up suspense or other emotional states which are deemed appropriate to the story. The external details become much more explicit than in print and little imagination is needed on the part of the viewer. The internal details, however,–the state of mind or thoughts of the characters need to be made explicit through facial or body expressions or through dialogue. Because complicated states of mind are difficult to portray through action, and unrealistic when shown through dialogue, many aspects of the printed story remain ambiguous in

a filmed version. Viewers must learn to interpret visual signs of various emotional states, but there is often little opportunity to verify whether these interpretations are the ones intended by the filmmaker. In an effort to achieve the emotional impact that is desired, the filmmaker often focusses on specific details which are intended to carry the emotional weight—a pair of nervously twisting hands indicate guilt, knitted eyebrows indicate anger. These details project an intensity of emotion which is difficult to modify. Emotions are shown as being stronger and more unequivocable than they often are shown as being in printed forms. Visual symbols are less easy to modify than verbal symbols are. The delicate nuances which can be conveyed by language are much more difficult to present visually.

Because of these differences of form, visual presentations excel at communicating a sense of place, period or event. They are less able to present psychological realities than physical ones. It is important for librarians to recognize these differences of the media and to make available to children a variety of presentations. If children grow up knowing only the strength of visual presentations, they may not come to understand the importance of people's inner life—their emotions, thoughts, doubts and memories. Language has developed over the years to enable people to express this interior life; and printed language offers the most sensitive means we have of communicating it as precisely as possible. It would be a disservice to children to deny them the opportunity to participate in the great sharing which print culture allows.

Synthesis for the Future

Having taken a look at some of the opportunities offered by the new information age, and at some of the important values from print culture that we do not want to lose, the time has come to consider how libraries can achieve a synthesis of the two

that will enable us to move effectively into the future.

The basis on which our plans must rest, of course is the question: *What is the major purpose of library service to children*? It seems to me that what we want to offer children through library services is access to a world of information and experience which would not be available in everyday life. This, of course, is similar to what school also offer to children. The difference is that librarians serve individual children—providing a variety of materials and services which can be used on an individual basis when children feel the need for them, rather than having to serve the average of a group of children.

In order to serve individual children, libraries must provide a variety of materials on a multitude of levels. Children need to be taught how to find the information that they require, the most appropriate medium for what they want, and how to understand and asimilate the information they assemble. While librarians in the past have sometimes been able to assert "This is the best book we have on sea birds. You will find everything that you want here," the modern librarian will have to help children to sort through the various items of information on sea birds and choose that which is appropriate. The danger in the future is not so much that we might not have sufficient information on a topic, but that we will have so much available that the individual will suffer from information overload and be unable to choose relevant items for his or her need.

Three of the main considerations in choosing materials are physical format, intellectual context, and affective component.

Physical format. The choice between a print format, a visual format such as television, filmstrip, or film; a sound recording; or a computer based online system should be made on the basis of the user's abilities and the material to be presented. The audio visual formats are frequently useful for children who have physical disabilities or who have difficulties in absorbing information from print. Most nonprint formats, however, require hard-

ware, whether that is a film or filmstrip projector, a cassette player, or a computer terminal. Print formats are often the most efficient and the cheaptest way of conveying the same information to a large number of children.

Intellectual content. Probably the most important aspect to consider in determining which material to choose for children is the intellectual content being conveyed. A print account of a Beethoven concerto conveys only a pale reflection of the music. In music, art, and some aspects of science, a visual or auditory version of the content is necessary for a full appreciation.

Other kinds of material, especially those which include a closely reasoned argument, are best presented in print formats which can be referred to again and again. These might include historical works; accounts of scientific theories such as evolution or biographies of individuals.

Online database services are usually print-based services but print which is read from a terminal has a different impact from print read from a page. In the last few years a number of encyclopedias have gone online. One of these is the *World Book Encyclopedia,* one of the most popular English-language encyclopedias for children. To decide whether or not a library ought to obtain this service, librarians are going to have to analyze the ways in which children use encyclopedias. An online system works best for small items of information which can be transmitted quickly without excessive cost. It is effective for material that must be updated frequently. An online encyclopedia, for example, could have current population figures, current political developments, and current obituaries much more easily than a print encyclopedia. On the other hand, if a child wants to read an article about elephants, there may be no need for up-to-the-minute information and a print encyclopedia would provide cheaper and more accessible information. Only by determining the patterns of use, can we decide upon the appropriate format.

Within the realm of printed books, librarians will have to

decide which topics are best handled in the small-segmented, non-linear books that I mentioned earlier, and which are best treated in a traditional mode. Because children will be demanding more and more information from libraries, accessible, fact-filled books are necessary. But we must be sure that the facts are easy-to-find and that the continuity of concepts or narrative are not omitted where necessary. We can no longer assume that children will read a book straight through from cover to cover. In fact, many books are not designed to read that way. We must help children learn how to use indexes, tables of contents, and other access points so that they can find out what they need to know.

Affective impact is another factor which must be considered in purchasing decisions. I spoke earlier about the different impressions given by film and print versions of the same stories. The vivid power of the images projected by visual and auditory media can grip children and arouse strong feelings. Librarians must decide whether a given topic is best treated in this way, or whether we want to induce the more contemplative mood associated with books. Both kinds of experiences are important for children, but both must be assessed and evaluated. We do not want to choose books which ask for a degree of intellectual and emotional maturity that is beyond children, or they will react with boredom. On the other hand, in an attempt to seize their attention and stimulate their imaginations, we do not want to offer material which is melodramatic or sentimental. To do either is to give children a distorted sense of reality.

The information age is bringing immense challenges to children's librarians. The promises and pressures of the new technologies and the changes which they have brought to our society make our task far more difficult than it has ever been in the past. We must learn more about children, more about media, and more about children's recreational and informational needs in order to develop library services which will enrich children and stimulate both their intellects and their imaginations.

Useful Reading

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