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MEDIA MESSAGE

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L'ASSOCIATION des MEDIA et de la TECHNOLOGIE en EDUCATION au CANADA
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AMTEC L'ASSOCIATION des MEDIA et de la TECHNOLOGIE en EDUCATION au CANADA
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COMMENT

I came back from St. John's with my batteries freshly charged! That can be the most valuable aspect of any experience. It may be good at the time, but how much better if it lasts a long time because the charging process was effective.

Elsewhere in this issue, Gar Fizzard will fill you in with much of the detail about the conference so I'll not dwell on that in this piece.

But there is one aspect of the conference that I find personally gratifying. The number, diversity and quality of the papers presented was such that I came away from St. John's with enough material in hand (or soon after sent to me) to fill the pages of this issue and the next. That's enough to warm the cockles of any editor's heart! For those who were at the conference but couldn't get to all the presentations and for those who could not get to St. John's, the published papers should fill many gaps.

* * * * * * * * * * * * *

Following the conference, three of us spent a day in St. Pierre. We simply wanted to visit that tiny French island while in Newfoundland. We located a local, commercially licensed pilot named Ron White who agreed to fly us to St. Pierre in a four-place Piper Cherokee Arrow. We flew there in an hour and a half on Friday morning, June 18; spent the day walking, looking, lunching, shopping, picture-taking and thoroughly enjoying ourselves. We left at about six o'clock to return to St. John's.

Now this doesn't seem to have a great deal to do with educational media in general or the conference in particular. But in a way it does. While in St. Pierre (and St. John's) I took a lot of 35mm slides. As time permits, I plan to write and record a brief narration to go with the slides and share something of the experience with some teachers and students in some of the schools of Toronto. In that way, the impressions will be shared and may in some small measure add to the knowledge and help shape the feelings of those from up-along about the eastern most part of this rather large country.

That too is part of what the conference was all about. And it's part of what the educational media are about every day.

Lou Wise

REPORT FROM THE PRESIDENT

ADDRESS TO GENERAL SESSION
June 16, 1976, at St. John's Newfoundland
by G. Fizzard, President

A.M.T.E.C. is a most unusual organization; it is almost a contradiction. To my knowledge just about no other organization represents so wide a range of professional interests — from the resource teacher to the researcher in computers to the technician to the television producer to the media services administrator to the graphic artist to the film distributor. Add to this divergence of interests the facts that the total membership is relatively small and that we are spread across the country in both languages, and some of the basic difficulties of the organization become apparent.

In many locations, while the total membership of A.M.T.E.C. is impressive, there is a relatively small number whose immediate and "every day" professional problems coincide. Hence, this basis for participation — the meeting and sharing of common practical problems — is at best tenuous in many parts of the country.

At the national level we are also faced with the difficulty of communicating among ourselves, not only on matters of general concern, but in areas of specific concern to our various subgroups. And all this on a small budget. The Media Message and a new experiment last year — the Newsletter — are making commendable efforts in this direction, but the fundamental difficulties remain; we have to attempt to overcome the problems of numbers, geography and finance.

As professionals who claim some competence and expertise in communication, we are faced, then, with a problem to challenge our own creativity, imagination, and innovative abilities.

In spite of the difficulties, it is apparent that there is a need for an organization such as A.M.T.E.C. The fact that close to 600 people have taken out membership in it is an indication that there is at least that number with an expectation of a role for the organization.

What does A.M.T.E.C. have going for it?

For one thing, the very source of some of its problems — its relatively small size, is also a strength. Whereas in a large organization, we may often feel that we are only names on a directory, A.M.T.E.C. is still sufficiently small that individual members are not lost in the crowd. It is possible for any member with an idea for the organization to see that idea brought to fruition. But this kind of influence and impact brings with it an obligation — an obligation to participate, to get in to the action.

It may sound like a cliche, but it is a fact that A.M.T.E.C. is nothing more than the members. There are no full-time officials in A.M.T.E.C.; there is no one at the central office whose full-time responsibility is to carry out the functions of the organization.

The officers are all full-time employees of some other institution and A.M.T.E.C. activities are in addition. I wish to stress this point and to make a plea that we resist the temptation to develop a "we — they" syndrome. Why don't "they" do something for me as a member? What has A.M.T.E.C. done for me? The emphasis, I suggest, on the first person is more helpful and more realistic. What can we as a special interest group in this location do to help ourselves and our clientele? How can the fact that we are members of A.M.T.E.C. assist the process? How can we use this vehicle of A.M.T.E.C. to help us bring together the views and energies of the various dimensions of the communications technology phenomenon? How can I as an individual contribute to the process?

This may sound like a copout for the officers of A.M.T.E.C., that I am obsolving them of inaction in advance. I don't mean it that way. The officers have an obligation to provide leadership, to take action on their own iniative on behalf of the organization. But I am saying that the amount of A.M.T.E.C. activity from that source alone has practical limitations, and that the vitality of the organization is in direct proportion to the willingness of individual members to be active members, to iniate ideas and to help work on them.

So far I have been making reference to our relationships as members of the organization. As a national organization concerned with media technology, we have an obligation, an opportunity, and a need to relate to other institutions on matters of mutual interest.

It is important for us as an organization to maintain and expand our contacts with the federal government and its appropriate agencies. In matters of policy concerning communications technology, especially as it affects education, we should be in a position to provide input to those who formulate and implement those policies.

We have relationships with other organizations that should be noted. At the national level, for example, we have had very useful cooperation with the Canadian School Library Association, expecially through the efforts of Fred Branscombe and Harry Newsom, and the project on standards that they have directed. At the international level, our contacts with A.E.C.T. in the United States have been close and friendly. We have an official relationship with A.E.C.T, and, while I see no reason for that to change, my own inclination is to collaborate more closely with the International Division of that organization.

And now I would like to reflect for a moment on broader relationships than those to which I have referred — the relationship of our professions to society at large.

It is, of course, common knowledge that these are unsettled times for all of us, as citizens generally as well as workers. We are, we are being told, living in a new reality. If this is so, and indeed it appears to be the case, we must examine our part in that reality.

We hear so much nowadays of restraint and, indeed, reduction in public spending, of getting priorities right, of cutting out frills. These exhortations are being directed at governments generally and all public institutions are no exception. Within educational institutions, it is not uncommon to find that administrators, in their hunt for nonessentials, often cast an envious eye on communications technology. Perhaps those of us involved in that area are vulnerable because we represent change to the administrators. It is probably true generally that in periods of uncertainty there is a tendency to reject experimentation and innovation in favour of the "tried and true", to adopt a "get back to basics" attitude on the naive assumption that if we can somehow create the illusion of the fictitious problem — free good old days, the reality will follow.

Perhaps we have contributed to our problems by being unjustifiably complacent in thinking that because in the past we were funded, there was a deep and abiding commitment to the essential nature of our functions. Perhaps we have taken our own value as an article of faith and have not asked enough fundamental questions about our own role in the broader educational process. Perhaps we have sometimes raised the expectations of our clientele too high and have believed our own press releases too readily.

So in this new reality, we must stand back to examine ourselves anew, to have the confidence that we can be part of the solution rather than part of the problem, but to temper our claim with the humility that comes

from the awareness that we have no panaceas. Only then can we lay claim to the contention that we have a valuable contribution to the institutions of which we are a part.

AMTEC '76 IN REVIEW

by Gar Fizzard, Chairman

I dislike writing reports and I am doing this under protest. But the editor insists that a conference issue would not be complete without its summary by the local organizing committee. So here goes.

For several years broad hints had been dropped that A.M.T.E.C. should be invited to St. John's. Two years ago, about the time of the Brock Conference, in a moment of weakness and abandon, a group of A.M.T.E.C. members in St. John's succumbed and issued a formal invitation to A.M.T.E.C. to meet in St. John's in June, 1976. With indecent haste the invitation was accepted, and so there was no turning back.

The first step was to get committees established, chairmen appointed, and terms of reference established. The following committees, with their chairmen were set up: Program (Duane Starcher), Finance (Norman Harris), Transportation/Accommodation (John Staple), Study Trips/Tours (Greg Stack), Services/Space/Production (Kyran Kennedy), Registration (Bruce Winsor), Exhibits (Bill Griffin), Hospitality (Pat Treacher and Aiden O'Hara), Publicity (Craig McNamara, Charlie Callanan, and Bob Hyde), and Translation Services (Dan Michaud).

Welcome to St. John's — the welcoming committee at the airport.

The first meeting of the embryonic planning committee took place in the home of one of the members. As the evening wore on and the imaginations became more and more lubricated, suggestions became more and more outlandish. Most of them were so outrageous that in the light of day they were promptly dismissed. One of the more sober proposals — that we look into the possibility of a cruise/conference — was investigated. Unfortunately, after receiving quotations from ships' agents from as far away as the Crimea, we regretfully concluded that the cost was prohibitive.

With an exotic ocean liner eliminated as a locale, we were reduced to planning a relatively conventional conference — well, hopefully, not too conventional.

The confirmation of a site was our highest priority. When we had issued the invitation we had assumed that a convention centre being planned for St. John's would be completed by June, 1976. It soon became clear that the facility would not be built on time — if ever. The best alternative was the campus of Memorial University, less than ideal as a conference site. As it turned out, apart from the distances between various functions (which Participaction would have endorsed), the facilities were reasonably acceptable.

By the time we went to Calgary in June, 1976, we had developed a logo (irreverently dubbed by some

Signing up at the registration desk.

philistines as the pregnant swan) and had prepared a promotional film. We had a lot of fun putting together the film. The combination of historic footage of St. John's — some as much as seventy years old — and a 'straight' commentary resulted in a spoof on hard-sell promotional films produced by convention centres, boards of trade, and tourist departments.

In September, 1975, the organizing committee began to meet weekly, a schedule that was maintained with few interruptions up to conference time. Some of the sub-committees went into high gear early in the fall; for others their time had not yet come. We found that it was necessary to activate the committees at different times, depending on the amount of lead time required for each.

For all of us a major source of concern was finance. We knew that simultaneous translation services would be a major expenditure. The question was: Could we expect help from Ottawa; if not, we were afraid that the registration fee would have to be so high as to be a deterrent to prospective participants. Fortunately, by early winter we had a commitment from the Secretary of State that we would get a grant to cover two-thirds of the simultaneous translation costs.

In planning the program and arranging speakers, we were reminded of the complex nature of A.M.T.E.C. It was a considerable challenge to provide for such a wide range of professional interests as is found in A.M.T.E.C. Our attempted solution was to schedule general sessions that would be of value and interest to most of the membership and to plan concurrent sessions of a more specialized nature. We identified three or more major interest groups within the membership and tried to schedule sessions so that there was a session — and only one session — for each interest group in each time slot. This was our goal, but we were probably at best only partially successful. After all, for most participants professional interests cannot be put into neat categories.

Dick Gilkey brings greetings from AECT.

Another problem for which we could not find a completely satisfactory answer involved the exhibits. We took our responsibilities to the exhibitors seriously, but space problems prevented us from putting them in as easy access to the participants as we would have liked. We would have preferred exhibit space near the rooms where the concurrent sessions were being held. This was impossible, and we chose the second best alternative — an area near the dining hall, where participants would eat the mid-day meal. Unfortunately, for the chairman of the exhibit committee, the area with panelled walls and carpeted floors was more suited to a club of genteel patrons than to an exhibit of electronic equipment. In view of the constraints, the arrangements for the exhibits were commendable.

Extra-curricular activities are important to any conference, and it was not lost on us that participants would expect something of a Newfoundland flavour. The best flavour we could think of was lobster at a Newfoundland 'time'. A time in Newfoundland is, roughly translated, a social event — a combination of dance, singing, stage presentation and food. Such a time is indigenous to the outports of Newfoundland and doesn't fare well in urban areas — certainly not in the urbane and sophisticated metropolis of St. John's (or as one newspaper wag insists on writing it, "Sin John's"). So, we decided to approach the people of Torbay, an outport close enough to the city for easy transportation and far enough away to have retained an outport atmosphere. By all accounts they gave us an unforgettable "time."

When it's Torbay Time, the lobster's the thing!

The dining hall: three squares a day.

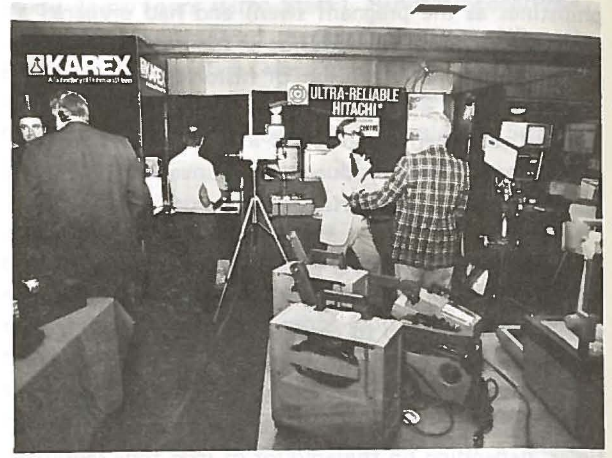
As June 10 drew closer all committes went into high gear, confirming and reconfirming every arrangement.

At the last meeting before the conference, the members of the committee agreed on two points:

(a) the infallibility of Murphy's Law, that is, "anything that can go wrong will, and at the worst possible moment." (We were reminded at the conference of the preeminence of Schwartz's Law that Murphy was an optimist). We concluded that the only way to beat Murph's Law was to believe in it and to act accordingly.

(b) we had developed and maintained good personal relationships during the two years of our planning and we should not jeopardize those relationships by incriminations in the event of mistakes (except that if the whole thing bombed, the general chairman would have to take the full blame for making the dumb suggestion of the conference in the first place!)

So everything was in place. All that remained was to get the delegates in town. Having a conference in St. John's in June is a risky business, as the flying weather is often most unco-operative. It is not uncommon at that time of the year to be fogged in for several days at a stretch. We feared, then, that when we woke on Sunday morning we would see fog. Of course, we did not. Instead we saw rain and snow – falling horizontally! True, the snow was melting before it reached the ground, but the sight of the white stuff among the rain, driven by gale force winds, put us in a state of disbelief. Snow? We hadn't seen any since March. We had just had several weeks of warm spring weather. And now snow!



The dealers and distributors supported us well with their exhibits.

Our immediate question was: can the planes get in? Fortunately, the answer was yes, although from the glassy stares of the passengers when they touched down, they clearly had a landing that they would like to forget but probably would not for some time to come. Fortunately, the next three days were sunny and reasonably warm, so activities that depended on good weather were not adversely affected.

Throughout the conference we found that for the most part we were living in the future. We were more concerned with what was going to happen in an hour or two rather than what was happening at the time. After all, the events in progress did not require our attention; they were already in place. It was the next stage of the program with which we were concerned; last minute confirmations had to be made and minor adjustments to our plans were sometimes necessary.

Participants at a conference normally evaluate its content and organization. While we invited this feedback at St. John's, we also evaluated the participants themselves. And we have concluded that we were fortunate in the quality of our guests. By and large they appeared ready to mix the substantive part of the conference and the social events in a nice combination. The minor irritants were accepted with good grace and patience. And to the surprise of some of our local committee, they demonstrated that not all mainlanders have lead feet.

When the banquet concluded on the night of June 16 and the conference came to an end, we were satisfied that by the standards we had set for ourselves the conference had been a reasonable success. While not everything had been as we had wished, on balance

we were pleased with the outcome. There was just one final chance of a problem: the departure of the participants could be delayed by fog (or snow?). Fortunately, Thursday was bright and sunny with all planes flying normally, and as far as we know everyone left as they planned (at least we haven't heard any cries of help from stranded and lost mainlanders).

The concurrent sessions were many and varied.

Now it's all over but the bills to be paid and reports to be written. We're glad we did it but we're glad it's over.

And now we're looking forward to A.M.T.E.C. '77 in Guelph where, without being concerned about the AV equipment for the next session or the next coffee break arrangements, we can relax and enjoy it all.

The closing banquet: past-president Fred Branscombe is "gifted" by incoming president Gar Fizzard.

* *

THE NATIONAL FILM BOARD'S INVOLVEMENT IN CANADIAN EDUCATION

by André Lamy

This promises to be an interesting and stimulating conference and I am honored to have been invited to deliver the keynote address on the National Film Board and its involvement in Canadian education.

When the Board was created in 1939, it was designed to be a public cultural institution. Its mandate then, as now, is to make and distribute films in the national interest – to interpret Canada to Canadians and to other nations.

If you will allow me to define education in its broad sense – as the transmission of a cultural heritage, as a process that does not stop with high school, or college, but rather continues throughout adult life – then you can readily see why the Film Board has a strong preoccupation in this area.

John Grierson, the NFB's first Commissioner, used to say there are more seats outside the cinemas than there are in them. They are all Canadian seats – in the classrooms, in the community halls, in the church basements. Add to that the audiences we can reach through both network and cable television and the number of seats outside the cinemas, outside the manipulations of the box-office, is collosal!

At the National Film Board, our policy is to avoid the traditional box-office route.

It doesn't work for us.

Fiction and feature films will continue to be a mode of expression in the NFB's future film-making policy. But our distribution will focus on reaching people outside the theatres.

With this in mind, the education milieu gains even more importance in our "politique".

Before I go into detail, let me tell you a little about the NFB itself.

We are a federal government agency, administered by a nine-member board of governors. As Government Film Commissioner, I am chairman of the Board. Three other members are civil servants and the remaining five represent the Canadian public, coming from the various regions of the country. The Secretary of State is the Minister responsible for the Film Board, while our estimates are scrutinized each year by the Parliamentary Committee on Broadcasting, Film and Assistance to the Arts.

We produce about 150 new films each year, in English or French — everything from one-minute TV spots to hour-long TV documentaries, dramas as well as theatrical shorts, feature length films and animated films.

We add these 150 new productions each year to our existing stock of some 2,000 titles which you will find described in our film catalogues.

Canadians have access to NFB films through our 27 free lending libraries in cities across the country and through some 150 affiliated public and private agencies.

We have an estimated world audience of some one billion. And we reach these people through sales by NFB offices abroad and through Canadian embassies and posts in 80 countries around the world.

Those are our production and distribution branches. Our technical services branch is vitally important too — known the world over for its inventions and innovations in filmmaking technology.

Now the cost to each Canadian for this whole enterprise is just over one dollar a year. So you can see, you are indeed getting a bargain.

And it is the education sector that gets the best part of this bargain.

Mr. Hugh Faulkner, the Secretary of State, has said that the NFB is a vitally important medium in the educational milieu. He has said further that public cultural agencies must become even more involved in education.

The National Film Board is prepared to continue its responsibility in this area, to work in collaboration with all the people involved in education — with provincial governments, with school boards and, most important, with people at the grass roots levels — with people like yourselves.

We decided that if the Board was to become more aware of the educational needs in Canada, we should first know what needs and problems exist in the use of audio-visual material. We wanted to know what were the existing practices so that we could assess what the future developments in this field should be. And specifically we wanted to see how we at the Film Board should continue to meet the requirements.

However, there was very little in the way of national data on the utilization of audio-visual material. So, last year, we began an investigation of how Canadian educational institutions used audio-visual materials. This resulted in our Educational Support Study which was completed just five months ago. Copies of the complete report are available through regional NFB offices across the country.

Our first task, was to establish base-line data, at a national level, on the utilization of non-print media. Any studies done on this in the past were of local or regional scope. Virtually nothing existed that took a national look at the question.

So our research team surveyed educational institutions and libraries across the country to find out what kind of films and audio-visuals they had on their shelves.

The questions we asked — where do films come from that are seen by students in Canadian schools?

— What is the country or origin?

— How much use is made of domestic productions?

You might remember the great flurry caused in 1970 by a study of the Educational Media Association of Canada. They reported that 80 per cent of the funds allocated for the purchase of 16mm film was spent on foreign productions and most of this was spent on films of U.S. origin.

This of course caused great concern about the possible dilution of the Canadian heritage in our schools by films that are at variance with the Canadian way of seeing things.

Although accurate, the EMAC study was based on a limited sampling of the buying patterns of Toronto educational institutions.

Our study set out to find how accurate these allegations were on a national basis; to take a country-wide look at the situation in order to clarify it.

We restricted the analysis for this point only in the study to films that have been defined as educational — that is, films that hold educational certificates.

And we found that during the period from 1971 to 1974, 65 per cent of available titles were of foreign origin.

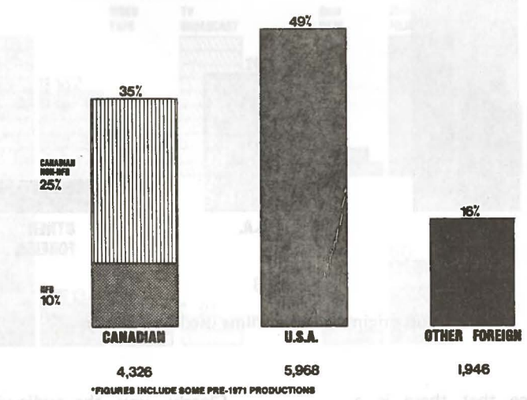


Figure 1

Number of 16mm titles available in Canada and certified as educational from 1971 to 1974 *

Then we asked the librarians at the provincial school district and the university level about the kind of prints they actually had on the library shelves.

Our results showed that the proportion of films from foreign sources as estimated by the librarians, was in the order of 66 per cent.

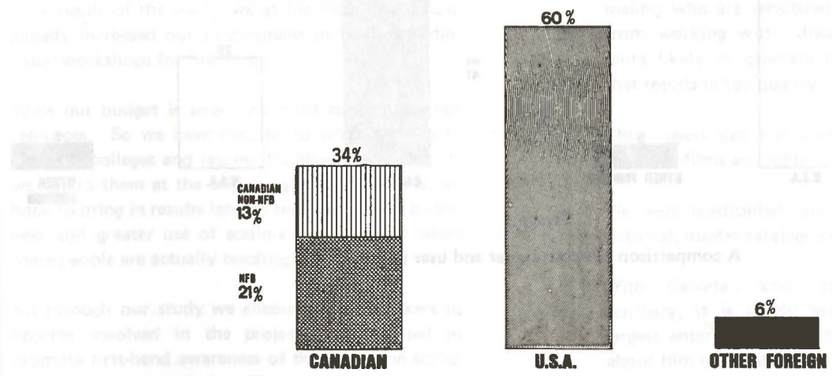


Figure 2

16mm copies held in education system film libraries

But remember, this proportion of foreign films on the shelf tells us nothing about which films teachers actually show their students.

During a one-month period, we sampled teachers across the country. We asked them what films they used in the classroom. We found that 65 per cent of the films they used were of Canadian origin.

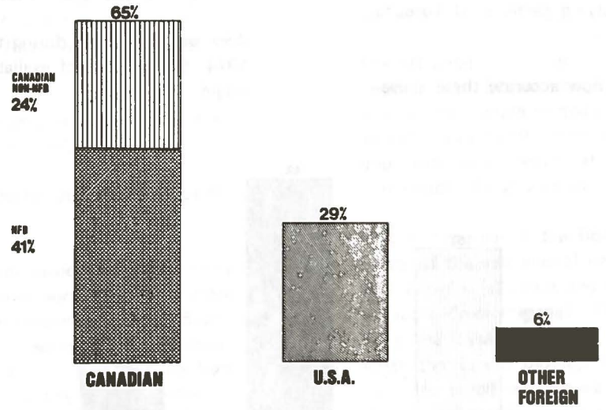


Figure 3

Production origin of 16mm films used by teachers

From these figures one can see that there is a difference between what was being bought by our school systems and what is being used by teachers.

Clearly, you, the audio-visual experts and directors, have an important role to play in straightening out this imbalance.

The buyers operate this way

The users operated this way

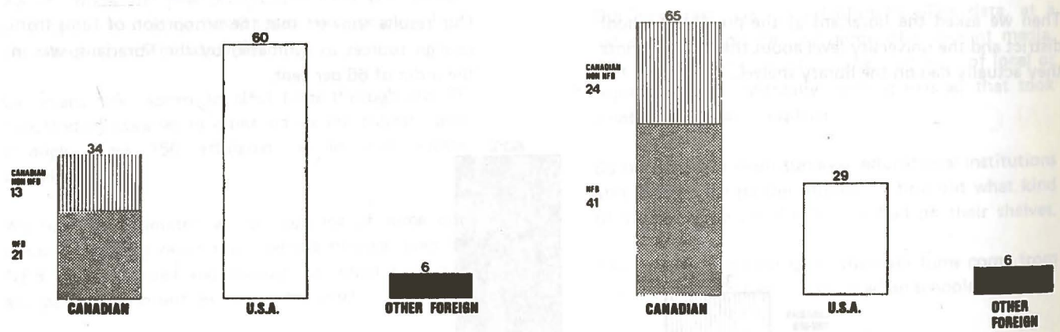


Figure 4

A comparrison between buyer and user practices

Our study also indicated that 61 per cent of the teachers who have used foreign-produced films, found points of view that might be considered unsuitable for Canadian curricula.

Then we looked at the kind of training teachers receive in audio-visual use and found that one third of the educators we interviewed said they entered their profession with no audio-visual training. Our survey shows that the extent to which media are use in the classroom correlates with the amount of training in audio-visual use that the teacher has received.

It was very encouraging, however, that more than 80 per cent of the teachers felt that more audio-visual productions were needed in virtually every area of education.

As to the extent to which films are used and accepted in schools at various levels here is what we found.

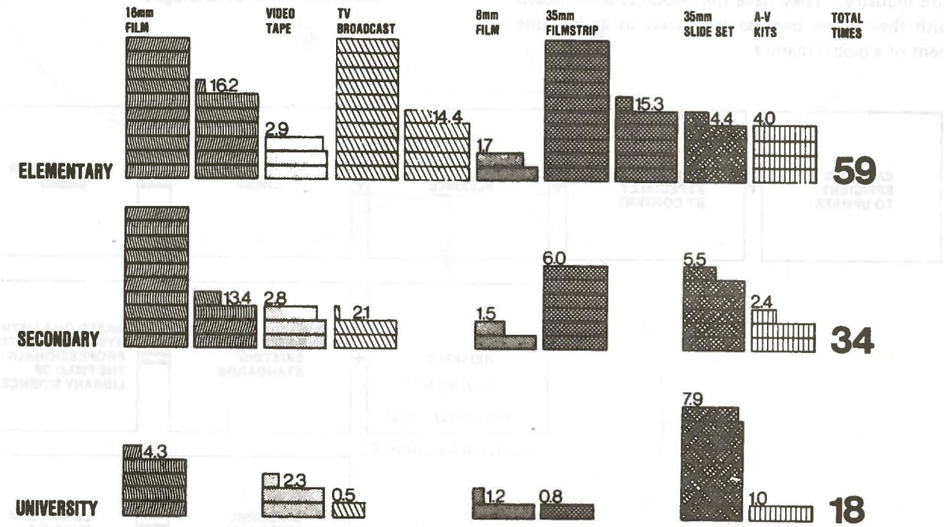


Figure 5

Use of principal A-V formats per year per teacher

As a result of the study, we at the Film Board have already increased our involvement in holding audio-visual workshops for teachers.

Since our budget is small, we must concentrate our resources. So we have decided to work more with teachers' colleges and teacher-training institutions. If we get to them at the beginning of their careers, we hope to bring in results later in terms of greater awareness and greater use of audio-visual materials when these people are actually teaching.

All through our study we encouraged filmmakers to become involved in the project. We wanted to promote first-hand awareness of the education scene. It is widely accepted that films made by decree are seldom as good as those made because of a film-maker's personal commitment. We think that film-makers who are sensitized from first-hand exposure, from working with educators and students – are more likely to generate the drive and enthusiasm that results in top quality films.

The biggest gap our study uncovered was that of access to films and information about films.

We were confronted constantly by the need for a national, master catalogue of Canadian films.

With Canada's small population and immense territory, it is nearly impossible for any but the largest enterprise to distribute films and information about film nationally.

Even the NFB, with its 27 film lending libraries across the country, with its affiliations of some 150 public

film libraries, even we can respond to only 50 per cent of the present public demand for community film service.

Educators, as a matter of fact, obtain only some 15% of the films they use from NFB libraries.

It is no wonder then, that the Canadian film distribution generally, and particularly in the even smaller and more specialized education market, is dominated by the products of an American entertainment and information industry. They have the resources to bombard us with their wares because they view us as just one segment of a global market.

We must consolidate and coordinate our activities to favor the distribution and utilization of the best Canadian films and audio-visual materials as our first choice. It is, I feel, especially crucial in the educational milieu.

With this perspective, we propose to establish a national, computerized system to make Canadian films more accessible to Canadians.

Here is what we consider to be the criteria for a successful national catalogue:

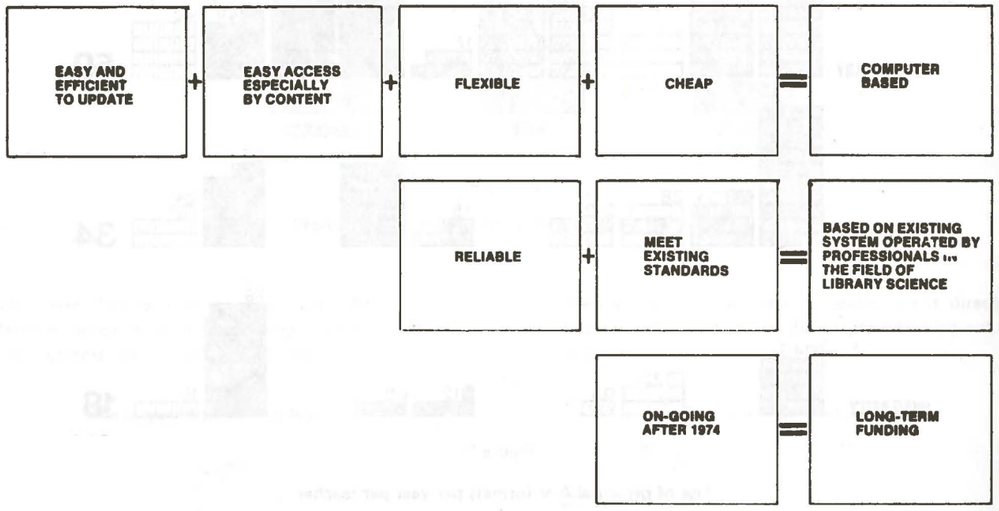


Figure 6

Criteria for national catalogue

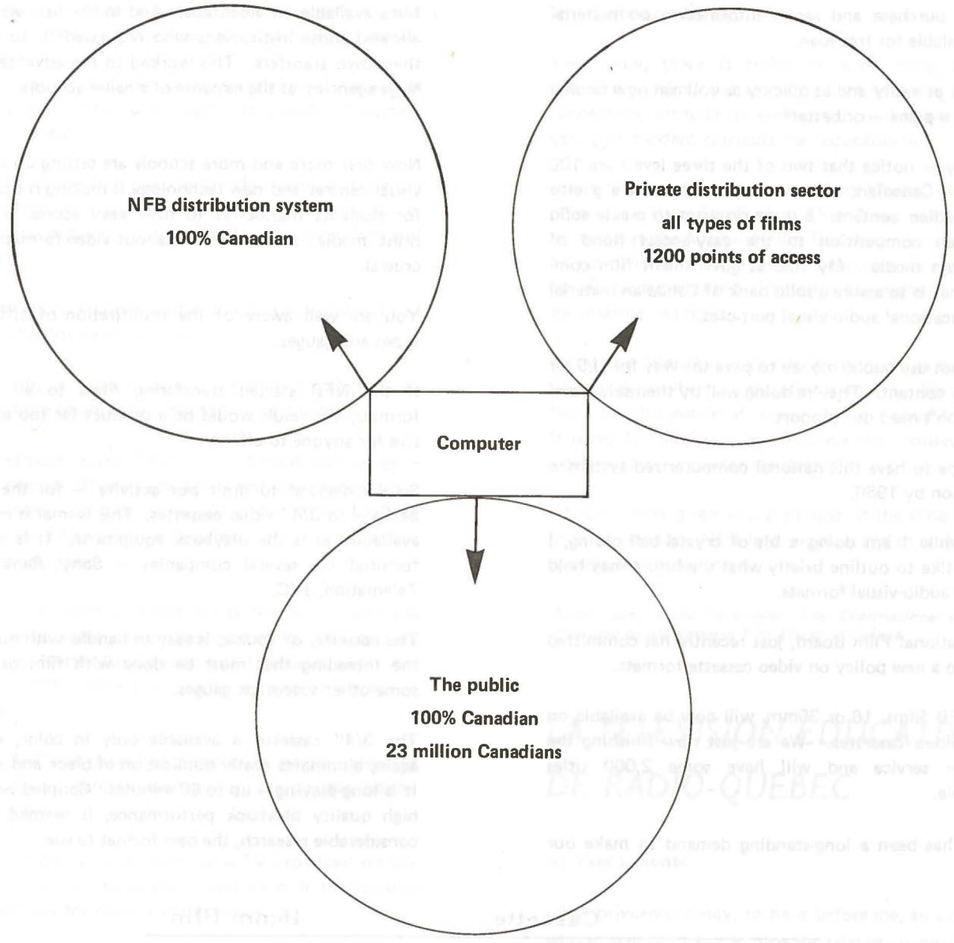


Figure 7

Three levels of the national, computerized film catalogue

On the first level we see it as a public enterprise, 100 per cent Canadian, operated on the general lines of the NFB's present distribution network.

The second level will tie in the private film distribution sector, giving the public some 1200 points of access to films of all kinds, including foreign films.

The role of the private sector will be to provide direct film loan services to the public at the community level. The private agencies will have access to the master file of data on Canadian material as well. And they will be the booking locations for the extensive film collections in the regional warehouses.

The third level consists of the users of the system — again 100 per cent Canadian — 23 million people in this country, the teachers and educators, the professional business, labor and community groups and the Canadian film industry as a whole. The system exists to meet the needs of you people.

The services provided? — catalogue information, program selection, booking assistance, utilization coun-

selling, purchase and rental information on material not available for free loan.

All this as easily and as quickly as you can now book a seat on a plane – or better!

Again you notice that two of the three levels are 100 per cent Canadian. We are not out to create a ghetto of Canadian content. But we do want to create solid Canadian competition to the easy-access flood of American media. My role as government film commissioner is to assure a solid bank of Canadian material for educational audio-visual purposes.

I will not use public money to pave the way for U.S. or foreign content. They're doing well by themselves and they don't need our support.

We hope to have this national computerized system in operation by 1980.

And while I am doing a bit of crystal-ball gazing, I would like to outline briefly what the future may hold in new audio-visual formats.

The National Film Board, just recently has committed itself to a new policy on video cassette formats.

All NFB films, 16 or 35mm, will now be available on 3/4" video cassettes. We are just now finishing the transfer service and will have some 2,000 titles available.

There has been a long-standing demand to make our films available on videotape. And in the past we have allowed those institutions who requested it, to make their own transfers. This worked to the advantage of large agencies, at the expense of smaller schools.

Now that more and more schools are setting up audio-visual centres and new technology is making it possible for students themselves to have easy access to non-print media, some decision about video formats was crucial.

You are well aware of the prolifiration of different types and gauges.

If the NFB started transfering films to all these formats, the result would be a product far too expensive for anyone to afford.

So we decided to limit our activity – for the time being – to 3/4" video cassettes. This format is readily available, as is the playback equipment. It is manufactured by several companies – Sony, Panasonic, Telemation, JVC.

The cassette, of course, is easy to handle, with none of the threading that must be done with film or with some other videotape gauges.

The 3/4" cassette is available only in color, which again, eliminates costly duplication of black and white. It is long-playing – up to 60 minutes. Coupled with its high quality playback performance, it seemed, after considerable research, the best format to use.

	Cassette		16mm film
10 min film	$58.	(50%)	$115.
20 min film	$75.	(36%)	$210.
30 min film	$90.	(30%)	$300.
60 min film	$135.	(29%)	$460.

Figure 8

Price comparison of 3/4" video cassette to 16mm film

This low-cost cassette should make it possible for any school library to become an audio-visual centre.

The cassette makes non-print material readily available for the student to use himself – it is really a "watch a book" format.

So it takes the film outside the classroom, outside the restrictions of a school period. It will change the relationship between film and student, between film and teacher.

In education, I would predict that the 3/4" format will prevail for the next five years.

The thing is that electronic technology changes so much more rapidly than mechanical technology.

For example, Super 8 film – mechanical technology – was invented 10 years ago and is just now gaining some acceptance. It took some 30 years (from 1920 to 1950) for 16mm film to be widely used – mechanical technology again.

But in the realm of electronic technology – portable video units were put on the market in 1967 and by 1973 in North America several thousand were sold every month. Who knows what changes will come in 5 years.

With 3/4" playback equipment, a whole range of possibilities becomes available to you in the educational milieu.

For example, you can pick up a TV broadcast on the weekend, or in the evening, and show it to students the next day for classroom discussion.

It is an interesting project, but you too can see the catch. As it gets bigger, as the demand grows, there will not be enough channels and then, of course, the company must go back to regular pre-programmed broadcasts.

The only way out of that difficulty would be to offer programs for home video-recording. The customer, for example, will be told that the program he wants will be available for recording at 3:30 a.m.

He then sets his vido-recorder for that time, picks up the program automatically and can watch it the next day, or whenever he chooses.

Now, about the future of productions, both in film and other audio-visuals. It is my belief that the difference between education media and mass media will disappear entirely.

Even now, there is really no such thing as an "education film" per se. Any film that can affect perception, attitude or emotion, as well as memory, can, with modern curricula, be "educational".

Films like Academy Award winners "Nashville" and "One Flew Over The Cuckoo's Nest", can and should be made at the National Film Board, can and should be educational films – because they are damn good fiction documentaries! Fiction is an excellent mode for interpreting reality.

We at the Film Board do not see our role as making films specifically for educational media. We make films for the public at large. If it is a good film, it is good for students, for businessmen, housewives, steelworkers – even for intellectuals.

I hope I have given you a glimpse of the broad outlines of what the NFB is doing now and of what you can expect in the future.

André Lamy is the Government Film Commissioner and Chairman of the National Film Board of Canada.

LA TELEVISION EDUCATIVE DE RADIO-QUEBEC

by Yves Labonté

I feel privileged today, to have before me, an audience whose main concern is directly related to media and technology in education.

Indeed, I was looking forward to this occasion, because I feel Radio-Quebec is presently living what I would term a "unique journey through public education". And of course I believe our story should be told, and poeple in the field of media and technology in education should hear it.

Educational television is in itself a concept of many dimensions and various interpretation. It is still in the process of experimentation, research and development, but already for away from school broadcasting.

Has Radio-Quebec discovered the ideal formula? I'd rather not answer this question by yes or no. I would say however that Radio-Quebec is trying to develop new ways and to amalgamate concepts of visual aids,

mass-media, culture and technology with those of continuing education, social development and television productions.

In an era of constant changes, new developments, growing needs and sophisticated technology, what public service is there to help people keep the pace with such a fast moving society?

Indeed, schools, colleges and universities, offer a variety of adult courses, and night classes. But these efforts suffer many limitations in accesibility and scope.

On the other hand, statistics show that with reduced working weeks, more and more time becomes available for leisure. In Quebec for instance, statistics reveal that adults are watching T.V. for an average of four and a half hours per day. Other statistics confirm that T.V. is considered by most viewers to be the most fascinating, most educative, most captivating and most influential on behaviour, opinion and family interest.

With this in mind, one can no long consider E.T.V. as a mere visual aid in a classroom.

A.V. Generations

In fact, I would feel justified to say that audio-visual aids in education have known four generations so far. The first generation used films, filmstrips and slides to illustrate parts of a teacher's lesson.

The second generation brought about T.V. teaching whereby the lecturer sat before the eye of a camera or stood up before a blackboard in the middle of a studio, broadcasting his science and reciting his knowledge through the network.

The third generation was more sophisticated with programs aimed at specific age groups: "The Electric company", "Sesame street", "Chez Helene", "Les Oraliens" and "Les Cent tours de Centour" are amongst them.

The fourth generation is what I would call "educational broadcasting", no longer limited to school broadcasting, but strongly related to the broader and much more complex permanent learning process of the individual which we call "continuing education".

Radio Quebec stands right here, in the middle of this fourth generation.

Visual Aid — Public Aids

E.T.V. is not and should never be considered simply as another visual aid in a classroom. It is a public aid in Society. It is a means for the viewer to become more aware of and more able to cope with the surrounding realities; it is a means for the citizen to acquire a greater participation in the making of a nation's collective life.

If it happens to be a support to a teacher's lesson in a classroom, we'll be glad to hear so. But Raido-Quebec's main purpose does not reside in school broadcasting.

As early as 1968, Bertrand Schwarts defined continuing education as follows, and I quote: "the objective of permanent education is to make each person capable of becoming an agent of change; that is to say, to better understand, the technical, cultural and social world around him. Permanent education must make each individual aware of his power to act, autonomist in the sense that he is able to see where he stands; able to understand his environment, influence it, and grasp the interplay of society's evolution and his own; able to confront evolution and changes." Unquote. Radio-Quebec's main objectives are in total agreement with Schwarts' definition.

Radio-Quebec, through its production, wants to help the citizen to go about in Society with easiness and confidence and to adapt, to evolve, to cope with what Alvin Toffler has termed "the future shock" without distress.

At Radio-Quebec, we consider that T.V. is meant to reach people at home in a very casual approach to their intimacy. T.V. is for leisure time, and should be fun to watch. It should be relaxing, pleasant and enjoyable. It should be reachable by a majority of viewers. The level of language, the accessibility of concepts, all of its programs should be devoted to the mass of people in opposition to selected groups such as students in a classroom.

To us, educational T.V. should not and must not be boring. It is a mass medium much more than a teaching device.

It is far more than a visual aid or a technical instrument to apprenticeship. It is indeed a social and cultural tool, a public aid to the evolution of man in Society.

Therefore I would feel justified to say that school broadcasting should be banned from T.V. unlesss it is used in closed circuit. Let me explain by putting these questions to you: Is it realistic to use a medium capable of reaching 4 million viewers to satisfy for instance the needs of approximately 2 thousand students in broadcasting a lesson on advanced mathematics? Wouldn't it be better to have slides, filmstrips, viewgraphs or videotapes in a classroom to supplement the teacher's effort instead of requiring the use of a mass medium?

An Era of Gadgets

Gadgetry is probably the illness of our days and age; and gadgets are often times expensive and worthless. Many teachers know how to use a camera, how to operate a playback unit, how to produce a T.V. show even. They are familiar with the technology and the terminology. They have become good operators, good technicians, sometimes good over all producers. But, do they know how to appropriately utilize the material; are they better teachers? Do they use the facilities to a better dissemination of their science? Are the students achieving better? How do we measure this better achievement? How do we compare with former results? How do we rate, how do we evaluate the better results due to the new techniques?

Do we use gadgets for gadgets, or do we really use visual aids to ease comprehension and to facilitate acquisition of new concepts by students? Do we use these gadgets to impress or to help the students? Should we have more and more teachers trained to the techniques of operating the equipment? Should we replace the blackboard by a T.V. set? Should we replace the teacher all together by an "on" and "off" switch?

I could go on and on with unpleasant questions. It seems however that teachers are more preocuppied by the "how to operate" rather than by the "how to teach with" audio-visuals. Nevertheless, it is obvious that with new techniques, we need better teachers, not better technicians.

Educational T.V. producers have the capability to produce good audio-visual material. In fact, many productions, intended for school viewing, are already available, unused and either ignored or considered obsolete by their sponsor, the Department of Education.

These productions were to be used in classrooms, as teaching aids. In many instances, the teachers were not even aware of their existence. Even today, teachers don't know what productions are readily available, or what is the main content of a production from which the title has been brought to their attention.

In other instances, while school programs were aired by E.T.V. and watched by students, the teachers themselves were leaving their classrooms to go for a cigarette puff in the hallway. Is this efficient and effective use of media and technology in education?

E.T.V. Opposite to School Broadcasting

School broadcasting by the mass media, as it is known and done today, is a waste of time, effort and energy. It is a waste of public funds as well.

We have to be sensible about it. Audio-visual material and school broadcasting will be worthwhile solely if the teachers are formed to their efficient utilization and active follow up, instead of trained to their operations. Personnally, I would even sustain that educational T.V. has no longer to do with school broadcasting: the former being a mass medium, the latter addressing small groups in classrooms.

I agree, that some specific matters might be better taught with the use of audio-visual material; but there again, either filmstrips, films, slides, video-cassettes or closed-circuit T.V. might be the answer.

Nevertheless, to Radio-Quebec at least, school broadcasting appears to be the wrong answer to better teaching; for a mass-medium is not meant to be a picture phone between a teacher and his students. Those who believe so should reassess their viewpoint.

From what precedes one can understand why I claim that Radio-Quebec, and probably educational T.V. as a whole, should not be viewed as a visual aid nor as a technical instrument, but rather as a full fledged educator. Radio-Quebec should be viewed as a human and social development instrument attentive to the needs of its public; not oriented towards school broadcasting but fully committed to educational television and the continuing education of all citizens.

Dialogue with the Public

Obviously, E.T.V. without the boundaries of a classroom and the limitations of school broadcasting becomes a very powerful, far reaching and, some might say, dangerous instrument in the hands of a few. Specially so if it is devoted to the promotion of social and cultural development of the people.

I am conscious that for many, it would be very tempt-

ing and it would seem very much easy to use a T.V.network to carry but one side of the story only and to bias the viewers judgement. Radio-Quebec has avoided these shortcomings by opening, developing and maintaining a constant dialogue with its public.

Attentive to the needs of its audience, Radio-Quebec invites viewers all through its programming, to communicate their impressions, their criticisms, their comments or their appreciation of each and all productions. In between the programs, questions are put to the viewers inviting them to reply by phone or in writing.

Twice a year, Radio-Quebec devotes all of its broadcasting time, for a full day, to the feed-back of its viewers who are calling in directly to the studios. Their opinions are voiced on the air, over the whole network; while in our studios some of Radio-Quebec directors and producers are lined up to receive the comments, and reply when necessary.

To sustain this dialogue, Radio-Quebec held seven work-shops with people from all walks of life to better study what were their expectations of E.T.V. These work-shops dealt with politics, education, economics, social needs, cultural affairs, science and technology, and environment.

Public Hearings

Although these activities had provided us with sound information about the needs of the population, in April '75, Radio-Quebec launched Public Hearings throughout the Province, inviting individuals and groups to voice their hopes and expectations about E.T.V.

Labor unions, universities, students organizations, parent-teachers associations, credit unions, economic groups, chambers of commerce and the general public, were invited to have their say. From 165 briefs presented and the constant feed-back received by Radio-Quebec, a three year plan has been developed and immediate action taken, to respond quickly to major needs identified.

The groups in the various regions want to have their say on the administration as well as the production of Radio-Quebec programs and activities in their respective areas. Insistance is made on the availability of Radio-Quebec programs for further use in class rooms.

It was often stressed that in the various regions of the province within audio-visual departments of colleges and universities as well as in the studios of private broadcasters there is good television equipment readily available and far from being used to the full.

All in all, what people expect of E.T.V. in Quebec amounts to the following: regional production centers should be established in all administrative regions of the province, they should be administered regionally by regional authorities, they should be linked together by a network of antennas and the regional population should be taking part in the preparation as well as the production of the programs. In all regions, democracy and participation are invoked as the basis for educational television. As one may see, the needs identified for E.T.V. are ways apart from school broadcasting.

Regional Centers

One year after the Public Hearings were launched, in April 1976, Radio-Quebec began what I termed earlier a "unique journey through public education."

We have taken up the challenge of democracy and participation. Thursday of this week, June 17, Radio-Quebec will have nine provisional committees, each composed of six elected members, established in each of the nine administrative regions of the province.

These provisional committees will recommend to Radio-Quebec ways and means to establish a permanent Radio-Quebec regional structure. It will also recommend people to be hired on a permanent basis. It will help identify themes and topics on which to produce a series of programs in their respective region. These programs, to be produced in the regions, will be broadcasted on Radio-Quebec network during the course of 1977.

Meanwhile, Radio-Quebec has conducted, with the help of engineering firms, a very detailed survey of all the sites which would be required to implement simultaneously, all over the territory, 42 satellites and 14 master antennas to form its network. The project has been submitted to the provincial government for approval and budgets. We hope the government will respond positively to the peoples' expectations so intensely and well identified throughout our Public Hearings.

As far as we are concerned, we are trying to respond rapidly and adequately to the needs and requests expressed by the population.

Split with Tradition

Our journey through educational television has brought us to make a fantastic split with traditional T.V. for we tend no longer to program series that will last the usual 39 weeks.

We have found that in order to respond to the needs of the population within a limited number of broadcasting hours per day, we had to make the best use possible of the time available. Thus, we developed programs based on themes which could be treated within a series, over a period of two weeks, three weeks, perhaps eight weeks of regular programming instead of the usual 13, 26, or 39.

At other times, a theme could be best developed within one full week at the pace of two hours per evening, five evenings in a row. Thus we can carry more information and respond more closely to the identified needs of our viewers.

On the other hand, we have also made a split with traditional education. Indeed the treatment of material has changed radically from the usual teacher behind the desk in front of a camera.

Radio-Quebec uses the interview formula as well as documentaries, films, screenplays, musical shows, drama and, yes, even quiz.

The flexibility of our series and the variety of our educational material, bring us to believe that we are more than just a visual aid to education. We are educators.

Co-Production ATEC

While Radio-Quebec devotes most of its energies towards its development within the province of Quebec, it has also helped in the making of an association of educational T.V. in Canada which is known as ATEC. Thus, to an extent, the spirit which inspires Radio-Quebec in its task will influence as well as benefit the other educational broadcasters in Canada.

Already three co-productions have been made successfully with the other members of ATEC. More and more of these co-productions, aimed to respond to similar viewers' needs, identified by each of the co-producers, will be made. I personally believe, that we are now developing in Canada a very peculiar

and progressive know how for educational T.V.

The Fifth Generation

Today, one may foresee within a very near future the fifth generation of educational broadcasting. Some of us may call it "further use" others may call it "broader casting". Whatever the name, the time is near when students will use videodiscs, video-tapes, video-cassettes, when they want it and where they want it, to acquire new knowledge.

A few cable distributors are already installing two way coaxial cables to allow their viewers "A LA CARTE" T.V. selections. It won't be long before the "on line query" will be made available by regional distribution centers for school and classroom viewings. The educational material will have to be produced by skilled educational broadcasters.

Its distribution handled by librarians at best with an educational background. Its careful selection made by skilled teachers.

Radio-Quebec has already foreseen such a development. The know how capability, acquired and developed during the last 8 years. allow us to believe that when the show begins we'll be right there . . . on the T.V. screen! But to be on the T.V. screen in a classroom by video-tapes or videodiscs, does not require the use of mass media antennas and networks enjoyed by E.T.V. broadcasters. School broadcasting and mass media? Radio-Quebec believes the two don't mix!

I would like to close with this remark: this morning, as you can appreciate, I have used no visual aid to support by exposé or to entertain you. Hopefully, I have thus contributed to impair the myth that the camera is to replace the pen in communications.

Yves Labonté is President director general, Radio-Quebec.

LA TÉLÉVISION ÉDUCATIVE DE RADIO-QUÉBEC PAR YVES LABONTE

Résumé

Après avoir situé le concept de télévision éducative dans le contexte de l'éducation continue, du développement social et culturel et de la spécificité de la télévision (mass média), par opposition á la télévision scolaire destinée à des clientèles restreintes, Monsieur Yves Labonté, président directeur général de Radio-Québec, rappelle les efforts faits par son organisme pour répondre le mieux possible à sa mission éducative:

Radio-Québec établit un dialogue constant avec sa clientèle (questions aux spectateurs entre les émissions, temps d'antenne entièrement réservé aux appels téléphoniques des spectateurs deux jours par année, ateliers avec des représentants de tous les milieux) pour répondre à ses besoins.

En avril '75, Radio-Québec a invité tous les groupes ou idividus intéressés à faire valoir leur point de vue lors d'audiences publiques. 165 mémoires ont été présentés.

Un plan triennal est issu de cette consultation. Le plan prévoit l'établissement de centres de production dans chacune des régions administratives de la province; ces centres seront administrés par des responsables régionnaux; ils seront reliés par un reseau d'antennes. La mise en oeuvre de ce plan est déjà amorcée.

Radio-Québec a rompu avec la tradition des séries de 13, 26 ou 39 semaines, pour adopter une programmation thématique plus souple.

Entrevoyant l'avènement de la "télévision sur demande", Radio-Québec s'y prépare.

COMPUTER-AIDED LEARNING -- A COOPERATIVE RESEARCH PROJECT OF THE NATIONAL RESEARCH COUNCIL OF CANADA

by J. W. Brahan

In 1969, following a preliminary feasibility study, the National Research Council (NRC) commenced a joint research and development program on Computer-Aided Learning (CAL) in cooperation with Canadian educational organizations and industry. The primary goal of the program is to ensure the availability, by 1980, of a viable and cost-effective computer-aided learning system for Canadian users. Within the framework of this pincipal objective, a number of sub-objectives have been identified, namely, to ensure that CAL systems developed for use in Canada are: acceptable to Canadian educational authorities and users; manufactured in Canada with maximum feasible Canadian content; economical to manufacture and use; assured of a long, useful life through development and application of essential technological standards; and sufficiently advanced by 1980 that NRC contributions to their further development will be minimized.

The program is organized to bring together the educator, the research worker, the systems designer and the manufacturer, permitting efforts to be appropriately shared in accordance with expertise. Educators develop course materials and evaluate the system in a variety of applications while technologists at NRC and in industry concentrate on system hardware and software development. It is important to note that the role of NRC in the program does not include the development of curriculum content. It consists of developing the technical facilitites necessary for their preparation by the educator. The NRC participation in the program consists of several activities: the operation of a CAL research network; development of specialized terminal equipment; development and implementation of CAL programming languages, software and technological standards; development of techniques for automatic classification and retrieval of reference materials; and the support of industry in the development of a CAL competence.

CAL Research Network

Late in 1969, a medium-scale time-shared computer was installed at the NRC laboratories in Ottawa to permit active participation of the collaborating educational groups in the program. This computer, a PDP-10, is fully committed to the project. Its use is limited to research, development and evaluation of programs, equipment and techniques of computer-aided learning. To encourage the free exchange of materials and techniques necessary for the development of CAL, all NRC services in systems programming, language development, special equipment design, and computer time have been offered without charge to cooperating groups undertaking CAL research programs. Each of the participating groups is, however, responsible for the costs of communication and the terminal equipment used in their project.

Two organizations have participated in the project since its beginning and have contributed significantly to its planning and ongoing operation. They are the Ontario Institute for Studies in Education (OISE) and the University of Calgary. The first outside organization to be linked to the computer was the OISE in Toronto. The initial connection to a single teletype was soon replaced by a link between the PDP-10 in Ottawa and a TSS-8 in Toronto. This provided access to the PDP-10 from some 24 terminals for several years in a project undertaken by OISE in cooperation with the Ontario Colleges of Applied Arts and Technology[1]. Since the inception of the program, in addition to the colleges participating in the OISE program, 15 organizations from Fredericton to Calgary have been linked to the computer for a variety of CAL research projects. Currently, seven organizations have active projects underway, with a total of ten external links to the computer. These vary from single teletype terminals to line-concentrator computers servicing a number of multi-media terminals.

Projects which are currently underway cover a variety of application areas. At Carleton University, a multi-media terminal is being used along with conventional terminals in the development of programs for the automated assessment of learning abilities. Algonquin College has commenced recently an investigation of the use of multi-media terminal equipment in their program of first language skill development. At the Public Service Commission Language Bureau, a preliminary investigation is being made of the use of the computer as an adjunct to traditional methods of teaching French as a second language. In cooperation with the Ottawa Crippled Children's Treatment Centre, special computer peripherals are being used to aid handicapped children to communicate. At the University of Montreal, a study is underway aimed at the development of a model of the learning process using techniques of artificial intelligence. In cooperation with the Department of National Defence, a pilot study is being undertaken to assess the effectiveness of CAL in the Canadian Forces trades training program.

Advantages of the research network operation are many. It provides a means whereby the users can actively participate in system development. Course materials and techniques developed on the network are available to all participants through the central computer. In this regard, it should be noted that the developing agencies retain control over the materials they develop. They agree, however, to make them available through the central computer to other participants for research and development activities. Any off-line, operational use is subject to agreement between the user and the developing agency concerned. Through the network, users have access to a large system for their CAL research, without the corresponding capital investment. Technological standards are developed in cooperation with the user and hence are more likely to receive acceptance. Daily

use of the network provides continuous evaluation of the system, increasing confidence in the resulting specifications. Finally, efforts are shared according to expertise, resulting in efficient use of resources.

Terminal Equipment Development

The computer terminal is often the component of the CAL system which determines the extent to which the potential of the computer can be exploited in any given instructional application. While the conventional keyboard-driven display unit has been used effectively in a number of CAL applications, particularly at the college and university level, the use of such a terminal limits the subject matter which can be considered, the flexibility of the approach, and the range of student population which can benefit from the system. With this in mind, the NRC-CAL laboratory program has placed considerable emphasis on the development of specialized terminal devices to meet CAL requirements.

A terminal development facility has been built in which the parameters of the terminal are defined by a program in a mini-computer [2]. In this way, the characteristics of the terminal can be changed by a software modification, thus avoiding extensive reconstruction of hardware. The unit was originally developed for use with the plasma display panel developed at the University of Illinois and in use in their PLATO project. To take advantage of the economies and range of equipment developed for use in the television industry, a television-compatible display with digital storage was developed which can be substituted for the plasma panel to provide equivalent facilities.

Many CAL applications require the presentation of audio information, preferably under control of the computer program. To accommodate this requirements, a random-access audio tape unit was developed which makes use of a conventional reel-to-reel tape recorder. This approach provides a large capacity store at low cost, but access to specific messages can be excessively long in many applications. For these cases, a magnetic disc has been developed which provides for the storage of 30 minutes of audio information with a maximum access time for any given message of approximately one second. The speed of access is sufficiently fast to permit phrases to be chained together. Thus, a variety of complex messages can be composed from a selection of short phrases. A disc changer, currently nearing completion, provides for the extension of the audio storage capacity through the use of multiple discs. Recent work on audio presentation devices has emphasized the use of speech synthesis which permits storage of audio information at the central computer and provides for easier updating of materials.

The speed and simulation capabilities of the analog computer make it particularly useful for demonstrating dynamic relationships of parameters such as speed, acceleration, force, work, etc. Interface software and hardware have been developed which permit students to time-share these simulation capabilities from their terminals. The analog computer can be programmed with the simulations of a variety of processes which can then be manipulated by the student from his keyboard. Graphical outputs representing solutions generated by the analog computer are directed to each student terminal as required over a common coaxial cable.

A facility is under development which permits retrieval of a single slide image from a series of such images recorded on video tape. Used in conjunction with a magnetic disc, this will provide the electronic equivalent of the random access slide projector currently in use, but with greatly increased capacity.

A transparent, touch-sensitive input tablet has been developed [3] which permits the entry of graphic information by the simple act of touching the display screen. Ultrasonic surface waves on a glass plate, transmitted from two adjacent edges are used to locate the position of the finger or other passive stylus. Since the tablet is transparent, it can be placed over a variety of display devices, such as a television display, slide projector screen, or even a printed card. The program in the computer can interpret the received coordinates according to the information displayed. Thus the student's input is directly and simply related to the subject matter on the screen in front of him.

The various display and input devices developed in the project have been incorporated in a multi-media student terminal which has been tested with a number of demonstration programs and also used in support of experimental research on learning difficulties conducted by Carleton University and the Rideau Regional Hospital School. This experimental terminal was also used as the basis for the development of a commercial terminal by Lektromedia Ltd. This terminal, the LEK-120, is being used in a variety of applications, including ground training of aircrew by Air Canada at two installations, each of 20 terminals, in Dorval and Malton.

Standards

Throughout the program, the importance of technological standards has been emphasized. Terminals which have been developed conform to standards adopted by the Canadian Standards Association and the International Organization for Standardization. Where existing standards do not respond to identified requirements, representation is made to the appropriate standards agency.

Support Software

In general, CAL terminal connected to the central computer utilizes only a small part of the total capacity of the communication link. Significant economies can be achieved if the line can be shared by several terminals. Software has been developed for the operation of remote line-concentrator computers which permits the operation of many terminals of differing capabilities through a single communication channel to the central computer. In addition to carrying out the multiplexing operation, the remote computer handles CAL processing tasks which cannot be carried out satisfactorily by the central time-shared machine. Examples of such tasks include timing measurements and control of student input.

Software, in the form of specialized support programs, is being developed also to permit effective use of particular terminal devices. An example of this work is provided by a program which permits the direct conversion from conventionally coded text to speech using a synthesizer. Thus, it is possible to have the computer "speak" text which was originally intended to be displayed using a video display unit or a typewriter terminal. The course author does not have to occupy himslef with the preparation of the phoneme strings required to operate the synthesizer and, unless he wants to adjust the pronunciation of selected words, which the program permits, the conversion process is entirely automatic.

Course Author Language Development

The effective exploitation of CAL has been hampered by difficulties encountered in the transfer of computer-based materials from one centre to another. While the problems are not entirely technological, a major source of difficulty results from the lack of a common programming language which can be used on a variety of computers with the range of terminal equipment used in CAL. The current multiplicity of programming languages used for CAL applications results in needless expenditure of resources to develop materials which already exist but are not directly accessible because they are written in a programming language not available at that centre. In an attempt to find a solution to this situation, the NRC Associate Committee on Instructional Technology formed a working panel on CAL languages whose members came from centres throughout Canada where they were actively engaged in a variety of CAL projects. The report of the working panel, published in 1972, took the form of a functional specification for a programming language to meet CAL user requirements . This formed the basis for the development of a detailed specification which was carried out by industry under contract to NRC and in late 1974, an Author Guide and Specification Manual for the language, NATAL–74, were published in both English and French . A major part of the current laboratory effort is devoted to the implementation of NATAL–74 on the PDP–10 computer used in the project . Upon completion of this initial implementation, it is planned to undertake the transfer of the implementation to a different computer.

NATAL–74 is a high-level programming language incorporating features which are demanded by the various CAL techniques currently in use. In addition to providing a means of transferring CAL programs from one computer to another, NATAL–74 provides the course author with the means of using a variety of terminal equipment for his CAL materials without requiring him to resort to the tedious programming details which are all too often associated with the use of such equipment.

While a few features remain to be added, the implementation of NATAL–74 has now achieved the status of a working implementation and testing has begun. As part of the testing the language and its implementation, several proven CAL programs are being recoded in NATAL–74. Work is now underway on the translation of CARE–1 (Computer-Aided Remedial Education), one of a series of programs developed at Pennsylvania State University which teaches techniques of identification of problems of the handicapped and which is currently in use at a number of centres. Translation of a series of three medical simulation programs developed at McMaster University has been started also. Over the next few months, additional courseware materials will be translated from a variety of programming languages to provide a measure of the strengths and weaknesses of NATAL–74.

At this stage, use of NATAL–74 has been very limited and it is premature to judge how well it responds to user requirements, but comments from the few initial users have been most encouraging.

Summary

The NRC program has emphasized cooperation with educational and industrail organizations active in CAL research and development. Through the operation of the CAL research network, a means has been provided for collaborating educational groups to be active participants in the laboratory project. In addition, through the NRC Associate Committee on Instructional Technology, particularly the Subommittee on CAL Programming Language which guided the work on the specification of the course authoring language —74, other centres have contributed to the project. Achievements to date have demonstrated the value of the program but it must be emphasized that the success is largely due to the contribution of the participating organizations. If the work is to reach a successful conclusion, there must be continuing cooperation between CAL users, equipment vendors and research groups.

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L'ENSEIGNEMENT À L'AIDE D'ORDINATEURS — CONSEIL NATIONAL DE RECHERCHES/CANADA

Résumé

Depuis 1969, un projet de recherches et de développement dans le domaine de l'enseignement à l'aide d'ordinateurs (EAO) a été entrepris au Conseil national de recherches (CNRC) en coopération avec l'industrie canadienne et les enseignants. Le premier but du projet est d'assurer l'existence, en 1980, d'un système viable et rentable de l'enseignement à l'aide d'ordinateurs pour les usagers canadiens.

Un aspect important du projet concerne l'opération d'un ordinateur moyen à temps partagé, installé pour permettre à des groupes d'enseignants intéressés à une collaboration de participer activement. Afin de stimuler l'échange des résultats de recherches nécessaires pour le développement d'EAO, les services du CNRC dans les domaines de programmation de systèmes, développement de langages, dessin de terminaux spéciaux, et l'usage de l'ordinateur sont offerts sans frais aux organismes qui participent au programme. Depuis le début du programme 15 organismes de Frédéricton à Calgary ont utilisé l'ordinateur pour différents projets de recherches EAO.

Les travaux actuels du laboratoire du CNRC comprennent le développement et l'implantation de NATAL—74, langage national de programmation pour l'enseignement à l'aide d'ordinateurs, qui a pour but de faciliter l'echange des programmes EAO entre les ordinateurs differents; le développement d'une facilité pour etudier les caractéristiques des terminaux d'affichages graphiques en utilisant un mini-ordinateur dont la programmation définit les paramètres d'un terminal d'essai; le développement des mémoires à accès sélectif de messages audiophoniques et la programmation des synthétiseurs de voix afin de permettre à l'ordinateur de "parler"; le développement d'une facilité basée sur bande et disque magnétique qui donnera l'équivalent électronique du projecteur de diapositifs à accès sélectif avec capacité très augmentée; ainsi que le développement d'une tablette d'entrée graphique sensible au toucher.

Dans le programme, on accorde une grande importance à la collaboration des centres de recherches pédagogiques et d'autres utilisateurs de l'EAO. Le reseau pour les recherches EAO coopératives a fourni les moyens efficaces pour permettre aux groupes de chercheurs de participer activement au programme. En plus, au moyen du Comité associé de technologie pédagogique du CNRC, en particulier le Souscomité des langages de programmation EAO qui a dirigé les travaux sur la spécification de NATAL—74, d'autres centres ont participé au projet.

POTENTIAL USE OF INTERACTIVE COMPUTER GRAPHICS IN SYMBOL COMMUNICATION FOR THE HANDICAPPED

by William Sawchuk

Most people are familiar with Communications Canada or the Department of Communications, and may have heard of the Communications Research Center or CRC. CRC is the research sector of the Department of Communications and it is perhaps better known as the agency that deals with earth satellites. Satellite activity started with the early Alouette — even though what is now CRC was at that time affiliated with the Defence Research Board — to the most recent Communications Technology Satellite or CTS, the more familiar acronym.

Besides the highly visible satellite program the Communications Research Center has a number of other research programs. One of these is the research into computer displayed images on a graphics screen and the possible interaction with them. Initially this research began as interactive graphics in support of computer aided design, such as the design and analysis of electronic circuits.

By interactive I mean the ability to interact with a visible image on a display screen. One often wishes only to modify a presentation, or if beginning from scratch, to build up a picture slowly. This is unlike an image on an ordinary television screen which is non-interactive. The only way it is interactive is by changing the channel dial.

The interactive analogy could be a blackboard and chalk, a paper and pencil, and so on. As such, it would run the range from freehand sketching to very structured or controlled drawing like architectual drawings or electrical circuits.

Since the initial CRC research effort in interactive graphics, the project has evolved into the design and demonstration of a system for communicating interactive graphics images. Mainly because of the expense involved in wideband communications the research has been directed towards the use of narrowband communications facilities such as existing switched telephone networks.

Normally when one is dealing with graphic presentation it is only necessary to send the total image once. Except for animation or TV-type of presentations there is no need to keep retransmitting the same picture. These latter types of presentations have their own merits and attributes and are not being disputed. However, the non-dynamic class of imagery is very useful and towards which our research is directed.

For a non-dynamic image only the picture change or modification needs to be transmitted, and this is usually a small amount of information. Since there is no need to keep retransmitting the same image, again and again like a TV frame, there can be a substantial saving in transmission costs. Thus, it has been recognized that if provision is made locally for refreshing and displaying a picture, and only new information is transmitted, then the existing switched telephone networks can be utilized.

Now let me talk on the philosophy of achieving this aim through what can be called a common visual space.

In order to achieve the simultaneous display of the same interactive graphics images at a distance, our research emphasis has been to provide a common visual space between individuals that is very similar in concept to the common audio space that now exists between individuals during a telephone conversation. This concept is illustrated in Figure 1.

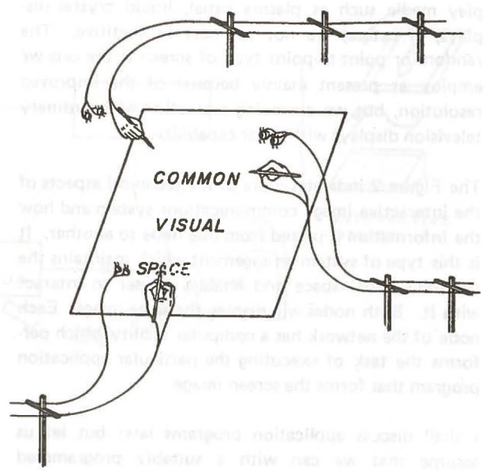


Figure 1

A somewhat whimsical illustration but it does portray the idea of a number of people being able to interact with a common writing space, with each individual aware of what the other has written. The strung telephone lines represent the transmission requirement — very minimal — for such an interaction, and also that the participants may be situated at some distance from each other, across continents for example.

In order to maintain the common visual space and to provide interactive capability, the technique is to include special mini-computer facilities at each node to maintain a common screen image. It is the provision of these facilities as well as implementing the common visual space idea that has been the main research endeavour of our group at the Communications Research Center.

Our decision to go the way of a computer capability at each node rather than a central computer with unsophisticated terminals linked in a time-sharing arrangement is because of factors such as:

- the local processing and storage of an intelligent terminal is now becoming cost competitive with data transmission costs;
- cost of storing a picture in memory is decreasing rapidly; and,
- cost of the computer processing unit hardware is also rapidly decreasing.

As yet there appears to be no breakthrough in display technology. The television tube, providing a raster format, is still the cheapest display device. Other display media such as plasma panel, liquid crystal displays, et cetera, are not yet cost competitive. The random or point-to-point type of screen is the one we employ at present mainly because of the improved resolution, but we are doing evaluation with ordinary television displays with color capability.

The Figure 2 indicates more of the technical aspects of the interactive image communications system and how the information is passed from one node to another. It is this type of system arrangement which maintains the common visual space and enables a user to interact with it. Both nodes will display the same image. Each node of the network has a computer facility which performs the task of executing the particular application program that forms the screen image.

I shall discuss application programs later but let us assume that we can with a suitably programmed computer put some information on a screen. In fact,

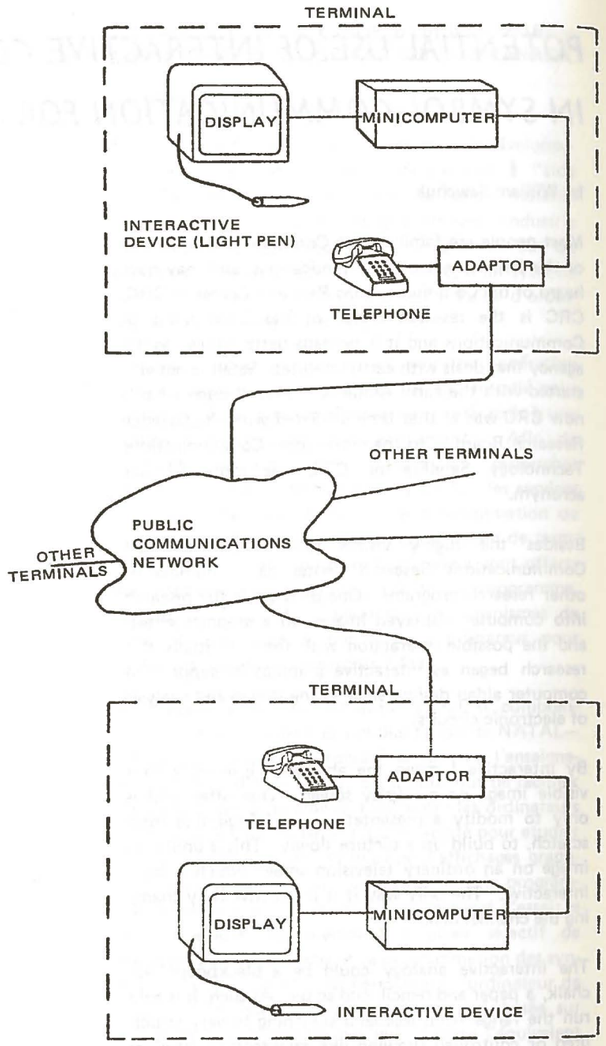


Figure 2

let us assume that we have two nodes and each node can display the same screen information because each runs an identical program. Then with a suitable communications package encompassing the minicomputer and adaptor we can have a system of two such nodes joined together via a telephone. In fact, we can have more than two terminals joined together, each displaying the same information although the technique for connection and interaction is more complicated. For now let us call that an implementation detail.

We must have some way of interacting with the screen,

that is, change what is already displayed or add entirely new items. This can be done with an interactive device such as a lightpen. A lighpen is a light detector in the shape of a pen which can, by pointing it to something on the screen, identify a specific location when an electron beam sweeps past that point.

Even though I shall refer mainly to a lightpen as a device that interacts with the screen, other interfaces are possible. For example, to select a particular screen entity one can have a tracking cross or cursor on the screen moved to that particular entity; the tracking cross can be moved by a number of different devices, such as a joystick, a stylus on an electronic tablet, trackball, keyboard, and other such electronic-mechanical designs. The advantage of a pointing instrument such as a lightpen is its ease of usage and also the effect of immediate feedback to the user.

Figure 3 shows in more detail how and the type of information that is passed between two terminals. First of all, between the application program and the display screen is some hardware and software which presents the screen image. This will be the same for both nodes if both have the same hardware facilities. Through this part of the network a relatively large amount of information, indicated by the bold arrows, will be passed. Note however, that this information is not communicated over the telephone line. But what is communicated over the telephone line is any interaction that takes place, and the amount of this information is relatively small; it is indicated by the dashed path.

As an example, consider that there are two separate but detailed pictures stored in the computer as formulated by the application program. They could be any

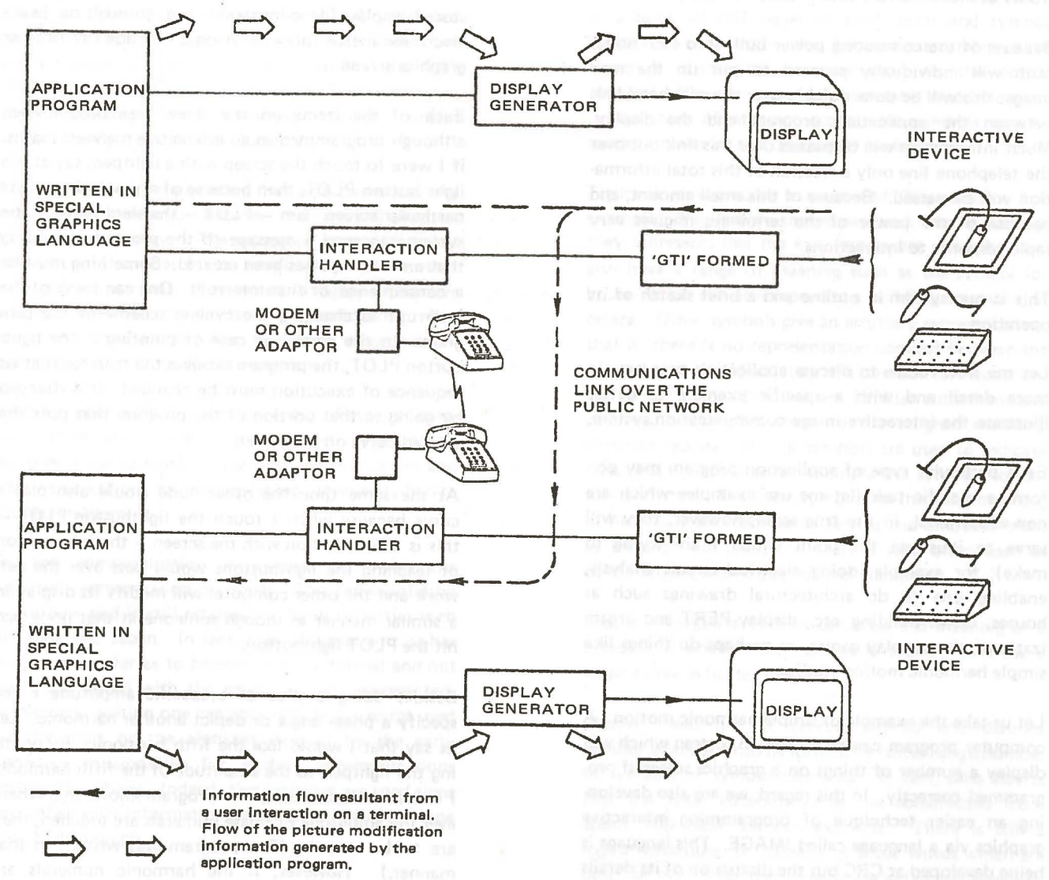


Figure 3

diagram or configuration (and later when I discuss symbol communication you will see what I mean) but only one detailed diagram can appear on the screen at any one time. Also on the screen is some particular text or a lightbutton, as it is usually called, that says "new diagram". Each node displays the same image and it is a lot of information that must pass from the application program via the display generator to the display to paint the complete picture.

Let us say that now one wants the other picture. All one needs to do is touch the light button "new diagram" with the lightpen. This then signifies to the application program via the interaction handler that a new picture is desired. This request is also passed on to the other node to its interaction handler via a telephone line. The amount of information passed along the telephone line is relatively small, a few computer words at most – a very short "beep" in the audio tone.

Because of the computing power built into each node, both will individually proceed to put up the new image; this will be done quickly over the wideband link between the application program and the display. Much information will be passed over this link but over the telephone line only a fraction of this total information will be passed. Because of this small amount, and because of the power of the terminals, it gives very rapid response to interactions.

This is our system in outline and a brief sketch of its operation.

Let me now return to discuss application programs in more detail and with a specific example to better illustrate the interactive image communication system.

Each particular type of application program may perform a specific task (let me use examples which are non-educational, in the true sense; however, they will serve to illustrate the point which I am trying to make); for example, doing electrical circuit analysis, enabling one to do architectural drawings such as houses, office building, etc., display PERT and organizational charts, play games, or perhaps do things like simple harmonic motion studies.

Let us take the example of simple harmonic motion. A computer program can be written in fortran which will display a number of things on a graphics screen if programmed correctly. In this regard, we are also developing an easier technique of programming interactive graphics via a language called IMAGE. This language is being developed at CRC but the discussion of its details is beyond the scope of this presentation.

For example, the next slide shows an axis on which a particular plot can be displayed, a table of parameters that define the plot, a simulated keyboard which enables one to select a new number from the table and lastly, but most important, a set of light button commands. These are commands to enable things to be done on the screen: that is, to ERASE the table of values (make them all zero); PLOT the described curve; ERASE the plot; and lastly, EXIT which specifies a return from this particular program.

Each of the screen items can be described as a vector or line, point, alphanumeric text, et cetera. And the application program describes all these items and where they have to be. Underlying software or computer programs take this information and store it in appropriate form in a block of computer memory called a display file. There is a processor in the computer called a display processor which reads this stored display file information and, through hardware electronic means, presents it on a cathode ray tube or graphics screen.

Each of the items on the screen are programmed although programmed in an interactive manner; that is, if I were to touch the screen with a lightpen, say at the light button PLOT, then because of my pointing to the particular screen item – PLOT – the electronics of the system can send a message to the program indicating that an interrupt has been created. Something must be a consequence of that interrupt. One can think of the interrupt as changing the cycling scheme of the program. In the particular case of pointing at the lightbutton PLOT, the program receives the message that its sequence of execution must be changed. It is changed by going to that portion of the program that puts the plotted curve on the screen.

At the same time the other node would also plot a curve because when I touch the lightbutton PLOT – this is an interaction with the screen – the information of teaching the lightbuttons would pass over the network and the other computer will modify its display in a similar manner as though someone at that node had hit the PLOT lightbutton.

Besides doing a plot of a specific amplitude I can specify a phase angle or depict another harmonic. Let us say that I would like the fifth harmonic. By pointing the lightpen to the amplitude of the fifth harmonic I can erase it; the computer program knows that whenever the amplitude or phase numerals are touched, they are to be erased. (The program was written in that manner.) However, if the harmonic numerals are touched nothing changes on the display screen. Again, a similar event will take place at the other node.

I can now proceed to put another number into the fifth harmonic by first selecting individual numerals by lightpen from the simulated keyboard on the screen; this is analogous to punching numbers on a calculator. Let's say I have selected the amplitude of 200 and the screen shows it registered above the keyboard.

By pointing to the lightbutton ENTER, this number will be displayed into the amplitude column at the fifth harmonic.

Now, if I were to point to PLOT, the result of this interaction will be a plotted curve of the superposition of the two harmonics described in the table. Because only two amplitudes are specified, they are the only ones that will be plotted.

If I wanted to start fresh, then by touching the lightpen to ERASE TABLE all the tabulated values are erased and the plotted curve removed. A significant part of the display image is altered on both screens but all that passed between the nodes was that the lightbutton ERASE TABLE was touched. Each computer, upon receiving this interactive request, erased independently its table and plotted curve.

Again it is worth emphasizing that with two nodes any sequence of interaction between the two will produce an identical display. The operator at one terminal may put in a number for an amplitude while the other may request the plot. The system is highly interactive and has potential in many specific applications. But the specific one which I wish to discuss in some detail now is that of symbol communication.

Before I deal with the specific topic of symbol communications and interactive image communications, let me give a background to symbol communication and later application to non-speaking physically-handicapped children.

Symbol communication is synonomous with the pictorial representation of words. This representation is not new and is still retained in Asian countries such as China and Japan. In fact, their pictorial writing has progressed so far as to become highly stylized and not easily associated with the object or idea represented. In pictorial writing one can also include the script used by the inuit or the alphabet devised by the early Canadian missionaries for written communications among the indians. Indeed, also included are road signs and other such information presentation which is done via a pictorograph.

Throughout history a simplified language has been advocated to overcome the many ambiguities in spelling, grammer and constructs of each of them. Languages such as Esperanto have been proposed but they often took a European base and a Roman script such that only individuals from European cultures could be readily familiar with such languages. For African or Asian cultures whose writings are of a different format, the concepts employed in these artificial languages would be difficult to master.

Thus, to have universal acceptance, symbols for words have been advocated but not very successfully. In more recent times a man by the name of Charles Bliss, an Austrian by birth but now living in Australia, has been a strong exponent of the use of simplified pictorial representation for words. He has spent over thirty-five years of his life developing his ideas into what he calls semantography or Blissymbols. He has provided detailed procedures on the use of his symbols in many aspects of written communication: most of it in a book of 881 pages of small print and symbol diagrams. Bliss argues that because his symbols have either a discernible representation to the actual physical entity, or a readily perceivable association, as in the case of abstract words, his symbols can be quickly mastered and universally understood.

Figure 4 shows some examples of Blissymbols. For example, Blissymbols sometimes look like the things they represent: like the eye, legs or car. But they can also have a range of meaning such as the symbol for house which can also represent a building, structure, et cetera. Other symbols give an arbitrary representation, that is, there is no representation concept between the symbol and the idea: like the symbol for: question, and, much-many. But, we are familiar with them and can readily associate them to the assigned meaning. Abstract representational symbols are used to indicate relational concepts as for example the symbols for before and after. The heart symbol has the basic meaning of heart but also represents feeling and emotion. And as we shall see later, the heart is very often used in combinations with other symbol elements.

Size is of importance and can alter the meaning of a symbol: a small circle represents mouth, whereas a larger circle indicates the sun.

Words need not be represented by one distinct symbol alone but can be formed by combining a number of symbols or symbol elements. In fact, Bliss asserts that the total vocabulary can be constructed from about 100 basic symbol elements. There is still a logical extension of meaning to those words which are built up from a number of separate individual symbols. Two examples of combined symbol elements are: school, which is made up of the symbols for building,

BLISSYMBOLS

LOOK LIKE THINGS THEY REPRESENT

EYE

LEGS

CAR

MAY HAVE A RANGE OF MEANING

HOUSE, BUILDING, STRUCTURE

ARBITRARY REPRESENTATION

QUESTION

AND

MUCH, MANY

RELATIONAL CONCEPTS

BEFORE

AFTER

HEART, FEELING, EMOTION

IMPORTANCE OF SIZE

MOUTH

SUN

COMBINED SYMBOL ELEMENTS

SCHOOL
BUILDING–GIVE–KNOWLEDGE

TELEVISION
THING–EYE–EAR–ELECTRICITY

Figure 4

give and knowledge; and television, which is made up of four individual symbols – thing, eye, ear, electricity. (A very ingenous technique of depicting objects, is it not?)

Indeed, going one step further, one can envisage combining symbol words together into sentences. Sentences can be constructed and written in a manner common to most written languages. In fact for these symbol word sentences Bliss has suggested a grammatical concept akin to that employed in common western European languages.

A verb is made by putting a verb indicator, a small inverted "v", the symbol for action, on top of the symbol. For example (Figure 5) the verb "to see" is made by a small inverted v on the eye symbol. Combining this with the symbol for "I" – a simple symbol for a human being, upright with legs together and feet outward, combined with the numeral 1 to indicate the first person – we get "I see".

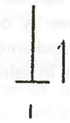
This is one small example and one can see more detailed sentences coming forth including objects, adjectives, adverbs, et cetera. We shall see more of this later.

Although Bliss had devised his unique communication facility he was frustrated by a general disinterest in his system. That is until Blissymbols were discovered in

BLISSYMBOL SENTENCE

NOUNS:

EYE



I

VERB MADE BY PUTTING ACTION INDICATOR ^ ABOVE SYMBOL L

(TO) SEE E

SIMPLE SENTENCE:

I

SEE

Figure 5

1971 by Shirley McNaughton and her co-workers at the Ontario Crippled Children's Center in Toronto. The group at the Ontario Crippled Children's Center had been searching for a technique that would enable non-speaking physically-handicapped children to communicate. Blissymbols offered these children a possibility for communication when previously they had been restricted to gestures of minimal vocal sounds because of their physical speech impediments. Although not the communications answer for all such handicapped children, symbols were one alternative to consider.

Briefly, the technique os symbol communication at the Ontario Crippled Children's Center school is to provide a vocabulary of symbols – from 30, 100, 200, 400 or 512 symbols – on a large display in front of the child. The display chart size is roughly 18 by 24 inches. It is placed on a tray in front of the child. By finger pointing to a particular symbol or a number of symbols in succession, the child can convey a thought or desire. Depending on the severity of the physical handicap a child may require a mechanical aid or a particular kind of interface to assist in selecting the desired symbol words.

You may note that the symbol chart is organized into columns of similar items. From the left, one has social phrases and question words, then conjunctions. The next columns begin with pronouns and human nouns, and then verbs. Situated in the "E" column are tense indicators for a higher level of sentence construction. After verbs come the columns of prepositions, determiners and qualifiers. Next are three columns of adjectives. The last columns identify nouns and they are subdivided into items of body parts, body functions and food, utensils and such, communications, clothing and substances, transport and recreation, furniture and house-related items, buildings and places, items of nature, weather and, in the last two columns, symbol words associated with time.

To further distinguish the organization of similar items, the columns of the charts have now been color-coded for easier identification.

From the initial trial with a small group of children at the Ontario Crippled Children's Center, the results have provided enough encouragement to increase the number of participants and to urge other groups and centers to initiate similar programs. There is a similar trial going on at the Ottawa Center, for example. The use of symbols has provided these handicapped children with a greater ability to communicate with those around them: therapists, peers, family, relatives and others. The workers at the Ontario Crippled Children's Center have found that even this minimal communication ability has increased the child's motivation to other areas of learning and communications such as speech, academic and therapy. The child becomes more confident in his capabilities, in expressing his emotions, and becomes more aware of the feelings and needs of others. So too do those around him who begin to perceive the child as a unique individual. Thus, symbol communication can be a technique upon which further enrichment of the child's life can be built.

Because symbols can be considered as a particular form of graphics one can see a ready connection between Blissymbols and the interactive image communications system developed at CRC. Like any other graphic material the symbols too could be readily transmitted from one terminal to another, or even to a network of terminals. Thus the technique of Blissymbol communication at the Ontario Crippled Children's Center can be one application utilizing the concept of a common visual space that was discussed earlier. Because of the greater utilization of technology, new approaches and improvements could be perceived in the use of Blissymbols in communication. Some of the features that may be added to the existing Crippled Children's Center's technique are as follows:

- a copy of the symbol selected can be placed in a separate display screen location to permit sentence construction. The display of symbols as sentences are being constructed helps in remembering those symbols selected,
- sentences or parts of sentences can be erased to enable correction or modification,
- the constructed sentences can be stored and retrieved to permit creation of stories,
- "turning the pages" of a symbol dictionary can be easily accomplished, and
- new words may be created from the basic symbol set, and these words added to the dictionary.

COMPUTER ASSISTED BLISSYMBOL COMMUNICATION

- display of selected symbols
- sentence construction
- erase sentences or parts of sentences
- storage and retrieval of sentences
- symbol dictionary of multiple pages
- creation of new symbol words from basic symbol set

To evaluate the technical feasibility of using an interactive graphics system and the common visual space concept in symbol communications, a two-node demonstration network was arranged. We have not employed non-speaking physically handicapped children as users because we realize that there will be requirements for providing the proper type of interface between the child and display screen. Our purpose was mainly to demonstrate the potential of our system and, after demonstration to those people working with handicapped children, to find out what modifications and further refinements may be necessary.

In our initial stage of experimentation a total of seventy symbols were selected; 35 symbols arranged in each of two tables. Some changes were made in the arrangement of symbol words in the table because of continuing improvements and modifications to the computer programs that generated the screen images. For this evaluation our concern was primarily with the feasibility and technical aspects of presentation rather than user constraints.

The total number of symbols displayed on the screen at any one time is limited by factors such as screen size, the resolution of the symbols presented and flicker. As well as the symbol words, a group of commands is situated along the right side of the display.

Now if I were to take a lightpen and point it at a symbol like "HELLO", then the symbol word "HELLO" would appear below the table. One can recall what was previously said about our interactive graphics system in that whatever appears at one node will be transmitted and displayed on the screen of the other node. It is neither the symbol table nor the symbol itself that is transmitted across the telephone line, but the information that represents that I touched the screen at a particular place. Every item on the screen is tagged with a number and essentially it is only this tagged number that gets sent across.

I have talked about using a lightpen to select items on the screen such as symbol word; clearly, in a more functional environment it will be necessary to design instruments and techniques for symbol selection more adapted to the handicapped child. It would not be difficult to make our system react to those pointing instruments and mechanical aids that are presently used by the handicapped child.

Suppose that I wanted to save this one word sentence and wanted to create another. Well I can touch the command lightbutton designated 'SAVE' and it will store away in computer memory my one word sentence and provide me with a blank space below the symbol table.

Consider now that I have selected three symbols "I LIKE HAPPY". There is a word I want but it does not appear in this particular table. Therefore I can now cycle through my dictionary, which is our implementation gives only one other page, by pointing to the command lightbuttom MORE SYMBOLS. Of course, it would not be too difficult to add many more symbol words in additional pages. Note that the partially constructed sentence still appears unchanged below the symbol table. I can now add a word to it or my friend at the other end can. Let us say he directs his pointing device to 'MUSIC'. We both will have the completed sentence on each of our screens. You can immediately see the possibility of a reasonable conversation with the displayed symbols words telling you what has been said.

The system has an erasure capability provided, that is, if a word is placed incorrectly in a sentence then by pointing to that symbol, it and any following symbols are erased. After erasure one can carry on to complete the sentence correctly. Of course, the symbol words 'MAKE MANY WORDS' were selected in turn.

What can also be seen on the screen are the words and symbols for "no more symbols accepted". In an actual display this warning flashes at a rate of a few times a second to indicate to the user that something important has occurred. This phrase indicates that no more symbols will be accepted although the command lightbuttons can be activated. The sentence can be saved by hitting the SAVE lightbutton.

If there were a total of six sentences constructed and saved then again a flashing message will appear below the symbol table in the space where the sentence would normally occupy. The words are SENTENCE BUFFER FULL (computer jargon unfortunately – in symbols it says "no more sentences accepted" – a more appropriate phraseology)!

None of the symbol words can be activated. however, the command lightbuttons may. In fact, if one wanted to see the sentences that have been stored away, then activating the lightbutton DISPLAY will present all the constructed sentences on the screen. Six sentences are the present limit of stored sentences although a minor modification to the computer program can easily increase the number. However, the number of sentences that can be conveniently displayed at any one

time is again limited by factors such as screen size, symbol size and flicker.

The lightbutton ANOTHER allows one to go back to the symbol word table and construct other sentences if the maximum of six has not been reached. All sentences would still be retained in computer memory unless cleared by the CLEAR lightbutton. CLEAR allows one to restart.

There are two other capabilities in the system. One of these is the ability to display the screen with text in another language. To create a text change all that is necessary in our particular case is to point the lightpen to the lightbutton FRANCAIS. Obviously other languages can be substituted. This is the universal aspect of the Blissymbolics.

For instructional purposes the system can respond by not providing any accompanying text to the symbols. By pointing to the box enclosing NO TEXT the display will be changed to that condition. A similar occurrence can happen to the displayed sentences where only the symbol words appear.

All of the images you see on the screen are presently drawn by software; all that is, except the textual information. This means that each line or segment of a line is actually described in the program. Arcs and circles are composed of many short lines in our system although there are systems on the market which can draw smooth unsegmented curves. Compare this to displaying text where all that is usually required is to specify the particular alphabet one wants and somehow "magically" it appears on the screen. One does not take each part of an alphabet or character and describe it in terms of short lines or arcs. An example is the letter 'H' which is made of two vertical lines and a shorter horizontal one joining them.

The display of characters on the screen is done by hardware. It is only necessary to specify the character wanted and not to describe it. The hardware will activate the correct sequence of dots in a matrix that need to be brightened to depict the particular character. Of course one has to make sure that the character is put on the screen at the correct place – this is to be indicated in the computer program. The eye then does the merging of dots to provide a reasonable definition of the particular character. We call this character generation by hardware.

A similar technique can be used for all characters, be they Greek, Arabic or other script, or even Blissymbols. Blissymbols generation in the character manner is a bit more involved. There are about one hundred basic symbol elements and to create a symbol word these symbol elements are positioned relative to one another in different manner to create different symbols. An analogy of course is the placing of letters of the alphabet side-by-side to create words. However, with Blissymbols it is not only side-by-side placement that is necessary but also other arrangements. Nevertheless, the technique is not beyond the possibility of present technology.

The greatest advantage of using a method as just described is that the display of symbols on the screen will be much faster. For example, to generate a complete new table of symbols on the screen presently takes about five seconds or so, but a hardware symbol generator could reduce this to a fraction of a second.

Our group at the Communications Research Center have done a study of the possibilities of such a technique but we have not actually provided such a capability into our system. We have also looked into the potential costs of a symbol communication system, particularly in trying to assess what the cost would be for a terminal or one node on a network in an arrangement to be used exclusively for symbol communication. To give "ballpark" figure of the costs involved, they would range from a minimum of approximately $1600 to a maximum of about $5600. The minimum costs would include a simple input panel of keys for selecting a symbol word from tables (each word by a sequence of 3 keys, say), vocabulary storage and a converted standard TV set for display. The maximum cost provides for a more elaborate input panel, a TV set used exclusively for displaying Blissymbols, a high speed digital tape recorder for vocabulary storage, and a programmable input control unit to do storage and retrieval of symbol words and sentences, and perhaps combine symbols to form new words. These figures do not include design and development costs. The costs are estimates for producing a small number of units after the terminals have been developed. The purchase price or rental fees for telephone line adaptors is not included.

Our initial venture into symbol communication indicates an encouraging future from the technical point of view. Obviously, more technical and behavioural studies need to be done before such a new interactive communication system can be stated as having merit. The interactive terminal for such a system would certainly not be cost-effective at this time, but the decreasing cost of computer hardware, such as processors, memory, display hardware, may alleviate some of the cost constraints.

If the problem of designing particular interfaces for physically-handicapped children can be overcome, then the effects of an interactive graphics system to symbol communication can be profound. Using such a system over existing telephone lines would certainly broaden the scope of the children's communication environment. An at-home terminal would readily enable them to communicate with their friends, relatives and therapists at more flexible hours and with less restriction and inconvenience. Our present demonstration system encourages us to undertake further work and development. This need not be restricted to the use of symbol communication for only physically-handicapped children.

At the moment we at the Communications Research Center are not doing too much more regarding symbol communications. But, another Branch of the Department of Communications is investigating all aspects of merits of symbol communication to see whether the Department of Communication – or the Federal government – should be involved in this activity. With all the interest shown at all levels, we are encouraged that research will continue.

William Sawchuk is with the Communications Research Centre, Department of Communications, Ottawa.

L'ORDINATEUR ET LA COMMUNICATION PAR SYMBOLES AVEC LES HANDICAPÉS

Résumé

Dans cet article, l'auteur W. Sawchuk, chercheur au Communications Research Center, décrit le système que cet organisme a mis au point pour permettre à certaines catégories d'handicapés physiques de communiquer entre eux ou avec un enseignant.

Ce système est essentiellement constitué d'un écran graphique – c'est-à-dire sur lequel on peut représenter des figures de type graphique – d'un mini-ordinateur et d'un crayon ou pointeur électronique. Le mini-ordinateur contient le programme – suite des consignes nécessaires à l'obtention d'un résultat – ainsi que la liste des symboles utilisés. Le pointeur électronique sert à repérer, pour les rendre opératoires, les consignes du programme apparaissant, sur commande de celui-ci, à l'écran.

Ce système, ou mieux, l'ensemble des dispositifs qui le constituent, n'est intéressant qu'envisagé sous l'angle de l'interaction. En effet, si l'on relie deux unités semblables à l'aide d'une ligne téléphonique par exemple, cela permet à deux utilisateurs de communiquer entre eux. En fait, il y a interaction d'une part entre l'utilisateur et l'ensemble des dispositifs qu'il contrôle et d'autre part, entre un utilisateur et un autre utilisateur qui peut lui répondre via les éléments des dispositifs qu'il a à sa disposition.

Le symboles utilisés sont ceux qu'a créés l'autrichien Charles Bliss. Ces symboles, qui ont l'avantage d'être "universels", permettent à un utilisateur quelconque (un enfant) de constituer des phrases, un peu sur le modèle de l'écriture chinoise dont l'unité est l'idéogramme.

Un certain nombre de ces symboles, choises avec soin pour leur caractère "représentatif", sont disposés en colonne, selon la fonction grammaticale qu'on leur accorde, sur une grande affiche. L'utilisateur y repère au besoin les symboles appropriés à la construction du sens qu'il veut signifier et peut les faire apparaître alors sur l'écran graphique qu'il a devant lui et sur celui de son correspondant. Pour ce faire, il doit se référer, comme on l'a déjà mentionné, aux consignes du programme énumérées sur un organigramme qu'il a à sa disposition et utiliser le pointeur électronique. A la limite, il a même la possibilité de créer, en cominant ceux déjà disponibles, de nouveaux symboles.

La capacité du système actuellement expérimenté par le CRC est assez limitée: il utilise en tout 70 symboles et le nombre de phrases qui peut apparaître sur l'écran ne dépasse pas 6 (simultanément)

Mais les recherches continuent au CRC et avec la collaboration du Ontario Crippled Children's Center on entrevoit dans un avenir prochain, la possibilité d'apporter des améliorations substantielles au système: augmentation du nombre de symboles disponibles – jusqu'à 512; augmentation de la production simultanée de phrases; modification de certains éléments du dispositif de sorte que toutes les catégories d'handicapés physiques puissent y avoir accès – par exemple, le pointeur électronique devient inutile à celui qui a perdu ses bras.

Le coût de production d'un tel dispositif pourrait varier, selon des études faites au CRC, entre $1600 et $5600, cet écart tenant compte du degré de complexité de ce dernier, de ses capacités d'utilisation.

Jusqu'ici, les expériences tentées avec les handicapés ont été très encourageantes: ces derniers adoptent facilement ce nouveau moyen qui leur permet de communiquer. Aussi l'intérêt des spécialistes de ce secteur de l'éducation est-il grand. Cet intérêt incite fortement les responsables du CRC à pousser plus loin leurs études et recherches.

A TEACHER'S EXPERIENCE WITH EDUCATIONAL TELEVISION

by Dave MacDougall

The North York Board of Education telecasts educational television programs into a number of their schools by the local CATV system. Having used this system extensively as a classroom teacher I would like to express my opinion of this type of service.

Introduction

This summary represents my firsthand experiences as a classroom teacher with educational television.

I have classified these experiences with totally passive[1] viewing of educational television into five areas;request scheduling, professional development, reflex-serial, appraisal of 16mm film and public relations.

In this report, I will indicate rejection of one facet, distaste for another and enthusiastic promotion of the remaining three.

Request Scheduling

The teacher phones the central educational media department and requests that a particular video tape be broadcast over the educational channel at a prescribed time on a particular day. Usually, one week's notice is necessary to insure that the request is satisfied.

I reject the educational merits of scheduled request service. Since all factors save one are beyond his control, the teacher is placed in the unpleasant position of being a helpless non-entity during the scheduled programme screening. He cannot stop the programme for discussion or still frame to indicate detail. Even more unfortunate, is the fact that the teacher must wave aside student questions since response acts as "noise" to the basic communication system emitting from the television monitor.

[1] I have differentiated information retrieval of educational television into totally passive and manipulative passive. Manipulative passive occurs when the teacher plays the tape on a video tape player located within his learning environment. Then the teacher can control both the timing and pacing of the medium.

Consider the factor of timing. The programme is scheduled for a rigidly inflexible scheduled time, say 10:00 a.m. Yet, a variety of incidents can delay or interfere with the teacher or student viewing readiness. The principal makes a public address annoucement; a nurse, another teacher or the librarian knocks at the door; some incident upsets the decorum of the class; problems occur with the television set; the set arrives late from the preceding user; students arrive late from physical education or the teacher misjudges the amount of time that the students need to complete a test assignment. Such factors as these, that the experienced teacher can take in his stride, the inflexible broadcast schedule cannot.

If the teacher wishes to preview the programme (which he should), more air time is required. Unfortunately, this previewing probably must occur outside of class hours in times which are even more prone to interruptions, i.e. phone calls, talkative colleagues and the inevitable meetings.

However, I shall indicate at this time that I am rejecting[2] a form of request scheduling which is characterized by two classifying features. The programme is linearly sequential and demand has, in all likelihood, been initiated by a single teacher.

Reflex-serial

However, programming which is serialized, diurnal and nonsequential can function effectively as an "aide" to the classroom teacher. The key to its success is the routine. Readying of the television set at the same time each day can have a positive effect on the classroom environment. The conditioned class mentally ready themselves to view the programme while the teacher gathers up the daily administrivia. Metric Canada; 9:15 a.m., five minutes of film shorts, pleasant talking faces, weather reports and metric projects submitted by Ontario schools, is, to the classroom teacher, one such welcome "aide". Since he is aware of the programme routine, the teacher can give the set sporadic attention, concentrating only upon those aspects which he has learned, prompt student questions. Otherwise he is free, to mark the attendance or to read those absence notes and the inevitable office bulletins. The students will hold their questions

[2] The former classification is cause for rejection, since, if the opening minutes are lost or interruption does occur, th eentire communication fails and the latter is cause for rejection on the grounds that it is uneconomic use of the monetary resources and air time of the broadcasting facility.

to the end since they realize that the programme is nonsequential and that comprehension of one part is not dependent upon another. Success, therefore, depends upon the conditioning of the teacher and the students to the programme timing and format, to the unstructured style and to the lack of linearity.

Preview of 16mm Film

The third use of television programming; previewing of films which are being considered for purchase, is of little practical value to the educational process since the medium is distorted.

Television and cinema film[3] are psychologically different media, produced utilizing diverse cinematographic techniques. Therefore, to present film intended for projection on television or to present television film in a projection environment, distorts the intended cinematographic efforts. To ask the teacher previewers to ignore such distortion and to concentrate their attention solely upon the pedagogical content is unrealistic.

Professional Development

The employment of cable broadcasting for development has tremendous potential but that potential can not be realized by broadcasting to schools on a regular basis, canned programmes such as Chalkdust. Extracurricular activities, committee meetings, preparation demands, pre-class sleepiness or post-class fatigue, reduce the teacher's receptiveness.

The production format that I propose is programming, indigenous and immediately relevant[4] to the needs of that board of education's teachers. Meaningful programmes, such as introduction to the new administrative structure, a tour of the media centre facilities, new trends in class grouping or an address by the new director should be broadcast to coincide with staff meetings.[5]

[3] Cinema film — film intended to be viewed on a large screen in a darkened environment.

[4] These tapes should be erased once that initial usefulness has been served.

[5] Most Ontario boards of education schedule all school staff meetings for the same day of the month.

The school principal should sanctify the screening by the attention he accords both the programme and the subsequent staff discussion.

Public Relations

The final recommended use of cabling is not aimed primarily at the school but, instead, indirectly emits from the school and is directed at the neighbourhood residences, the majority of which are connected to the same cable system. Previews of the school play, sequences of a student's day, or excerpts from the field day, will thrill parents while increasing their interest in the neighbourhood school. Not only is an excellent public relations service provided, but simultaneous viewing within the classrooms will provide a strong impetus to school spirit and to student empathy for the learning environment.

Unfortunately, the technical staff of the educational media centre refused to broadcast such tapes, arguing that portapak recordings do not meet technical broadcast standards. However, I cannot accept this as a valid veto of such presentations. Rather, onus should be placed upon the technical staff to find a solution so that such production can be satisfactorily broadcast.

Conclusion

I would recommend that demand retrieval be phased out[6] as uneconomic and an impractical monopolizing of the cable lines and that emphasis should be placed upon serial scheduling. However, close attention must be paid to the schedule allocation which should reflect meaningful input from concerned classroom teachers. Furthermore, I feel that professional development programming, if tactfully injected, has a potent future to play in the future evolution of the teacher and of the learning environment, while viable home-school empathy can prosper through the presentation of school gernerated video production.

[6] These programmes, like 16mm films and large kits should be bicycled to the schools and each school provided with at least one video tape recorder. Frequently used tapes should be purchased by the individual schools.

Dave MacDougall is a Resource Teacher with the Grey County Board of Education, Ontario.

REVIEWS

by Guy Leger

Good historical film dramas are not produced too often. One which came my way recently was The Maple Leaf Forever. The story is how Alexander Muir, of Leslieville, wrote this well known Canadian tune. With authentic costuming and setting this film provides a charming view of rural Ontario life in 1867. Recommended for junior (4-6) and intermediate (7-8) students.

Few non-narrative films are produced for intermediate and senior high school students. One Eyed Men Are Kings depicts a man in his mid fifties who looks after his invalid mother and her pet dog. The poor man is treated like a doormat by everyone he knows. He must sneak behind closed doors each time he wants to smoke. He continually runs into problems while walking the dog. On one of these occasions he sees how well a blind man is treated and decides to try this sham.

An excellent film useful at the intermediate level for language arts or character study.

As an educator using masss media I am always interested in materials which can help teach some of the principles of communication or visual literacy. The series Viewpoint from Thames television in Great Britain contains many of these elements. Though I personally disagree with many points raised in the programs, they do challenge our beliefs and concepts, and stimulate discussion. The series comes with a good set of guides or references which should help to implement a course in mass communications.

In the last issue I failed to mention another Canadian source of reviews which would be useful to school librarians and media personnel. Canadian Material is published by the Canadian Library Association and contains an annotated critical bibliography of various media. The listings are according to the Dewey Decimal system and cover all forms of media.

The Maple Leaf Forever available from the Film Works, 103 Burgess Avenue, Toronto, Ontario M4E 1X2. 10 minutes, colour, sound.

One Eyed Men Are Kings available from McGraw-Hill Ryerson Ltd., 330 Progress Avenue, Scarborough, Ontario M1P 2Z5

Viewpoint is available from Bruce Raymond Ltd., 107 Queen's Quay West, offices 509/13, Toronto, Ontario M5J 1A7

Canadian Materials is available from the Canadian Library association, 151 Sparks Street, Ottawa, Ontario K1P 5E3

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Monday, June 14

_____ Opening Session (A. Lamy) 9:00 a.m.

_____ Potential Use of Interactive Computer Graphics in Symbol Communication for the Handicapped (W. Sawchuk) 11:00 a.m.

_____ Telephone Teaching — Wisconsin Style (Dr. L. A. Parker) 11:00 a.m.

_____ Presentation Form — The Key to Utilization (H. Johnston and R. Leitch) 11:00 a.m.

_____ A Cooperative Approach to the Development of Self-Instructional Modules on the Use of Media (F. Winter) 11:00 a.m.

_____ Luncheon. One Man's Media Are Another Man's Poison (J. Holmes) 12:00 noon

_____ Report on Media Evaluation Seminar, Open University (C. McNamara and Dr. B. Hartmann) 1:30 p.m.

_____ Media Services at the School District Level (R. Oldford) 1:30 p.m.

_____ The Creative Process in Creating Children's Picture Books (E. Cleaver) 1:30 p.m.

_____ Computer-Aided Learning — A Cooperative Research Project of the National Research Council of Canada (J. W. Brahan) 3:30 p.m.

_____ The Preparation of Materials for Handicapped Children (Dr. R. T.Braffet) 3:30 p.m.

_____ Children as Media Creators (E. Cohn) 3:30 p.m.

Tuesday, June 15

_____ Celestial / Terrestrial Distribution Techniques (L. Cox and L. Boisvert) 9:00 a.m.

_____ Educational Television at Radio-Quebec (A. Normand) 9:00 a.m.

_____ AMTEC/CSLA Standards: A Progress Report (Dr. F. Branscombe) 9:00 a.m.

_____ Application of the Computer to Film Libraries (K. Everest) 9:00 a.m.

_____ Selective Review of Research Studies Showing Media Effectiveness (Dr. J. Moldstad) 10:30 a.m.

_____ Luncheon. An Instructional Design Centre for Canada? A Progress Report (Dr. M. Oliver) 12:00 noon.

_____ Meeting of E. Cleaver and A. Blades, authors/illustrators of children's books, with the public. 8:00 p.m.

Wednesday, June 16

_____ Test Reports from the National Film Board of Canada (R. W. Curtis) 9:00 a.m.

_____ Problems and Prospects of AMTEC — An Open Discussion (Dr. F. Branscombe) 9:00 a.m.

_____ A Study of State and Provincial Educational Broadcasting Networks (Dr. T. Ditzel) 9:00 a.m.

_____ Annual General Meeting of AMTEC (10:30 a.m.)

_____ Exploration of Various Media for Tele-Teaching (M. Ryan and N. Mendenhall) 1:30 p.m.

_____ Total Immersion Media Institute (G. Potter) 1:30 p.m.

_____ Readalong (A. Fasan, K. O'Bryan, R. Vernon) 1:30 p.m.

_____ An Interactive Communication Model for Non-Directive Multi-Location Learning (R. Lortie) 1:30 p.m.

_____ Instructional Development: The State of the Art (Dr. T. Schwen) 3:30 p.m.

_____ Sesame Street North (D. McCarthy and M. McCarthy) 3:30 p.m.

_____ Community Learning Centre Project and Community Schools (C. Callanan and W. Shallow) 3:30 p.m.

_____ Designing Instruction for the Communications Technology Satellite (M. Richmond) and How to Achieve It (Dr. L. Parker) 3:30 p.m.

_____ Banquet. Communications: The Newfoundland Phenomenon (Dr. O. Tucker) 8:00 p.m.

(Note: Meetings of special interest groups on Tuesday, June 15, 1:30 p.m. were not recorded)

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