# Telidon: Its Potential and Problems for Traditional and Distance Education

by G.A.B. Moore

## Introduction

Computers once meant "number processing machines" and if we were not involved in teaching a subject with some mathematics we could conveniently leave the computer to the math and physics departments. The notion of computers as "logic machines" moved us a bit closer to considering their place more widely in the curriculum but for many of us the computer was a foreign object and too confusing with which to become involved. In the past couple of years the microcomputer has emerged, not only as a number processor but also as a processor of words and images which places it at the heart of educational work. One development of potential value to both traditional and distance education is the merging of Telidon technology with the microcomputer.

Telidon in 1985 is quite a different creature from Telidon of 1981 when the Canadian Department of Communication launched its $27.5 million program to support Telidon's development. While the basic Telidon approach remains, that of a system of computer codes to produce colour graphic images, the early Telidon standard has given way to the North American Presentation Level Protocol Syntax (NAPLPS). Low cost adaptors for the home TV set supposed to be here by 1983 are still not here. There are adaptors or decoders but they are not low cost. What has happened is that several microcomputers can now be outfitted with a software decoder from $99 to $199, depending on the micro, which give the computer the capability to function like a terminal. Predictions made by the University of Guelph in 1983 that Telidon would emerge as an enhanced capability of the microcomputer rather than as an "add on" to the TV set seem more likely of fulfilment than the reverse.

This paper will report on work at the University of Guelph beginning in 1982 with Telidon as an agricultural extension medium as well as an instructional medium. From this experience several conclusions are drawn about the potential of videotex, to use the more generic term for Telidon, for traditional and distance education.

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## I. From Farms to Classrooms

1982 the University of Guelph, along with several other educational institutions, was awarded a Telidon equipment grant from the Department of Communication under its Industrial Investment Stimulation Program (IISP). The proposal listed three areas of study and application. The first was an agricultural information service. The second was an on-campus electronic information service for students and staff and the third was the use of Telidon in teaching.

### GRASSROOTS Field Trial

The first major project grew out of an invitation from Infomart, Winnipeg, to conduct a joint six month field trial in introducing its agricultural information service GRASSROOTS into Ontario. This project had three specific objectives:

1) to create a commercial class "Telidon Page Creation Centre" operating at industry standard.
2) to create agricultural content of relevance to Ontario agriculture to be available to Ontario farmers from the GRASSROOTS database in Winnipeg.
3) to test this Telidon service with as many representative Ontario farmers as facilities would permit.

The agreement between the University of Guelph and Infomart was signed December 23, 1982 and preparatory work began immediately for the field trail which operated from April to October of 1983. Guelph appointed a three person project management team and assigned three regular media production staff to the "Page Creation Centre". This was augmented by three temporary staff. In addition electronic staff were given fractional assignments on an "as required" basis. The management team comprised the project director, The Coordinator of Agriculture Extension, (both of whom had existing full-time responsibilites) and the Manager of the "Page Creation Centre".

Infomart provided training to the Page Creation staff on site at Guelph enabling staff to become competent with the two Norpak Information Provider Terminals. Two years later these staff report that the most valuable activity for them was the one week training at the beginning of the field trial which enabled them to achieve the required standard. These staff members were all seasoned in their fields and had assignments as follows:

| Telidon Responsibility | Previous experience |
|---|---|
| Manager, Page Creation Centre | Media Producer |
| Page Designers (3) | Graphic artist/exhibit designer |
| Database Manager | Research Assistant |
| Writer | Writer |

An initial target of 300 pages of Ontario content for the field trial was more than doubled with 688 pages being created. This included a market summary of Ontario farm prices supplied by the Ontario Ministry of Food and Agriculture and updated daily. A Calendar of Events for the Ontario agricultural community listed events by region, by date and by subject. A user was able to scan the information available by using any one of the three search modes. Agricultural extension courses in the Independent Study program were included in the database with an on-line course registering system available. Several interactive farm management programs were produced including a Crop Budgeting Aid and a demonstration Sire Selector program. Research reports and summaries of Animal Health Care seminars were included from the Ontario Veterinary College as well as an on-line ordering system for audio cassettes of the Health Care sessions.

Infomart undertook to expand its 24 hour weather forecasts to include Central and Western Ontario for the regions of Windsor, London, Owen Sound and Toronto. In addition several agribusiness companies contributed product information of interest to the Ontario farm community and trading information from the Toronto Stock Exchange was made available.

The second project objective was to make the GRASSROOTS database available to Ontario farmers. To achieve this and to enable the Guelph Page Creation Centre to load the Ontario content into the Winnipeg computer, a dedicated 4,800 bps dataroute line was leased from Bell Canada. A sixteen port concentrator was installed at Guelph which provided two program ports on the Winnipeg computer for the Page Creation units and 14 simultaneous user access ports. These were configured to provide:

- 8 Guelph local phone dial-up access ports
- 3 University of Guelph campus access ports
- 3 In-watts access ports
- 1 Program port, Westex News, University of Western Ontario
- 1 Program port, Page Creation, University of Guelph.

It was found that Bell's Datapac was not available outside of the larger urban centres which rendered it inaccessible to the large rural areas. Access was possible to Datapac but incurred a 35 to 70 cents per minute long distance charge. A further complication was that Telidon terminals were equipped with split speed 1200/150 bps modems which were unsuitable on Bell's Datapac service although they could be made to work over the voice network. Modems at 1200 bps and compatible with Datapac cost approximately $1,000 at the time of the trial which rendered this option unattractive.

The third objective was to test the service on selected Ontario farms. The telecommunications problems have been identified and these placed serious financial constraints on the project's ability to encompass a geographically dispersed farm audience which would be representative of Ontario agriculture. Through the participation of several commercial agri-business firms[1] funds were made available to procure additional terminals and to add a second trail area. Chatham in the heart of Southwestern Ontario's cash crop region was selected as the second trial site and a four-port "mini-mux" line extension was installed reducing Guelph's local dial-ups to four.

Terminals were installed on forty farms, thirty in the Guelph area in two waves of fifteen each and ten around Chatham. Farmers were selected by a committee of Guelph faculty and were offered the service on a no-charge basis for two months in return for agreeing to complete a detailed written questionnaire prior to terminal installation and a second questionnaire at the end of the period.[2] In addition online responses were solicited during the trial. The offer of service included an integrated Telidon terminal (decoder, monitor and modem), free telecommunication over the installed network, training in the use of the service, and maintenance on the equipment.

With the system installed, the project team undertook to recruit several members of faculty to explore instructional applications of the medium for on-campus instruction and for possible distance education application. Four courses were selected with high visual content or the need for frequent and immediate feedback to students. These were a first year introductory course in Zoology, a first year Neuroanatomy course in Veterinary Medicine, a third year couse in Psychology and a fourth year course in Ornithology. A course in Extension Education used the Telidon systems test and feedback capacity for a computer literacy quiz related to TV Ontario's "Bits and Bytes" series.

### GRASSROOTS Findings

There was general agreement among participants that this farm information service was easy to use and provided valuable information on weather and commodity markets. It was also found that expectations of detailed information on such topics as herbicides, feed ration balancing formulas and local market quotations were not as well met.

The delemma of Telidon or videotex as a single service entity, as it was originally conceived, or as an extension of the microcomputer, emerged early in the trial. When the trial ended participants were invited to continue the service by acquiring a terminal through lease or purchase and paying ten cents per minute telecommunications charge to use the network. Eight trial participants elected to lease a terminal and no one bought since they indicated a desire for an integrated service with a microcomputer. During the trial a software decoder from Microstar, in Ottawa, became available for the IBM PC. Several participants already owned Apple II plus micros; however, no completely satisfactory decoder for the Apple was available and their owners elected to keep their options open by leasing a terminal.

The participants in the trial covered a wide age spectrum from young to well established farm operators. The majority reported gross annual sales of agricultural products in excess of $200,000. This suggests that an economic threshold may well exist below which this videotex service is too costly to be justified.

While the majority of respondents indicated they were seriously considering acquiring a microcomputer they were still looking. They were inclined to see the GRASSROOTS type of service as one of the external options on the microcomputer to complement its local record keeping and financial analysis functions.

At the end of the trial in October 1983 and through all 1984 the absence of a reasonable rural telecommunication service for Ontario presented a major block in further acceptance of this or any other Telidon service. While access costs in Manitoba and Saskatchewan were reasonable at five and eight cents per minute respectively, Datapac in Ontario at 15 cents per minute was not available outside larger cities. The cost of a long distance call of 35 to 70 cents to reach a Datapac port or the University of Guelph network was seen by our participants as prohibitive. The promise for 1985 is that an INET trial in zone 519 of Southwestern Ontario will be available at 25 cents per minute.

## II. The Instructional Applications and findings

Telidon's tree structure and menu approach makes it extremely easy for first time users. However, this structure was not found to be suitable for instructional purposes. Special action task software was written by Infomart to University of Guelph specifications. This enabled several interactive approaches to be taken in designing instructional sequences. The major emphasis in this first instructional trial was for testing and feedback modules to support PS1 or other mastery type courses.

Ten to twenty minute test modules were created in the Zoology, Ornithology, Neuroanatomy and Psychology courses. These were optional for students and were presented as opportunities for them to test themselves against the course material. The modules were tests of learning rather than as tests for mark accumulation. They did have the features of immediate feedback to the student, suggestions for study following an incorrect response, randomization of test items allowing multiple attempts until the achievement criteria was reached and feedback to the instructor in the form of printed reports of student performance. These modules were created by the Guelph Page Creation Centre in close consultation with the participating members of faculty. The materials were then uploaded from Guelph into Infomart's Winnipeg computer in similar manner to the provison of the agricultural content for GRASSROOTS. While the latter task was performed directly from Guelph, the interactive nature of the instructional materials required software engineering intervention

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[1] These companies were Chipman Inc., ciba-Geigy, Cyanamid, Pioneer Hybrid and Shurgain.

[2] Deloitte, Haskins and Sells, Management Consultants contributed the Market Research analysis.

ed to deliver television signals over a large geographical area with signals to be received by small dishes and retransmitted to cable television. Presently 140 communities in British Columbia are able to receive Knowledge Network programming. In November 1982, there were 375,000 regular viewers throughout the province. In addition, some communities in the Yukon and Northwest Territories, Alberta and the northwestern section of the United States are able to tune in to Knowledge Network transmissions.

The Knowledge Network provides educational and general interest programming for children and adults, telecourses and live interactive educational broadcasts, constituting a total of 98 broadcasting hours per week. Fifty-nine percent of the programming is produced in British Columbia, the majority of which originates with educational institutions responsible for post secondary and continuing adult education. The number of educational institutions, government ministries and agencies which provided and supported educational programming on the Knowledge Network in 1983 totaled 33 and include the University of British Columbia, the University of Victoria, Simon Fraser University, 15 two-year colleges, and several learning institutes.

The Knowledge Network is thus not a separate Distance Education institution, but rather one working part of the total commitment to "Distance Education" in British Columbia. The term "Learning System" is used to describe what happens when the existing educational structure including government plus universities, community colleges and provincial institutes strive to cooperate to expand educational opportunity through the use of a variety of technological efforts, chiefly the telecommunications satellite (Forsythe and Collin, 1983).

Integral in the organizing principle of the "Learning System" are the Learning System Working Groups, consisting of representatives from the participating educational institutions. The Knowledge Network assists the members by providing the opportunity for the cooperation and problem solving necessary to further development of the educational network.

At the community level, Learning Centres, part of local colleges when possible, have been established in 67 locations throughout the province. The Centres offer local residents a variety of services relating to Knowledge Network courses as well as other "Distance Education" efforts. Such services include audio conferencing opportunities to facilitate interaction with instructors and other students, special library services for degree students, etc.

During 1982-83, 8,000 students enrolled in various degree and continuing education courses offered through the Knowledge Network by cooperating educational institutions. Analysis of student enrollments indicate that students residing in the more sparsely populated areas of the province and thus beyond physical accessibility to the three Universities located in the southern part of the province are participating "Distance Education" students tend to be approximately 10 years older than full-time on-campus students, are employed full-time and have families. Educational opportunities are therefore being provided and more importantly accepted and used by those who otherwise might not be served.

A new phase of development has been completed by a subsidiary corporation, the Knowledge-West Communications Corporation. It now operates as a broadband closed circuit service which links five teaching hospitals and the universities with two-way video, audio and data units. The Knowledge-West also acts as a Developmental Directorate for new ventures in closed-circuit satellite video conferencing, data network and electronic publishing (Forsythe and Collins, 1982). The implications of this work are interesting and promise future development.

## CONCLUSIONS

As can be readily noted from this brief overview, the primary uses thus far for satellite communications have primarily been in areas of extending preparatory and first year university courses (USP, UWI, Knowledge Network) in-service teacher training (USP, UWI, KN), continuing education (USP, KN) and in-service professional training (e.g. agriculture, health; UWI, Indonesia, KN). Non-formal education at all levels was attempted in both the Canadian and Indonesian projects. The only country to attempt formal instruction at the primary level was India (SITE project as a prelude to INSAT 1-B). Another particularly beneficial use of satellite technology was in the use of audio teleconferencing systems for direct instruction, tutorial counselling and project administration (USP, UWI, KN, and to be included in Indonesia). In the case of the IBC, this system (video transmission from central site and audio feedback) also proved useful as a decision making forum for adults concerned with mutual regional problems. While effective at the adult level, however, the literature suggests that teleconferencing systems may not be viable for larger-scale education endeavours such as support for in-school primary education (Casey-Stahmer and Lauffer, 1982).

Thus while the current use of satellite technology for distance education is relatively limited, the literature is almost uniform in suggesting two major trends within the next twenty years: 1) The expansion and use of satellite technology will render the accessibility to television and radio almost universal within the next twenty years but the major trend for applying information and educational services in the third world will remain with radio (Block, 1983), and 2) the nations that could profit most from satellite technology for both formal and non-formal educational development are those that can least afford them, because they lack the finances, industrial base and technical infra-structure to maintain a comprehensive system (Polcyn, 1981). Small-scale terrestrial based projects will remain the norm for most of the developing world for some time.

But for those countries currently on the edge of exploiting satellite television technology such as China, Brazil, Mexico, Indonesia, Saudi Arabia and India, the foreseeable prospects are encouraging. The major challenges to be faced by these nations are those of software development, orchestration of human resources, and activities at the receiving end (feedback and motivation factors), whether it be school, home or village community centre based. These are precisely the problems faced by the major developed nations and there is little reason to expect that developing countries will be different although the circumstances may warrant different solutions. Canada, for example, is able to supply its own technology, has adequate financial resources, and target audiences which are relatively small from an international prospective. It is therefore free from many of the overwhelming concerns facing developing nations and able to explore a variety of issues which will refine the use of satellite technology for education.

Satellites can provide the technical means to distribute educational material over large distances at increasingly affordable costs but harnessing the technology to equalize educational opportunity will require careful planning if this potentially major innovation is to be successfully exploited.

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## TELIDON


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to load the Telidon created pages to the action task software.

Student access to the instructional materials was provided through Telidon terminals located in the Library and in the Audio-Tutorial Laboratory of the Ontario Veterinary College. Students were issued with a course identification number and a personal password and signed on the system initially like a regular GRASSROOTS subscriber. The course IDs, however, were set up as a closed-user group and the students by-passed the standard menus to be taken directly to the appropriate materials for the assigned course. Telecommunication between the terminals at Guelph and the Winnipeg database was achieved through the University's computer network to which the dataroute concentrator ports were linked.

The instructional materials took two basic forms. The course in Zoology used a resource reference approach. Here many of the overhead visual materials used in class were available for reference and review on the terminal. Interactive features were introduced so that the student could contrast and compare different cell structures or order the way in which an illustration was presented. In the other courses in Neuroanatomy, Ornithology and Psychology a test and feedback approach was used. Here students were presented with multiple choice or short answer questions. In some tests a second try was allowed after an incorrect response while in others the next item was presented immediately.

The system described worked reasonably well but there were problems. Operating on a large database with a fluctuating user demand caused the system to have a variable response time. During periods when the 1500 GRASSROOTS subscribers accessed the Chicago Board of Trade commodity prices, a noticeable slowdown in the response time of the system provided an aggravation to a student who had to wait up to 30 seconds (sometimes longer) for recognition and feedback to an entered response. The University's computer network was being expanded during the time of the trial and this led to occasional failures in gaining access or being "dumped" during a session. Similarly, occasional interruptions of the GRASSROOTS system led to the same result. A frequent problem was the volume of traffic on the three University access ports which led at times to delays of up to 45 minutes in signing on.

While this instructional system was being used for on-campus students it was emulating a distance education mode. Any terminal on the GRASSROOTS system, with the appropriate ID and password, could access the instructional materials. When it is considered that the system services users in Alberta, Saskatchewan, Manitoba and Ontario, as well as those in GRASSROOTS America, the potential for a serious distance educational application can be appreciated.

TABLE 1

**STUDENT RESPONSES TO TELIDON USE IN COURSES IN NEUROANATOMY AND INTRODUCTORY ZOOLOGY**

| | | Neuroanatomy | Zoology |
|---|---|---|---|
| Number of enrolled students | | 20 | 600 |
| Response rate | | 95% | 33% |
| Previous awareness of Telidon | | 65% | 22% |
| Previous use of Telidon | | 20% | 6% |
| Number of sessions used | | 1-3 | 1 |
| Nominal duration of sessions | | 30 min. | 30-45 min. |
| Found system easy to use | | 92% | 78% |
| Value of colour graphics | | 100% | 86% |
| Accuracy of colour graphics | | 92% | 68% |
| Would you like to see the system used for marked examinations | Yes - | 77% | 58% |
| | No - | 23% | 27% |
| | undecided - | - | 15% |

### Student Reaction

Surveys were conducted in the Winter Semester of 1984 among students using the system and a second survey was taken of students at the end of the first module in the Fall Semester of 1984. They reported the system as basically easy to use, the colour graphics of value and expressed a desire for continued use.

In the following tables the results of the Winter and Fall Semester surveys are shown.

The above results come from two different types of student. The Neuroanatomy course is a fourth year Biological Science course which enrolled majors and the high level of positive response may be associated with this group's broad exposure to a variety of methods over its academic career and its members' relative maturity. The Telidon materials used were designed for the first year Veterinary Medical students and were used by them in the previous semester. This course was not offered in the Winter Semester and the students were not available at the time of the survey. The content of the Biological Sciences' course in neuroanatomy was similar to the Veterinary course. The use of the Telidon test materials by a different instructor and the positive acceptance by the students suggest an interesting example of sharing and exchange of costly resources.

The Introductory Zoology course presented a different student group. Here first year students generally are regarded as less flexible and more dualistic in their thinking (Perry, 1970). They do not have the degree of experience with a variety of methods as upper class students. As a group they were much less aware of the Telidon medium than the fourth year students and were generally less secure with its educational value. While those expressing negative views of its use in marked examination are approximately the

same as in the fourth year group a significant minority were uncertain. This suggests some caution in using "high tech" systems with students who may be generally insecure in a new environment. This has implications for distance education where the human factor is even more remote than in an anonymous class of 600.

**TABLE 2**

**STUDENT PERCEIVED ADVANTAGES AND DISADVANTAGES OF TELIDON AS AN INSTRUCTIONAL MEDIUM**

| Advantages | Disadvantages |
|---|---|
| • immediate feedback | • slow response time |
| • emphasizes student learning | • impersonal |
| • self-pacing | • tested on material before studied in class |
| • good practice questions | • limited variety |
| • variety of questions | • access difficult |
| • allows indiviual or group study | • too trivial |
| • more objective | • wrong answers not corrected |
| • stimulates recall | • spelling counts |
| • opportunity for review | |

These student responses show a recognition of positive attributes in the human learning domain for this type of automated study system. The items on the "disadvantage" side are thoe which fortunately are addressable. Some of these are technical and relate to the choice of equipment, e.g. slow response time, difficult access. The majority of negative points relate to matters of instructional design such as the sequence of tests related to the course syllabus, the triviality of limited variety of test items or the question of spelling and the handling of wrong answers. In free form comment students remarked upon its "excellent aspects of colours and visual accuracy", "most impressive motivating factor", "good visual representations" and "the graphics are great especially for neuroanatomy".

A second study was conducted by Herrmann (1984) among 303 students in a course in "Behavioral Aspects of Drug Action". This course treats information from the fields of pharmacology, psychiatry and psychology. Its students come from a variety of backgrounds and include a number of continuing adult students. The course is offered in the evenings which makes it the type of course eligible for consideration in a distance education mode.

Recent approaches in the Department of Psychology have focussed on the learner rather than on the teacher. It has emphasized methods applied to produce measurable improvements in student retention and attainments. Among the methods used has been the Personalized System of Instruction (PSI) developed by Keller (1968). This approach has been found to show improved student performance and increased student satisfaction (Leppmann and Herrmann, 1982). However, in the "Behavioral Aspects of Drug Abuse" course, while the introduction of the PSI option resulted in a one letter grade average improvement of student performance, it did not increase satisfaction with the course. A consistent flaw reported by students was an unrealized expectation that the contents of the course would be vividly and dynamically demonstrable. The actions of drug agents are frequently not ethically demonstrable and according to students were rarely clearly portrayed but wre highly boring.

Attempts were made over a two year period to address the problem by introducing film and graphic material and the inclusion of the PSI option. In this study two sections of the course were taught using traditional lecture and seminar methods. Two sections offered a PSI format with module quizzes presented as computer text via a VAX computer system. Two other sections used the PSI format with student quizzes presented via Telidon using highly graphic and colourful material. All students wrote a common examination prepared and graded independently of the course instructor. They also completed a questionnaire which surveyed study habits and attitudes (Herrmann 1983).

Herrmann (1984) found that the students in the PSI plus Telidon sections reported a significantly greater satisfaction with the course than those in either the lecture/seminar or PSI plus VAX sections. Table 3 presents model responses obtained from at least 66 per cent of the students.

**TABLE 3**

**STUDENT RESPONSE PATTERNS TO THREE TREATMENTS IN A COURSE IN BEHAVIORAL ASPECTS OF DRUG ACTION**

| | Model Response by >66% | | |
|---|---|---|---|
| | Lecture/Seminar | PSI/VAX | PSI/Telidon |
| 1. Time and effort compared to other courses | same | more | as much |
| 2. Amount of effort compared with other Lecture/Seminar methods | as much | more | as much |
| 3. Apply this method to other courses | no/no difference | yes | yes |
| 4. Help needed for organizing a course | need help | little | little |
| 5. Exam material preference | text/lecture | text/lecture | text/lecture |
| 6. Exam type preference | multiple choice | multiple choice | short answer |
| 7. Preparation for modules-/seminars | cram | systematic | systematic |
| 8. Opinion about module method | N/A | like | like |
| 9. Module tests | N/A | difficult | fair |
| 10. Value of feedback | N/A | little help | helpful |
| 11. Mechanical details | N/A | easily understood/simple | easily understandable |
| 12. Expected grade | same | higher | higher |

While both PSI treatments yielded enhanced academic performance as measured by the common final examination students in the PSI with Telidon sections reported greater satisfaction with the course than students in either the lecture/seminar or PSI plus computer text sections. Hermann also found less study time and greater satisfaction by students using Telidon than by other PSI students. In examining student responses between the two groups using computer displayed test items, it was found that Telidon presented questions were perceived as "fair" while the same question asked in computer text on a regular CRT was seen as "difficult". In addition the same feedback given via Telidon was viewed as being "more helpful" than that given via the monochrome CRT.

A third survey was conducted among Ornithology students at the completion of the first test module in the Fall Semester, 1984. Similar methods of designing and delivering the visual test items were employed as in the courses reported thus far. Table 4 presents the initial reaction of students to this use of Telidon enhanced instruction.

Students were asked to compare this system with the traditional testing system. Among the responses three patterns emerged, those favourable, those critical and those offering suggestions for improvement. Favourable comments were "easier to use, less work", "OK for self-testing", "OK but I'm not familiar with reading from a screen", "OK, but disheartening when you choose a wrong answer", "definite improvement". Among the critical reactions were "impersonal", "limited range of responses", "prefer traditional, no allowance for ambiguity", "problem in getting the exact wording", "too inflexible with spelling", "puts more pressure on the individual with errors in key punching not noticed right away".

The most frequent comment for improvement was the request by nearly half of the respondents for the correct answer to be displayed. While this raises the question of the instructional intent it does provide some indication of student unease with an automated system. Attempts were made in the design of some modules in other courses to relieve this tension by giving a second try on multiple choice or short answer items.



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5. The nomination must include a brief biographical sketch of the nominee as well as any other information which will be useful to the selection committee in making their decision. This should include the educational background and the reasons why the nominator feels the award should be made.

Presentation of the award(s) will be made at the AMTEC Annual Conference Awards Function. This will be part of the annual conference in Calgary in June 1985.

Nominations should be submitted to the Awards Chairman as soon as possible. Address all nominations to:

**David MacDougall**
**Director of AV and TV Services**
**Sheridan College of AA & T**
**1430 Trafalgar Rd.**
**Oakville, Ontario L6H 1L1**

TABLE 4

**STUDENT RESPONSE TO THE USE OF TELIDON DELIVERED TESTS IN COURSE IN ORNOTHOLOGY N = 15**

| | | |
|---|---|---|
| 1. Is this the first time you have taken a test using Telidon? | Moderately easy to use | 100% |
| | Yes | 100% |
| | No | - |
| 2. Did you have any problems with the system? | Yes | 53% |
| | No | 47% |
| 3. What was your reaction to this technology? | Very easy to use | 40% |
| | Moderately easy to use | 60% |
| | Difficult to use | - |
| | Very difficult to use | - |
| 4. Was the test... | too long? | 20% |
| | too short? | 27% |
| | right length? | 33% |
| | no answer? | 20% |
| 5. What was your impression of the graphics used? | added significantly? | 33% |
| | useful | 60% |
| | not very useful | 7% |
| 6. Was the display time... | much too slow? | - |
| | too slow | 20% |
| | acceptable | 73% |
| | very good | 7% |
| 7. How did you find the graphic depiction of content? | inaccurate | 7% |
| | some uncertainty | 33% |
| | acceptable | 47% |
| | accurate | 13% |
| 8. Was the wording of question easy to understand? | Yes, very | 27% |
| | Yes, fairly | 60% |
| | No, confusing | 7% |
| | uncertain | 7% |
| 9. Would you like to have access to this material during the semester as a self-testing aid? | Yes | 93% |
| | No | 7% |

## III. Discussion and Implications

While the two uses of the Telidon system reported here (agricultural extension and instruction) may appear unrelated to distance education, it is in combining the findings of both studies that some guidance may be offered for distance education planners.

The agricultural extension field trial with GRASSROOTS revealed that it is possible for a university to collaborate with a commercial electronic publisher to their mutual advantage. The University was able to get up to spped in a very short period of time without the capital and operating expense associated with a major database delivery system and network. The system operator gained access to a region otherwise difficult to enter. It also gained experience in the design of action task software not then in use by the company. Ongoing working relationships were established which make it possible, subject to agreement on specific applications, for the GRASSROOTS system to serve a number of distance education projects. The existence of the GRASSROOTS network, relative ease of access, and economy of use should not be overlooked by other institutions interested in this technology for distance education. The analogy here is using the railway company to transport goods rather than building your own railroad or highway system.

Secondly, from the agricultural field trial emerged confirming evidence that Telidon is an easy-to-use home service for otherwise inexperienced computer users. This confirmation was also received from the specific on campus instructional applications. Furthermore, while there were technical reliability problems, they are of sufficiently short duration or limited frequency as not to man the general acceptability of this service for home based information access to extension and distance education resources.

Two major hurdles, however, were identified in the agricultural field trial which are of intense importance for distance education. The first is the entry cost of the terminal. A Telidon dedicated terminal with decoder, monitor and 1200 bps modem costs in the vicinity of $2,000 and is a single purpose device. An IBM PC type microcomputer with the necessary software decoder, colour board and modem will cost in the vicinity of $5,000 although the educationally priced IBM PC Jr can be put in service with a Telidon configuration for less than $2,000. The microcomputer decision will, for many potential distance education users, be based on more broadly defined needs than for the use of Telidon access. With costs of this magnitude and the elusive low cost TV Telidon adaptor not yet in sight one is led to conclude that the population of home access terminals is not yet sufficient to warrant major investments in creating Telidon materials for distance education. "How will the students access the data?"

The second major hurdle is regional in significance and has to do with the availability and cost of telecommunication services. In parts of Western Canada telephone line charges established for Telidon by the Government operated telephone companies are extremely reasonable at 5 cents per minute in Manitoba and 6-8 cents per minute in Saskatchewan. In contrast, Eastern Canada has no such provision with regular voice tariffs costing at least 50 cents per minute. In addition rural phone lines are frequently party lines and the attachment of data terminals to such lines is not permitted. The arrangement Infomart has made with Bell Canada for a special INET rate of 25 cents per minute in dialing area 519 is a move in the right direction but its cost structure will inhibit all but short access sessions by the majority of individual users. The recent breakup of AT & T in the United States is resulting in rate increases for some institutionally provided distance education services which threaten the continuance of these services at least in present form. Since Canada is moving in a similar direction with telecommunications policy, potential applications of Telidon to distance education should examine this dimension carefully and then proceed with caution.

From the instructional applications reported it can be seen that there is potential for Telidon as an effective, user friendly and student accepted system. If the terminal problem and the costs of telecommunication can be resolved within a specific distance education project than our evidence suggests that Telidon is the only presently available practical method of displaying detailed graphic and textual information using a range of colour. It appears to provide intrinsic motivation to students when properly used.

The Guelph trials, unlike the educational television panacea projects of the 1960s, undertook to limit the scope of the application of Telidon to one or two specific aspects of the course. The project team worked with an educational philosophy which sought to emphasize student performance and output rather than teacher input. Most earlier media approaches have concentrated on information input, i.e. the more senses you use the more you can share in. Knowledge of what is expected, student practice and awareness of achievement through feedback on performance seem to the author to be the most fruitful areas for improving student learning. The Keller PSI method and other approaches which emphasize learner responsibility, especially in post secondary and distance education, have demonstrated that such improvement is achievable. These methods, however, are costly in providing intensive and frequent feedback and often result in compromises which reduce the immediacy of the feedback and hence much of its educational power. It is in this era where the Guelph trial concentrated its study of Telidon and where its initial success occurred.

### Conclusion

The potential for Telidon in distance education lies more in the quality of the instructional design decisions than in the technology. This has always been the case with educational media but the novelty of another system can blue one's vision of what comes first, purpose and plan or tool. There are many existing forms in which course content for distance education can be delivered. The test, the audiocassette, printed or film slide illustrations, all can deliver content at a fraction of the cost of Telidon or other computer based systems. What they cannot do as effectively nor as effeciently is provide students at a distance with frequent short tests of learning achievement and immediate feedback. It is in identifying similar limited segments of distance education delivery where Telidon can make a useful contribution.

**NOTE** Based on the difficulty of serving larger numbers of students on campus from a distant database, the University of Guelph and Tayson Information Technolgy have developed a standalone IBM PC based system, VITAL (Videotex Integrated Teaching and Learning System for Education and Training).




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## MEDIA NEWS

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theory. As editor of that journal, Winn is certainly in the position to assess trends in content. Perhaps prospective authors/researchers in the field will answer his call for more papers on the topics of analysis and design, as well as the social aspects of educational technology. Copies of this conference paper may be found in the ERIC document collection as ED 243 440, or ordered from the EDRS (ERIC Document Reproduction Service). Note that EDRS has a new mailing address: 3900 Wheeler Avenue, Alexandria, Virginia 22304. The Association for Educational Communication and Technology (and **ECTJ**) may be contacted at 1126 Sixteenth Street NW, Washington, DC 20036.

## CALL FOR PROPOSALS

A major Secretary of State funded project is soliciting proposals from individuals interested in contributing secondary curriculum materials or research papers on transportation and communication. It is expected that, based upon proposals submitted, persons selected to contribute will include teachers, college instructors, university level researchers, and other writers and researchers.

Materials to be developed will discuss the social, political, cultural, and/or economic aspects of transportation, resource extraction transportation, broadcasting and new communication technologies. Much, although not all, of the work commissioned is expected to be regionally informed, nationally significant case studies.

Small research grants ($500-1000) will be available to selected individuals. Opportunities will be available for contributors to attend coordination meetings and/or workshops/symposiums in August, 1986, Expo year in Vancouver. The project will publish selected materials in either one of four teacher/learning booklets or a monograph. Selection of contributors will be made in January 1985.

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## ICEM CONFERENCE

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tain, Nigeria, Switzerland and the U.S.A.

The theme of this year's conference was "Educational Technology to Enhance Learning at a Distance". The program for each day consisted of a number of speakers followed by a symposium involving the speakers for that day. All of the program events were plenary session, with simultaneous translation between English and French being provided over headphones. A wide variety of topics was presented along the theme of Distance Education:

Think before you leap: How to reduce problems in Distance Education (Dr. Bill Winn, University of Calgary)

Extending opportunity: Telidon technology in Vocational Education (Amelia Turnbull, Alberta Correspondence School)

Educational Teleconferencing (Dr. G. Barry Ellis, University of Calgary)

Educational Technology to enhance learning at a distance: a systematic approach (Dr. Ron J. McBeath, San Jose State University)

New Realities in Educational Communications (Peter L. Senchuk, ACCESS Alberta)

Clearinghouse for Computer Software (Dr. S. Jim Thiessen, General Systems Research Ltd., Edmonton)

Technology in Distance Education: Improving Man's humanity to Man (Dr. John S. Daniel, Laurentian University)

By Making too many technological turns, one ends up going around in circles (Andre Hebert, University of Quebec)

The TV Ontario Academy on Computers in Education - a Canadian distance-learning system: Bits and Bytes (Don Robertson, TV Ontario)

Distance Education: the Nigerian experience (Francis Z. Gana, Ministry of Education, Lagos)

Format: Canada's National audiovisual information system (Donald Bidd, National Film Board, Montreal)

Satellite Communications: Past Present and Future. (W. Terry Kerr, Department of Communications, Ottawa)

Telidon: its use in Distance Education (Dr. Robert A. Abell, Alphatel Systems, Edmonton)

Among the many AMTEC members attending the 1984 ICEM conference were president Bill Hanson, immediate past-president Barry Brown and president-elect Ed Crisp. President Bill addressed the session on the morning of the second day of the conference, bringing greetings on behalf of AMTEC and describing its function to the interested delegates.

The chairman of the ICEM 1984 Conference was Hans Kratz of Alberta Education. (Many will remember him as chairman of the highly successful AMTEC Conference held in Edmonton in 1979.) Hans took care of every detail including the weather, which was perfect. After this experience let us hope that the Council decides to meet again in Canada before too long. ICEM was founded in 1950 under the name of International Council for Education Films; the name was changed in 1966 to International Council for the Advancement of Audiovisual Media, and in 1980 to International Council for Educational Media. ICEM enjoys Consultative Status, type A, from UNESCO, through the International Film and Television Council, and maintains a secretariat in Paris, France. □

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